

HOLDEN

GM HOLDEN DRIVING ENERGY EFFICIENCY IMPROVEMENTS



Industry Greenhouse Program Key outcomes

Savings (p.a.)

Reduction in energy costs

Savings of approx. **\$946,000**

Volume reductions (p.a.)

Reduction in Greenhouse Gas emissions

11,597 tonnes of CO₂-e
(Equivalent to emissions from 828
average Australian households)

Return on investment

Implementation costs (to date) **\$840,028**

Recovery of implementation costs **11 months**

Further information

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In 2003 the Fisherman's Bend plant of GM Holden established an energy reduction target of 10 per cent and indicators suggest they will achieve this goal in 2007.

At Fisherman's Bend GM Holden manufactures engines for local and export markets and designs and develops cars of the future. The nature of the production process at Fisherman's Bend is energy intensive, with manufacturing on site including a casting foundry, component fabrication plant, and two engine plants to manufacture and assemble four and six cylinder engines.

GM Holden has a core manufacturing philosophy of people and technology working together. Nowhere is this more evident than in the efforts of the Holden workforce who have actively sought to employ both advanced and simple technologies to drive energy efficiency across its facilities.

In an endeavour to maximise energy efficiency a number of sophisticated computerised energy monitoring systems have been put in place to optimise energy efficiency of the furnaces and compressed air distribution plants. The most significant gains are seen as a result of improved management and streamlining of compressed air systems. Almost 75% of greenhouse gas emission reductions are attributed to this action alone. Improvements made to the compressed air system in Plant 18 (where the Global V6 engine is manufactured) have eliminated unnecessary compressed air loss and this project alone resulted in savings of over \$700,000 with a payback on investment of less than 1 year.

The use of variable speed drives is a well recognised contributor to improved energy efficiency and reduced greenhouse gas emissions. For GM Holden the installation of one variable speed drive on the cooling water circulation pump resulted in energy savings of \$38,000 and greenhouse gas emission reductions of almost 580 tonnes.

Improved management of building heating, cleaning of skylights, installation of occupancy sensors on lighting and replacement of existing lighting with tri-phosphor tubes have each resulted in small improvements and when combined contribute to an impressive energy reduction outcome.

Following a comprehensive assessment, a number of modifications were made to the foundry where engine blocks, crankshafts and other engine components are cast. Upgrading the foundry furnace's combustion air preheating system has reduced the overall foundry greenhouse gas emissions by almost 834 tonnes and saved more than \$67,000 in energy costs per year.

Focusing on less energy intensive activities at the Fisherman's Bend site has also helped reduce the greenhouse gas footprint. For example by maintaining insulation on the cafeteria's hot water pipes and modifying the kitchen exhaust, all for the minor cost of \$750, GM Holden has been able to make a greenhouse gas reduction of almost 21 tonnes per year. Recognising that the need to improve energy efficiency is an ongoing task and as part of its company wide suggestion scheme, GM Holden continues to receive and implement employee suggestions aimed at conserving energy and reducing energy costs.

'GM Holden strives to meet the highest standards of environmental performance in all its activities and we are strongly committed to introducing environmental initiatives and improving systems already in place. Across our manufacturing operations, GM Holden works on the principle that emissions and waste can be prevented or minimised by the use of innovative technologies and environmentally compatible materials.'

**Rod Keane, Executive Director
- Manufacturing, GM Holden**



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