

Verified energy efficiency improvements at the Reserve Bank of New Zealand

Rob Bishop
Technical Director
Energy Solutions Ltd.
Wellington

In 1999, Chris Ward, Facilities Manager for the Reserve Bank, received a Diploma in Energy Management at the Central Institute of Technology (course and institution since disbanded). His project was increasing the energy efficiency of his building, and for the next ten years, he did that very successfully.

He faithfully recorded the energy use of his building, diagnosed problems, and via new fitouts of floors, lighting upgrades etc. drove the usage of his building down by about 20%.

In 2007, he contracted a professional energy audit to investigate whether there were any other potential savings available, especially as the chillers were nearing the end of their life and needed replacement, and possible up-sizing to meet the increasing loads.

Energy Solutions reported that there was significant savings for improvements to the existing HVAC system's operation (i.e. no capital cost improvements), and offered a guaranteed savings contract to implement and verify these improvements (and refund fees if the savings were not achieved).

The first phase, 2008-09 saw the temperature setpoints shifted, minimum outside air amounts reduced, and water-heating schedule changed. These relatively simple changes resulted in a 22% reduction in building energy use, while improving the comfort in the building to the best ever recorded. Verified energy savings were \$60,000/yr, at a cost of \$60,000. Energy use per square metre is now about 40% below the Property Council benchmark. Carbon emissions were reduced by 224 t/y of CO₂.

In 2009-10, the monitoring and verification continued, and showed that the savings persisted, but that the background load of the building was creeping upward, mostly due to higher occupant and equipment density.

In 2010-2011, a second phase of improvements is about to begin, which is estimated to save another 20%, again at about a one-year payback.

This project documents a range of operational improvements to existing commercial buildings, with a ten-year energy record and savings verified using the IPMVP, which should be replicable in many other buildings.