

TOYOTA

ENERGY REDUCTIONS BEYOND THE FACTORY GATE



Industry Greenhouse Program Key outcomes

Savings (p.a.)

Reduction in energy costs

Savings of approx. **\$600,000**

Volume reductions

Reduction in Greenhouse Gas emissions

13,760 tonnes of CO₂-e

(Equivalent to the average emissions from 980 Australian households)

Return on investment

Implementation costs (to date)*

n/a

Recovery of implementation costs

n/a

* Although investment of \$201,150 was directed to dedicated energy saving projects, significant but unquantified additional expenditure was incurred in general plant improvements and in the implementation of Toyota's Kaizen (continuous improvement) programs. No ROI measurement can therefore be estimated.

Further information

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At its Altona factory where Camry and Aurion are produced for the domestic and export markets, Toyota has been working hard to achieve its targets to reduce greenhouse gas emissions. Toyota has committed to reducing, by 2010/11, greenhouse gas emissions per vehicle manufactured by 13% of its 2001 base year emissions.

The EPA Industry Greenhouse Program energy audit, conducted in 2003, identified opportunities to decrease energy use at the plant. The resulting initiatives included reviewing the compressed air system, reviewing paintshop activities and changing the way cars were washed prior to being painted.

Focusing on the rationalisation of compressed air systems and air demand, as well as scheduled leak detection, delivered one of the most impressive results. An audit revealed that too many compressors were running and that many of them were simply not needed. The removal of excess compressors, together with the leak detection and maintenance program, resulted in a GHG emission reduction of over 2500 tonnes CO₂-e per year.

Decommissioning the paint shop's topcoat afterburner (used to reduce paint shop odours) also delivered results. Changing the paint formulation, reducing the amount of paint required and minimising overspray, reduced odours and eliminated the need for the afterburner. This single project saved \$195,000 in natural gas and over 2,600 tonnes of CO₂-e each year.

An example of Toyota's holistic approach to energy and production efficiency was the removal of the Wet Deck Oven process. Previously, assembled bare steel car bodies were thoroughly washed before application of the anti corrosion coatings. They were then inspected

to remove imperfections, washed and dried in the wet deck oven prior to application of primer paint. By dramatically improving the initial washing process there was no need for further inspection and therefore no need to use the wet deck oven. This process improvement resulted in savings of over 1,300 tonnes CO₂-e per year, as well as significant water and labour savings.

Toyota has also worked to reduce its greenhouse impact beyond the factory gate. It has done this by reducing the fuel consumption of the vehicles it manufactures, by shifting some of its interstate deliveries from road to rail and by increasing environmental awareness amongst its dealers. Also beyond the Altona production plant, Toyota's commitment to reducing greenhouse gas emissions extended to purchasing 100% accredited Existing Green Power Rights for the Toyota Headquarters, thereby offsetting a further 8,640 tonnes of CO₂-e per year.

'Toyota Australia is focused on continual improvement in environmental performance, which includes activities that minimise resource consumption, with particular effort in the areas of water and energy use.'

Max Yasuda, President and CEO, Toyota Australia

Toyota is continuing to pursue greenhouse gas reductions through the expansion of energy efficiency measures in all areas of the business and reports on these achievements as part of its annual public Sustainability Report.



EREP - BUILDING ON THE SUCCESS OF THE INDUSTRY GREENHOUSE PROGRAM

Industry Greenhouse Program highlights

Realising the business benefits of energy efficiency.

EPA Victoria's Industry Greenhouse Program is the first regulatory greenhouse and energy efficiency program for industry, and one of the first in the world.

Large energy using and greenhouse gas emitting sites have been required to undertake an energy audit and implement any actions with a payback period of three years or less.

The projected final outcome for the program at the end of 2007 includes:

- Reduction in GHG emissions of 1.23 Mt CO₂-e per annum, an average of 3.0% reduction in the annual GHG emissions for these sites (from a 2003 baseline)
- Annual savings of \$38.2 million in energy costs for Victorian Industry with implementation costs of just \$64.6 million.
- Average payback on implementation of just 20 months.
- A total of 1377 actions were completed under the program to the end of 2006, and this is expected to increase to 2436 actions by the end of 2007.

With growing pressure on all our environmental resources, it is increasingly important that companies use energy and water as efficiently as possible and minimise waste production and disposal.

Building on the success of the Industry Greenhouse Program, EPA Victoria is currently developing a new program, Environment and Resource Efficiency Plans (EREP) program.

Under the program, Victoria's largest industrial and commercial users of energy and water will be required to assess energy, water and waste flows and implement identified cost effective actions.

Save Energy

Energy source and use has significant impact on profitability, productivity and greenhouse gas emissions.

- Install variable speed drives (VSDs) on pumps and other equipment.
- Optimise your boiler performance with regular maintenance and tuning and consider insulation, fixing steam leaks and installing economisers.
- Optimise your compressed air systems through insulation, fixing air leaks and optimising operating pressures.
- Review your plant lighting including efficiency of lighting, motion and daylight sensors and removing unnecessary lighting.
- Ensure your hot water system is insulated and running at an optimal temperature.
- Explore heat recovery options in industrial processes, such as collecting condensate for use as feedwater for your boiler or using waste heat for space heating.
- Assess your heating, ventilation and air conditioning (HVAC) systems. Consider optimising thermostat settings depending on the weather (26 °C in summer and 18 °C in winter). Ensure systems are switched off out of operating hours.
- Regularly review plant equipment as upgrading equipment can often improve productivity and deliver energy savings.

Save Water

Understanding where water is used and lost in your business provides opportunities to quickly save water.

- Can existing processes use less water? Vacuuming, sweeping and high-pressure trigger nozzle hoses can be just as effective as cleaning with water.
- Review tank & system cleaning processes to identify opportunities to automate or amend to minimise water required for cleaning.
- Minimise water use in cooling processes by recycling cooling water, using fogging nozzles instead of running mains water, and shutting off flow when not in use.
- Identify opportunities to reuse or recycle your rinse, waste and greywater – the final flush may be able to be used as the first rinse.
- Establish a regular preventative maintenance program for water pipes to ensure blockages are removed, and leaks and overflows are minimised.
- Reduce water pressure where possible to minimise volume of water lost to leakage.
- Install rainwater tanks for irrigation use.
- Use non-potable water for appropriate end-uses in place of potable water (for example, dust suppression, on-site toilet flushing).
- Replace existing fixtures with more water efficient fixtures (for example toilets, taps and equipment).

Reduce Waste

Reducing waste can save your business money as well as saving valuable resources and helping the environment.

- Choose products with less packaging and purchase raw materials in bulk to minimise packaging.
- Plan ahead and avoid waste by matching raw material quantities to batch sizes.
- Educate and involve all staff in waste minimisation projects with rewards for new and creative approaches.
- Regularly review causes of 'off-spec' product and adjust systems and processes to minimise these occurrences.
- Establish 'take back' loops with suppliers such as packaging waste, product, which is faulty, or at the end of its useful life.
- Minimise product residue in packaging by removing more raw materials.
- Avoid product spillage through installing conveyor and gutter guards.
- Evaluate product design and manufacturing processes to find ways to avoid producing prescribed industrial waste.
- Investigate whether your waste could be used as a resource elsewhere and find opportunities for reuse.
- Share recycling resources with other businesses in your community to reduce cost. For ideas, see www.wasteexchange.net.au.

These are just a few of the opportunities available to improve profitability, productivity and your business environment. For other helpful weblinks and information on what other businesses are doing to improve their resource efficiency and sustainability visit www.epa.vic.gov.au/outcomes