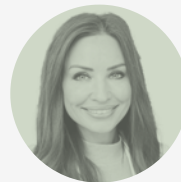
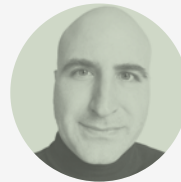


HYB25

Sustainability Tech Edition

Unlocking Smart & Sustainable Tech
Solutions for Hospitality



The Hotel Yearbook

Foresight and innovation in the global hotel industry

HY8



Smart technology and behaviour change for water conservation in hotels

Water Conservation

Xavier Font

Professor of Sustainability Marketing, University of Surrey

Pablo Pereira-Doel

*Director of Undergraduate Hospitality Programmes, Surrey Business School,
University of Surrey*



Water scarcity is a growing challenge, particularly in tourism hotspots where guests consume far more water than residents. While technology—such as smart shower timers and leak detectors—can help, its effectiveness depends on guest behavior. Our study, conducted across hotels in Denmark, Spain, and the UK, tested real-time eco-feedback devices in showers and found they reduced water use by 25.79%, saving an average of 10 litres per shower. Guests responded best to selfless, high-effort messaging, demonstrating that combining technology with behavioral science can drive meaningful conservation. As water becomes an increasingly critical resource, hotels must embrace smart solutions that balance sustainability with guest experience.

WATER SUSTAINABILITY IN HOSPITALITY

Water scarcity is a pressing global challenge, with over a third of the world's population living in high water-stressed areas and forecasts indicating worsening conditions. Many of these regions are popular tourism destinations, aggravating the situation as tourists use significantly more water than residents. For instance, while individuals at home use around 120-170 litres per person/day, a tourist use up to 350 litres. Water conservation in hospitality is not only about sustainability; it is essential for business resilience. Hotels rely on water for various operations, from guest rooms and swimming pools to landscaping and food production. Water shortages can disrupt operations and damage reputation. Hotels, as major water users, face increasing pressure to implement sustainable practices that balance guest experience with environmental accountability.

While technology offers valuable solutions for water conservation, it is not always a panacea. Showerheads, leak detectors, smart timers, greywater recycling mechanisms, and water-efficient appliances can significantly reduce water consumption, but their impact will be limited -or insufficient- if guests and staff do not adapt their behaviour. To optimise the benefits of technology innovation, a human-centred approach needs to be always present. This means that we need to understand people, specifically how they interact with water and why or why not. Behavioural science-based approaches can offer these answers.

TECHNOLOGY-ASSISTED BEHAVIOURAL CHANGE INTERVENTION

Showers constitute one of the most water and energy-intensive behaviours at home and in tourist accommodations, making them a prime target for conservation efforts. Research shows that showering accounts for a substantial proportion of in-room water use, with reductions largely depending on guest behaviour and hotel infrastructure, such as showerheads, water pressure and flow, the use of timers, and so on.

One such solution is the use of continuous real-time eco-feedback technology in shower cubicles through a smart device that detects when a shower is taking place and provides immediate information to guests in form of a timer, capturing their attention and influencing their behaviour. Importantly, guests' freedom remains unrestricted.

To evaluate the impact of real-time eco-feedback technology, we conducted a covert experiment across six tourist accommodations in Denmark, Spain, and the UK. [The study](#), published in the *Journal of Travel Research*, involved deploying over 100 smart shower devices to test their effectiveness in reducing shower duration, and consequently, water and energy consumption as well as emissions from heating the water. The smart device also recorded key data, such as the date and time of each shower, its duration, and the number of water pauses. Participants were real hotel guests who were unaware of the study, allowing their natural behaviour to be anonymously captured.

The experiment collected data from over 17,500 shower events and found that guests who received real-time eco-feedback reduced their water runtime by 25.79%, either through shorter showers or water pauses for lathering. This translates to an average reduction of 77 seconds per shower, saving approximately 10 litres of water per shower at a standard flow rate, along with the associated energy and carbon emissions. This significant reduction stresses the potential of real-time eco-feedback technology to drive sustainable behaviour even in hedonic settings like hotels.

HOW BEHAVIOURAL SCIENCE CAN ENHANCE OR LIMIT TECH INTERVENTIONS

Beyond technology, behavioural insights play a crucial role in optimising -or even reducing- conservation efforts. The study also explored the impact of persuasive messaging combined with the real-time eco-feedback. Different messages were tested, contrasting selfless (environmental responsibility) and selfish (personal benefit) motivations, as well as varying the levels of effort required to comply. For example, one message framed the challenge as *a typical shower here has water running for 4:50 mins, will you beat the clock?* while another message *a typical shower here has water running for 3:30 mins, will you beat the clock?*

The findings revealed that messages priming selfless motivation and setting a high-effort goal (3:30 mins target) were the most effective across accommodations. Participants, real hotel guests, were more motivated to shorten their showers for environmental purposes than for personal benefits. This suggests that hotel guests are more likely to engage in pro-environmental behaviour when their actions align with broader social values and when a clear, measurable goal is presented. Ultimately, we all want to feel good about ourselves.

INDUSTRY IMPLICATIONS

The study demonstrated that guests are ready to conserve water when hoteliers make it easier for them to do so. The implications for the hospitality industry are profound. Water conservation is not only an environmental necessity, especially in many coastal and island tourism destinations, but also a financial and regulatory priority.

Hotels implementing real-time eco-feedback and behavioural nudges can:

1. **Reduce operational costs** – Lower water and energy consumption directly decreases utility bills.
2. **Enhance ESG performance** – Sustainability metrics are increasingly scrutinised by investors, regulators, and travellers.
3. **Improve guest experience** – Many travellers prefer hotels with visible sustainability initiatives that allow them to contribute to conservation efforts. Guests want to do good.
4. **Comply with future regulations** – As governments introduce stricter water conservation policies, proactive hotels will be better positioned to adapt.

ACTIONABLE INSIGHTS FOR HOTELS

Hotels seeking to integrate real-time eco-feedback technology into their sustainability strategies should consider the following steps:

1. **Install real-time water eco-feedback devices** in guest showers to increase awareness and trigger guests' conservation behaviour.
2. **Leverage persuasive messaging** by aligning them with guests' values and behavioural tendencies. The message is important, it can facilitate or impede behaviour.
3. **Experiment with goal-setting techniques** to identify the most effective reduction targets.
4. **Integrate water conservation data into sustainability reporting** to strengthen ESG transparency and compliance.
5. **Train staff to communicate sustainability efforts** and encourage guest participation in conservation initiatives.

CONCLUSION

As the hospitality industry moves toward greater sustainability, real-time eco-feedback technology represents a cost-effective, scalable, and high-impact solution for water conservation. This study provided robust empirical evidence that real-time eco-feedback technology, when combined with the right behavioural insight, can significantly reduce water consumption in hotels.





Looking to find out more?

Visit the Hospitality Net World Panel

In the **Sustainability in Hospitality** World Panel, over 90 industry experts share their insights, solutions, and strategies to help the industry navigate growing environmental and societal challenges.

Sustainability Gives Hotels An Edge In The War For Talent. Or Does It?

How can sustainability be communicated beyond clichés and greenwashing?

Hotel Sustainability: Top 3 Technologies to Implement in 2020

Who makes hospitality sustainability happen: Governments, Industry, Consumers?

Climate Emergency And The Hospitality Industry: Are We On Track?



www.hospitalitynet.org/panel