

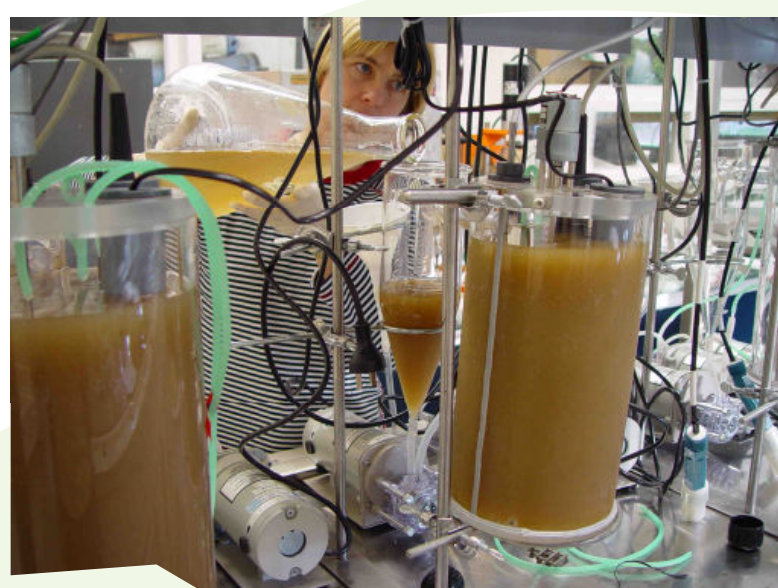
What we're doing

SCION RESEARCH

WASTE 2 GOLD

Scion's Research Programme

Background



RDC have contracted SCION to develop a sustainable technology to convert our sludge into usable carbon products. Large volumes of municipal and industrial wastewater are generated every year worldwide. Most of this wastewater is biologically treated to remove dissolved carbon, solids, toxicity, pathogens and other contaminants, with the resulting treated effluent discharged to surface water bodies. These treatment processes also result in the production of large quantities of wastewater related organic solids, from both primary and secondary treatment, termed biosolids.

Existing treatment/disposal options include landfilling, land application, windrow composting, vermicomposting and combustion. In the long-term, with ever-increasing demand for energy, increasingly high cost of conventional energy production, and continued development of highly efficient new technologies, energy recovery is likely to be a key driver in the management of organic waste solids. A sustainable and acceptable option for the long-term management of organic solids must be one that (1) minimises or eliminates waste residues; (2) eliminates any potential toxicity issues; (3) generates value; and (4) preferably can be implemented on-site to minimise transportation costs.

The technology



Scion's Waste 2 Gold research programme provides a sustainable solution to the disposal of solid organic waste. It is based on a deconstruction process that uses heat, pressure and air to convert organic wastes into (1) readily degradable organic feedstocks, which can be used for industrial biotechnology applications, such as biodegradable plastics or bioenergy/electricity production; and (2) a by-product containing nutrients and metal salts suitable for further value recovery (e.g. fertilisers). Scion's approach differs from others in this field in that it is aimed at controlling the deconstruction process to yield useful intermediaries and substrates for downstream bioconversion, rather than complete breakdown to CO₂ and water. Scion is developing both innovative deconstruction and biotechnology platforms targeting this outcome.

Rotorua's biosolids

One specific project in the Waste 2 Gold programme is the processing of biosolid wastes from a municipal wastewater treatment plant (WWTP) into value added products. There are a number of factors supporting this approach:

- There is increasing pressure on local councils to minimise disposal of WWTP wastes into landfills – it is currently 15% of all landfill waste in NZ – in order to reduce methane emissions and leachates that this waste contributes to;
- From 1 July 2009 all wastes entering NZ landfills have been levied at \$10/tonne. In addition resource consents for new landfills are increasingly more difficult to obtain; and
- The technology solution could either produce a higher yield of methane that could offset WWTP electricity costs or it could produce carbon intermediaries that could offset C-dosing costs.



SCION 
Next generation biomaterials

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