



A Southland school has seized the opportunity to lead by example with a wood energy project that delivers financial and health and safety benefits.

Donovan Primary School's year-long quest for an efficient and sustainable heating system started with a bang. Staff and students arrived at school one morning in 2012 to find water running down the driveway and the school's old coal boiler shattered. Sometime in the night, the dirty, 40-year-old technology had finally given it all away.

School principal Peter Hopwood organised a temporary replacement in the form of a noisy diesel-powered boiler and embarked into unfamiliar waters, evaluating coal, wood chip, wood pellet and diesel boiler technologies.

Calculating costs

On the face of it, Hopwood said, a new coal boiler was the cheapest replacement option, costing around \$100,000 compared with \$300,000. However, when lifetime running and management costs were included, wood and coal cost about the same.

Locking the school into a coal energy future would present other financial risks. Choosing coal required it to take a punt on the price staying low over a 20-year time-frame, even assuming fuel was available.

"We could have got a much cheaper coal boiler, but supply was uncertain since the loss of the Ohai mine," Hopwood said. The school also now had first-hand experience of diesel. The temporary boiler proved to be massively expensive to run, costing nearly \$1000 a week in peak winter periods

The chips are down

Wood fuel boilers can burn wood pellets or wood chips. When a local sawmill, Niagara, offered an affordable multi-year chip supply deal the decision was made, leaving Hopwood safe in the knowledge that the boiler could be easily converted to pellets if needed.

An open tender led Donovan Primary to select Spark Energy as lead contractor responsible for design, layout and mechanical and electrical installation around the state-of-the-art Austrian ETA HACK 220kW boiler.

Eduard Ebbinge, managing director of Spark Energy, said a key aspect of the project was being able to use the existing boiler building with minimal modification. That reduced costs significantly.

The biggest challenge was the constrained fuel store, or bunker. Ideally the bunker would have been enlarged, but there wasn't room and digging further underground was out of the question due to the presence of drainage and water infrastructure.

Ebbinge said a point of pride was the creation of three 1650 litre buffer tanks to store energy. These tanks could fit through the existing boiler room door to further reduce the cost of building modifications. Thanks to the tanks, heating can continue economically at night for events such as parent-teacher meetings.

The system is highly automated, he said, featuring a touchscreen interface and a camera in the hopper. Remote management is achieved via an internet portal. "There were no surprises. It was a very logical process," Hopwood said of the installation.

Walking the talk

There was one other factor in Donovan's decision to invest in a modern, efficient wood boiler: it allowed the school to practise what it preached. Hopwood said conservation is part of what schools teach children so adopting a renewable energy system showed it was walking the talk.

With many coal boilers in schools around the country reaching their end of life, Donovan Primary became an example of another kind. Four other schools have visited to see the new coal boiler in action and to inform their own energy investment decisions.

"Every school wants to do the right thing," Hopwood said.

With plentiful cheap heating for the Southland winters, Donovan Primary can look to the future with confidence. Two new classrooms are being built and they too will be heated by the new boiler via underground pipes.

Wood fuel a winner

Donovan Primary moved on to evaluate its wood boiler options.

Hopwood said a modern wood boiler required much fewer man-hours to operate and maintain.

Because they leave only small amounts of ash, an efficient wood boiler only needed to be emptied once a month compared with lugging 17 cans of hot coal ash each week.

Even better, unlike toxic coal ash, wood ash can go into the garden.

A new wood boiler also held the promise of improved health and safety and a clean working environment for staff. "There have been cases of tragedy in the North Island with boiler blow-back," Hopwood said.

✓ KEY FEATURES

ETA HACK 220kW wood chip boiler heating three 1650 litre insulated ETA buffer tanks.

System uses existing boiler building with minimum modification while fuel handling is integrated into the existing coal hopper.

Colour touchscreen user interface with remote access to boiler controls via the ETA internet portal.

Compensated flow temperature control and compensated buffer tank temperature control Hoppercam.

✓ KEY BENEFITS

Lower whole of life costs in areas such as fuel, boiler management and supervision.

Ash volumes have been drastically reduced and what is produced can be used in the garden.

A clean, safe working environment for staff.

Donovan Primary is now seen to be practising what it preaches using efficient renewable energy.

✓ SECTOR APPLICABILITY

Schools and education and other sectors with distributed facilities.