

Performance monitoring options for houses

Performance monitoring usually entails the installation of some equipment in the area being examined followed by the regular collection of data and its analysis. Monitoring the performance of your house is critical to ensure that all systems are running as they should be. After all, how else can you tell how your house is performing? Although performance monitoring of houses is not yet common, it is a smart way to better understand and manage your most expensive asset.

Why monitor?

The reasons for monitoring your house are diverse and may include to:

- ensure that you are getting value for money from your energy services
- ensure goals for resource use are being met – and if not, why
- check the functioning of systems
- spot maintenance issues quickly and easily
- use as an educational tool to progress knowledge
- plan for the future by tracking progress
- align with benchmarks

or may be just out of curiosity.

What to monitor?

What you monitor will depend on the reasons why you are monitoring. Typically, you might want to measure a combination (or all) of the following: resource use (i.e. electricity, gas and water use), environment parameters (i.e. temperature and relative humidity), waste generation (landfilled, recycled and composted wastes) and occupancy rates. Other factors such as the accuracy required, ease of data collection and analysis, and the purchase of the equipment will also influence what is monitored and how.

Log book – basics in recording

Whatever monitoring you do, you'll want to keep tabs of the results. A log book (just an ordinary exercise book will be fine) will help keep all the information collected in one place and can be used to provide set-up details and notes to make the interpretation of the results in the future easier. Ideally, the log book should be updated weekly with information collected for each issue being examined, as well as house occupancy rates (i.e. average or daily numbers of people in the house).

If you are collecting data through a computer (such as weather station data), you will want to have the log book attached to a USB memory drive for back-up purposes.

Easy and cheap monitoring

Useful and informative monitoring may be carried out on a tight budget – options include:

- dual (indoor-outdoor) temperature sensors (less than \$30 each)
- reading (whole house) energy meters and water meters, weekly or fortnightly
- keeping a log book of times at home (to see what services are provided to how many people)
- a graduated water tank water level if you have a water tank
- recording waste going to landfill by weight (e.g. using bathroom scales)

More involved and pricier monitoring

If you want more sophisticated results, you may want to consider:

- weather stations that have a PC/Mac connection for historic records – these can be purchased for around \$200 from electronics stores or other outlets
- combined temperature and humidity sensors/loggers that record thousands of measurements (at around \$100 each)
- recording waste in more detail, e.g. by type (landfilled, recycled, bio-composted), by weight
- smart energy meters, which provide a better breakdown of all the energy end uses – this is best discussed with your energy company.

Data analysis

Analysing the data periodically is the fun part! Do the figures look sensible, and if not, why? Can you see trends over time? Do these trends seem sensible? How does your house set-up compare to others (e.g. your friends or neighbours). Might the temperature and humidity results explain the occupants' recent health issues?

Depending on why you are doing the monitoring, you may want to compare the performance of your house with national or regional benchmarks to see how your dwelling compares. One of the better benchmarks developed is the Beacon's High Standard of Sustainability www.beaconpathway.co.nz/being-homesmart/article/beacons_hss_high_standard_of_sustainability, which provides a variety of resource, comfort and health metrics.

Things to remember!

- What you are monitoring is a combination of the house and the people inside it. A different set of people in the same house can result in very different resource (energy and water) use and waste generation.
- Spending a bit more at the start in purchasing equipment that is easy to use will save a lot of time.
- Be careful about the placement of temperature sensors/loggers – for example, make sure temperature sensors stay out of the sun so they represent the space being examined and not just how much sun one particular spot gets.

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