

DATE *Dec 2007***RENEWABLE ENERGY**PROJECT *Strategic review; Renewable Energy Options***OPTION ASSESSMENT**SUBJECT *Renewable Energy*

	Wind (250kW)	Solar PV (13kW)	Wood Boiler (80kW)	Solar Collector (60m ²)	Ground source heat	Anaerobic Digestion (kW)	Biodiesel generator
Energy Supply kWh	567,000	10,700	359,100	42,000	359,100	200,000	900,000
Typical Installed Cost	£x	£x	£x	£x	£x	£x	£x
Maintenance required	Low	Very Low	Medium	Very Low	Low	Medium	Medium
Operator involvement	Low	Very Low	Medium	Very Low	Low	Medium	Medium
Reliability	Good	V. Good	Good	V. Good	Good	Good	Good
Resource availability	Fair	Fair/Good	Good	Fair	Good	Good	Fair/Good
Fuel Storage Requirements	None	None	Yes	None	None	Yes	Yes
Suitable Location	On site	Roof	Adjacent Building	Roof	Outside building	Close to Building	Separate; fire safety
Intrinsic Load	None	None	10% Capacity	<5%	25%	10%	Unknown
Approx CO ₂ Saving Tonnes	244	5	91 (cf oil)	11 (cf oil)	60	52 (cf oil)	360

Vegetable processing & packing facility; Renewable Energy Options:

Carbon Zero Consulting (CZC) was contracted to provide a detailed assessment of potential renewable energy alternatives for a proposed large vegetable processing and packing operation.

Our client has a strong relationship with the major supermarkets and foresees the need to provide high quality produce whilst minimising costs and **carbon footprint**.

The new site has a significant electrical power requirement as well as seasonal need for space heating of factory floor and office accommodation. As a farmer's co-operative, the client has access to a significant resource of rape-seed which they will process on-site into bio-diesel. This was taken into account during the assessment.

Each renewable technology was considered for power and/or heat generation. A sedum 'green roof' was also assessed as an option and could be incorporated if the final roof support design is suitable.

Wind power generation was not considered beyond an initial viability assessment due to the proximity of significant woodland and unsuitable topography.

The details of each technology were summarised in an options matrix similar to that shown.

The conclusion was that a generator should be procured and installed. It will consume 100% bio-diesel produced on-site. The generator was sized to provide the peak 500kW requirement for the site and as such they would be 'off-grid' for power consumption. However, a grid connection was recommended for emergency back-up and for export of additional power back to the grid as a source of revenue. On-site power generation will save the client over £50,000 per annum.

For heat provision, it was concluded that a Ground Source heating scheme was the preferred option. The site lies on a major aquifer and so an open-loop design was recommended. This would also supply a grey water resource for the factory. Heating costs will be at least 50% lower than a gas or oil boiler alternative.

For wastewater treatment, an aerobic system was recommended followed by construction of a large reed bed

