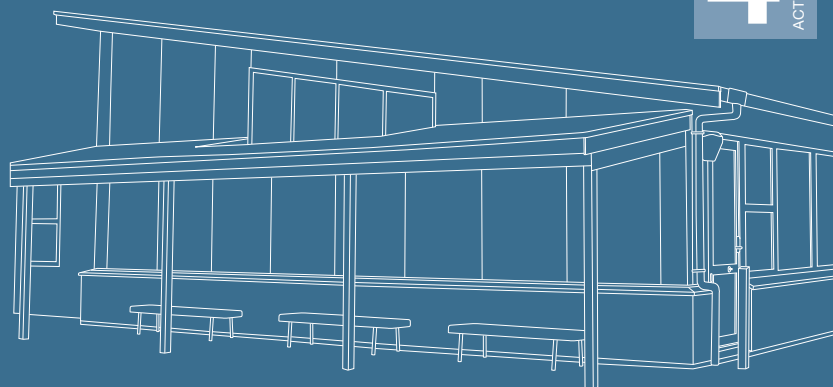


Saving energy in schools: water heating



Water heating typically makes up about 8% of school energy use but can be as high as 50% if your school has a heated pool¹. The right water heating system can significantly reduce energy consumption. And, when the whole school makes an effort to use less hot water, it will make an even bigger difference.

Choosing a system

If you're planning to upgrade some or all of your water heating system, take into account all areas that require hot water - staffrooms, bathrooms, canteens, classrooms, changing rooms and swimming pools. If you have a centralised hot water system, and need to run the whole system even when hot water is needed only in a small number of specific areas, it may be more cost-effective to install smaller local hot water units.

Water heating options

Solar water heating

Solar water heating works through panels which collect thermal energy from the sun. These are extremely cheap to run, though the initial outlay is relatively expensive. They need year-round direct sun and need to be boosted by other energy to keep temperatures even. There may be grants available - see www.energywise.govt.nz/funding-available/solar-and-heat-pump-water-heating-funding.

Heat pump water heating

This works in the same way as heat pump space heaters, except that heat is delivered to a water storage tank. It uses less electricity than a conventional electric tank and can be installed in both new and existing buildings. They work best in areas with average air temperatures above 7 degrees Celsius (though most will still run more efficiently than a traditional electric heater in below-zero temperatures).



Instantaneous water heaters

Instantaneous gas or electric water heaters don't need a storage tank as they heat water on demand. They take up little space and can often be mounted externally. Gas versions can instantly deliver large quantities of heated water at a good flow rate. Electric versions are a good choice where hot water demands are relatively low and a central system is impractical. They may not be sufficient in extremely high demand situations e.g. changing rooms.

Wood energy boiler

These operate on wood chips or pellets which is a 100% renewable, low emission and virtually carbon neutral energy source. Wood is cost-effective compared to many fossil fuel alternatives though the cost and availability may vary by region. New wood boilers are have a relatively expensive capital outlay compared to gas and oil, but are highly efficient and often fully automated. It's often possible to convert an existing fossil fuel boiler (e.g. coal) to wood energy.

¹ Based on analysis of energy audits at 20 secondary schools throughout New Zealand

Heat recovery systems

Heat exchangers can be added to existing hot water cylinders to draw heat from existing central heating systems. This solution can be fitted to an existing boiler, which provides space heating and hot water. This is an efficient way of recovering and utilising 'waste' heat.

Swimming pools

If your school has a pool, water heating can eat up around 50 percent of your energy use

Pool covers minimise evaporation and reduce the heating energy required by as much as 70%. To be effective, they need to be maintained in good condition and used consistently – i.e. at the end of each school day, and in weekends and holidays. Insulating pool buildings can also help to maintain water temperatures.

Action checklist

	Create an energy saving culture at your school. Get staff and students on board, and set targets for energy use (including hot water).
	Remind staff to rinse dishes with cold water and ensure dishwashers are used on eco settings and run only when full.
	Check your hot water temperature thermostat isn't set higher than necessary. Water shouldn't be more than 40°C at the tap (Ministry of Education's health and safety guidelines) and must be 60°C at the cylinder to prevent the growth of Legionella bacteria.
	Fit flow restrictors to high-use hot water taps. Flow control aerators cost a few dollars and can halve the volume of water used while still giving good pressure.
	Install efficient showerheads in changing rooms. They provide good even pressure and temperature without wasting energy or water.
	Make sure smaller hot water boilers such as the zip in the staffroom are switched off at the end of each day.
	Replace washers or fittings on any dripping hot taps promptly.
	Ensure boilers are maintained regularly, in line with manufacturer's recommendations. They should be tuned and set correctly to avoid incomplete combustion.
	Wrap electric hot water cylinders to prevent heat loss. Insulate the cylinder and pipes within at least a metre of the cylinder.
	Insulate any high-use hot water pipes and external hot water pipes.
	Get an electrician to decommission hot water cylinders that aren't needed. There are often numerous under-sink hot water cylinders in schools that are never used.
	Turn off hot water cylinders during holidays. Often these are left running 24/7, all year round. Timers can be fitted on existing cylinders to shut down on weekends and holidays.

For more information

For more information on water heating systems, visit www.energywise.govt.nz/how-to-be-energy-efficient/your-house/hot-water/choosing-the-right-water-heating-system

To find out more about saving energy at school, check out the other action sheets in this series or visit www.eecabusiness.govt.nz/how-to-be-energy-efficient/schools

