



Biomass Boiler Case Study: Stanton St. Quintin Community Primary School

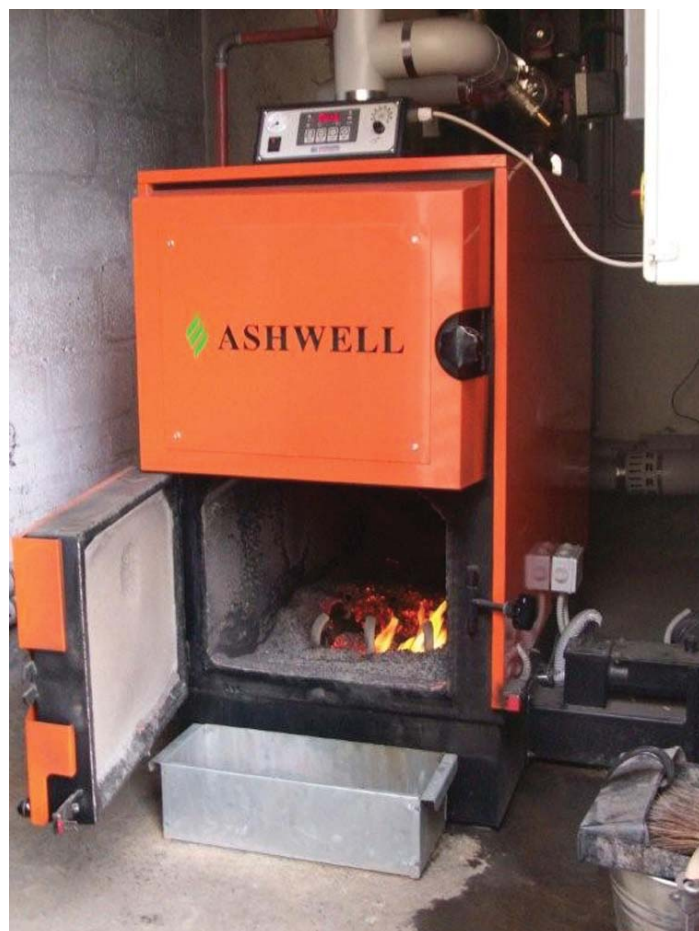
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Stanton St. Quintin Community Primary is a small village school of around 110 pupils near Chippenham, Wiltshire. Business Manager Anita Druce is so happy with the school's biomass boiler that she contacted our ECO Team Schools Officer, Emma Conway to tell us about the school's successful experience. Biomass boilers typically use wood fuel, in the form of wood pellets or wood chips. Here's Stanton St. Quintin's Biomass story...

How did you come to the decision that you needed a biomass boiler?

I attended a school sustainability event where we were shown biomass boilers in action and I was really impressed with them. Being a rural school, we have no gas provision and we have always used oil for our heating demands. Our oil-fired boiler was due for renewal so I thought it would be an ideal opportunity to convert to biomass. Oil is costly, inconvenient (in that it requires regular deliveries which may be unreliable e.g. hampered by snow and the price fluctuates considerably), so it is difficult to budget for energy demands across the year. Plus, oil prices are expected to continue to rise and I wanted to protect the school from spiralling heating bills.

Furthermore, we felt that it is a great way to raise awareness with our pupils of the current environmental challenges that we face and how we can choose alternatives to reduce our impact. The children are aware of the way we obtain our heating and it provides a good basis for environmental projects.



How did you go about putting your plans into action?

In-School Decision Making

The school leadership team and the governors were consulted on the idea and they agreed that we should pursue the possibility of replacing our oil fired heating system with one which runs on biomass (that is, wood fuel-typically wood pellets or wood chips).

Implementation

Wiltshire Council appointed Ridge as the consultants, who provided modelling on the project. I asked a number of companies to visit the school to give their technical advice and to provide quotes for the installation. The project went to tender and C.J. Deighton & Co., a local building contractor, won the contract to convert all our oil provisions to suit the needs of a biomass heating system.



Installation

We scheduled the installation to take place during the summer holidays to avoid disruption during term-time. Before the new boiler could be installed the oil boiler was removed and the boiler room converted.

Our oil tank room was also converted to house a sealed storage area for wood pellets. It is sealed to prevent moisture penetrating the pellets. The pellets are then fed through to the boiler by a screw feeder. To allow large delivery vehicles access to the store an external feed into the pellet store was constructed. As is often the case with building works, we experienced delays, which meant that for the first month of the new school year we were using temporary heaters and we experienced some disruption, which we would like to have avoided!

How did you finance the installation?

The total project cost was £49,613 in 2007, which included design, installation and project management fees. We were lucky to obtain a grant from DEFRA to contribute to the cost. As a member of the maintenance pooling scheme, Wiltshire Council contributed the cost of a standard oil boiler replacement (around £23,000) and the remainder we fundraised within the school with our "Heat our School with Biomass Fuel" campaign.

How much does the fuel cost?

Our biomass boiler uses wood pellets, rather than the cheaper wood chip fuel which requires extra storage space that we don't have. Based on our 2010/11 fuel deliveries (2 x 7 tonnes, with 4 tonnes left in May 2011) we use around 10 tonnes per annum. The price of wood pellets is £185 per tonne, so we have an annual heating bill of £ 1,850. However,

when you factor in a £250 delivery charge for two deliveries, it totals £2,350. Heating for evening and weekend letting of our building is included in this price so, it works out about £18 for each day we heat the school. The cost is much lower and much more consistent than oil.

More competitive rates on fuel may be available from other companies. However, we choose to stay with our current supplier due to concerns over delivery vehicle size.

Are you saving money?

From our previous oil purchase records, we used an average of around 5,100 litres of oil per year. At current oil prices, this works out at £3,111 per year. So even without shopping around, we are saving £761 a year, and with oil prices predicted to rise these savings are likely to increase year on year, too. This doesn't include, however, the maintenance costs that you would have to pay if you didn't have somebody at the school who could clean the boiler on a regular basis like I do.



What about your carbon footprint?

One litre of oil equates to 3 kg of CO², so before we would have been emitting 15,300 kg carbon each year from our heating oil alone! Biomass is considered carbon neutral, so our carbon savings are significant! Also, unlike oil or coal, biomass is renewable, so we don't have to worry about it running out.

Does it meet your expectations?

Definitely-it works! Our building is so warm that we have had to turn the thermostat down!

The project has been fascinating and I am convinced that this has been the right decision for our school. There are more maintenance responsibilities, but so long as you are aware of these before you commit to biomass and you know you are able to meet them, it is a great way to heat your building. It is efficient, low cost and carbon-neutral. What is more, every single fuel delivery order I have made has been the same price, whilst oil and gas prices have been

fluctuating and rising. I am confident that our school will enjoy lower and more predictable heating bills into the future when we would have otherwise been struggling.

How did you engage pupils in this process?

The children were involved right from the start because we consulted with them on the decision-making process for replacing the boiler. Throughout the planning of this project the school pupils and the wider school community were fully involved and there was much support for the idea. Children and also their families got involved in fundraising in the local community to fund the project to happen. The project was included in classroom and assembly topics to maintain engagement and keep the pupils informed of issues surrounding the boiler replacement.

You mentioned maintenance. What is involved?

Our boiler needs a maintenance clean once a week and this needs to be done when the boiler is cool such as first thing on a Monday or at the weekend. It takes about 15 minutes but it is a messy job! You need to wear a face mask to protect from the dust and I always need a shower afterwards. As I come to a fitness class here at the school on a Saturday morning, I clean the boiler afterwards; if you are the person responsible for cleaning the boiler, you need to find a way to make it work around your regular routine. Also, you will need a friendly local chimney sweep to come and give it a more extensive clean

twice a year. Some boilers are self-cleaning and others may require less frequent cleaning, but be sure to ask about this if you are considering biomass.

What key considerations and tips do you have for other schools considering biomass?

- You will need large vehicular access to the designated fuel store area
- Ideally you should schedule the works for the very beginning of the summer holidays to allow for delays and minimise disruption
- Check with installer companies that you have an area suitable for a boiler and fuel
- If you want the cheaper option of wood chip, do you have a big enough storage area?
- How many deliveries will you need per year? This will be dependent on your fuel storage capacity and your heat demands.
- Is there somebody who can clean the boiler once a week when cool? If not, you need to factor in the cost of a contract to do this.
- Are you considering using your boiler for your hot water needs too? If so, what would be the cost, level of disruption and the duration of works?
- Is there a local fuel supplier who could meet your needs in terms of supply and quality? If so, you may be able to save on delivery costs and reduce your environmental impact further.
- If you go ahead with installation, I would recommend that you ensure that there is a gauge on the front of your pellet store. No such gauge was installed on ours so I found it difficult to know when another delivery should be scheduled.

Below is a summary of advantages and disadvantages of biomass according to Anita's experience.

Advantages	Disadvantages
Fuel costs far less	Regular cleaning needed
School protected from oil and gas price rises	Cleaning is a dirty job and requires a face mask
Price is consistently easier to budget for	Chimney sweep needed twice a year
Fuel is carbon neutral area	Large delivery vehicles need to get within close proximity of the store
Fantastic educational tool	Delivery takes around 45 minutes and is noisy
Raised environmental awareness and understanding within the school	

...And finally, would you recommend biomass to other schools?

On the premise that it is feasible for your particular school, absolutely!

Useful Links

Carbon Trust

General advice and information on biomass:

<http://www.carbontrust.co.uk/biomass-heating/biomass-heating/Pages/Default.aspx>

Regen South West

Directory where you can search for biomass services and suppliers in your local area:

<http://www.regensw.co.uk/directory/?location=directory>

South West Wood Shed

Lots of useful local information on biomass:

<http://www.southwestwoodshed.co.uk/index.php/search>

Department for Energy and Climate Change

If you are considering converting to biomass, you may be eligible to receive the Renewable Heat Incentive.

The most up-to-date information can be found at:

http://www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/incentive/incentive.aspx

For more details on Stanton St Quintin's biomass boiler experience E-mail School Business Manager, Anita Druce at: admin@stanton-st-quintin.wilts.sch.uk