

Unlocking new revenue streams for rural landowners

Growth in New Zealand's bioenergy sector is starting to drive an increased demand for greater quantities of biomass. Whether it is high quality wood fuel, biomass for transport fuels or production of biogas. New Zealand's landowners are very well-placed to meet the demand and take advantage of this emerging opportunity. The opportunities that exist include:

Wood fuel

Wood fuel produced on farms can be used for the production of heat or as a feedstock for the emerging transport biofuels market and can be produced from small or large woodlots, shelter belts and purpose grown biomass crops, horticultural prunings and crop stubble. The growing or sourcing of these materials can all be integrated with traditional land uses and become important revenue streams for the landowner.

Organic matter

Landowners are often in a situation where they produce organic matter which becomes a waste. Integrating bioenergy solutions into traditional land use activities can turn this waste into a valuable resource. Such organic wastes will include animal wastes, dairy shed effluent, piggery wastes, stable manure, poultry farm wastes and any on-farm animal processing materials. Interestingly, this is not so much a new opportunity, but more about knowing how wastes and residues can be converted into feedstocks for bioenergy and other bio-processing options.



Case study for the use of a wood chip heater on a dairy farm

This case study was undertaken to determine the viability of using a highly automated purpose-built wood chip type Low Temperature Hot Water (LTHW) boiler to provide hot water heating for a dairy shed wash down along with space heating and Domestic Hot Water (DHW) for nearby farm houses. The farm was located in Pateoroa, Central Otago, and was a dairy conversion unit with a new shed and two farm houses. The peak heat load for the dairy farm was 59 kW and the annual heating energy consumption was 98 MWh. The investment costs as well as the annual demand related costs (mainly fuel costs) and operation related costs for the different heating systems were determined. Given the current market situation, a minimum annual energy consumption of

approximately 200 MWh or a smaller investment cost of approximately \$70,000 made the chip boiler system feasible.

The Bioenergy Association assists rural landowners establish new energy projects on their farms by linking groups of landowners together and assisting with identifying potential demand.

Producing biogas on your farm

Biogas' is gas produced during the breakdown of biological matter, which can be used to provide electricity, heat and transport fuel. Biogas can be produced using effluent from farms, crop wastes, sewage or at landfills.

Small-scale biogas schemes can generate electricity or heat for use on the farm, within communities, in businesses and in homes, and in some cases can also export electricity back into the local network. Farms and businesses which export may be able to sell the electricity to a power retailer or to another user.

A prototype biogas system has been operating for several years on a Landcorp-owned farm at Eyrewell, North Canterbury. Manure from the farm's 900 cows is collected on a concrete pad outside the milking sheds, and pumped into a tank digester. The gas produced is used to power a generator that provides around a third of the farm's energy requirements. An arrangement with local retailer, Genesis Energy, means that any excess electricity that is exported, gets subtracted from the farm's overall cost of electricity.

The Bioenergy Association can assist rural landowners ensure that the best contractual arrangement with energy companies is achieved.

Growing eucalyptus can provide a range of economic benefits

The rapid initial growth rate, crown structure, foliage and high wood density of eucalypts makes them ideal for a range of uses, some of which can be integrated with the production of sawn timber or pulpwood. These include: *foliage production, agroforestry honey production, coppice production, carbon sequestration, and land treatment of waste water and solid waste.*

The foliage can be used as stock fodder as sheep, cattle and deer readily eat the leaves of a number of eucalypt species. Eucalypts offer an advantage over willows and poplars because they are less vulnerable to seasonal moisture deficiency.



Ponds used for effluent disposal can provide the raw material for a biogas system. Covers also help to reduce odour.



The following points have been noted in a Southland trial:

- *leaves, bark, and small twigs of E. gunnii are palatable and at times they are more attractive than grass.*

Any eucalypt that is palatable to rabbits, hares and possums will be readily eaten by livestock. Some eucalypts are not readily digestible by stock—so check before planting.

BANZ and the New Zealand Farm Forestry Association can assist in planning your farm forest.

Growing crops like Miscanthus offers new opportunity

Miscanthus is a highly productive “green” energy crop that produces income from the second year after planting, and has an estimated life of 20 years, offering revenues over that period on a consistent and sustainable basis. It produces a high-quality fuel that can displace coal and other fuels, and also has a range of other uses.

Miscanthus and other crops are seen as an integral component of the recently developed New Zealand Bioenergy Strategy - www.bioenergy.org.nz/resource/is28-potential-for-miscanthus-fuel-supply-in-nz. Typically, the crop yields 17 tonnes per Ha and has a calorific value of around 17 GJ/tonne which means that a hectare can produce around 300 GJ pa, or more in favourable growing conditions.



Baled Miscanthus

The product is expected to be grown close to point of use, reducing delivery costs, with farmers devoting part of their property to this crop. From the farmer’s perspective Miscanthus provides income from the second year after planting and requires little management or fertiliser once established. Income from the crop is expected to be based on a back-to-back fuel supply contract, and therefore consistent and predictable.