

Evesham Vale Growers: From Green Waste to Renewable Energies

Deep in Worcestershire, a green energy revolution is taking place. The county, and in particular the Vale of Evesham, has long been famed as Britain's 'Fruit and Vegetable Basket', producing a variety of produce on a massive scale - including being the traditional home of asparagus. But now, in response to the drive for the UK to grow more of its own food and reduce reliance on imports, the region is stepping up its production.

For one of the region's main producers, Evesham Vale Growers, the growth in their business has triggered a need to find a solution to a mounting waste problem and to reduce costs of heating and power. EU and UK regulations mean that waste generated from its 30 acres of glasshouses and 2,000 acres of outdoor salad vegetables is categorised as industrial waste and as such cannot be returned to the land as fertiliser. The company, struggling with both the financial and the environmental costs of sending the waste to landfill, came up with a neat piece of joined up thinking that resolved both issues.

The firm has developed an Anaerobic Digester (AD) Plant at Fladbury, near Evesham, which turns its green waste into energy that can be used both to heat and light its tomato greenhouse and to sell back the excess to the National Grid. Matt Powell, Operations Manager, explains: "Originally we thought it would be a good way of getting rid of our waste. We didn't really envisage that we could generate our own energy from this waste. Now we make both our own electricity and clean gas. About 2/3rds of the gas is used by ourselves, the remaining gas is upgraded to natural gas and sold back to the Grid. A by-product of this process is that we produce food grade CO₂ which can be put back into our greenhouse to aid the photosynthesis process – we think that this is unique in the UK. We also use some of the gas to produce ½ MW of electricity per hour, about 40% of which is used within the plant, with the surplus also exported to the National Grid. What it all means is that our carbon footprint for the greenhouse returns to zero."

It is both a highly technical and innovative process that required a significant investment by the company's owners, the Bille family. The payback on such an



investment is, however, comparatively short at approximately six years. And the company has further ambitious plans to develop its green credentials.

Plans are afoot to embark on an investment programme that will total more than £30 million. Two years' ago, the company acquired a further 650 acres in nearby Throckmorton on which they have obtained planning permission from the local authorities (Worcestershire County Council and Wychavon District Council) for a further larger AD plant. This plant will be fed mostly from animal waste including some from the nearby chicken farm who will, in return, receive heat and power for their chicken sheds.

There are plans to grow the company's beef herd from its current 200 to 1,000 and use the natural waste produced by the cattle to



fuel the new plant. Planning permission is also being sought from the County Council to use the food waste collected by nearby local authorities to generate energy. If approved, it will reduce the pressure on landfill sites and the number of trips the councils currently need to make to a composting site some 50 miles away. There is the potential too to recycle waste from other local authorities and large food waste producing operations such as schools and hospitals.

Further into the future, Evesham Vale Growers' vision is to run delivery trucks on bio-fuel which can also be produced by the AD plant. In the meantime, the company has permission to erect a 24 acre solar panel farm and is in the throes of submitting another application for a further 47 acres. An additional 20 acre greenhouse is also on the cards.

All of this activity generates jobs – and therefore economic benefits – for the region. The firm currently employs

nearly 600 staff during its peak summer season, all of whom spend their time and money in the neighbouring towns of Evesham and Pershore. The plans for growth will potentially mean the creation of at least another 100 jobs.

The Worcestershire Local Enterprise Partnership (LEP) has worked closely with Matt Powell and Evesham Vale Growers to support them throughout their period of expansion. Infrastructure improvements have been made to the nearby road network, including a new roundabout access from the adjacent A44 into the AD plant. “The LEP has helped us in our dealings with the various authorities,” says Matt, “We are in the fresh produce business and need to move quickly – we have no time for protracted planning processes which create barriers to growth.” The LEP is able to help councils and businesses understand each others' needs better and, for Evesham Vale Growers that meant that things moved forward rapidly.

Horticulture and Food Production is one of the key sectors identified by the LEP as critical to Worcestershire County's economic growth and prosperity. Another is the development of green, sustainable energy solutions. The LEP is keen to fully support Evesham Vale Growers as a major food growing and production company. The AD plant and green energy processes adopted by EVG demonstrate a unique and innovative way in which a traditional growing sector is massively increasing its food production whilst at the same time contributing to the renewable energies revolution.

The Technology

The 30 acres of greenhouses currently used to grow Evesham Vale's tomatoes are innovative in many respects.

All the produce is grown hydroponically. Plants are inserted into a Rockwall block and water is circulated continuously. Most other producers in the UK don't have a system of continual water flow. Water is sourced from a reservoir that harvests rain from the greenhouse roof. The hydroponic process keeps disease at bay and the growing cycle is therefore prolonged. Typically, the crop is planted in January and will be harvested until November. Bees are released into the greenhouse for pollination purposes.

Thermal screens have been installed and allow a constant temperature to be maintained. This will save an estimated 10-15% in energy costs.

In the AD plant, green waste is taken through an initial aerobic stage, then into an anaerobic stage that results in vast quantities of biogas being produced.

The raw bio-methane is used in two different ways. Approximately 2/3rds is converted by an on-site Combined Heat and Power (CHP) plant for heating and lighting of the greenhouse. The remaining 1/3rd is upgraded, sold back to the National Grid and used to supply the neighbouring populations.

CO₂, a by-product of the AD process, is pumped into the greenhouse to aid photosynthesis. This increases tomato production by about 20%.



Potential benefits arising from the AD process

1. Carbon dioxide assists growing process through photosynthesis.
2. Electricity produced for lighting and power.
3. Excess electricity exported to Grid and tariff received.
4. Heating in cooler months produced from gas.
5. Surplus clean gas exported to Grid and tariff received.
6. Bio-fuel produced from gas for commercial vehicles.
7. Rainwater harvested and reused in hydroponic growing.
8. Reduced need for landfill.
9. Reduced costs associated with landfill.
10. Anaerobic digester residue becomes high quality fertiliser.
11. District heat and power to adjacent developments.
12. Use of animal waste.
13. Opportunity for local authority food waste disposal.
14. Similar for other major establishments.
15. Cheap power for year round growing under lights.
16. Increase in food production quantities
17. Decrease in food miles from imports.
18. Reduction in volume of imported food.