Energy Management Strategy

Vision:

Victoria University of Wellington will deliver industry leading energy management practice and energy conservation.

Energy Consumption Targets:

Best practice energy management is more than simply energy conservation, however the key driver of the energy management programme at Victoria is minimise the financial cost and environmental impact of the University through reduced energy consumption.

From a 2015 baseline Victoria will:

- Reduce energy use per square metre by 16 percent to 131 kWh/yr.sq.m by 2025
- Reduce total energy use by 900 MWh/yr to 33.1 GWh/yr by 2025.
- Reduce total carbon emissions from energy by 16 percent to 4,800 tonnes by 2025.

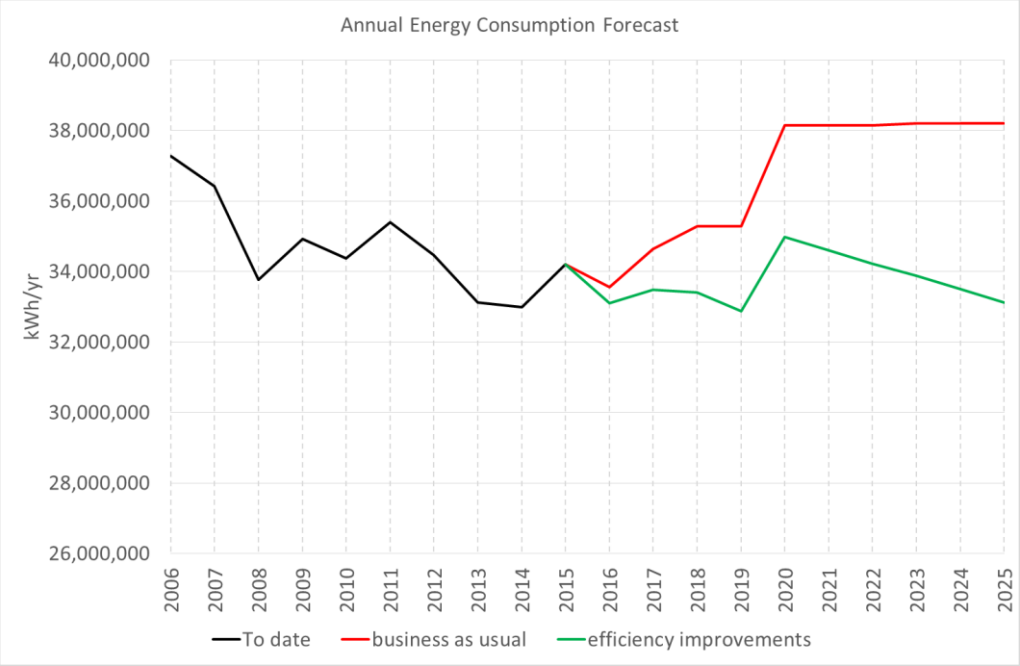

Figure 1: Targeted future energy efficiency improvement

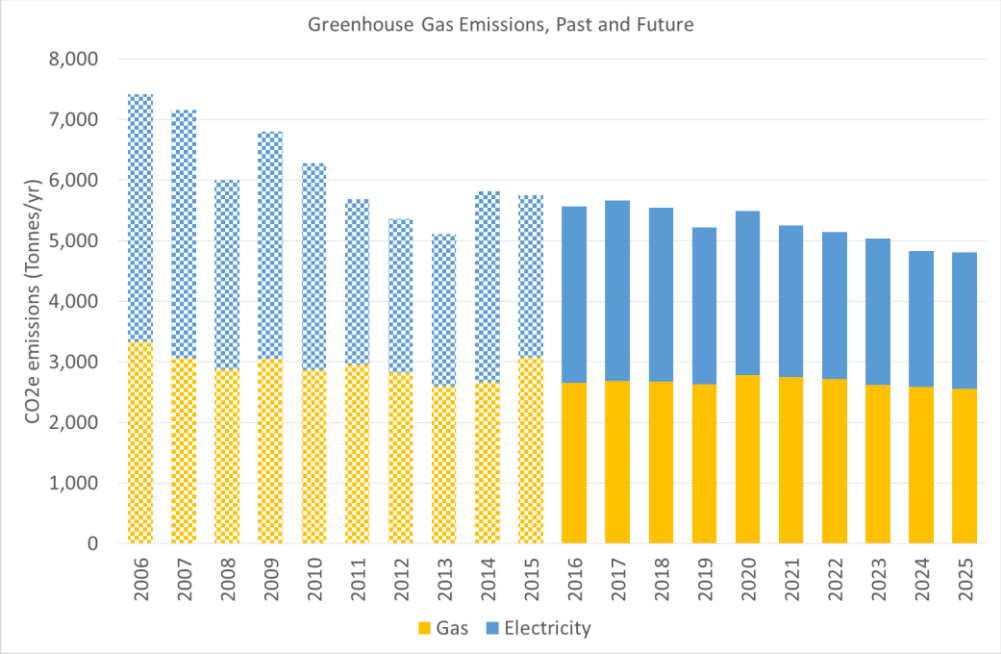

Figure 2: Forecast carbon emissions from electricity and natural gas

Context:

In recent times Victoria has made several significant steps to strengthen its commitment to sustainability. The appointment of the Assistant Vice-Chancellor (Sustainability), the embedding of sustainability in the Strategic Plan and the decision to move out of investments in fossil fuel companies clearly demonstrate that sustainability is a strategic priority for Victoria.

To support this strategic leadership and commitment it is important that Victoria 'walks the talk' by demonstrating that campus facilities are also on a path to sustainability. Energy consumption forms a large part of the University's environmental impact and maximising energy efficiency is central to improving sustainability performance.

In 2015 the University (excluding accommodation) spent over $3 million on electricity and natural gas and generated 5,752 tonnes of greenhouse gas emissions (CO_2e) – which accounted for 47 percent of the total carbon footprint. Thus energy management is important for both the environmental and financial sustainability of the University.

Scope:

For the purposes of this document Energy Management is limited to energy used to service the University's buildings (both owned and leased). This includes electricity, natural gas and a negligible amount of diesel used by the generators. It does not include air travel, fuel used by vehicles or bottled gases used by laboratories.

Student accommodation facilities have historically operated with varying degrees of autonomy from the University. They manage their own energy demands and hold their own budgets for utilities. As such, Facilities Management has had limited involvement in energy management of the accommodation portfolio and has been excluded from the data analysed in this document. As part of this strategy, it is intended that the energy management processes of student accommodation become more integrated with the rest of the University.

Background:

In 2006 ten year targets for energy consumption were set. At that time the historical trends in energy use were analysed and the known campus development plans were considered in formulating the targets as well as forecasting what the 'business as usual' case would be if no energy management was performed. The progress towards these targets are shown in the following graphs.

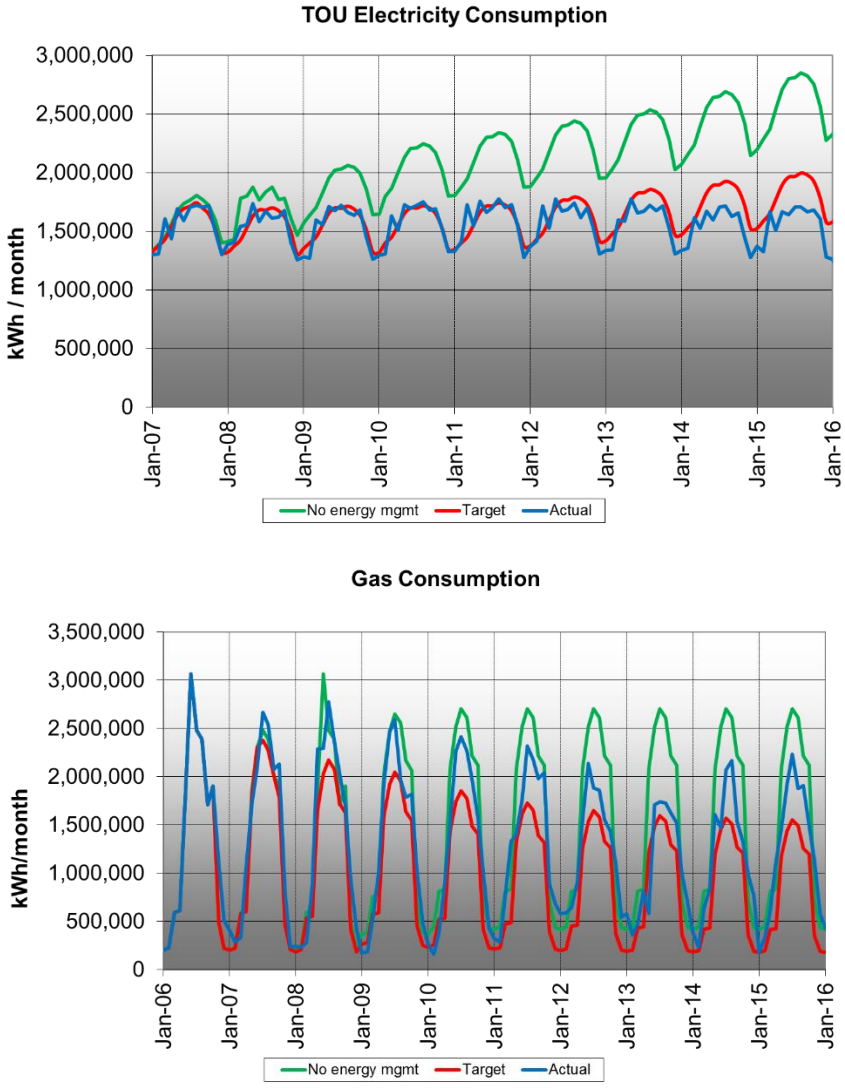

Figure 3: Historical energy consumption compared to targets

In 2015 electricity consumption was 13 percent below target and 39 percent below 'business as usual'. Gas use was 50 percent above target (which in retrospect was an overly ambitious target, due to the growing demand for climate controlled space, particularly labs, on campus) but still 17 percent below 'business as usual'.

Energy used in buildings (electricity and natural gas) account for nearly all of the University's scope 1 and 2 emissions. As portion of the total measured carbon footprint of the University, energy in buildings accounted for 47 percent in 2015 as shown below.

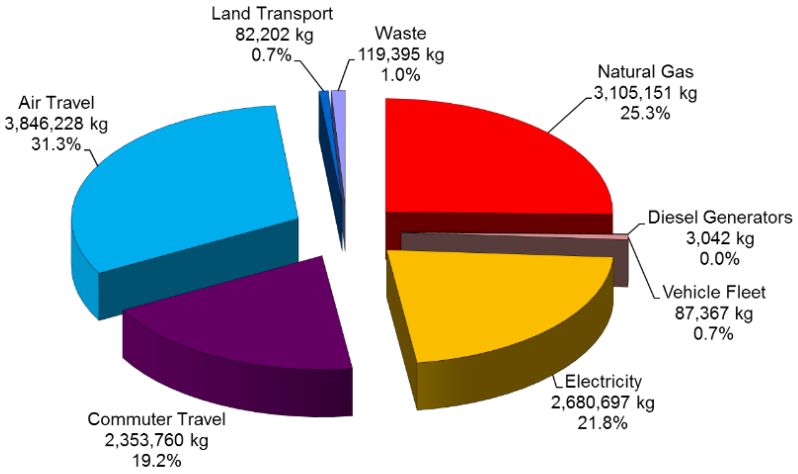

Figure 4: 2015 CO_2e emissions by source

Over time the emissions from electricity and natural gas have been dropping as shown figure two.

In summary, to date the energy management programme has resulted in:

- A reduction of in energy use of about 9% from 2006
- An improvement in energy efficiency of about 25%
- A reduction of greenhouse gas emissions of about 22%

Every year Victoria participates in a benchmarking survey by TEFMA (Tertiary Education Facilities Management Association). In 2014 the survey was completed by 63 tertiary institutes around New Zealand, Australia and Hong Kong. This provides the most comparable benchmark figures – while the climatic variations are significant between institutes and the various academic disciplines have different energy demands (for example science is more energy intensive than humanities), it at least provides sector specific benchmarking.

	Total Energy (GJ)	**GJ/sq.m (gross)**	**GJ/EFTS**
Victoria	123,214	0.55	7.26
NZ Avg	91,061	0.62	8.58
NZ Uni Avg*	163,025	0.64	11.31
Aus Avg	217,158	0.68	9.41

Figure 4: 2015 TEFMA energy benchmarking

* excludes reporting Polytechnics

This indicates that Victoria is already performing very well compared to industry norms. Victoria uses substantially less energy per square metre and per student than average.

Implementation:

Victoria will achieve industry leading energy management practice and energy conservation through the delivery of an Energy Management Implementation Plan which focuses on five key areas: Energy Supply, Monitoring & Reporting, Energy Efficiency, Engagement & Collaboration and Investment.

Energy Supply

Victoria will effectively manage the supply of energy to its facilities by:

- Ensuring there is a secure supply of energy through reliable infrastructure and energy sources
- Purchasing energy through robust procurement processes to minimise the cost of energy
- Managing energy supply contracts through strong relationships with providers
- Participating in programmes to reduce demand on the local electricity network in times of peak demand to ease pressure on generation
- Actively seeking opportunities to expand use of renewable energy generation and cogeneration on site

Monitoring & Reporting

Victoria will closely monitor where energy is being used on campus and report on consumption by:

- Ensuring there is sufficient detail available through energy metering
- Analysing energy data to identify opportunities for energy saving and track trends in energy consumption
- Effectively measuring and billing tenants for their energy consumption
- Reporting on progress towards energy targets and distributing energy performance results to enable wider ownership of energy conservation

Energy Efficiency

Victoria will maximise energy efficiency through the implementation of cost effective solutions by:

- Using all available avenues for the identification of efficiency opportunities
- Expanding the energy management programme to include Student Accommodation
- Undertaking a comprehensive energy assessment of University houses
- Renewing mechanical plant and continuously commissioning it to ensure the control strategies are optimised
- Upgrading the light fixtures and lighting controls
- Ensuring all new construction and refurbishment incorporate energy efficiency into the design to minimise life cycle cost
- Applying international standards to verify the delivery of energy savings

Engagement & Collaboration

Victoria will involve a wide range of stakeholders to maximise the impact of its energy management programme by:

- Developing a structure where schools and CSUs take more responsibility for managing their own energy use
- Securing external partnerships to gain funding, expertise or scale-up the impact of energy initiatives
- Collaborating with academic staff to utilise the campus as a living laboratory
- Communicating stories of success

Investment

Victoria will continue to prioritise funding for energy management by:

- Having annual Opex budget allocation with a standard investment criteria template to prioritise investment
- Making additional budget available through the Capex bidding process

Responsibility:

The delivery of the Energy Strategy will be driven by Facilities Management through Energy Management Team which will be led by the Energy Analyst and include the Asset Manager, the Associate Director Facilities Management, EECA and Maintenance contractors with the involvement of other consultants and contractors when required.

The Sustainability Office will engage with Campus Services to support and monitor the delivery of this plan. It will also play an important role in ensuring there is senior leadership buy-in for this Strategy and its implementation.

Schools and CSUs will be given greater visibility and accountability for energy management.

Students will be encouraged to participate in energy initiatives.