

# Zetland Estate

Carbon Lean Offices in Rural Richmondshire



The Zetland Estate at Aske in Richmondshire has been in the ownership of the Zetland family since the 1763's and is under the management of the current Earl of Ronaldshay. It is a working estate employing 9 full time staff, 2 directly in forestry. It provides office accommodation for 30 of business in buildings dating back to the 1800's across 5 sites. About  $\frac{1}{3}$  of the estate is ancient or semi natural woodland and the pastureland has a predominance of in-field 'veteran' trees, mostly limes, ash and oaks. The estate previously used 160,000 litres of oil annually to heat the estate office, chapel, main house and tenanted offices.

## objectives

- To reduce oil dependency and end high cost/volatility pricing that oil use entails.
- To bring estates woodland back into rotation, ensuring retention of the two existing forestry staff and enhancing estates biodiversity value.
- Reduce tenants 'Carbon Footprint', improving tenants ability to compete on grounds of being more sustainable or 'green'.
- Improve tenant retention with low cost/sustainable heating.

## actions

- Before engaging in the refurbishment and conversion of the farm buildings a feasibility study was undertaken looking at suitable boiler installers.
- A fuel assessment of the estate woodland was conducted, to ensure replacement of 160,000 litres of oil via estate woodland was possible.
- Storage methods for the chip were assessed with construction of a purpose built store on the site of the estates old saw mill undertaken. The store is South facing to aid chip moisture reduction, has a solid floor, plus transport links to the boiler / around the woodland are well established.
- A transport system for the woodchip had to be designed, this had to fit with the nature of the heritage buildings. A blower system designed by Priden Engineering was chosen, which is powered by one of the estates tractors.

## achievements

For Local Residents/Office Users:

- Creation of 37,000 sq ft of business units, heated by biomass, providing 30 businesses with 'Carbon Lean' accommodation.
- Creating a major saving on the estate heating bills, saving approximately 549t of CO<sub>2</sub> annually.

For the Region:

- 2 jobs have been secured on the estate in the fuel supply, woodland management, and via increased estate works, with greater security of work for local sub-contractors used by Zetland.
- Creation of a regional exemplar for biomass, showing good woodland stewardship can provide economic 'Carbon Lean' heating.
- Creation of a diversification enterprise for the estate business; managing other local smaller estate woodland, supplying wood as fuel etc.
- Demonstrated excellence in woodchip delivery, using a bespoke engineering design that has now be replicated elsewhere.

## background

- Zetland Estate runs 2 boiler houses, a 150Kw Froling for the offices and Aske Hall uses a pair of 220Kw Frolings, all supplied by Ecoenergy. Twin Services Mechanical & Plumbing Contractors, a local company, undertook the pipe works.
- Storage on the estate utilises the former sawmill with its established transport links and timber storage areas. All the timber is stored 'in the round' for a period of up to eighteen months before conversion into chip form.
- The chipping is undertaken to G50 standard using one of three local chipping contractors. All chipping is undertaken direct into the purpose built chip store, as the old sawmill had no suitable buildings. This is an open fronted South facing, concrete floored building, with a vital good through draft.
- Chip is at an average of 30% moisture, with the storage shed holding in the order of 5 weeks supply or 75-80 tonnes. The fuel source is predominately mixed conifer species and is most based on co-product / utilisation of woodland management arisings with the majority of useable round wood going to the sawmill market.
- The delivery system is of a bespoke design, by Priden Engineering; based on a converted animal feed blower. It has a capacity of 12 cubic meters, which can be deposited in the fuel store in about 40 minutes. The trailer is driven by a 110bhp Valtra tractor and can pump woodchip up to 8m. It cost £25,000, and this is wholly reflective of the one off design cost, the Forestry Commission gave £8,300 of financial support, via it's grant scheme.
- Zetland Estate also provides an outwith forestry and contracting service, assisting other local woodland owners and small estates, allowing further dissemination of good forestry practice. They also have a thriving log fuel business supplying the local community with approximately 200 tonnes annually.

## quotes

*"Because of the estate utilising wood fuel we have been able to return a traditional programme of forestry, with felling, new planting and growing trees for value".*  
Shaun Purkiss, Zetland Estate Head Forester.

*"Using woodfuel has not only led to a drastic reduction in heating bills, but also meant previously worthless timber now has a value".*  
Lord Ronaldsay, Zetland Estate Owner.

## partners

Forestry Commission  
Yorkshire Forward  
Yorwoods  
Econergy – Boiler Supplier  
Twin Services Mechanical & Plumbing Contractors  
Priden Engineering - Trailer  
Willis Contracting – Chip Store  
Brian Stephenson, R Blakey, J & S Vicary – Chipping Contractors

## funding

£8,300 Forestry Commission  
Infrastructure Grant  
Econergy Enhanced Capital Allowance

## lessons learnt

- Good ventilation for chip is essential especially when utilising heritage buildings that have been designed for other purposes.
- Ensure that issues around electricity supply, especially the absence of 3-phase are fully considered.
- Gaining a good understanding of the forestry supply chain helps in producing adequate timber supplies and address securing a consistent fuel supply.