

# Commercial water use in Auckland

BRANZ research into water use in Auckland's non-residential buildings shows that size and the way the building is used are the biggest factors in determining consumption. Age seems not to matter.

**UNDERSTANDING HOW WATER** is used in non-residential buildings is key to improving the water efficiency in New Zealand's building stock. Buildings that are more water efficient help reduce pressure on water supply systems and enhance business competitiveness.

However, current understanding of water use in non-residential buildings in New Zealand is very limited.

## BEES focus on non-residential

The BRANZ Building Energy End-use Study (BEES) includes research to establish where and how water is used in non-residential buildings and what factors drive its use. BEES is a 6-year research programme that commenced in 2007 to survey and monitor non-residential buildings. As part of this, BEES recently completed a study on water use in Auckland's non-residential buildings.

## Building an Auckland baseline

BEES is developing a baseline of water use to gain a deeper understanding of use in this varied category of buildings.

A baseline forms an important starting point for building owners and users to do better, as it enables comparison of a building's performance to the typical performance of other non-residential buildings with similar use.

The baseline has been built from a dataset of 5,725 BEES properties. This has been created by linking 2 years (2009-11) of water-use data from Auckland's regional water service provider, Watercare Services Ltd, with buildings in the BEES sample frame. The dataset represents 51% of all non-residential BEES buildings in the Auckland region.

## Design can improve office and retail water use

Quotable Value (QV) use categories have been used to group buildings for analysis by their use. The focus for BEES was on water use in office and retail buildings, as water use in these building types can be reduced by good building design and utilising water-efficient appliances.

There are some non-residential buildings that contain industrial water using processes that tend to be unrelated to building design. Therefore, separating industrial water use from building-driven water use was important when creating the baseline.

## Use and size are factors

The non-residential buildings stock is diverse, with respect to size, age, building utilisation and design. Some buildings combine several very different building use functions. This study explored

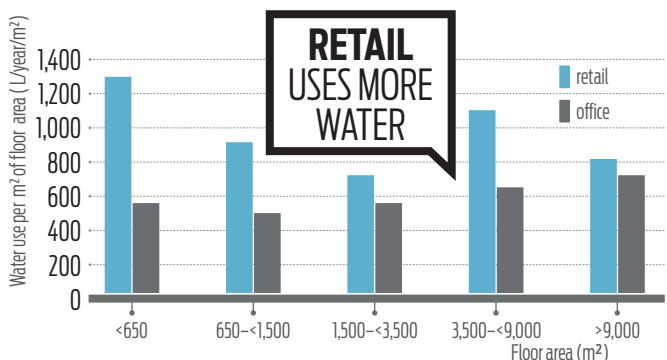


Figure 1: Mean of annual water use per m² floor area for non-residential buildings.

the influence of size, age and building utilisation on water use using the structure developed in other research components of BEES.

It was found that building use and size are most significant in explaining differences in water use. Age does not seem to be an important factor.

Office buildings appear to be reasonably similar with respect to how they use water.

For retail buildings, a further breakdown by user profile was needed. However, large variances in water use were still found between retail buildings of a similar size, age and use.

### Key findings

Annual rate of water use per unit floor area of a building is shown in Figures 1 and 2. Findings include:

- in general, office buildings tend to use less water than retail buildings.
- smaller office buildings generally use less water than larger office buildings.
- smaller retail buildings appear to use more water than larger retail buildings, with the exception of 3,500-9,000 m<sup>2</sup> buildings. The reason for this is not yet known.

Based on the 5,725 properties for which we have water data in BEES, the annual water demand for non-residential buildings in the Auckland region is estimated at 8.6 million m<sup>3</sup>.

### Small number are big consumers

The water demand of non-residential buildings appears to be dominated by a relatively small number of buildings with very large water consumption.

Water-use in non-residential buildings was found to vary over a large range. The largest water user used 100,000 times more than the smallest water user and 2% used no water at all.

The analysis of this data provides a framework for developing benchmarks to guide water-efficiency improvements in non-residential buildings in New Zealand. ◀

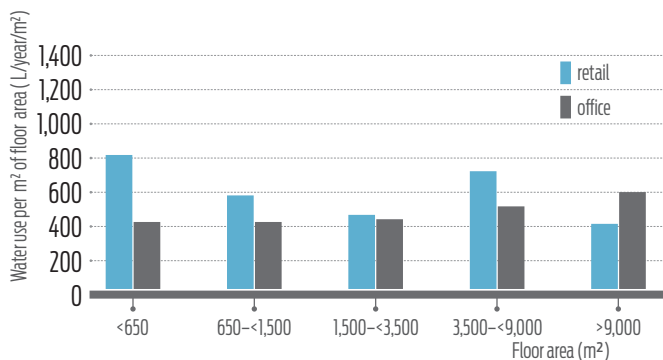


Figure 2: Median of annual water use per m<sup>2</sup> floor area for non-residential buildings.