**Challenge**
- Many energy conservation interventions use a financial incentive. This is not relevant in cases where others pay the bill, such as energy use at work, in hotels and in residential rentals with all-inclusive utilities.
- Innovations that provide feedback on energy and water consumption are a promising intervention to target energy and water conservation in scenarios where others pay the bill.

**Research questions**
- How can we motivate people who don’t pay water and energy bills to use less water and energy without the use of financial incentives?
- How is the water usage of these users affected by intervention with a technological innovation that offers real-time feedback on water usage?

**Innovation**
- The Amphiro device is installed in showers; provides real-time feedback on water temperature and volume of water used (in L) or energy consumption (in kWh).
- An image of a polar bear on ice is displayed; the iceberg melts as more energy/water is consumed.
- Bluetooth used to transfer data collected by the devices.

**Experiment**
- Amphiro devices and measurement equipment were installed in 256 rooms at TSH Rotterdam and Den Haag.
- Measurement equipment recorded, at 10-15 minute intervals, data on water usage and energy consumption in the room.
- Study was conducted in three stages: 1. Pre-intervention (baseline data) 2. Intervention 3. Post-intervention (one month after device use).

**Results and impacts**
- Per room, per year:
  - Water: $-20\% = -3760\text{L}$
  - Energy: $-215\text{kWh}$
  - CO$_2$: $60\text{kg}$
  - €18,49
  - Earn back period 3 years / ROI 33%
  - + awareness guests
  - Long-term behavior change → continued water use $-10\%$, 1 month after removal device

**Conclusions**
This study has:
- Measured the effectiveness of a technological innovation on guest water-saving behavior at TSH.
- Gathered detailed information on individual energy and water use of students and short-term hotel guests at TSH.
- Resulted in new scientific knowledge and practical insights for organizations who want to stimulate savings in cases where users don’t pay for utility bills.
- Demonstrated that interventions that provide real-time feedback about energy and water use are a way to significantly reduce costs, carbon emissions and contribute to the education and behavior of guests.

**Score card**
- Ease of implementation: 
- Impact: 
- Return on investment: 
- Process: 

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**Main partners:**
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- Wageningen University & Research
- BECTRO Installatietechniek
- Amphiro

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