Coal boiler replacements for New Zealand public schools

EECA
TE TARI TIAKI PŪNGAO
ENERGY EFFICIENCY & CONSERVATION AUTHORITY

Coal boilers in New Zealand public schools are readily being replaced by renewable woody biomass or electric heating sources, under the Ministry of Education Te Tāhuhu o Te Mātauranga (the Ministry) School Coal Boiler Replacement Programme.

The removal of all remaining coal boilers in public schools, of which there are now around 100, is expected to reduce state sector carbon emissions by around **89,000 tonnes over 10 years**. As of 26 January, 2023, **42 boilers have been replaced through the programme**.

$10M
Ministry of Education

$65M
State Sector Decarbonisation Fund (adminstered by EECA)

$75M
Total funding

The State Sector Decarbonisation Fund supports the Carbon Neutral Government Programme, which has been set up to accelerate the reduction of emissions within the public sector.

Replacement solutions recommended to schools

66	5	42	10
Wood pellet boilers	Air - water heat pumps	Air - air heat pumps	Wood chip boilers

Converting the existing boiler - For the most straightforward projects, new wood pellet or chip boilers can be fitted into a school's existing infrastructure. This can be favourable if the existing boiler is not yet toward the end of its life, and the storage and fuel set up is suitable.

Containerised boilers – For larger schools, a containerised boiler that runs on either wood pellets or wood chips can be favourable if the existing infrastructure is unsuitable, and there is access to wood pellet/chip supply in the area.

Air to water heat pumps – Air-water heat pumps can be favourable when there is limited space, there is sufficient electricity supply, and the hydronic system is in good condition.

Air to Air heat pumps – In a school with lower heating requirements, this option may be used if there is sufficient power to the school and the hydronic system is in poor condition.

Determining the best solution for a school

In addition to funding allocation, EECA facilitates the completion of individual feasibility studies for each of the schools. The purpose of this study is to identify the best solution for a school, and make a recommendation based on technical and cost factors.

The best solution may depend on:

- The location of the school
- The availability of resources in that location
- Specific features of the site – such as access and availability of space.
- Whether the school has already started to transition away from coal to another type of low-emissions heating.

This process has now been completed for all 136 schools that have been identified with coal boilers (151 coal boilers in 136 schools).

The physical removal of coal boilers and installation of low-emission alternatives is managed by MOE contracted project managers– The Building Intelligence Group, and Argest.

Benefits of heat pumps (air–air and air–water)

- **100% electric** – New Zealand's electricity grid is around 80 – 85% renewable, and increasing - heat pumps are also highly efficient.
- **Futureproof** – not dependent on a finite source of fuel, making them low risk for supply issues.
- **Versatile** – can provide both heating and cooling, depending on the seasonal needs of the school.
- **Solar compatible** – solar panels can be installed and used to supply electricity for heating.
- **User friendly** – offer almost immediate heat with the flick of a switch.

Under this programme, these heat pumps have been installed by Aquaheat Facilities Services, Decarbonised Energy Solutions, and Laser Electrical.

Benefits of containerised wood pellet boilers

- **Integrated storage** – wood pellets are delivered by truck and transferred into the container itself, where they are stored and used.
- **User friendly** – the automated system means that fuel does not need to be handled, and can be turned on and off as needed, with minimal maintenance and noise.
- **Easy install** – containers are built off site and delivered in a 'plug and play' state. Building consent is not needed, and the system can connect to existing pipework and radiators.
- **Versatile** – containers can be moved from site to site and can be joined together in 'cascade' if more energy is required.
- **Space effective** – a standard 20-foot container fits inside a parking spot.
- **Low emission** – renewable wood pellets are effectively carbon neutral, and do not add fossil carbon to the atmosphere. The ash produced can be used as compost for school gardens.

Under this programme, they have been supplied and installed by Aquaheat Facilities Services, CH Faul and Company, Ecotec, Finite Planet Ltd, and Heatwise Solutions Ltd.

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