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<p>Pure Power Technology is the New Zealand operating subsidiary of Pure Power Global, a resource-based company that is commercialising technology to convert biomass into high-value specialty chemicals. Specifically, Pure Power owns a process for manufacturing high-quality natural lignin, xylose and fuel ethanol from woody feedstocks, including <i>Salix</i> (willow), <i>Eucalyptus</i>, and other types of hardwoods. Pure Power has applied for international patent protection on its process and on the products derived from it.</p> <p>In the first step of the Pure Power process, hardwood crops such as plantation-grown coppiced willow are chipped and digested with ethanol at high temperature and pressure in order to remove lignin. The lignin is then precipitated and sold as a chemical feedstock. Natural lignin has been shown to be a very suitable feedstock for manufacturing a variety of products. For example, lignin can be used as a phenol substitute in the manufacture of phenolic resins, as a polyol substitute in the preparation of polyurethane foam, or as a precursor for carbon fiber manufacture.</p> <p>In a second step, the hemicellulose component of the feedstock is extracted with water at high temperature and pressure to yield a product stream rich in the 5-carbon sugar, xylose. Xylose is a platform chemical used in the food and pharmaceutical industries. Among other products, xylosed can be converted into xylitol, a natural sweetener that is low-energy, suitable for consumption by diabetics, and does not cause tooth decay. Xylitol is currently used globally in the manufacture of chewing gum, toothpaste, and many other products.</p> <p>The cellulose remaining after the extraction of lignin and hemicellulose is easily digested with cellulase enzymes to give glucose, which can then be fermented and distilled to provide fuel-grade ethanol. The same distillation module is used to recover the process ethanol used in the first extraction step.</p> <p>In addition to the Pure Power process, the company has developed nurseries of various willow species to provide the planting stocks for large-scale commercial coppiced willow plantations. An engineering study on the process has been carried out by AMEC Engineering, with a view to establishing a commercial demonstration plant either in NZ or in other territories which have sustainable supplies of hardwood feedstocks.</p> <p>Pure Power currently plans to build a flexible commercial demonstration plant in order to establish the optimal processing conditions for a variety of feedstocks. Production biorefineries able to process 250 tonnes/day or more of biomass will then be rolled out in various locations where feedstock is available.</p>	<p>Core Skill(s):</p>
	<ul style="list-style-type: none"> • Processing technology development • Biomass production, harvesting and transformation to specialty chemicals and biofuels
	<p>Biofuel Focus:</p>
	<ul style="list-style-type: none"> • 2nd generation (from non-food crops such as coppiced willow) biofuels and bioproducts • High-value specialty chemicals, such as high-quality natural lignin and xylose, to replace petrochemical feedstocks, • Bioethanol
	<p>Core Product/Activity:</p>
	<ul style="list-style-type: none"> • Technology development
	<p>Key Project Activities:</p>
	<ul style="list-style-type: none"> • Design, construction and operation of a commercial demonstration plant (10 tonnes biomass/day)
<p>Leading Edge:</p>	
<p><i>Proprietary process for producing high-value specialty chemicals and ethanol from woody biomass, as opposed to other "cellulosic ethanol" processes that destroy or degrade the most valuable components of biomass in the singular pursuit of ethanol.</i></p>	
<p>Investment Base:</p>	
<ul style="list-style-type: none"> • New Zealand, International 	
<p>Employees:</p>	
<ul style="list-style-type: none"> • Ten (8 with tertiary qualifications in science, engineering or business administration) 	