CASE STUDY | SPLASH PALACE, INVERCARGILL

SPLASH PALACE

WOOD ENERGY SOUTH

For Invercargill's popular water-world Splash Palace, a decision to replace coal-powered boilers with wood burners has delivered regionally, financially and environmentally.
Going to the pool in Invercargill is a much more pleasant experience thanks to new wood-burning boilers that have allowed Splash Palace to raise the temperature of its facilities by a full degree.
The extra warmth was an unplanned benefit the pool's users are, understandably, pretty enthusiastic about. But the project has delivered on any number of fronts.

Fuelling the pool

An indoor facility featuring an eight-lane 50 metre pool and spa facilities and pools for tots and learners, Splash Palace is owned by Invercargill City Council (ICC), which naturally has an interest in both the local
environment and regional development.
By 2011, maintenance costs for the pools old lignite coal boilers were becoming prohibitive, prompting the ICC to think about alternatives that were both efficient and not too expensive.
Coal was certainly seen as the cheapest fuel, but management was aware that wood chips were being used more and more. Better still, wood chips could be sourced locally. "Replacement of the boilers was a logical option for us and changing to wood chip fuel provides sustainability of fuel source and helps support a developing local industry" ICC building asset manager Paul Horner said.

Unexpected bonuses

As a long time coal user, ICC knew what to expect from that fuel source. However, switching to wood delivered a bundle of surprise benefits in areas such as health and safety and the environment not highlighted in the feasibility study.
The new system has an automatic conveyor that takes ash away from the boiler. Staff no longer need carry eight buckets of "scalding hot" ash upstairs every day.
"The wood chip ash is only a fraction of the volume that was generated by lignite," Horner said. "This means we went from having two skips of coal ash sent to the landfill every week, to half a wheelie bin which can be composted in the garden."

Building momentum

Another unplanned benefit of backing wood chips to fuel the pool took a few years to arrive. Last year, Venture Southland and the Energy Efficiency and Conservation Authority (EECA) launched a three-year initiative called Wood Energy South focused on establishing a regional cluster of wood energy use in Southland.
Backed by $1.5 million of government funding, Wood Energy South aims to realise a trifecta of benefits for Southland: lowering energy-related carbon emissions, improving air quality and providing local employment and business opportunities.
While the project focuses on building capacity regionally it is also expected to act as a pilot for New Zealand. EECA also has funds to assist businesses in Southland with wood energy projects and welcomes applications as part of the Wood Energy South project.

Lessons shared

The Splash Palace conversion holds lessons for anyone seeking energy efficiency.
If an organisation is considering a similar shift and can't fund an independent cost-benefit analysis, Horner suggested an open tender for "heating solutions" as an alternative. Such an approach would allow a range of fuel and technology suppliers to team up to offer options.
That, he said, is a far more sensible approach than just replacing old equipment with the same again. Depending on the project plan, Wood Energy South can also help fund up to 50 percent of the cost of a feasibility study up to a maximum of $15,000.
Fuel hopper size also needs to be considered, Horner said. The same hopper used for lignite was used for wood at Splash Palace, but the equivalent volume of wood equated to a supply for two days compared to seven for lignite.
"We knew we were going to have that issue," he said. "We decided to wait and see. We are looking at increasing the size of the bunker."

Improved capacity

Then there is that extra degree of heat that is keeping the pool's customers happy. That was a result of the new system being so highly efficient.
"The warmer pool is because we have slightly more capacity and better control over the heat output," Horner said. "the old boilers were going flat out to keep the temperature up. Now we can do it with ease.

Weighing the options

ICC commissioned a feasibility study to investigate all of its options and to quantify their full life-cycle costs.
While the wood chips, produced to specification by Niagara Wood Fuels in nearby Kennington, were 15 percent more expensive than lignite coal, the analysis showed the whole-of-life cost of a wood boiler system was cheaper. Lignite fuelled boilers simply required too much management and maintenance. By moving to wood, ICC boosted staff safety and made real cost saving in areas such as supervision and the disposal of waste ash, which has been massively reduced in volume.
Wood fuel also future-proofed the required $650,000 boiler investment against new clean-air environmental requirements. Horner said it has delivered a huge reduction in CO2 emissions, for example, though the cost savings here are minimal due to the plunging price of carbon credits.
While a full post-implementation analysis has yet to be conducted, Horner said the project is about "cost neutral".

☑ KEY FEATURES

Splash Palace installed a 675kW Binder chip boiler and back-up 600kW diesel boiler in November 2011.
Summer usage is 10-12 cubic metres of wood chips per day while in winter that rises to 18-21 cubic metres.
The project costs $650,000 while fuel costs $10,000 to 20,000 a month depending on the season and weather.

☑ KEY BENEFITS

Lower whole of life costs, especially in areas such as boiler maintenance and supervision.
Ash volumes have been drastically reduced and the residue can now be composted.
Regional development has been boosted through buying fuel from a local provider and through the launch of a government-backed wood energy hub.
Warmer pools – the efficient boilers have allowed water temperature to be increased by one degree.

☑ SECTOR APPLICABILITY

The project is relevant to local government and operators of pools and other facilities requiring heating.

EECA BUSINESS™ PUTTING ENERGY TO WORK

Venture Southland
Business, Tourism, Community & Events