



Guidance for responding to requests for biomass fuelled heating of schools and government facilities

Scope of this guidance

This guide is to assist preparation of responses to requests to supply biomass fuelled heating equipment for schools or other government facilities¹. Equipment with higher heat outputs and for other applications should generally follow the same guidelines.

As every school or government facility will be different in terms of layout, building structure and incumbent heating systems, it is important that proposals responding to requests are well articulated as it is likely that alternative technologies or fuels will be evaluated against the proposed biomass heating solution. It is expected there will be a number of biomass fuel solutions proposed from multiple parties with different biomass fuel types. The guide will also assist the procurement entity (School or Ministry of Education) evaluate proposals received according to a common framework.

The evaluation of options by the procurement entity will be undertaken on a financial lifecycle basis and include both tangible and intangible costs and benefits² over the 15-year assumed economic life of the heating equipment.

The procurement entity will evaluate the different technologies and fuels of each proposal as a total heating solution, up to the nominated point of connection to the building heating system. All information that would be required for preparation of a feasibility study³ or business case should be provided so as to ensure that decision makers have correct information. This should include both equipment and fuel information and data suitable for the undertaking of an investment risk analysis on the options being evaluated.

Government facility owners will generally require that guidance or tenders are prepared within the scope of *SNZ PAS 5311:2021 Biomass boiler systems for small and medium heat loads*⁴.

Fuel

As all combustion equipment is designed for a specific fuel the specification defining the biofuel to be used in the equipment proposed should be based on the boiler designer's recommendations and specific biofuel characteristics.

¹ A discussion on equipment suitable for heating in this output range

<https://www.usewoodfuel.org.nz/resource/biomass-heating-medium-systems-guide>

² Guidance on lifecycle analysis of heating equipment is available <https://www.usewoodfuel.org.nz/resource/tg14-evaluation-of-heat-plant-opportunities>

³ Guidance on the information required for comparing different technologies and fuels is available <https://www.usewoodfuel.org.nz/resource/biomass-heating-feasibility-guide>

⁴ <https://www.standards.govt.nz/shop/snz-pas-53112021/>

Identifying and discussing the likely supply of biomass fuel suitable for the equipment proposed is the most important element to be addressed in the proposal. Biomass fuelled heating equipment can have an economic life of 20-30 years so it is important that the owner/operator of the heating equipment has a good understanding of the fuel supply risks for the lifetime of the equipment. However, because in a lifecycle analysis the present value of costs and benefits become insignificant after around 15 years, for the purpose of evaluation of alternative heating proposals a 15-year economic life should be assumed. If this is done a residual value at year 15 should be included.

Over the expected economic life of a heating facility the sources of biomass fuel are expected to change. As a consequence the characteristics of fuel may change over time and so, if it is likely to be relevant, proposed combustion and storage equipment should be chosen or designed to be able to handle the expected variations in fuel characteristics.

Characteristics of the proposed biomass fuel will depend on a number of factors including:

- **Type** What type of fuel does the heating equipment take. Wood pellet fuel is very different from other solid biofuel such as wood chip or briquettes.
- **Quality** What kind of fuel is needed in order for the installed equipment to operate at maximum efficiency? All solid biofuels are not the same. Does the combustion plant require high quality fuel or can it use lower, and thus cheaper, quality fuel? What is the fuel specification for the particular combustion plant?

Some fuel types have wide variations in consistency of characteristics whereas wood pellets are manufactured to very precise specifications.

- **Cost** Relative to the alternatives, what is affordable? Provide evidence that there are biomass fuel suppliers able to deliver at that price?
- **Quantity** What volumes of fuel are needed and when, who could supply it?

The biomass fuel is expected to be either in pellet, briquette or chip form (hog fuel is unlikely to be suitable for such small heating applications)⁵.

Because the procurement entity is looking for a total heating solution and may not have experience in sourcing biomass fuel the proposal should provide information on the biomass fuel suppliers likely to contract for supply of fuel⁶. Information should be provided on the fuels they provide and their experience in supplying in that locality. Statements should be included from the most established suppliers as to how they can provide assurance that they will have adequate quantities assumed in the proposal for the life of the heating equipment.

Information on why the proposal is based on the specific fuel (pellets, briquettes or chip) should be provided so that the evaluation of the proposal can compare fuel risks. Where wood chip is proposed the assumptions on biomass characteristics to be used for the equipment should be specified.

A proposal that offers a total heating solution of equipment and fuel supply will assist consideration of the biomass heating option against other heating options. Similarly, the longer the term of any fuel

⁵ Wood fuel is defined by specific characteristics such as length and moisture content. The characteristics of the full range of solid biofuels is set out in www.usewoodfuel.org.nz/resource/tg01-solid-biofuel-classification-guidelines

⁶ Biomass fuel suppliers should be accredited by the Bioenergy Association as having adequate quality assurance systems and procedures. [Wood Fuel Supplier Accreditation Scheme](#)

supply contract included in the proposal the more attractive it will be against limited fuel supply or equipment only options.

The proposal should include information on the likely fuel supply contract⁷ being used by accredited fuel suppliers and standard practice for fuel price escalation over the term of the fuel contract. The least amount of effort a procurement entity has to do to evaluate proposals the more positive they will be to those proposals.

Because fuel may come from different biomass fuel suppliers over the economic life of the facility any supporting analysis provided should include data on the differing fuel characteristics for each of the possible different sources of fuel. This should be accompanied by comparison of the levelised cost of energy from the different fuel types, including of the fossil fuel being replaced if known.

Matching heating equipment to the fuel

The proposal should include all ancillary equipment or services necessary for the facility to be successfully operated and maintained for the assumed 15-year economic life. This includes fuel reception, handling and storage.

A summary, including diagrams and photos of the equipment, including fuel reception, handling and storage should be provided so that when evaluation of the proposal is undertaken the evaluator has a clear and simple understanding of the full suite of equipment proposed.

The proposal should provide information and data that the equipment is suitable for the fuels likely to be available for the assumed 15-year economic life of the facility.

Where available monitored performance data of the proposed equipment and fuel used in similar other facilities should be provided. This should include fuel consumption, operating characteristics and heat outputs. References to other similar facilities with the same equipment and fuel type should be listed.

Information should be provided which outlines why the proposed equipment and fuel is proposed with comparison to alternative solid biofuel options.

Heat plant operation

The proposal should outline all the required consents and permits for the heating facility to be installed and operated and should include in the proposal for the equipment supplier to obtain all the required consents and permits as this will be attractive to a procurement entity.

Information on the required operation and maintenance by the facility owner of the proposed equipment should be included in the proposal. The proposal should include training of operational staff such that the Occupational Safety and Health responsibilities of the facility owner are able to be met. After equipment installation and successful commissioning of the facility a certificate must be provided attesting to the completed training of the named operators and any recommendations for subsequent revision at a future date. Information on guarantees and recommendations for external inspection or annual maintenance should be provided.

⁷ A model fuel supply contract and standard fuel price escalation clauses are available from *Technical Guide 6 Contracting to deliver quality wood fuel to customers* <https://www.usewoodfuel.org.nz/resource/tg06-contracting-deliver-quality-wood-fuel-customers>

Because modern automatic operation small heating systems require infrequent operator attention the proposal should include description of the equipment control mechanisms and alert systems for heating performance and fuel storage monitoring. Advice, based on monitored data from other similar heating facilities, on the likely frequency of operator attention should be provided. Information on any external monitoring capability should be provided.

Where there will be differences in the operation and performance of the proposed equipment compared to the heating system which it replaces this should be provided with supporting data. This should include comparison on the heat demand and supply profiles between the existing and proposed equipment.

Information should be provided on the equipment and fuel storage safety systems, including day hopper burn back protection, expansion vessel, pressure relief valves, air relief valves, analogue pressure and temperature gauges, and isolation valves.

Emission of particulates to air

Information on expected emissions of particulates to air should be included in the proposal. This should be supported by monitored data, if available, from other facilities using the same combustion equipment and fuel, and operated in the same manner.

If the emissions of particulates to air will be within the relevant Regional Air Plan Rules clean up of emissions of particulates will not be required.

Greenhouse gas emission

The proposal should include any relevant advice on potential emissions of greenhouse gases to air and mitigation requirements/considerations relevant to the equipment being supplied. In particular comparison should be provided against the greenhouse gas emissions from the existing facility.

Other less tangible costs and benefits

Government owned facilities often have additional community benefits which provide intangible value. Where the proposed new biomass fuelled equipment would contribute to the local community these should be summarised.

Facilities proposed for the Ministry of Education should provide information on how biomass fuelling will:

- Create innovative learning opportunities for students at the school
- Link to existing or planned curriculum items/activities

Lifespan financial analysis

To assist the procurement entity undertake a financial lifespan analysis budget prices for fuel should be obtained from the possible fuel suppliers and included in the proposal. Also included should be advice from the possible fuel suppliers on possible price changes over the economic life of the equipment proposed.

Anticipated lifespan of technology should be included along with typical maintenance requirements and fuel price escalation clauses.

The specification should provide an estimate of lifecycle financial benefits and costs over the anticipated 15-year economic lifespan of the technology.