



Creating biofuels from wood

Scion is working with international collaborators to develop new ways of deriving energy from renewable resources.

In New Zealand, forests offer a significant opportunity for large scale production of biofuels to replace fossil fuels. A pre-treatment process for radiata pine developed by Scion improves the enzymatic conversion of this softwood into sugars. These sugars can be used as feedstocks for the production of biofuels such as bioethanol, biobutanol and hydrocarbons.

The development of Scion's pre-treatment process has focussed on overcoming the economic barriers associated with biofuel production from lignocellulosic (woody) biomass. The programme addresses three key technical needs:

- Minimising energy and chemical inputs for thermomechanical pre-treatment.
- Maximising the yields and purity of fermentable wood sugars.
- Maintaining the functional value of "native" lignin for co-product and energy production opportunity.

The ongoing focus of the programme is to maintain high levels of recovery while further reducing the cost of the process. This research is being carried out as part of the New Zealand Lignocellulosic Biofuel Initiative programme.

New Zealand Lignocellulosic Biofuel Initiative

The aim of this multi-agency programme is to demonstrate that biofuels and lignin co-products can be produced from softwoods in a cost-effective and environmentally sustainable manner. Key to this programme is the combination of pre-treatment with enzymatic digestion and fermentation stages.

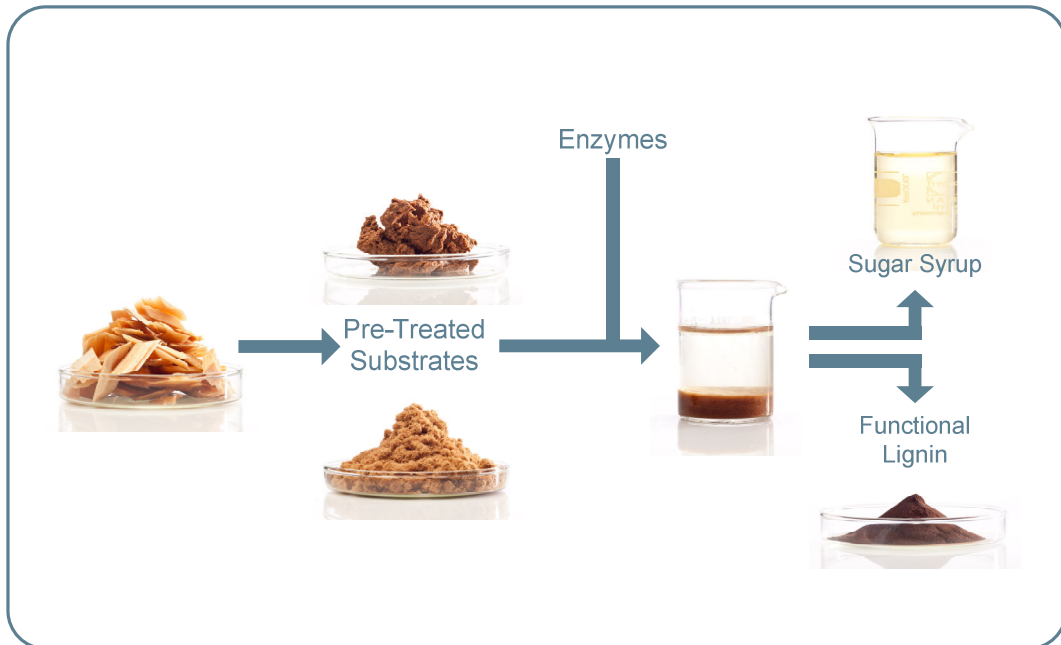
Research at laboratory and pilot-scale is being used to model the economics of a 90 million litre per year commercial bioethanol facility in New Zealand.

The partners in this programme include Beca AMEC and the United States Department of Energy Joint Bioenergy Initiative.



The biorefinery approach

The biorefinery concept is a central focus of Scion's biofuels research. This approach involves deriving multiple products from woody biomass.



Scion has achieved a 79% recovery of fermentable sugars from the pre-treated softwood.

The lignin, which is extracted as a co-product of the process, can be converted into renewable replacements for, or alternatives to, current petroleum-based products used in resins, adhesives and plastics. The utilisation of co-products, such as lignin, is essential for the economic viability of the softwood-to-biofuels value chain.

Downstream production of the final biofuels and co-products is being addressed through adopting bolt-on technologies from other national and international providers.

About Scion

Scion is a Crown Research Institute that specialises in research, science and technology development for the forestry, wood product and wood-derived materials and other biomaterial sectors. Scion's purpose is to create economic value and contribute to beneficial environmental and social outcomes for New Zealand.

In the liquid biofuel context, Scion will fulfil this purpose through increasing renewable energy production and energy security by developing New Zealand's ability to produce sustainable bioenergy and liquid biofuel products.

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