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Position statement

Forests to fuel could slash electricity problems

A wasted opportunity is passing New Zealand by to make the most of damaging forest slash by failing to treat it as an energy solution, instead regarding it as a headache, says Bioenergy Association executive officer Brian Cox.

“While slash lays rotting in forests it costs communities in terms of flood damage, but as fuel it could slice household electricity bills.

“It’s known that energy from forest residue sells at about $16 a gigajoule (GJ), under half the cost of heat from electricity at $36/GJ”.

A gigajoule as a measure of heat energy and 1GJ is capable of heating 25-50 homes for a year. One house in NZ uses about 36 GJ a year.

“Slash can keep boilers running and lights on without having to inflate power prices, reserving electricity for critical uses”, says Cox.

Pricing slash as an energy resource will help create incentives to clear debris before it wreaks havoc on communities. There are also projects underway including Scion’s Biowave marine biofuel project, to turn forest waste into fuels.

“With some planning and pricing, biomass could supply 27% of the nation’s energy by 2050”, says Cox.

Removing more slash for income generation through power generation also provides upside for foresters’ operations.

“It means planters have better access to sites, with a more easily improved stocked area and better forest regeneration is possible.

“Minimising slash piles reduces fire risk and spontaneous combustion hazards on skid sites”.

He says this winter has proven to be one of serious discontent within New Zealand’s energy industry as the nation digests news that its gas supplies are running perilously low.

“We have the shortage resulting in Methanex and Ballance Agri having to reduce their business activity. That has a sharp impact upon the people they employ and the region they operate in.

“Meantime, electricity prices continue to rise”.

Bringing the two issues together provides a solution beneficial for all of New Zealand, both households and businesses.

"Using forest biomass to produce energy can free up electricity and natural gas for other higher value uses.

"Gas supply can also be boosted by using food waste to produce biogas, diversifying our sources and supply, as we have already seen being done by Ecogas in Reporoa".

Cox said without a biogas strategy New Zealand risks seeing the worst of both worlds.

"That is, even more business closures due to energy costs, and flooding damage continuing from forestry".

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Additional information

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Bioenergy and biofuels sector
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1. Bioenergy has a unique point of difference from other forms of renewable energy as it is the most flexible and versatile form of renewable energy and contributes widely to the New Zealand economy. The use of biomass for energy (bioenergy) provides a fundamentally different least cost approach to achieving a *low carbon economy* compared to all other renewable energy forms. Biomass use and bioenergy can:
    - substitute for all fossil fuel uses for any energy application and is carbon neutral,
    - contribute to carbon storage (remove GHG from the atmosphere)
    - provides significant opportunities to address environmental issues arising from optimisation of land use (e.g. pastoral intensification and landfilling)
    - Provide many opportunities for regional economic growth and employment based on our under-utilised land resource.
2. Focusing on use of biomass as a valuable resource leads to new business opportunities, improved business resilience of landowners, and extraction of value from waste. Energy is often the co-product of higher value products such as regional employment, bio-based materials and more resilient land use.
3. Bioenergy is from a fully renewable resource, using proven technologies and has extreme flexibility. The processing of biomass can produce a wide range of revenue streams from application of heat; generation of electricity; use as transport fuel; extraction of chemicals and manufacture of bio-based materials; use as bio-fertiliser; and purification of water.
4. Communities and business adopting a circular economy approach by matching local wood and waste residues as feedstock as an input to creation of products, optimises the financial viability of the business, offsets costs of waste disposal and being used to generate employment and new business that supports the local economy.

5. Bioenergy initiatives are generally highly integrated with other sectors and other activities so cross-sector and all-of-government approaches are necessary. For example, integrated agriculture land use for animal health management with shelter can produce revenue creating wood fuel.
6. Bioenergy could achieve greenhouse gas reductions of:
    - 1.8 Mt CO_2 -e pa from reduced use of coal and gas for process heat
    - 1.8 Mt CO_2 -e pa from reduction of methane from waste
    - 5.0 Mt CO_2 -e pa from use of biofuels in transport

    These levels of greenhouse gas reduction are comparable but less cost than many of the other initiatives currently being pursued by Government.
    www.bioenergy.org.nz/greenhouse-gas-reduction
7. The vision for bioenergy - Economic growth and employment built on New Zealand's capability and expertise in forestry, wood processing and bioenergy production from waste - leading to new business opportunities which by 2050 could more than double biomass energy supply up to 27% of the country's energy needs, with a consequential 15% reduction in greenhouse gas emissions*. [* compared to 2017]

Combustion of biomass for process heat
www.usewoodfuel.org.nz

1. The use of biomass fuels for process heat are proven and widely used by those with immediate access to biomass which can be used as a fuel.
2. The market for buying and selling biomass fuel by those without immediate access to their own sources of biomass builds on strong foundations.
3. The biomass fuel supply chain has a number of players but like any evolving market the New Zealand biomass fuel supply market now has cornerstone players who are expanding their supply capabilities at a fast but orderly rate so that boom/bust scenarios will be avoided.
4. Unlike fossil fuels whose quantity is finite there is potentially no reason why biomass fuel supply will be a future problem. There are many avenues for sourcing biomass such as plantation and farm forestry. The 1 billion trees programme will produce additional biomass fuel plus be a new carbon sink every 30 years by planting commercial forests. Biomass processing could be integrated at least cost (or vice-versa) with waste to energy bioprocessing.

Waste to energy
www.biogas.org.nz

1. Waste-to energy results in the generation of heat and electricity through anaerobic digestion processing of residual waste streams that cannot otherwise be sustainably reused or recycled and therefore diverting waste from landfill.
2. Use of residual waste streams to produce energy forms part of the circular economy.
3. New Zealand can achieve zero waste to landfill by 2040 if we start seeing residual waste as an opportunity and not a problem.
4. An ideal opportunity exists to co-locate waste to energy facilities processing organic liquid and solid waste residual waste streams with industrial heat users to displace the use of fossil fuel for the generation of heat and power.

5. An ideal opportunity exists to combine bio-processing waste with the upgrade of wastewater treatment plants. These upgraded plants have the ability to generate revenue to offset operating costs for local government bodies and could progressively be developed to the point of zero residual chemical discharge to water or sludge to land.
6. Diversion of waste from landfills to waste to energy facilities reduces CO_2 and methane emissions improving air quality, enhances the economic resilience of communities through reduction in wastewater treatment facility usage, reduction in landfill reliance whilst providing new offtake business opportunities through the production of electricity, heat and bio processing opportunities.
7. The technology for Bio-processing waste and wastewater is well developed and the footprint is smaller than for existing sewerage processing systems employed, particularly those disposing to land.
8. Technology for treatment of both liquid and solid residual waste streams is well developed and accepted internationally and able to be utilised in New Zealand with minimal (if any) changes therefore mitigating technology risk.

Transport

www.liquidbiofuels.org.nz

1. Replacing use of petroleum for transport and manufacturing can be achieved by the extraction of biochemicals from biomass and the manufacture of new bio-based products.
2. Biofuel blends are a flexible and easily delivered renewable fuel for heavy land transport and marine engines where other renewable fuels are uneconomic or inappropriate .
3. Domestic production of gaseous and liquid biofuels from perpetually renewable natural resources will produce new employment, additional income from less productive lands, and provide future fuel supply security.
4. Storable biofuels can be used to enhance electricity security and heat demand using current proven electricity generation technologies.
5. Processing of gaseous and liquid biofuels can be readily integrated with other forms of bioprocessing.