

CASE STUDY 3

Retirement of centralised domestic hot water

Introduction

Many schools built in the 1960's and 70's utilise a centralised boiler to produce domestic hot water. These systems often have significant energy losses associated with the boiler and pipe work that circulate the water around the buildings. In general where the demand for hot water is low or intermittent these centralised hot water systems are expensive to operate and it is worth considering changing to an alternative that uses a number of modern smaller hot water heaters.

Case Study:

In a Melbourne secondary college the centralised hot water boiler had failed. The quoted cost of replacing the boiler and improving the associated heat exchange tank was \$14750. An energy audit arranged through SEAV found not only that there was a more economical alternative to replacing the existing domestic hot water boiler but that many other savings could be generated with payback periods between 4 months and 2 years.



Figure 1:
The old hot water boiler and hydronic storage tank that were disconnected. Energy wasted from these units came to 27% of total gas consumption. This is enough to supply gas to 12 homes in Melbourne.

It was recommended that 5 high efficiency hot water heater located near to where the hot water is required replace the centralised hot water system. Units were located near the home economics, science, staff room and assembly hall.

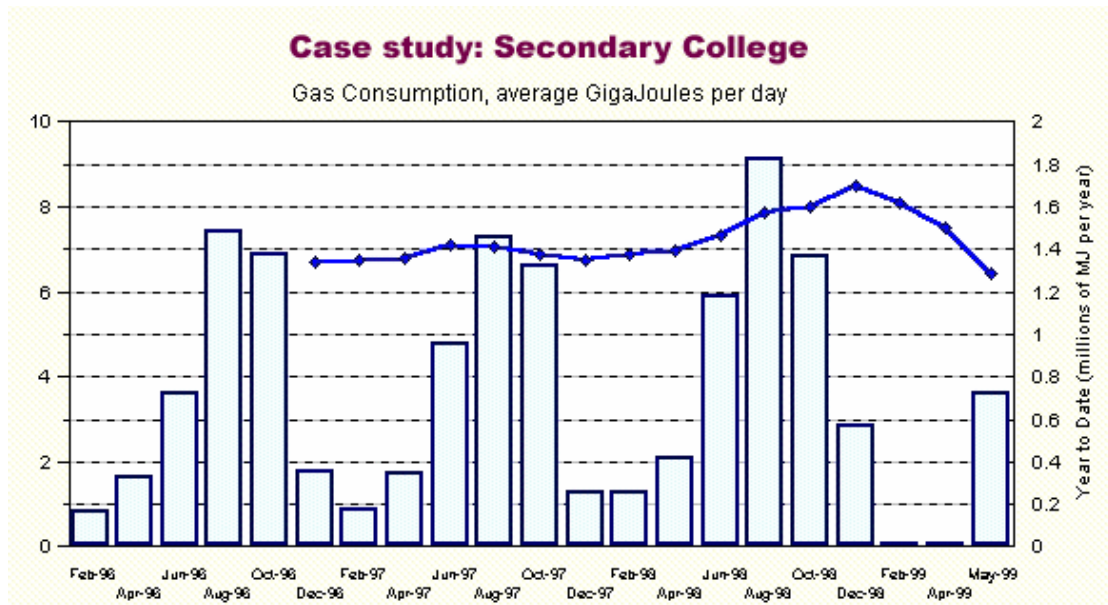
Units chosen were continuous flow gas hot water heaters which take little space and come in indoor and external models. As there is not storage tank the energy losses from these water heaters were reduced significantly. The cost of this project was \$11,000. (Less than the quote to replace the current boiler.)



Continuous flow hot water heaters are made by many leading manufacturers including Aquamax, Bosch and Rinnai.

Savings

Results from the project showed a 39% reduction in gas consumption compared with the same period last year, as shown in the graph below.



The solid line in the graph highlights accumulated 12 month consumption (i.e the amount of energy used in the previous 12 months). This has shown a clear downward trend since the new hot water equipment was installed in December 1998. The energy and cost savings from this project have been calculated at 1.4 GJ/day and \$4300 / year respectively. This is about 14% of the schools total energy consumption.