



# The behavioural rebound effect: What is it and why does it matter?

Project A1.3 – Economic  
modelling and analysis

New, more efficient technologies are a great way to save water. For example, a water saving showerhead means a household will use significantly less water for every minute the shower is on. But installing a water efficient showerhead could mean members of the household start showering for longer. Research funded by the CRC for Water Sensitive Cities has provided insights into how and why water saving behaviours may be reduced after households install water saving devices or technologies.

## The rebound effect

Basic economic theory predicts people will reduce their water saving behaviours after installing a more water efficient technology. A more efficient showerhead means that every minute of shower time is now less expensive, so people may tend to shower for longer. Because of this rebound effect, the savings from installing a water saving device that is, say, 50% more efficient, may achieve a reduction of only around 30% once the extra usage is accounted for.<sup>1</sup>

The rebound effect within economics has, to date, been thought of as being entirely financially motivated. New research by the CRC for Water Sensitive Cities also shows a behavioural rebound effect. Put another way, the rebound effect is caused by money savings as well as by other reasons, like considerations of their environmental impact, etc.

## The behavioural rebound effect

Consider the showerhead example again. If a household did not pay for its water (or the energy for water heating), would you expect the duration of their showers to still increase after installing a more efficient showerhead? People save water not just for monetary reasons; they may want to save water to reduce their impact on the environment, or to be a good citizen and not use too much water from dams.

After installing a more efficient showerhead, a household actually will have less motivation to maintain its environmentally beneficial behaviours (such as shorter showers to save water). In a shower with an efficient showerhead, the water saving from shortening your showers is less than in a shower with an inefficient showerhead. Even people who care mainly about saving water for environmental reasons might still increase their shower length. This behavioural rebound effect could apply to a range of examples where a more water efficient technology is installed, depending on how people interact with the technology. For example, evidence from the United States demonstrates a rebound effect from low flow showerheads and more efficient washing machines. Not surprisingly, though, water efficient toilets do not seem to be used more often.<sup>2</sup>



<sup>1</sup>These are hypothetical numbers—the purpose of this research was to establish whether there was a behavioural rebound effect and not to estimate the size.

<sup>2</sup>Olmstead, S. M. (2014). Climate change adaptation and water resource management: A review of the literature. *Energy Economics*, 46, 500–509. <https://doi.org/10.1016/j.eneco.2013.09.005>

## Moral licensing

Moral licensing is a psychological phenomenon that makes the behavioural rebound effect worse. When an individual makes a moral choice, they may give themselves a psychological licence to subsequently make a choice with less moral considerations. In the case of the behavioural rebound effect, the research found that when people choose a more environmentally friendly technology, they reduce their environmental behaviours by more than if they had no choice. For example, if someone bought an efficient showerhead, they will be more likely to increase their showering time than if a landlord installed the showerhead without giving the tenant a choice.<sup>3</sup>

### What can we do about this?

The bad news: This research also tested what might happen if we make it easier to save water (on purely environmental and not financial or other grounds). Do people increase their water saving behaviours? Unfortunately, the results suggest that on average, they will not. If you make it easier to save water, individuals will probably not improve water saving behaviours and instead use their extra time and energy on other things.

The good news: The research showed that the rebound effect is driven by more than just money, but also because people care about the environment and about what they believe to be the social norms. There is much ongoing research into how to nudge people into more water saving and environmentally friendly behaviours, and this research could provide insights into how to offset the behavioural rebound effect. Indeed, the reductions in water use around Australia during and after Millennium drought and/or due to significant price increases have been shown to far exceed the impact of these rebound effects.<sup>4</sup>

## Lessons learnt

When predicting the water savings that can be achieved from a new technology, we need to account for a possible rebound effect that lowers the amount of water saved due to the new technology.

When people choose a water efficient technology, they may engage in moral licensing and reduce their water saving behaviours by even more than they would if they had no choice in whether to adopt the technology or not.

We need to think more deeply about the balance between investing in water efficient technologies and encouraging water sensitive behaviours. These two ways of reducing water consumption should be considered together. If technologies are invented that make some water saving behaviours obsolete, then we no longer have to invest in encouraging that behaviour. For example, motion sensing taps take away the need to figure out how to stop people leaving taps on in public toilets. If a water saving behaviour still needs to be encouraged, such as taking shorter showers, we need to be aware that efficient showerheads may make encouraging shorter showers more difficult.

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<sup>3</sup>Dorner, Z. (2018). A behavioural rebound effect: results from a laboratory experiment, Monash Business School, Department of Economics Discussion Paper 17/17.

<sup>4</sup>Turner, A., White, S., Chong, J., Dickinson, M. A., Cooley, H., & Donnelly, K. (2016). Managing Drought: Learning from Australia. Retrieved from Alliance for Water Efficiency, the Institute for Sustainable Futures, University of Technology Sydney and the Pacific Institute for the Metropolitan Water District of Southern California, the San Francisco Public Utilities Commission and the Water Research Foundation website: <http://rgdoi.net/10.13140/RG.2.1.1084.0725>

## Further reading

Dorner, Z. (2018). A behavioural rebound effect: results from a laboratory experiment, Monash Business School, Department of Economics Discussion Paper 17/17.

## Further information



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