

Getting power from pellet technology

Nottinghamshire schools are being heated using locally-grown short rotation coppice. *Mike Abram* finds out more

It has finally happened. A fully up-and-running partnership supplying wood pellets – made from short rotation coppice – to heat schools.

There has been plenty of talk about growers supplying biomass to heat local schools, hospitals or other public buildings in recent years but the scheme to supply coppice wood pellets for up to 65 Nottinghamshire schools is one of the first to get off the ground.

It is all a long way from the dark days of the ARBRE project for Nottinghamshire grower Fred Walter. He started growing short rotation coppice when that project's grants encouraged him to plant around 11 years ago. By the time the project failed he was already involved in setting up Coppice Resources, a firm that specialises in planting, managing and harvesting energy crops

Woodchip project

- Coppice biomass supplied to heat schools
- Pellet plant developed
- Reduces carbon dioxide emissions
- Target of 65 schools

across the UK.

He now grows 100ha of willow on his farm – all on poor quality land that has been back-filled with pulverised fuel ash from local power stations. Yields are about 7.8t/ha a year – not as much as where SRC is grown on better land, but as he says: "It's better than 0.5t/acre barley."

And it has cost him next to nothing. Grants covered the planting costs, inputs are restricted to an application of sewage sludge after harvest, which occurs once every three years. Indeed, harvesting is the biggest cost, he says. "When you do a run the harvester needs to be full at all times – if the crop doesn't justify cutting don't do it."

Together with money he can earn from including headlands in Entry Level Stewardship schemes and energy crop subsidies he reckons he clears about £200-£225/ha profit from his SRC. "It used to stack up reasonably well against wheat, until this year, but what else can I do with the land. It's better than sheep."

After the ARBRE project failed Mr Walter found a home for his SRC at various co-fired power stations, but from this year it will all be used in biomass heaters in local Nottinghamshire schools.



Wood pellets from Fred Walter's short rotation coppice will heat up to 65 schools.

CUTTING TECHNOLOGY

■ CRL has developed its own header to fit on forage harvesters to direct cut SRC, the firm's Chris Mell says. "The original machines we used from Sweden were not up to the job. The colder growing season they have meant their coppice wasn't as big as ours."

After discounting very specialised sugar cane cutting equipment on the grounds of economics, CRL set about building its own header. The result, mark five, has a hydraulic drive transmission rather than a mechanical transmission. "It needed to be more easily fixable to a range of machines."

The switch has cost a little in power and efficiency, Mr Mell admits. "But it just means you need a bigger engine to run it."

The header is just under 3m wide, which is determined by how SRC crops are generally planted, and has two rotating saw blades. A front reel pushes over the willow, pre-tensioning it, before it is chopped into 17mm chips. Output is about 15 acres or 150 oven-dried tonnes a day, Mr Walter says.

So far, three headers have been built for clients in USA and Ireland, as well as the Sutton Grange model, Mr Mell says. But he admits the header is expensive – currently at about £90,000. "Hopefully we can get the costs down through economies of scale once the design is finalised."

The header has been fitted so far to Claas Jaguar forage harvesters and a New Holland FX48.

The schools will be supplied with pellets produced using a new automated pellet plant developed by Biojoule (see panel). The firm is working in partnership with CRL, with the pellet plant installed at Mr Walter's Sutton Grange Farm, near Retford. CRL is committed to supplying enough coppice or other woodchip to produce 10,000t of pellets a year.

The pellets are then sold by Biojoule onto The Energy Crop Company, which distributes the pellets to the schools. So far, biomass boilers have been installed in 20 schools, according to Alan Allsopp from Nottinghamshire County Council.

Using the boilers has resulted in the reduction of carbon dioxide emissions by 2400t a year, helping the council meet its Local Public Service Agreement target of an annual 3500t reduction, he says. "The aim, if we can secure funding, is to fit or convert boilers in 65 schools, using about 4000t of pellets a year. Once we're delivering the full programme it will save 10,000t of carbon dioxide."

No other council yet operates a



The aim for Nottinghamshire County Council's Alan Allsopp is to save 10,000t of carbon dioxide through the use of biomass.

scheme on the same scale, Mr Allsopp says. "But this is the future for schools and other public building heating, particularly if they have a wood source on the doorstep."

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PELLET PLANT SYSTEM

■ Pelletising woodchips makes them easier to burn and cheaper to transport, but conventional pellet plants are both expensive to build and maintain.

Biojoule has developed a system that is fully automated, small-scale and transportable, which means it can be taken to smaller resource areas, such as energy crop growers' farms, and still be economic to run.

Built in pre-wired ISO containers, the plant consists of six units, explains Fred Dumbleton, Biojoule's technical director. SRC woodchip is loaded into a large scale drier, after being partially dried in a windrow for up to two months after harvest, and dried down to 8-12% moisture content.

Once dry the material is transported into the pellet mill, where a hammer mill grinds the chips into a coarse sawdust. "It works by air transport; it sucks in woodchips and blows out the dust." The sawdust is then fed into the pellet mill. "It makes nearly 500kg of pellets a hour."



Biojoule's plant produces 500kg of pellets an hour, says Fred Dumbleton.

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Coppice Resource's header to direct cut coppice costs £90,000, says Chris Mell.