 **Academies Property**

**Information**

**Note D**

## Acquiring biomass systems

You do not need to complete a form but you will need to supply a business case as explained [below](#BusCaseQs); the acquisition of biomass systems is “novel” within the terms of the [Academies Financial Handbook](http://www.education.gov.uk/aboutdfe/executiveagencies/efa/efafundingfinance/b00212647/external-assurance/academies-financial-handbook).

To ensure you use the right information and form, please also refer to:

* [the Introduction to academies property information notes;](http://www.education.gov.uk/aboutdfe/executiveagencies/efa/efafundingfinance/b00212638/efa-academies-capital/academypins)
* [Which Form](http://www.education.gov.uk/aboutdfe/executiveagencies/efa/efafundingfinance/b00212638/efa-academies-capital/academypins)
* [The Glossary](http://www.education.gov.uk/aboutdfe/executiveagencies/efa/efafundingfinance/b00212638/efa-academies-capital/academypins).

If the proposal involves disposals, including playing fields, you will need to complete the relevant form (see Which Form).

#### Step 1 Evaluate the options

Your application for consent will normally follow an options appraisal as set out in the [Academies Financial Handbook](http://www.education.gov.uk/aboutdfe/executiveagencies/efa/efafundingfinance/b00212647/external-assurance/academies-financial-handbook) .This will consider all reasonable options and articulate why a biomass system is your preferred option. The business case questions below set out the main technical questions you need to answer. The main issues your appraisal needs to address are:

Value for money: comparing the costs and benefits of other types of systems; challenging the terms being proposed by suppliers, including market testing other suppliers,

How the project will be financed.

In most cases the financing of biomass systems requires long-term lease arrangements that usually involve loans. The standard policy is that academies are not permitted to take out loans at a rate above the bank rate, as explained in the [Academies Financial Handbook](http://www.education.gov.uk/aboutdfe/executiveagencies/efa/efafundingfinance/b00212647/external-assurance/academies-financial-handbook). If your project requires a loan at above the bank rate, then it will not receive Secretary of State consent. The reason for this policy is that it is not possible for the academy to guarantee its ability to repay the loan over such a long period.

If the proposal can be financed, you need to follow public procurement practices set out in [Managing Public Money](https://www.gov.uk/government/publications/managing-public-money).

Conducting an environmental impact analysis (including liabilities of storage of fuel) and satisfy the space requirements for access and egress of large delivery trucks and for chimney height (all of which will be material to obtaining planning consent). You should have discussions with the local planning authority as early as possible on the feasibility and acceptability of your preferred option.

Depending on the level of complexity of the decision and the range of expertise you have within the Trust, you may need external independent legal, financial, technical and property advice to support the appraisal process.

Be sure to allow for the time to collect all information, to appraise all options and for the Education Funding Agency’s (EFA) assessment process. Do not enter into any agreement, options or conditional contracts until you have received written notification of the Secretary of State’s decision.

#### Step 2 Submit the business plan

Write a business plan that contains the information that answers the business plan questions below.

Submit your application when:

* you are sure you have answered the business plan questions and
* your Accounting Officer has signed the plan. We cannot consider applications submitted without this signature.

#### Step 3 Clarify any points in the application

Provide any further information we might request to clarify your application, so we can assess it as speedily as possible.

Please email your business case with all attachments to: [***academy.questions@education.gsi.gov.uk***](mailto:academy.questions@education.gsi.gov.uk)

You will receive an acknowledgement within 3 working days of receipt of your business case providing a unique reference number. We will then determine if you have provided all of the information that we need to make a decision. We will only be able to consider your case after you have provided all necessary information. Once the information is complete, we aim to provide you with a decision in 10 to 30 working days, depending on the complexity of the proposal.



**Biomass project business case questions**

The questions below ask for the physical and technical information and risk analysis when considering acquiring biomass systems. The term biomass “systems” is used rather than “boilers” in order to include the potential range of biomass units and control mechanisms that could be used.

#### Estate Energy Strategy

* What is our estate energy strategy?
* What are our needs, priorities and constraints – i.e. what options have we considered in terms of needs (heat, light, electricity), types of fuel, cost, characteristics of the estate, carbon emissions and educational impact?
* What combined heat and power (CHP) options have we considered?
* What other options have we considered – e.g. gas absorption heat pump, heat exchange unit?
* Is electricity-production by a biomass system realistic?

#### Efficiency

* How efficient (in kwh/m2) would a biomass system be for my estate re. energy use per day / term / year, as compared to fossil fuel systems?
* How do my institution’s operating hours and building loads fit with the continuous operation of biomass systems?
* What is the optimum array of biomass, renewables, fossil fuel and electrical systems that would meet the heating needs of our estate?

#### Fuel

* Wood chips or pellets: how have we ensured availability and can we mitigate against risks of increasing cost and reducing supply?
* Where will the fuel be stored? Can it be kept dry?
* Can fuel be delivered without disturbing pupils, students and neighbours (pneumatic delivery is very noisy)?
* How will we manage the risks of fuel storage – space, lorry turning circle; spontaneous combustion, gas poisoning, industrial disease (there have been fatalities attributed to bio-fuel storage)?

#### Safety

* How would the system deal with the risks of continuing combustion in the event of power failure?

#### Design

* Does the system deal with the complexities of flue / chimney design?
* Have we considered options for the mix of biomass and fossil fuel units?
* Are the control mechanisms able to manage the whole estate environment?

#### Suppliers

* Is an Energy Performance Contract (EPC)[[1]](#footnote-1) a feasible option (taking into account risks, unknowns, initial investment)?[[2]](#footnote-2)
* Have we considered all options, including:
  1. Supply and install system only;
  2. 1 + maintenance
  3. 2 + operating
  4. 3 + fuel supply
  5. 4 + charge for energy delivered

#### Procurement

* How have we ensured that we have followed the correct public (and EU if above thresholds) procurement practices in determining potential suppliers and to achieve best value?

#### Funding

* Have we considered the Renewable Heat Incentive (RHI), Enhanced Capital Allowance, Feed-In Tariffs, Enterprise Investment Scheme and Salix?
* Have we maximised RHI?
* What financing, leasing and supply options have we considered?

#### Case Studies

* Are there existing installations in comparable institutions from which we can learn?

#### Further Information from DfE:

* Priority Schools Building Programme [Facilities Output Specification](http://media.education.gov.uk/assets/files/pdf/f/psbp%20fos_001.pdf)

#### Further information from other organisations:

* [The Carbon Trust](http://www.carbontrust.com/)
* [Chartered Institution of Chartered Building Services Engineers](http://www.cibse.org/):

Journals (December 2012, April 2013)

* [Health and Safety Executive](http://www.hse.gov.uk/services/education/index.htm)

## ANNEX: Priority School Building Programme Facilities Output Specification (FOS)

*The information below is an extract from the* [*FOS*](http://media.education.gov.uk/assets/files/pdf/f/psbp%20fos_001.pdf) *and is intended to highlight the factors and issues in procuring heating systems.*

**Boiler plant**

* + 1. The Contractor shall ensure that:
       1. All boiler loads are based on the results of an hourly heat demand model for the building[[3]](#footnote-3)[1].
       2. All tanks are designed for future use with bio-fuel.
       3. All burners are commissioned by an engineer employed by the burner or boiler manufacturer;
       4. Carbon Monoxide (CO) detection equipment interlocked with safety shut-off valves is installed in all boiler rooms.
       5. All chimney flue systems except those serving direct gas fired boilers operate under negative pressure without flue fans.

**Commissioning/Acceptance/Annual Tests for boiler/flue systems**

* + 1. For all boiler plant and direct-fired hot water generators of output greater than 4kW, the Contractor shall carry out commissioning and annual performance tests for emissions and combustion efficiency and record the results in a logbook. Tests shall be in accordance with professional-level guidance such as that published by the Carbon Trust and the Chartered Institution of Building Services Engineers (CIBSE).
    2. The Contractor shall ensure that the boiler/flue system is tested during commissioning once the boiler can be brought up to full fire for a sustained period as follows:
       1. by Flue Gas Analysis with an EN 50379:2[[4]](#footnote-4)[2] compliant instrument;
       2. at full fire and at low fire;
       3. for O2, CO, CO2, HC measured in mg/m³;
       4. to record the temperature of the incoming combustion air and of the flue gases;
       5. for pressure differential to verify the performance of the flue. The flue system is tested to ensure that its leakage rate does not exceed that designated according to EN1443[[5]](#footnote-5)[3] for the particular flue type;
       6. the flue gas loss % (i.e. - % energy loss up flue [Siegert Formula]), lambda (the degree to which the fuel air mix approaches the ideal), boiler efficiency and dew point shall be recorded.
    3. Where there is no permanent monitoring of flue-gas analysis, flue-gas temperature, mass flow, flue gas velocity and draft there is an opening with readily removed, gas-tight cap into the side of the primary connecting flue of 12 – 22mm for a Flue Gas Analysis probe. This is within 500mm of the boiler connection or according to the boiler manufacturer’s instruction and upstream of any draft stabiliser or anything which might alter the temperature or composition of the flue gas.

**Annual monitoring**

* + 1. The Contractor shall design the system to enable annual repetition of the above test to provide an independent check on the system’s efficiency and its emissions (as required by the Services Output Specification).

**Biomass and biofuel systems**

* + 1. The Contractor shall assess the feasibility of using any Biomass boiler systems using the Carbon Trust Biomass Boiler sizing tool. The tool should be used to prove that the heating system balance temperature, the utilisation factors for the boilers, the sizes of buffer vessels and/or thermal stores and the seasonal heating system efficiency justify the use of Biomass as a fuel and justify the key parameters of the system design. Account shall be taken of legislation and design advice[[6]](#footnote-6)[4].
    2. For biomass and biofuel systems to function efficiently, a reliable and consistent supply of quality controlled fuel is required[[7]](#footnote-7)[5].
    3. The feasibility assessment and planned fuel supply shall be recorded in the heating strategy submitted as part of the IPDSB stage Environmental Strategy report.

1. CIBSE Journal 2013 [↑](#footnote-ref-1)
2. CIBSE Journal 2013 [↑](#footnote-ref-2)
3. [1] An example is the heat demand model used in the carbon trust biomass boiler sizing tool. [↑](#footnote-ref-3)
4. [2] BS EN 50379.2 [↑](#footnote-ref-4)
5. [3] EN 1443 Flue leakage [↑](#footnote-ref-5)
6. [4] Guidance on what load is suitable to be met with which type of biomass system, burning which fuel is available from CIBSE and the Carbon Trust. [↑](#footnote-ref-6)
7. [5] BS EN 15234-1:2011 Solid biofuels. Fuel quality assurance. General requirements [↑](#footnote-ref-7)