

The Sustainable Bathroom

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Introduction to more sustainable bathrooms

Bathrooms make up a significant proportion of a hotel's total water and energy consumption. According to the American Water Works Association, for example, a US hotel's average water consumption is between 382 to 787 litres (84 to 173 UK gallons) per room per day, significantly more than the average US household daily use of 315 litres (69 gallons) a day.

It might help to explain why bathrooms have become a major focus for hoteliers looking not only to reduce costs but also to minimise their environmental impact. Belinda Try, executive director of bathroom designer Apaiser, says: "Bathrooms are emerging as a core opportunity for designers, developers and builders to create a more eco-aware environment."

However, environmental concerns need to be balanced with the needs of guests. Debra Patterson, environmental ambassador at London's The Savoy hotel, says that careful design, including bathroom design, was at the core of the property's recent £200m refurbishment programme. The aim was to provide the exclusive facilities guests would expect while "seamlessly blending sustainability and luxury without compromising the product for our guests" (see Spotlight for Scarlet Hotel).

Environment considerations go beyond the bathroom space itself. Michael Levie, co-founder and chief operating officer of citizenM Hotels, explains: "The materials used in the bathroom dictate the most about its environmental performance but operators should above all also keep in mind transportation required for the materials used in building it, the waste generated during construction and its subsequent biodegradable component."

Which materials should I use?

The environmental impact of construction materials is huge (in fact, second only to food). In the UK, for example, WRAP, an organisation that promotes waste reduction and recycling, cites the following statistics on the annual impact of construction materials in the UK:

- 19% of the total national ecological footprint;
- 23% of the total national greenhouse gas emissions;
- 420m tonnes of material consumption (7 tonnes per person); and
- 30% of all road freight on UK roads.

So, the growing demand for reclaimed materials – those taken from another project and reused as they are – and recycled materials – those reconfigured to create new products, such as reclaimed marble, is welcome. As well as diverting waste from landfill, the reclamation and reuse of building materials removes the need to extract raw materials and saves on manufacturing and processing, which reduces energy consumption and additional impacts, such as transportation.

According to WRAP's 2008 Reclaimed Building Products Guide, "substitution of a few well chosen, locally sourced reclaimed materials can reduce the environmental impact and the embodied carbon of a project significantly." Comparing the impacts of reclaimed and new materials, WRAP found a reduction of 96% for reclaimed steel and 79% for reclaimed timber.

While there may be cost savings to using recycled or reclaimed products, it isn't guaranteed. For the reclaimed products covered in the WRAP guide mentioned above (including bricks, stone and internal and fit-outs), the cost comparison with new product ranges varied from 80% savings to 200% cost premiums.

See http://rcproducts.wrap.org.uk/construction/reclaimed_building.html

As well as reclaimed and recycled materials, natural materials, such as timber from sustainable forests (eg those certified by the Forestry Stewardship Council [FSC]) and stone, are good "green" options as are non-chemically derived materials and those products that consume low amounts of energy in their production.

Belinda Try of Apaiser says that the production of acrylic and pressed steel baths, for example, have a high carbon footprint and generate "environmental issues that are disguised in the finished product", such as the consumption of large amounts of non-renewable resources and energy for extraction, production and transportation.

For sustainable materials in their most utopian form, you need to look at those made on the principles of the "cradle-to-cradle" (C2C) concept. This follows the example of nature where there is no such thing as waste. In its simplest form, cradle-to-cradle materials employ sustainable production, operation and reuse practices with social responsibility incorporated into product development.

Some products created according to these principles, from flooring to glass and cleaning products, now carry the Cradle to Cradle trademark (C2C) – see <http://c2c.mbdc.com/c2c/list.php?order=type>. They are evaluated for manufacturing processes, material properties and toxic ingredients, and their reuse potential through recycling and composting.

Materials to choose:

- Natural products, such as stone, sustainably sourced timber, cork and 100% natural rubber;
- Those containing low levels of binding agents and constituents, such as glass.
- Recycled content tiles, including those made of recycled glass;
- Reclaimed or recycled marble, granite, rubber or ceramic – reused or remade from waste or by-products and bound with small amounts of resin and polymers;
- Materials containing resins (e.g. in stone composites) that help retain heat in water longer than conventional bath ware reducing water and energy consumption;
- Salvaged brass, aluminium and other alloys;
- Recycled glass for washbasins or shower doors;
- Certified sustainable timber, and bamboo or wheat board for bathroom furniture;
- Recycled or reclaimed material for shower curtains, such as fabric cuttings, sailcloth, recycled plastic or polyester.

Always check the eco-properties of the finishes of the above products.

The Scarlet Hotel, England

The multi-award-winning luxury 37-room eco-hotel in Mawgan Porth, Cornwall, England, employs a number of different environmental initiatives to ensure its bathrooms are as environmentally friendly as possible: Recycled grey water – the waste water from showers and baths – is treated and then used to flush toilets. Aerators have been installed on all taps and showerheads to reduce water consumption while still maintaining good pressure. All toilets are dual flush and the cisterns are smaller capacity requiring

less water. Urinals work on a sensor, only flushing after use rather than on a continuous cycle, and taps have been fitted with sensors to ensure they are not left on unnecessarily.

Guide to green amenities

Paul Connelly, head of purchasing at Beacon Purchasing, advises: “When choosing guest amenities, hoteliers should consider which aspects of sustainability are most important for the hotel and for guests – use of natural ingredients, reduction of waste, recyclable packaging, CSR credentials of the supplier, cruelty-free production, etc. – and assess their supply options accordingly.”

There is a huge choice of eco-amenities on the market. Here are some tips to choosing the right ones:

- Opt for toiletries containing natural ingredients and organic extracts, and packaged in biodegradable or recyclable material.
- Bulk pump dispensers save money and resources by reducing waste to landfill, but consider batch traceability and how this can be managed through controlled stock rotation.
- Paper bottles and packaging can provide as much as a 92% reduction in waste by volume when compared with hard plastic bottles.
- Bottles made from polyethylene terephthalate (PET), which are recyclable.
- Toilet paper and paper products made from unbleached or bleached but chlorine-free processes, using recycled materials, and biodegradable. Paper dispensers, rather than traditional toilet rolls, can reduce consumption and save money.

How to reduce water consumption

Taps, toilets and showers alone contribute about 30%-40% of a typical hotel’s water usage (Still AWAITING SOURCE), so it is a key area where hoteliers want to reduce consumption both to save money and improve sustainability. Follow these steps:

- Check that basin and bath/shower taps do not leak – according to Waterwise, a leaking tap wastes at least 5,500 litres of water annually – and replace faulty fittings or washers as required.
- When refurbishing guest bathrooms, fit water-efficient low-flow showerheads and aerator taps as these can reduce costs as well as water consumption. InterContinental Hotels Group’s Holiday Inn in Flinders, Australia, recouped its AUD \$22,000 (USD \$19,500) investment in low-flow technology after 18 months and cut water usage by 50%.
- Opportunities for grey-water harvesting should also be explored, from reusing sink, shower and bath water in kitchen waste disposal units and other back-of-house facilities, to new guest toilet units that combine a toilet and sink (e.g. from Roca), which include a self-contained grey water recycling component directly linking the used sink water with the water in the toilet flush.

Saving ways

Toilets Install a water-saving device in each toilet cistern to reduce water usage during each flush. The Hippo, for instance, is a simple polyethylene open-ended box gadget, which when placed in the cistern claims to save up to three litres of water for every flush.

Baths

Some new styles have lower overflow holes than traditional baths, which means baths are filled to a lower level so saving on water.

Showers

Install electric showers, instant heat showers and flow regulators, which monitor the water flow and signal to guests when their shower time is up. Paul Priestman, a director at design company Priestmangoode, created the Waterpebble water-saving gadget after seeing the sign “Please Use Water Springly” in a hotel. The device is attached to the plughole and can be pre-set to a default time (3

minutes 50 seconds) or to a particular hotel's requirement. By monitoring the water flow, it indicates via traffic light-like LEDs (red for time up) when the guest could, if they like, finish the shower.

Taps

Use water-efficient, aerated taps and showerheads that retain water pressure but use less water around 4 litre/min (0.9 gallons) compared to 6½ litre/min (1.4 gallons), and sensor-controlled taps.

Urinals

Opt for waterless or controlled flush rather than continual flush.

Towels

Communicate re-use programmes to guests and staff.

The Savoy Hotel, London, England

During recent refurbishment of The Savoy, part of Fairmont Hotels & Resorts, each room was designed using the latest technology to ensure that the guest experience was enhanced while the hotel's carbon footprint was reduced. Each bathroom has motion sensors that control the temperature and lighting (low energy) and natural air-ventilation systems. All toilets have dual-flush options. While the rain showerheads could be considered an extravagant luxury, the overall environmental impact is reduced by pre-heating the domestic hot water from the kitchen refrigeration system.

How to reduce energy consumption in the bathroom

With the large choice of low-energy products on the market, it has become significantly easier to reduce energy consumption in bathrooms. When researching such products, it is also important to look out for those with recyclable end-of-life parts.

Energy-saving features

- Temperature controls on taps;
- Insulated piping;
- Solar panels to heat bath water;
- Hand driers that dry hands in super quick time, reducing energy consumed.
- Energy-efficient hair driers;
- Sensor-controlled fixtures (e.g. on taps);
- Low-energy extractor fans;
- Digital shower systems with timer settings; and
- Low-energy LED lighting and light-reflecting paint to enable lower wattage lightbulbs to be used.



How to ensure your cleaning products are green

While necessary for maintaining hygienic conditions, some cleaning products can present health and environmental concerns because they contain chemicals associated with eye, skin or respiratory irritation. In addition, many commercial cleaning products are classified as hazardous, creating potential handling, storage and disposal issues.

Shaun Chatterton, CEO of Green Planet Solutions, says: “Reducing human health and environmental concerns should be the paramount consideration when making purchasing decisions for cleaning and hygiene products.” He advises avoiding products with phosphates, petroleum and chlorine.

**REDUCING ENVIRONMENTAL AND HUMAN HEALTH CONCERNS SHOULD BE THE
PARAMOUNT CONSIDERATION
SHAUN CHATTERTON, CEO, GREEN PLANET SOLUTIONS**

See the guidance below on purchasing cleaning products plus other good bathroom practice:

DO	DON'T
<p>Buy eco-friendly products – look at the green “credentials” of your suppliers.</p> <p>Check the contents of your products; use plant-based/chemical-free, bio-degradable and biocompatible products.</p> <p>Only replace waste paper bin liners when soiled.</p> <p>Install fast dry hand driers in washrooms and bathrooms.</p> <p>Check that product containers are environmentally friendly, too.</p> <p>Use a supplier with knowledgeable sales people and who understands your environmental concerns.</p>	<p>Use disposable products, such as paper towels (try washable, microfibre products instead).</p> <p>Duplicate cleaning products – an eco-friendly antibacterial cleaner will work in the bathroom and the kitchen.</p> <p>Think that green products are less effective than old-fashioned chemical ones – they can be just as good.</p> <p>Forget to read the small print on products.</p>

Source: Green Planet Solutions

Changing staff behaviour and guest buy-in

Staff training

When a hotel has established its sustainable practices, it should ensure staff know about and understand the impact of good bathroom management on the overall sustainable performance of the hotel.

Whitbread, for example, has developed a list of 10 tips for its housekeeping department. Following training, these tips are provided on a laminated credit card, which can be kept on housekeepers’ keys.

10 energy-saving bathroom tips for staff

1. Don’t expect staff to understand why “green is better” without training and education.
2. Make the most of natural daylight and keep curtains and blinds open rather than switching on lights.
3. Save water and only flush the toilet once during room cleaning.
4. Ensure environmental towels signs are displayed in every bathroom.

5. Use recycling facilities for disposal of glass, paper, cardboard, oil, etc.
6. Only operate washing machines with full loads and where possible use 30°C laundry programme.
7. Report any maintenance issues, such as dripping taps or running toilets, as soon as possible.
8. Be aware of current energy consumption for your site and target areas to focus on each month.
9. Ensure staff use only the recommended amounts of cleaning products.
10. Train staff in how to use cleaning products economically, and keep reminding them.

Source: Whitbread & Beacon Purchasing



How to achieve guest buy-in

While guests are clearly the main contributors to energy and water use in bathrooms, hoteliers need to avoid “telling” guests how to behave, warns Ed Gillespie, co-founder of Futerra Sustainability Communications. There are, he says, three key factors that can help encourage guests to change their behaviour:

1. personal habits;
2. social proof; and
3. infrastructure.

“Hoteliers need to look for clever and creative ways to encourage or reinforce a new habit or behaviour,” explains Gillespie. “You can be as creative as you like with this, but it’s about creating a salience and awareness of the opportunities, as well as explaining to the guest what you are doing so the process becomes something collective that they become part of,” he says. Introduce the following measures:

- Give feedback of the hotel’s achievements and detail progress that’s been made over time.
- Encourage guests to feel they are active participants in improving the footprint of the hotel by detailing the part guests have played in the process.
- Put a timer in the shower; you don’t have to tell guests to use it, but if it’s there, they may well try it out of sheer curiosity.
- Instead of having a generic card requesting guests to reuse towels, personalise the message. Provide guests with social proof that they are doing the right thing. For example, have a note saying most guests who stay in this room use one towel for the duration of their stay.

IHG towel reuse programme

It’s easy to be dismissive about towel re-use programmes on the basis that they are old hat, but they can make play a significant role in reducing a hotel’s water consumption. InterContinental Hotels Group

(IHG) has developed Innovation Hotel, which showcases its sustainable ideas. One programme, which encourages guests to “put your towel on the rack” to use another day, has proved an extremely effective way of reducing water and energy use. The scheme, which includes training staff to understand the towel and sheet reuse programme, saves more than 199 million litres (44 million gallons) of water a year in the US alone.

The future

Many hotel groups have developed “modular” construction methods where individual pods are assembled then transported to the site to make up larger structures. The pods not only provide fast delivery, low-cost reconfiguration and flexibility but, because they are factory-constructed, they can also offer consistent delivery of built-in green design. This can include everything from the use of environmentally friendly building products to energy-saving technologies. Michael Levie of citizenM says: “We have several large pieces that assemble a bathroom and are able to obtain all sustainable advantages but we don’t have a total pre-build bathroom unit going in as yet because we believe the aesthetics and functionality suffers too much.”

Intelligent technology is a growing trend. New designs in flush mechanisms mean they require less water and less cleaning. Akira Watai, general manager of bathroom fixtures manufacturer TOTO, explains: “Water is used in a whole new way. Rather than flushing straight down into the bowl, three high-pressure water jets create a whirlpool, like a tornado, removing dirt and grime. This function not only ensures maximum hygiene, but is also exceptionally quiet and saves water, as one flush is often enough.” This system uses 6 litres (1.3 gallons) for a normal flush and 3 litres (0.6 gallons) for a light flush (compared with approximately 13 litres (2.8 gallons) for the normal flush a decade ago).

New developments

- Flow regulators and water-efficient taps. For example, CeraMix Blue taps reach the desired temperature quicker, thereby saving water.
- Waterless urinals.
- Shower gadgets, such as Waterpebble.
- Grey water recycling, such as Hansgrohe’s AquaCycle from Pontos, which treats through biomechanical SmartClean technology (a UV-light sterilisation process that kills germs and bacteria).
- “Intelligent” drains (such as those from Roca), which show users how much water has been used, and all-in-one toilet-and-wash basin, which uses grey water direct from the sink. Roca’s sink/toilet system with self-contained greywater system claims to reduce water consumption by up to 25% compared to a dual-flush toilet.
- Antibacterial solutions and products using photocatalytic reaction (acceleration by the presence of a catalyst) to help speed up the breakdown of pollution agents. When the photocatalytic coating (most commonly titanium oxide) is exposed to light, it breaks down organic substances such as bacteria and fungus through an activated oxygen process (see products such as TOTO’s Hydrotect Coatings and The Supply Solutions’ antibacterial tiles).
- 100% sustainable packaging materials that are fully compostable are likely to challenge traditional oil-based plastics in the near future and significantly reduce environmental impact. For example, LATHER, a US-based hotel amenities company, offers its products in biodegradable plastic packaging made with an additive called EcoPure. It accelerates the biodegradation process (one to 20 years rather than hundreds of thousands of years); the treated plastic is also recyclable.

NH Hoteles

NH Hoteles’ Green Rooms initiative uses five key drivers to reduce the environmental impact of its bathrooms. New dispensers of toilet paper and paper towels have been installed to achieve a significant reduction in the amount used. Traditional taps have been replaced with aerators in 77% of hotels and 85% of showers, while dual-flush devices have been installed in 79% of hotels. Its “Agua de la Tierra” range of amenities are packaged in containers made of biodegradable plastic; it contains an additive called polyolefin that breaks down much quicker than normal plastic (between two and seven years). The toilets

operate using a flushing system fed from collected rain and shower water, requiring 25% less water than a traditional model. These initiatives, combined with water-saving systems for basins and showers, have seen in-room water consumption fall by 40%.

Acknowledgement

Apaiser

www.apaiser.com.au

International Review of Tourism and Water Use, March 2011 by Stefan Gössling & others

http://canterbury-nz.academia.edu/CMichaelHall/Papers/535883/Tourism_and_water_use_Supply_demand_and_security_-_An_international_review

Aslotel

www.aslotel.co.uk

Beacon Purchasing

www.beacongreenhotel.co.uk

citizenM

www.citizenm.com

Fairmont Hotels & Resorts, The Savoy

www.fairmont.com/Savoy

Futerra Communications

www.futerra.co.uk

Green Planet Solutions

<http://greenplanetsolutions.co.uk>

InterContinental Hotels Group (IHG)

<http://innovation.ihgplc.com>

NH Hoteles

<http://corporate-information.nh-hotels.com/wda/eng>

Scarlet Hotel

www.scarlethotel.co.uk/environment.asp

Whitbread

<http://cr.whitbread.co.uk>

Resources and Further Information

CeraMix Blue

www.ideal-standard.co.uk/ceramix-blue/washbasin-mixer-tap-taps-a5648aa.aspx

Cradle to Cradle Certification

www.mbdc.com

Hansgrohe AquaCycle

www.hansgrohe-int.com/1187.htm

Hippo: The Water Saver
www.hippo-the-watersaver.co.uk

iGreenBuild.com
www.igreenbuild.com

Lather Hotel
<http://latherhotel.com>

Roca Intel Drains
www.roca.nationwide-bathrooms.co.uk

TOTO
www.totousa.com/Products/Toilets.aspx

Waterpebble
www.waterpebble.com

WRAP
www.wrap.org.uk/construction