



“Beyond sustainability - doing what it takes to improve our world”



OUR VISION

Biomaterial Futures: advancing the widespread utilisation of renewable materials and products from plants for economic, environmental and social returns.



Scion's vision is built on developing plant-based biomaterials as renewable substitutes for products derived from non-renewable resources. This includes the development of new manufacturing and waste management processes as a truly sustainable means of meeting consumer demands now and into the future.

From its beginnings as the Forest Research Institute, Scion has pioneered modern plantation forestry practices as a sustainable means of meeting New Zealand's lumber and wood fibre needs. The Crown Research Institute is committed to extending this concept to deliver new ways of creating sustainable biomaterials for future generations.

SCION HIGHLIGHTS



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Sustainability is a concept that applies to every level of human activity, from the local community to the entire planet. It is about using the earth's resources in a way that ensures the continuity of human prosperity in a healthy environment.

Scion is making the concept a reality by creating new bio-based systems and technologies for the future of New Zealand.

From the Chairman and the Chief Executive Officer



Dr Russ Ballard Chairman (left) and Dr Tom Richardson Chief Executive Officer.

In a world demanding bold solutions to pressing issues, Scion continues to demonstrate commitment to forging change. Our focus is on developing new technologies utilising renewable plant resources and waste streams that will enhance the prosperity of our nation, and the living standards of future generations of New Zealanders.

The 2005/06 financial year has been a challenging and successful year for Scion. The past 12 months have brought major science highlights, business awards and significant progress towards achieving our Biomaterials Strategy. We have also continued the evolution of our Company and management structures in order to deliver this strategy. Difficult trading conditions in the forestry sector and the early stage development pressures on our expanded forestry-facing joint venture, Ensis, have negatively impacted on Scion's financial result.

We have refined our Biomaterials Strategy into four key areas: multiple values forests and forest products research delivered primarily through Ensis;

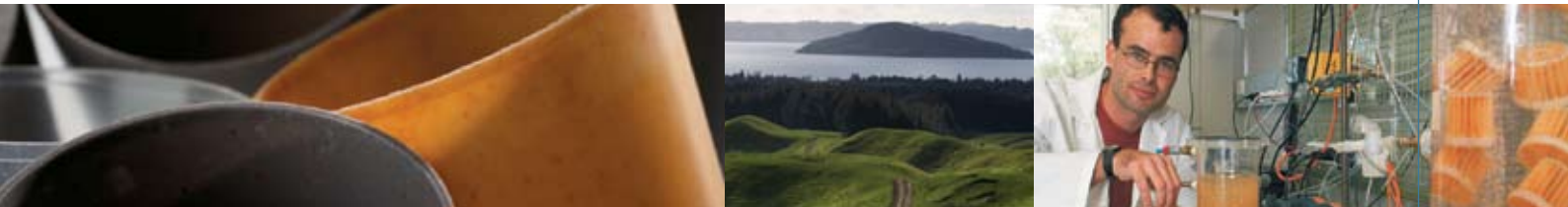
the exploration of alternative fibre and non-fibre opportunities, which is the focus of our Biomaterials Research units; an understanding of changing consumer needs and trends, which is delivered through our Sustainable Consumer Products group; and our Incubation and Innovation businesses, which deliver niche research and development, and other services. Each part of Scion plays an integral role in delivering this strategy.

Benefit to New Zealand

Scion is committed to working closely with our aligned sectors to drive the uptake of research, science and technology for the benefit of New Zealand. To deliver solutions for the forestry sector, Ensis was expanded in 2005/06 with the inclusion of the Sustainable Forest Management and Forest Biosecurity and Protection areas. Ensis now provides research and development across the forestry and forest products value chain.

A key project in the past 12 months has been a review of the forest industry research co-operative structure.

The 2005/06 financial year has been a challenging, but very successful, year for Scion and its operations



For the past 18 years, forestry research in New Zealand has been undertaken through five joint industry/research provider co-operatives. A large portion of this research, funded by Government and industry, has been undertaken at Scion.

The review has led to the development of a new company that will steer the future direction of forest growing and management research in New Zealand. The new entity, Future Forests Research Ltd (FFR) has been established by the forest industry in conjunction with research organisations, and will take the form of a Trust company. Its role will be to develop and manage research themes, giving research providers like Scion the direction and stability necessary to provide relevant solutions to the industry, and New Zealand.

This new research model will help ensure that Scion's research strategy is closely aligned with the New Zealand forestry sector's requirements.

This year Scion completed a major study to assist the forestry sector in developing an industry-wide strategy for improving profitability and increasing returns on investment. Trade and Economic Development specialists identified the strengths and weaknesses of New Zealand forestry and processing industries compared with our main global competitors. This project, which was carried out in collaboration with forestry consultants Chandler Fraser Keating and LEK Consulting, was funded by the Forest Industry Development Agenda (FIDA).

Working with the University of Wisconsin, Scion's Trade and Economic Development researchers have completed a significant report, the World Wood Industries Outlook: 2005-2030. This work represents a fundamental resource for the sector and is expected to become a central reference document for projections of global wood fibre supply and demand.

To aid the New Zealand forest products sector in developing new products, Scion's Sustainable Consumer Products unit has been assisting businesses by developing assessment frameworks that allow the sustainability of new products to be quantified, and communicated. As a result of this process, Scion is now working closely with the wood product sector in the development of new products.

A survey of the forestry sector reinforces our own beliefs that Ensis is beginning to deliver real value and that this tight collaboration with CSIRO is the best way to build the research capability available to the New Zealand industry. Our forestry expertise provides a springboard into our other activities that will contribute towards developing New Zealand's future bio-based economy.

Scion is working to enhance existing processes to transform renewable resources and waste streams into new materials and products, and to develop sustainable systems and processes for the manufacturing sectors.

A core element of this vision is forming a better understanding of the molecular architecture of plants, with the aim of developing better biocomposite products. During the year, an independent review was carried out of the plant biotechnology programmes in New Zealand. The purpose of this review, which was initiated by the Foundation for Research, Science and

Technology (FRST) and conducted by an international panel of scientists, was to establish what capability resides in New Zealand and how it is applied.

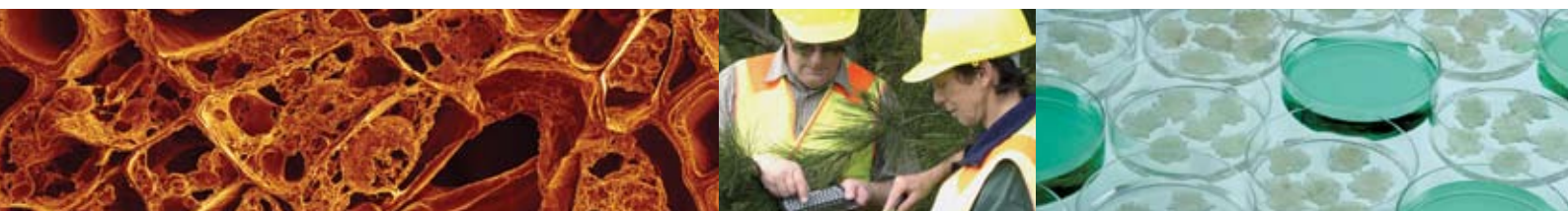
The review ranked Scion's Cellwall Biotechnology Centre as one of the top programmes in the country, confirming that Scion is well placed to capitalise on opportunities offered by plant biotechnology in New Zealand.

To further build our strengths in biomaterial research Scion has joined forces with science institutions from around New Zealand and the world, including the McDiarmid Institute in Wellington and the Max Planck Institute in Germany. Other examples of this collaborative approach can be seen in our leadership in establishing organisations such as the Biopolymer Network and Beacon Pathway Ltd. Leveraging the skills of others to support our strategies in this way is the key to how we achieve our vision.

Organisational Development

Scion now has a total of 344 full time equivalent (FTE) employees, 320 based in Rotorua, 17 in Christchurch, and the remainder in other locations. Of the total Scion staff, 162 work within Ensis, which also involves 150 CSIRO employees spread across sites in Australia.

For an organisation whose key asset is its people, a strong emphasis is being placed on developing our current and future capabilities in all areas of our business. A major development in this area has been the launch of the Leadership Excellence Programme in conjunction with the New Zealand Institute of Leadership at the University of Auckland. The aim of this programme is to develop Scion's individual and collective leadership capability to ensure our success as a leading science organisation.





Corporate Services

The 2005/06 financial year has seen the development of a combined Corporate Services group providing financial, legal, information technology, knowledge centre and facilities advice and services to the Scion business. By combining these groups we have been able to create a multi-disciplined team with common goals and processes that better serve the business. This new group is already making inroads with significant improvements in Scion's facilities management and financial systems.

Maori Strategy

Scion's focus on laying the platform for better Maori business engagement in previous years has paid dividends in the past 12 months. This relationship building process has enabled Scion to increase provision of science and research services to Maori organisations seeking to develop their own business opportunities and capabilities. As a result, we are working with a number of iwi groups throughout New Zealand to develop research strategies that will deliver higher value land and resource use.

Financial

The 2005/06 financial period has been a transition year for Scion, particularly with the transfer of an

additional two business units into Ensis, the 50:50 unincorporated joint venture between Scion and CSIRO. Ensis accounts are equity accounted.

In 2005/06, Scion showed a group operating deficit before taxation of \$1.297 million on total revenue of \$21.345 million. The operating deficit showed an unfavourable variance of \$2.299 million when compared to budget of \$1.002 million profit. The deficit is a result of lower than budgeted profits, particularly in Ensis and Atlas Technology, our software development arm. This result includes restructuring costs relating to the re-organisation of corporate overheads of \$0.231 million. Offsetting these were significant savings in corporate overhead costs of \$1.883 million and the benefits of a sale of intellectual property of \$0.371 million.

Scion's total revenue was \$21.345 million, which is an unfavourable variance of \$6.673 million compared to a budget of \$28.018 million. Total Government revenue remained essentially flat year on year, and the main contributors to the unfavourable variance were a drop in commercial revenue within Atlas, a reduced Ensis gross margin, and the closure of Vigil.

Equity accounting for Ensis results in Scion's revenue reflecting our 50 per cent share of the Ensis gross margin contribution of \$8.796 million (Scion's share was \$4.398 million), from a total Ensis revenue of \$57.708 million.

The group operating result included committed organisational investment in Beacon Pathway Ltd of \$0.200 million. In addition, committed investments undertaken in WQI Ltd, Frontline Biosecurity Ltd and Radiata Pine Breeding Company Ltd were processed through Ensis.

Scion has made a considerable investment in its people in 2005/06, contributing \$1.149 million to supporting scientists and staff in postdoctorates, sabbaticals, student stipends and tertiary training. Even in difficult financial years we feel it is critical to the long term performance of the organisation that we continue to make measured investments in developing our capability.

The net deficit attributable to the shareholders was \$1.644 million, compared to a net surplus of \$0.619 million reported in the previous financial year. The net deficit attributable to shareholders was materially driven by lower than budgeted returns in Ensis and Atlas, offset to some degree by a reduction in management overhead costs.

Net cashflows from operating activities were \$1.054 million, compared to \$0.961 million in the previous financial year when no distributions to shareholders were made. The increased cashflow was due primarily to receiving distributions from Ensis of \$5.612 million, compared with \$0.051 million in 2004/05.

While the joint venture distributions were significantly up on the previous financial year, they were \$4.270 million lower than budget, with higher than budgeted working capital requirements in Ensis.

As a result of lower than planned cashflows during the year, Scion informed its bank that it was not going to meet the bank interest cover covenant. The bank agreed to suspend this until October 2006 when we forecast to be back within the bank's covenants.

A focus on accruals and debt collection resulted in significant improvements this year, with Scion's accrued revenue dropping from \$1.173 million in 2004/05, to \$0.197 million this financial year. This puts the business in a good position starting the 2006/07 financial year. At the same time, there has been a good improvement in the debtors' days, with long-standing debtors dropping from 30 per cent in February 2006, to only 2.2 per cent of all debtors by June the same year.

Scion spent \$2.480 million on capital expenditure in 2005/06. Included in this expenditure was \$1.587 million spent on scientific equipment including a differential scanning calorimeter, thermal gravimetric analysis and an injection molder, while \$0.893 million was spent on information technology and infrastructure, particularly in the refurbishment of offices and laboratories.

Te Papa Tipu Properties, the subsidiary company established by Scion in 2004 to manage its site, incurred expenses during the year in relation to the development of the North Drive Estate - the next step in the development of the Te Papa Tipu Innovation Park. The first revenue from this is expected in the 2006/07 financial year.

During the year, an agreement was struck with the Public Service Association for a 3.5 per cent wage increase for all staff, each year for three years. As an organisation whose future success depends on the talents of its people, this decision was seen as vital for the ongoing sustainability of the business.

Conclusion

The 2005/06 financial year was a busy year for Scion and its people. Scion has refined its Biomaterials Strategy and has made good progress towards achieving it on all fronts. Within this, Ensis has refined its strategy to deliver full value chain research and development for the forestry sector. We have also made considerable improvements in corporate support in order to better service the business and these changes are already making an impact.

We would like to formally acknowledge the efforts of Scion's retiring Board directors, Bryce Witcher, who was also Deputy Chairman, Giff Davidson and Jane Taylor. All three of these directors helped drive the development of Scion's Biomaterials Futures strategy and the formation of Scion as it is today. As such, they have left an important legacy for our organisation and its future direction.

Finally, we would like to give sincere thanks to our staff, management, Board, partners and collaborators for their continuing commitment to Scion. We have learnt from our challenges, enjoyed our shared successes, and we look forward to progressing our strategies and delivering value for our customers and the nation during 2006/07.

Corporate Governance

Scion's Board of Directors is appointed by its Shareholding Ministers, the Minister of Crown Research Institutes and the Minister of Finance. All members of the Board are independent. The responsibility of the Board is to guide and monitor the business of Scion and its subsidiaries and includes:

- adopting policies of corporate conduct (including Risk Management and Delegations of Authority) and ensuring that systems and procedures are in place to carry out those policies;
- reviewing and approving Scion's Statement of Corporate Intent and Strategic Business Plan;
- evaluating the performance of the Chief Executive Officer;
- evaluating the effectiveness of the Board;
- adopting annual budgets, and;
- monitoring performance against key objectives and budgets on a monthly basis.

The Board operates in accordance with Scion's Constitution. It has seven directors which meet 11 times over the year. The Chief Executive Officer, Chief Financial Officer and Company Secretary attend all meetings. The Board may retain independent advisors including independent legal counsel, or other experts, as it deems appropriate.

The Board has two standing committees, the Audit and Risk Committee and the Remuneration and Organisation Committee.

The function of the Audit and Risk Committee is to assist the Board in discharging its responsibilities regarding financial reporting, regulatory conformance and matters of risk management. The Committee is the liaison with internal and external Auditors, assesses the performance of financial management, reviews audit findings, the annual financial statements and interim financial information, and has oversight of compliance with statutory responsibilities.





The Committee is composed of no less than three directors appointed by the Board on the recommendation of the Chairman. While the Chairman of the Board is a member of the Committee, he is not Chairman of the Audit and Risk Committee.

The objective of the Remuneration and Organisation Committee is to assist the Board in the establishment of remuneration and organisation policies and practices, and to assist the Board in discharging its responsibilities relating to the appointment, remuneration setting and review of Scion's Chief Executive Officer and other senior executives. The Committee also reviews and recommends to the Board on development and succession planning, training and development plans and incentive plans.

The Committee is composed of no less than three members of the Board, appointed by the Board from time to time. The Chairman of the Board is an *ex officio* member of the committee and has full voting rights.

The Chief Executive Officer and Company Secretary attend all committee meetings and all directors are entitled to attend all committee meetings. Each committee establishes annual work plans and undertakes an annual review of its objectives and responsibilities and its terms of reference.

The Board's risk management policy and procedures involve formal reporting by management of the most significant risks Scion is exposed to and the Board regularly monitors management of those risks. There is also regular monitoring and reporting on recommendations made by external auditors.

Ensis Governance

Ensis is an unincorporated joint venture between Australia's CSIRO FFP Pty Ltd and Scion Australasia Ltd. Ensis is the primary vehicle through which Scion delivers research and development to the forestry and forest product sectors.

The Ensis Liaison Board oversees the overall governance of the unincorporated joint venture. The Liaison Board comprises six members: two CSIRO corporate executives, two Scion board members, the Chief Executive Officer of Scion and the Director, Ensis Investment, of CSIRO. The Liaison Board currently meets bi-monthly. A Management Committee, comprising representatives of the parent companies, Dr Rick Ede (Director, Ensis Investment, CSIRO) and Dr Tom Richardson (CEO, Scion) oversees the overall management and control of the joint venture.

Ensis is managed by an executive team comprising the Chief Executive and senior executives, including the general managers of the science units. The Ensis Chief Executive reports to the Ensis Management Committee.

Beyond sustainability

Doing what it takes to improve our world

As a growing number of people throughout the world strive for a higher standard of living, the burning question is - how can modern consumerism be sustained?

Answers to this question are emerging as sustainability, and all that it implies, becomes a driving force in mainstream business. Scion's Biomaterials Strategy is evolving to help find better ways of producing materials, energy and products for the future.

Scion believes that the sustainability of modern consumerism depends on the wise utilisation of renewable resources and the elimination of waste. Building on its foundation of forestry knowledge, Scion is looking to develop integrated technologies which can transform renewable resources and waste streams into new materials, high-value products and environmentally-friendly processes.

The forest industry in New Zealand provides a working model of how the concept can work. Plantation forestry is a renewable source not only of wood and fibre, but also of plant cell walls (lignocellulosics) which will provide new biomaterial building blocks for the future.

Biotechnology is being used to develop fit-for-purpose plant cell walls and fibres that provide renewable lignocellulosic feedstocks and extracts. Microbiologists and organic chemists then find ways to transform feedstocks (and waste streams) into valuable materials through new biological processes. All these materials are inspiration for biomaterials researchers who turn new bio-based materials into renewable products.

Meanwhile, ongoing research ensures the sustainability, productivity and health of the plantation resource, which gives rise to the living raw materials of Scion's vision.

Scion is committed to driving paradigm shifts within the forest products industry and creating new opportunities for bioresources. While this vision underpins Scion's activities, the transformation it seeks to achieve requires strong links with other research and development organisations, government agencies and the private sector. Scion is forming a network of partnerships, both nationally and internationally in order to build this critical mass. This combined level of focused effort will help to ensure that new and emerging consumer needs can be met for future generations.



Manufacturing of the future

Getting the most out of renewable plant resources

The key components of wood and bark are cellulose, lignin and tannin, collectively known as lignocellulosics.

Scion views the utilisation of these feedstocks as a means of getting the most out of renewable plant resources.

Fine-tuning the feedstocks

Significant breakthroughs have been made over the past year in gene discovery for the ultimate purpose of modifying plant cells so that greater value can be extracted from the plant. Towards this end, Scion has established a new method for testing the function of genes in pine. Using a technology known as RNA interference (RNAi), scientists are able to interrupt the expression of any given gene, giving them clues to determine the original function of the targeted gene.

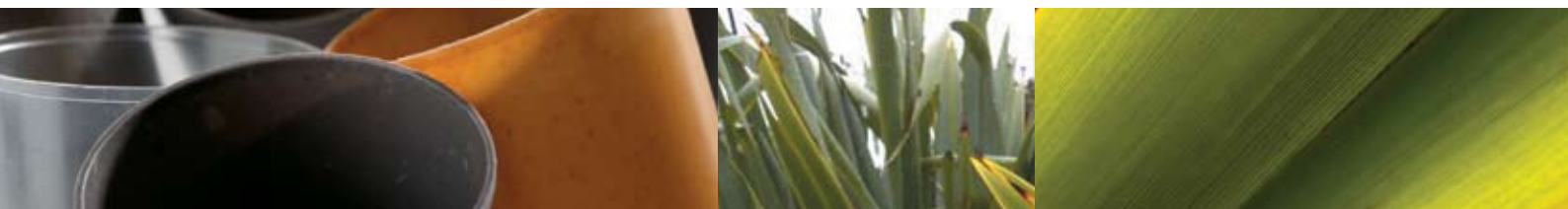
This technology has enabled scientists to understand how lignin, the ligno part of lignocellulosics - is formed within cells. While this development is of immediate interest to the pulp and paper industry, it also offers potential benefits for the generation of bio-fuel and other bioproducts, which are dependent on cell wall composition.

Transforming waste into gold

The utilisation of biomass residues from food, beverage, fruit and vegetable processing, dairy, forestry and related industries is critical for the future sustainability of industrial production. It is particularly important in New Zealand with the impending implementation of the 2010 Organic Waste Strategy, which requires the diversion of commercial organic wastes from landfill to beneficial use.

The challenge of reducing waste has served as a major catalyst for integrating industrial biotechnology in the forestry sector. Scion's long history of developing management systems for the waste streams of pulp and paper mills provides a unique platform of knowledge and expertise in this area.

Carbon-rich waste streams contain diverse organisms that can be harnessed to perform a wide range of functions, from the stabilisation of organic matter to the production of added-value products.





Risk assessment for New Zealand's unique environment

Understanding and monitoring the environmental impacts of existing and new technologies is becoming an integral part of the New Zealand manufacturing environment. In the past year, Scion has invested heavily in a flow cytometer for the analysis of blood samples in aquatic species. Since this new equipment is primarily designed for human blood, scientists have been required to develop new methods for analysing samples from different indicator organisms, such as fish and other aquatic species. This significantly increases Scion's capabilities in environmental risk assessment relating to industrial discharges.



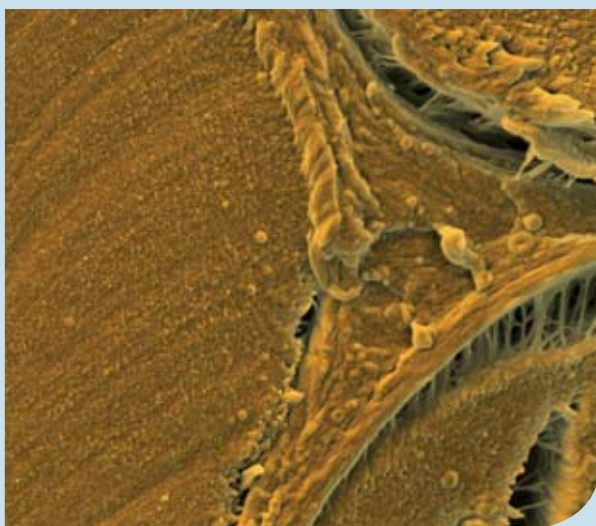
Dr Michael Landman - aquatic ecotoxicologist

EXPLORING NANO-FIBRES

Cellulose is an abundant natural polymer that has stiffness properties to rival other high-performance materials. Research by Scion is seeking to exploit cellulose on a nano scale, for the purpose of developing strong, light-weight, natural fibre-reinforced composites. These products are anticipated to be superior to composites assembled from plant fibres on a macro-level, in terms of both strength and water resistance.

This nano-structure research is carried out jointly within the Cellwall Biotechnology Centre and Biomaterials Engineering Group, using fibres such as wood, hemp and flax. Using electron microscopy, nuclear magnetic resonance spectroscopy and X-ray diffraction techniques, scientists are developing better methods for investigating natural plant structures to access the incredible stiffness that individual microfibrils possess.

Over the past year Scion has collaborated with the University of Colorado at Boulder to use electron tomography for visualising the crystalline core of cellulose microfibrils and its association with hemicellulose. This project represents the first application of this technique to either cell walls or polysaccharides, pushing the resolution limits down to 1 nm.



To accomplish this involves understanding exactly what organisms are present and identifying those that offer potential for transforming waste compounds into useful products.

As part of Scion's biodiscovery programme, scientists have identified and characterised a unique organism currently known as "Y88". This bacterium belongs to a group of organisms that is widely distributed in nature and has been utilised for a range of biotechnological applications, from bioremediation of environmental contaminants, to production of polymers. Y88 is the first strain of this genus known to be capable of both nitrogen fixation and polymer synthesis. As such, it transforms high-carbon waste streams into bioplastics.

To explore the function of micro-organisms such as Y88, Scion has created a unique facility known as TOGA (Tritrimetric and Off Gas Analysis). Designed to measure the metabolic functions of organic systems, this new technology helps to put Scion at the cutting edge internationally in environmental biotechnology. TOGA can be used for a range of applications, including the analysis of bacterial polymer production, composting, and waste water systems.

The development of new materials made from renewable plant resources remains a major focus for Scion. As biopolymers and natural fibres become more widely used globally, Scion is forging new opportunities for plant fibre crops in New Zealand. Wood and harakeke (flax) fibres are being investigated for new biocomposites and for unique sources of functional polymers for bioplastic and bioresin applications.



Ross Anderson - biomaterial scientist

New wood fibre plastics

Over the past year, Scion has developed a new feedstock for industrial applications of wood fibres that can streamline manufacturing and improve the mechanical performance of wood plastic composites. To overcome the handling difficulties associated with wood fibres, Scion has developed a novel method of converting wood fibres into pellets suitable for extrusion and injection moulding. An international application under the Patent Cooperation Treaty has been filed for worldwide protection of this new technology. Scion is now working with a manufacturer to explore commercial applications.

Environmentally intelligent bioplastics

Scion continues to work with commercial partners in the development of bioplastic materials that offer controlled degradability in the environment. These products offer good opportunities in export markets such as Europe and Japan, where regulators increasingly favour materials which consider "end of life" disposal options.

The same formulation approaches are also useful in other polymer products such as adhesives, coatings, foams or composites, and fibre based materials. Scion has acquired extensive experience in testing and formulating biodegradable plastics and has established a database on biofunctional additives.

Unique natural fibre composites

Over the past year, the Biopolymer Network (BPN) hosted well-attended industry seminars to promote commercial opportunities for biocomposites, bioplastics, biofoams and moulded structures. These seminars, supported by FRST, were highly effective in generating interest and raising awareness of potential applications for new technologies.

Scion and its BPN partners, Canesis Network and Crop & Food Research, have focused on potential applications for fibres derived from harakeke. While the strength characteristics of these fibres compare extremely well with other natural fibres, harakeke offers more than just good performance. In a bid to develop composite materials that are visually attractive, the BPN is producing materials that incorporate harakeke fibres for enhanced appearance in interior panel applications.



Evamaria Clauss - biomaterial chemist

Designing sustainable products and systems

To achieve sustainability, it is necessary to distinguish which activities have negative environmental impacts and which are environmentally favourable. To provide this insight, various models of resource use have been developed, such as life cycle assessment and ecological footprint analysis. Scion is supporting the design and uptake of sustainable consumer products through providing such tools and knowledge to the businesses and organisations that drive change.

Life cycle assessment

Sustainable product design involves looking at the full life cycle of the item, from production to disposal. The aim of this approach is to identify how the greatest



gains can be made in product performance, while at the same time reducing production costs and negative impacts for the environment, economy and end-user. Life cycle assessment (LCA) is an effective tool to assess such impacts. Scion is using this principle in the development of proprietary products for commercial manufacturers, in collaboration with industrial design company, Locus Research.

Scion is also assisting businesses by developing assessment frameworks that allow sustainability gains to be quantified, valued and communicated. Using this experience, Scion is engaging with Winstone Wallboards and Fletcher Building to develop strategies for sustainable development in the construction sector. For example, Scion is assisting Winstone Wallboards to investigate options for collecting waste plaster products from building sites.

Over the past year, Scion initiated the formation of a steering group for LCA practitioners in New Zealand. This forum arose from a growing need for communication and collaboration between the limited number of LCA specialists within New Zealand, and thereby serves to strengthen this important knowledge resource.

New Zealand's ecological footprint

Fundamental to sustainable product design is the use of renewable raw materials produced with markedly reduced environmental impact. Scion is involved in a major project to measure the ecological footprint of New Zealand's primary industries. This research is part of an on-going Government-funded initiative known as "Ecological Footprint Plus" aimed at quantifying the environmental impact of producing wood, meat, milk and wool.



Scion's role in the first phase of the six-year project, focuses on the plantation forestry sector. Results from this study can be used by forest growers to identify processes or management practices that potentially reduce environmental impact. Researchers are also now looking at the wood processing sector to highlight opportunities for improving the efficiencies of manufacturing processes.

This is the first time that analysis of this depth and scale has been undertaken in New Zealand. On completion, this information will result in marked improvements in the environmental outcomes from these industries.

A glimpse at future housing

In order to make the principles of sustainability real in the modern world, Scion takes important social considerations into account when seeking to understand market requirements. In the past year, Scion led a project funded by the Centre for Housing Research in New Zealand (CHRANZ) which focused on identifying factors that will determine how the New Zealand housing sector may look in 2030. The outcome was a set of future scenarios depicting a range of housing options. This project, which drew on Scion's expertise in scenario planning, generated information that is now being used to shape Government housing policy.

Tools such as scenario planning and information on consumer behaviour are relevant throughout the construction industry, and in Government policy and regulation. The insights gained through applying this knowledge allow better positioning of forest products and other bio-based materials in these important sectors.

SCION REWARDS DESIGN INNOVATION

As part of a leadership role in improving the sustainability of new products based on renewable resources, Scion awarded three prizes for outstanding timber designs at the University of Auckland School of Architecture.

School of Architecture students Rajneel Prasard, Mark Craven and Bojana Djokovic were the 2005 recipients of the Scion Timber Design Studio Award. The purpose of this award is to encourage innovative use of wood in architectural design and a clear understanding of timber as a building material. This year's winning designs included temporary shelters for the Pacific Islands, a marine laboratory and a residential building.

Sustainable land use

Forestry offers major benefits to healthy, productive landscapes

PUTTING THE ENVIRONMENT INTO THE EQUATION

For anyone who owns large areas of land, there are many conflicting decisions to be made about the profitability of chosen land uses and the long-term sustainability of the ecosystem. How much land should be allocated to agriculture? What areas are better suited for forestry? And what are the likely profitability, socio-economic and environmental outcomes of these decisions?

In what is believed to be the first large-scale project of its kind, Ensis has undertaken a land use optimisation study with Ngati Whakaue Tribal Lands Inc. (NWTL) in

Rotorua to address these questions. The result of this exercise is one of the most informed balance sheets ever seen for land use - containing all financial information plus an account of environmental impacts.

Using an integrated spatial modelling approach, scientists are helping NWTL to make land management decisions across three large properties in the Rotorua basin. These decisions account for the environmental impacts and expected financial returns of their various land use activities. The system integrates outcomes of land use in terms of primary products, greenhouse gases, water quality, soil conservation and visual impacts.

“This type of project allows us to lift discussions of sustainability to a whole new level. It helps farmers to look at their property as a land resource, rather than just a farm.”

- Rick Vallance, General Manager NWTL



From left: Dr Oliver Chikumbo - environmental scientist, Rick Vallance - General Manager NWTL, Hamu Mitchell - Chairman NWTL



Aside from being one of New Zealand's top export earners, plantation forestry has gained increased recognition for the environmental and social values it can contribute. These benefits include erosion control, water quality, carbon sequestration and biodiversity conservation.

Scion provides land owners with tools that enable them to include forestry as part of the landscape mix, and manage their resources in a way that is consistent with regional and national policy. These modelling tools quantify and demonstrate the tradeoffs and opportunity costs of including forestry as part of a broad mix of land uses.

Alternative pathways opening up for forestry

The past two years have seen a marked decrease of investment in new planting of radiata pine. However, against this trend the Douglas fir Research Cooperative has completed a busy year, with membership now greater than ever and planted area continuing to increase.

Among the many initiatives taken as part of an expanded research programme, a comparison was made between Douglas fir growth in New Zealand and in the Pacific Northwest, where the species originates. This research, carried out in collaboration with the University of Washington in Seattle, showed that height growth (site index) is similar for the same regimes, yet volume growth of Douglas fir plantations in New Zealand is typically 50 per cent greater than in the Pacific Northwest.

Indigenous forestry branches out

Exciting progress has been made in promoting the vision of plantation forestry using indigenous species. In February 2006, Ensis hosted a large "Native Forestry for Production" hui in Rotorua with the support of FRST, Technology NZ and the Ministry of Agriculture and Forestry involving representatives of more than 50 Trusts from the Waiariki Region. This engagement has laid the foundation for a new programme of research aimed at empowering forest growers with information related to the establishment and economics of long-term indigenous forestry species.

Biological solutions to risk management

A milestone for forest weed management was reached this year with a decision by the Environmental Risk Management Authority (ERMA) to allow the release of a new insect as a biological control agent for *Buddleja davidii* (buddleia).

Originally introduced as an ornamental shrub, buddleia's ability to colonise bare ground and out-compete young trees has made it one of the worst forest weeds in New Zealand. The biological control agent, known as *Cleopus japonicus*, has the potential to stunt the growth of buddleia through defoliation. Preparations are now being made to release the insect into North Island plantations.

ERMA's announcement justified the long and rigorous testing process undertaken by Ensis as part of New Zealand's environmental safety requirements. When biological control is successful, it provides a sustainable and environmentally-friendly way of controlling pests and can reduce the need for chemical sprays.

Renewable energy

Sustainable development in any form is dependent on renewable energy systems



George Estcourt
- bioenergy engineer

Bioenergy remains a core part of Scion's Biomaterials Strategy, with the main activities focusing on the use of woody biomass for the production of heat and power. These activities support New Zealand's need to decrease reliance on fossil fuels under our obligations to the Kyoto Protocol.

PRIMARY SCHOOL DUMPS COAL FOR WASTE WOOD HEATING

A number of Rotorua schools are converting to new sustainable heating systems which will be healthier for children and cleaner for the environment. Scion has teamed up with Solid Energy subsidiary, Nature's Flame, in a joint project to adapt old coal boilers and transform them into new wood pellet heating systems.

The wood pellets are produced from waste wood - a combination of untreated sawdust and wood shavings which are by-products from the timber industry. These raw materials are compressed into a clean burning, homogeneous fuel which is 100 per cent renewable, carbon neutral and produces no sulphur emissions.

Recently, the Wood Pellet Conversion programme received a significant grant from the Rotorua Energy Charitable Trust, which will make the conversion process more accessible to all schools.

Constant refinement in mechanical pulping

A major challenge for pulp and paper research is devising methods to reduce energy consumption. This is particularly important in mechanical pulping, which is one of the largest users of electricity in New Zealand.

Ensis Papro is working with J&L Fiber Services, a United States product developer for the pulp and paper industry, to improve the design of refiner plates in mechanical pulping. These refiner plates grind wood chips into pulp fibre, producing large amounts of heat, which in turn generates steam. Conventional refiner plates are designed to treat the fibre in an optimal manner; however, the trade-off is that steam is prevented from escaping easily.

The refiner plate design contains holes that allow the steam to escape without disrupting the flow of fibre in the refining zone. The plates can be installed in traditional plants without any need for modification. The design was tested by Ensis Papro in the Rotorua pilot plant and the new plates have since been subjected to a full mill trial. Initial results demonstrate that up to 15 per cent of energy can be saved without loss of pulp quality.

Harnessing biogas to power dairy farms

Scion has completed a study to investigate how dairy farms can generate their own electricity from the biogas produced from dairy shed wash-down waste. Bioenergy specialists presented a number of different scenarios for a dairy farm to partially meet its electricity demand by using this type of biogas plant. An energy supply and demand analysis was carried out on each of the scenarios and then compared on their ability to reduce electricity costs.

This project was carried out in collaboration with Wrightson Ltd and forms part of a larger study aimed at implementing bioenergy systems on farms.

Christchurch plans a strategy for biosolids reuse

Ensis is contributing to a major community initiative with the Christchurch City Council to enable the people of Christchurch to design a strategy for the future management of biosolids (sewage sludge).

A team of Ensis, University of Canterbury, Landcare Research and Te Runanga o Ngai Tahu staff completed a series of Scenario Workshops, which culminated in community, business, Maori, rural participants and national/local regulators developing proposals for the strategy. Participants recommended that the biosolids be used for energy generation and, in the longer-term, a combination of energy generation and land application, contingent on the removal of contaminants from the waste stream. The feasibility of energy generation is currently being evaluated by the Council and technical consultants.

Capitalising on innovation

Working with industry partners to transform bright ideas into commercial opportunities

Scion continues to establish early connectivity with industry partners to identify commercial opportunities for new products and processes. A number of new technologies and partnerships have reached significant milestones over the past year.

Composting technologies

Scion and Andar Holdings Ltd received a Technology for Business grant to fund the next stage of research and development of the ProFert technology, a new

composting system for animal wastes. The key target for the on-going programme is feather waste utilisation, with scientists focusing on identifying appropriate molecular biology and inocula selection techniques. This initiative is the first project to emerge from the PreSeed Accelerator Fund programme.

ATLAS Technology

ATLAS Technology develops business management software systems for the forestry sector. Currently

NEW TECHNOLOGY ENHANCES WOOD STABILITY

Ensis scientists have developed an acetylation technology that reduces the ability of wood to absorb moisture. This technology has been sold by Scion to Titan Wood Limited, a subsidiary business of Accsys Technologies based in the United Kingdom.



Kourosh Nasheri - wood treatment scientist

Acetylation is a chemical process which physically modifies wood, significantly reducing its ability to absorb moisture. Acetylated wood has enhanced durability against fungi, improved properties for coatings and dimensional stability, and is more resistant to UV damage. It is also indigestible to wood-eating insects. These attributes suggest that acetylated wood can potentially be substituted for CCA-treated wood. This technology also offers greater appeal than standard timber treatments because of overall cost benefits.

The acetylation technology has been under development at Ensis for some time and has been proven on a small pilot plant scale. Titan Wood will progress the technology through to full commercialisation, initially in European installations.

Titan Wood is specifically applying their technology to radiata pine, so uptake of this technology could open a whole new market for New Zealand timber in Europe and beyond.



more than 500,000 hectares of forest in New Zealand and 1.1 million hectares across Australia and Fiji are managed using ATLAS software systems. This is a remarkable achievement and secures ATLAS' position as a leading supplier of world class forestry software.

Yield Table Manager, (YTM) released June 2006, is the latest program to join the ATLAS suite of products. YTM allows forest yield information to be consistently managed and linked with harvest planning at a tactical and operational level.

On June 30, ATLAS officially became a Microsoft Certified Partner by qualifying with a ISV/Software Solutions competency. This achievement recognises ATLAS' proven expertise in developing and marketing packaged software applications based on Microsoft technologies.

AVOIDING THE CRUSH

A new invention was launched by Ensis Papro this year to measure the stiffness of corrugated boxes. This technology helps exporters reduce the risk of product damage through faulty packaging.

The instrument, known as a "Dynamic Stiffness Tester" or DST, can be used by corrugated board manufacturers to avoid damage that occurs during the manufacturing process. The DST works by oscillating or vibrating a sample of board to measure its torsional stiffness. Experienced use of the DST will allow weight reductions without reduced performance in corrugated board or boxes.

Eighteen units were sold to Australasian producers this year and steps are under way to market the DST offshore through an international licensee.

The project is part of the wider Smart Packaging research programme at Ensis Papro aimed at developing innovative technologies to enhance the function, performance and cost-competitiveness of paperboard packaging.

Barbara Johnson - pulp and paper specialist



Building New Zealand's science resource

THE JOINT FORCES OF CSIRO & SCION

ensis



Ensis - the joint forces of CSIRO and Scion

Ensis is the unincorporated joint venture between Scion and CSIRO that was established in 2004. The ability of Ensis to enhance the extraordinary potential of the forestry sector was strengthened this year, with the transfer of the Forest Biosecurity and Protection, and Sustainable Forest Management units to Ensis. The purpose of this collaboration with CSIRO is to provide greater research and development capability for the forestry sectors in New Zealand and Australia.

As a result of the expanded collaboration, research and development are now delivered through six areas, covering the entire forestry value chain:

- **Genetics** - Breeding better trees to deliver higher quality and performance in the market.
- **Forest Biosecurity and Protection** - Providing the science needed to protect forests from pests, pathogens, weeds and fire.

- **Forests and Environment** - Developing management systems for productive and sustainable plantations, and managed natural forests.
- **Wood Quality** - Working with industry to understand, manage and extract value from a variable wood and fibre resource.
- **Wood Processing** - Working with partners to create wood processes and products for the consumer market.
- **Papro** - Working with the pulp, paper, and packaging industry and commercial partners to create new fibre-based products and processes.

Local recognition of this venture was gained when Ensis received a Rotorua Business Award in September 2005 for Best Emerging Business. This award recognises the significance of this trans-Tasman collaboration and the new dimension it brings to the Rotorua community.

Wood quality

The New Zealand forest industry has taken great strides in monitoring and managing wood quality within the plantation resource. This progress has been achieved through targeted research carried out in close association with end users. The research collaboration offered by Ensis is now demonstrating the clear benefit of taking a joint approach to a common problem, with New Zealand and Australian forest growers sharing many of the same wood quality issues.

Two research projects funded by WQI Ltd are providing an opportunity for greater collaboration between Ensis scientists across New Zealand and Australia.



Fourteen Ensis researchers from three different units, Wood Quality, Forests and Environment, and Forest Biosecurity and Protection, have teamed up to work on the two complementary projects aimed at investigating the main causes of resin defects in radiata pine, which degrade the value of appearance-grade products.

The research will examine the effect of wind and water stress on the formation of resin defects. Researchers will use a range of tools including the process-based

growth model CABALA, which was developed by Ensis scientists in Australia to determine the effect of environmental stressors on tree growth and development.

These projects offer a strong example of the resources that become available through trans-Tasman collaboration. Combine this with good industry focus through WQI Ltd and a high level of confidence is achieved that the results will be successful scientifically and valuable to industry.

BUSHFIRE RESEARCH CAPABILITY TURNS UP THE HEAT

Wild fires became a major issue last summer in New Zealand as fire fighters battled a record number of blazes around the country. The formation of the Ensis Bushfire Research Group has provided much greater capability to support the fire managers who must grapple with these emergencies.

Support from the Australian government, via the Bushfire Cooperative Research Centre, has enabled Ensis to address the development of wildfire simulation models. These models enable the prediction of fire spread and behaviour across landscapes. A high-profile Ensis initiative brought together international fire modelling specialists for the first time in New Zealand. Fire scientists from the USDA Forest Service, Canada's Alberta Forest Service, and organisations from Australia demonstrated how modelling technologies can be used to predict fire behaviour and to aid in the deployment of fire fighting resources.

Ensis is now looking to adopt an appropriate model and customise it with the data required for local New Zealand environments. In addition to plantation

forest owners, the Department of Conservation is interested in adopting this technology for managing fire suppression resources on public lands.



Capability Fund

In the 2005/06 financial year, Scion received \$2,784,900 from the Ministry of Research, Science and Technology to invest in science capability.

In keeping with the intention of this fund, Scion invested this money to both enhance the national science capability in the organisation and to develop the science platforms that underpin Scion's strategy.

Allocation of the fund was aligned to two main themes. Firstly, to underpin capability that sustains social, environmental and economic growth from the forest industries and secondly, to create new economic, social and environmental returns from further exploitation of plant fibre in New Zealand.

The following synopsis specifically relates to the Capability Fund projects.

1. Supporting growth in the forest industries

1.1 Capability in social and environmental impacts, and management and production of amenity forests. The focus in this sub theme was enhancing skills in human productivity and sustaining capability in soil science.

Human productivity - Enhancing human productivity has been highlighted as a key to growing the economy. Scion is host to the Centre for Human Factors and Ergonomics (COHFE), which has played a key role in enhancing worker safety and productivity for the forestry industry for many years. COHFE has also expanded its role into other primary industries.

Soil science - This is an area of science critical to New Zealand's primary industries and a capability that Scion sees as vital to strengthen. Although the specific project has focused on nutrient management

strategies for forestry, a key outcome has been in building strong end-user support and aligning Scion research capability to SLURI (the Sustainable Land Use Research Initiative) with the intention of participating in this initiative from 2006 onward - thereby aiding in positioning SLURI as a National Centre for Soil Science.

1.2 Protection of New Zealand's forestry assets

- Scion receives support through FRST for science underpinning biosecurity, fire research and species diversification. The focus in this last year has been to further support capability growth in biosecurity - specifically focusing on host plant resistance mechanisms to insect pests. It has also enhanced a postdoctoral study and extended linkages to two universities.

1.3 Expansion of capability in wood material science

- Wood material engineering is a key to the development of higher valued products from the forest industries. The focus here has been in expanding capability to align to major initiatives in wood segregation and in drying - the two critical steps underpinning wood material enhancement.

Wood segregation - The development of wood segregation tools depends on an understanding of the factors that drive timber performance such as stability. Scion has used capability funding to support the development of two new instruments for quantifying wood and its spatial variability. Two staff skilled in acoustics, ultrasonics and tomography have been employed, and up-skilling of staff by an international expert in acoustics and spectral techniques has been achieved.

Wood drying - A major factor affecting wood properties is the moisture content of timber. Accurate management of wood drying adds substantial value to the end product, while getting it wrong can add substantial cost. Increasing the precision of moisture content estimation in wood processing will substantially aid in managing wood properties during processing. Scion has used Capability Funding to progress research in this challenging area and has been able to further develop an in-kiln, moisture-sensing device.

2. New bio-based industries

Scion's strategy is to see expansion of value and opportunity from the current forestry industries, along with the development of new industries from plant resources. The premise is that the bio-based materials industries of the future will have an expanded product range (from structural timber through to polymers), will have neutral environmental impact and will be producing sustainable products. To achieve this vision, skills are required spanning cell wall biotechnology, natural products engineering, industrial biotechnology and product design. These skills both create a platform for future industries and help diversify established industries.

2.1 Development of high valued materials from biological resources and waste streams.

Deriving polymers/chemicals from biomass - Scion has developed approaches to exploit enzymes in pre-treatment processes to separate polysaccharides from other polymers. In addition, support was provided for the internally funded postdoctoral programme on enzyme-mediated transformation of natural polyphenols, in a quest for new bio-chemicals. This type of transformation using biological processes instead of inorganic chemicals is seen as an important growth area for future industry.

Microbiology - Scion is building a comprehensive research programme around using micro-organisms to break down waste and synthesise new

COHFE (CENTRE FOR HUMAN FACTORS AND ERGONOMICS)

COHFE is recognised internationally as a major contributor to the application of ergonomics and human factors in primary industries. In recognition of this expertise, COHFE was recently invited to chair the panel discussion on priorities for future research in the primary industries at the International Ergonomics Association Triennial Congress in Maastricht, Netherlands.

This year COHFE engaged in a successful international exchange with a staff member working in the United Kingdom for 12 months. This exchange resulted in David Riley, Principal Ergonomist of the United Kingdom Health & Safety Laboratory, working with COHFE in Rotorua for six months.

Capability Funding has been used to support two PhD programmes in this area. One project focused on the physiological workload of professional forest workers, using impact of chainsaw sharpness as the case study. The second project addresses the problem of soft tissue injuries and is focused on the meat industry.

COHFE leader Richard Parker (left) with David Riley - UK ergonomist



bio-products. Activities in this area have revolved around the identification, characterisation and function of bacterial colonies. Such knowledge lays the foundation for potential bioprocessing technology in New Zealand.

Genetics - Scion has national capability in gene technologies to underpin development of new forest germplasm. Modifying the cell wall to enhance critical properties such as stiffness and stability is key to creating new high-value forests products. The specific focus of the capability fund in this area is to enhance Scion's competencies in functional genomics and gene discovery, and to extend skills and experience to other plant fibres. This includes the identification of novel genotypes, determining their impact on traits of interest and the ability to express genes in the cell wall.

2.2 Developing a sustainable infrastructure for New Zealand.

Green chemistry - This project is focused on proprietary modified zeolite products in freshwater nutrient management. During 2005/06, the Capability Fund has been actively utilised to develop Scion's skills base in this area, with two lead scientists recruited with specific skills in physicochemical processes, product development and efficacy analysis.

Bionanotechnology - Research by Scion is seeking to exploit cellulose on a nano scale, for the purpose of developing strong, lightweight, natural nano-fibre-

reinforced composites. Relationship developments with McDiarmid Institute researchers are leading to new interactions and future programmes that interface biomaterials, biotechnology and nanotechnology.

Degradable bioproducts and biocomposites - Capability has been built to advance the formulation and processing of intelligently degradable bioplastic or biocomposite compounds. Much of the work has focused on polylactic acid (PLA) and other bioplastics with selected biomass additives for extra strength. Prototype products have been developed with industry partners, and commercial negotiations have begun with selected New Zealand companies in some aspects of this work

2.3 Promote sustainable economic growth.

New product development - The development of new high-value wood-based products requires robust knowledge and understanding of consumer markets, the drivers for material and product selection, end user requirements, product life cycles and the nature of competing products and services. During 2005/06, funding was used to develop capability to meet these needs, using the building and construction sector as the target market. This investment has expanded Scion's capability in life cycle analysis, consumer research, systems analysis and product design. A holistic design framework has been developed which has been tested with two building products.

VERITEC

Veritec is Scion's own analytical chemistry laboratory, specialising in forestry and biomaterial related activities. Veritec provides a variety of component level tests focused on soil, foliage, waste water, wood and wood preservation for researchers and end users across Scion and the sector.

Reflecting a core focus on improving the quality of service to both internal and external clients, Veritec is implementing a quality system based on NZS, ISO and IEC 17025 criteria. The implementation of this system within Veritec will increase its ability to produce reliable, cost-effective and defensible data.

Responding to market demand, Veritec has included additional testing services over the past year including Popiconazole and Tebuconazole treated timber and solution testing (for fungicides).

Creating a legacy of knowledge

SCIENTIST PUTS SPOTLIGHT ON FUNGI

Ensis pathologist, Dr Peter Gadgil, has completed the first comprehensive reference book on fungi that live in New Zealand's forests. Entitled "Fungi on Trees and Shrubs in New Zealand" this volume forms part of an international reference collection, published by the University of Hong Kong.

This book is a notable career achievement that represents a significant contribution to the knowledge of New Zealand species. Works such as this provide an effective means of capturing the wealth of knowledge accumulated by scientists with a lifetime of experience in a specialised field.



Dr Peter Gadgil - forest pathologist

Taking forests into schools

The Forests of Life programme reached a significant milestone this year when Mokoia Intermediate students from Rotorua planted their own patch of native forest on the Te Papa Tipu Properties' grounds. Teachers report this activity gave the children and their families a real sense of ownership of this project and stimulated even deeper interest in broader forestry values.

The Forests of Life programme is managed and developed by Ensis and is funded through the Ministry of Education's Digital Opportunities fund. The purpose of this programme is to promote a greater awareness of ecological science and the principles of sustainability in schools.

This year, the science programme was expanded to include its first Australian school, in addition to securing its second Rotorua district school. Rotorua's Reporoa College and Golden Square Secondary in Bendigo, Australia will now join Mokoia Intermediate in Forests of Life.

Bringing science teachers into science

Rotorua's Reporoa College science teacher Tim McLay has been granted a Royal Society of New Zealand Fellowship to spend a year working for Ensis in Rotorua. The Fellowship is part of the New Zealand Science, Mathematics and Technology Teacher Fellowship Scheme, which enables science teachers to gain valuable research experience in the field.

Mr McLay is working on a variety of field and laboratory projects, including investigating nitrogen leaching from broom (a leguminous weed), and its impact on water quality. This Ensis project is a response to widespread concern about increasing concentrations of nitrate in surface and ground water, and the need to quantify the various sources of the nitrogen.

Providing a Gateway into Science

Scion has opened its doors to the Gateway programme, which provides opportunities for high school students to gain work experience in scientific research. Over the past year, students have been identified by Reporoa College to participate in the Government-funded programme. These students will commit to working at Scion for one day a week, for a minimum of 10 weeks, and their work experience goes towards credits for their national qualifications.

Maori strategy

Growing partnerships and contracts

Scion has achieved significant growth in partnerships and contracts with Maori, moving the organisation's Maori Strategy to a new level. The focus on laying a platform over the previous years has paid dividends in the past 12 months as Scion has increased provision of science and research services to Maori organisations seeking to develop their own business opportunities and capabilities.

Scion is working with a number of Iwi groups throughout New Zealand to develop their research strategies. FRST-funded scoping projects with Runanga and Trusts have enabled Maori to consider innovative technology opportunities to add value to their operations.

Ngati Porou Whanui Forests Limited is working with Ensis Genetics to provide assessments on alternative species to complement radiata pine plantations on the East Coast, increasing the biodiversity landscape. Ensis is also assessing native tree trial opportunities for Maori organisations in the Te Arawa region. Totara, rimu and kauri offer enormous potential for sustainable production of wood for furniture or building products, or to meet intergenerational cultural needs such as carving.

Scion's Biomaterials Research capabilities have been instrumental in developing an indigenous plant-focused research concept based on raupo (water reeds). Key stakeholder, Te Arawa Maori Trust Board, has supported the proposal, which seeks to explore untapped pools of traditional practices and uses of raupo as a knowledge platform for discovering modern-day processes and products. This is aligned with the Ministry of Research, Science and Technology's Vision Maturanga strategy.

In November, Scion hosted a Harakeke Hui at its Rotorua site, focusing on potential opportunities available to the emerging harakeke industry in New Zealand. The hui brought together a variety of different groups who have an interest and a stake in the harakeke industry, including Scion, the University of Auckland, the Biopolymer Network, MAF, local Iwi groups and others. Scion is investigating the use of harakeke fibre as a natural fibre industrial reinforcement material that could potentially replace fibreglass in a number of applications.

A Te Reo learning programme was implemented at Scion at the end of 2005. The ongoing programme is an important step in equipping Scion's scientists for engaging with Iwi. The focus is not just on basic vocabulary and pronunciation skills, but also on enabling staff to develop an understanding of Maori tikanga (protocols) for their everyday work. The programme has been developed in conjunction with Waiariki Institute of Technology and has proven extremely popular with staff. The format will be revised in 2006 to make the courses even more accessible to scientists.

Engagement with Tangata Whenua has proved its worth in regard to scientists consulting with Iwi on specific research projects, such as the release of the weevil *Cleopus japonicus* as a biological control agent for buddleia, a serious forest weed. Representatives from Ensis Forest Biosecurity and Protection have worked closely with local Maori partners to seek endorsement for researching *Cleopus japonicus* on the Te Papa Tipu Innovation Park site. They have also met with Maori landowners in native forest areas for possible release sites. Such projects lay a valuable foundation for future biological control initiatives, as Iwi consultation is an important aspect of the ERMA approval process.



Te Papa Tipu Properties Limited

Te Papa Tipu Properties Limited (TPTPL) was established by Scion as a subsidiary company in March 2004 to manage the 114 hectares of land that hosts Scion and its operations at Rotorua. All of Scion's land assets were transferred to TPTPL who now manage the entire property and provide a dividend to Scion. The Te Papa Tipu Properties board reports to the Scion Board of Directors.

At the same time, the establishment of TPTPL has been an important step in forging closer relationships with Tangata Whenua and taking a more holistic view of the land assets of the Group.

TPTPL's vision is to develop the site, taking into account the interests of Tangata Whenua and

acknowledging the commercial and public good expectations of Scion. One of the objectives is to create an innovation park that contributes to the overall regional development of Rotorua, as well as providing benefits to Scion and its wider operations. The Te Papa Tipu Innovation Park will be a technology hub that services economic development in Rotorua and the wider regions.

This vision has taken a major step forward in 2006 with the sub-division of six hectares into nine leasehold sites on the North Drive Estate. Companies operating in the areas of forestry, scientific research and biomaterials will be secured as long-term lessees, with the first tenants commencing building later in 2006.



Staff achievements for 2005/06

Medals and Awards

Armin Thumm was awarded a travel grant from the Trimble Foundation to travel to Germany to further his work investigating the interaction between natural fibres and bio-based plastic matrix materials, in order to develop high performance bio-based composites.

Dr James Turner was awarded the John Balneaves Travel Award, which will be used to collaborate with the University of Wisconsin-Madison faculty on research into policies influencing trade access for New Zealand wood product exports.

Dr Haydon Jones was awarded the Morice Fieldes Memorial Award for best PhD thesis in soil science in 2005.

Dr Dave Cown and **Sig Ormarsson** (Chalmers University of Technology, Sweden) were awarded the George Marra Award from Wood and Fibre Science for excellence in writing and science.

Dr Luis Gea received a Scholarship from a European Union forestry project related to tree breeding. This enabled him to travel to Spain to participate in the revision of breeding strategies for Douglas fir and radiata pine for Spain and Portugal.

ISAT Linkage funding was awarded to **Murray Smith** ("Metaproteomics and Bioinformatics Technology Development") and **Marc Gaugler** ("Chemical mapping of polyphenolic interfaces").

Toby Stovold gained a Queen Elizabeth II technicians study award, which he used to attend a Tree Breeding course in South Africa, at CSIR.

Tara Murray was awarded the MacMillan Brown Agricultural Research Scholarship to assist with her studies on the biological control agents of *Paropsis charybdis*, the Eucalyptus tortoise beetle.

Nod Kay was awarded an OECD Fellowship for a joint venture project with the United Kingdom Forest



Dr Adya Singh was awarded the prestigious Shorland Medal by the New Zealand Association of Scientists for his outstanding contribution to plant and wood sciences. His ground-breaking research work in microscopy involved studying structure and tissue development in plants.

Sarah Addison won a QEII technicians' study award for travel to the John Innes Centre in Norwich, United Kingdom, an international centre of excellence in plant science and microbiology. The purpose of this trip was to further explore the environmental technologies that can create added value from industrial waste streams.

Research organisation on macroecology (the vulnerability of ecosystems to pests). An associated OECD Fellowship was awarded to Dr David Wainhouse (Forest Research, UK) to work with Ensis in Rotorua.

Ian Nicholas received a travel award to Australia through the New Zealand Institute of Forestry (NZIF) Chavasse Travel award. The purpose of this trip is to assist in developing a stronger blackwood market in New Zealand.

Katrin Walbert won an award in the postgraduate research funding round from Lincoln University for travel to an international mycorrhiza conference in Spain.

Dr Russell Burton, Dr Brian Richardson and Barbara Forbes each received a Certificate in Company Direction from the Institute of Directors in New Zealand.

An **Ensis project** won the top prize in an international Nikon photo competition. The photo of radiata pine wood impregnated with a chitosan-melamine copolymer was submitted by Ensis internship student Kristina Thaelmelt. A team of scientists including Kristina Thaelmelt, Adya Singh, Kirk Torr and Robert Franich first used the photograph as part of their 2005 research to understand the process of stiffening radiata pine veneer.

Fellowships and Memberships

Dr Rowland Burdon was elected a Fellow of the New Zealand Institute of Forestry. There are 25 Fellows among the Institute's total membership of over 800.

Dr Guna Magesan became the first New Zealand scientist to sit on the editorial board of the Japanese Soil Science and Plant Nutrition Journal.

Dr Christian Walter was appointed as one of the five associate editors of the journal "Plant, Cell, Tissue and Organ Culture".

Dr Phillip Wilcox was appointed to the FRST Te Tipu o Te Wananga reference panel to evaluate research proposals in this year's bidding round.

Dr Alan Fernyhough was appointed a member of the MoRST Nanotechnology Steering Group Committee to develop a nanoscience and nanotechnologies roadmap for New Zealand.

Dr Elspeth MacRae was appointed a member of The Navigator Network, which has been set up in association with the Ministry of Research, Science and Technology to identify emerging science trends and innovations, particularly in biotechnology and nanotechnology.

Qualifications

Erina Hingston was awarded an MSc in molecular biology from University of Waikato. She was a Tuapapa Putaiao fellow.

Karen Love completed an MSc in chemistry from University of Waikato.

Angela Pannier was awarded a diploma in biological engineering from the University of Technology of Dresden (UTD) and a diploma in Biotechnology from the University of Technology of Compiegne (both MSc equivalents). The UTD mark was "sehr gut", the highest ranking.

National sporting achievements

John Lee served as cross country coach for the New Zealand mountain bike team, which competed at the world Mountain Bike Championships in Italy and the Melbourne Commonwealth Games. In recognition of his contribution to sport, John received the Prime Minister's Coaching Scholarship in 2006.

Sonia Foote represented New Zealand in the mountain biking team at the Melbourne Commonwealth Games.

Katrin Walbert represented New Zealand at the 10th Annual Xterra World Triathlon Championships in Hawaii (October 2005).

Mission accomplished

An announcement by Biosecurity Minister Hon Jim Anderton that painted apple moth and fall webworm had successfully been eradicated in Auckland marked the end of a long campaign led by the Ministry of Agriculture and Forestry (MAF). Both pests posed a considerable risk to New Zealand's urban forest estate and Ensis scientists were among many key players in the eradication effort, involving aerial and ground-based spraying over large suburban areas.

Ensis forest entomologists provided technical advice on the insects, including the completion of a host testing study to determine their preferred diet. Quarantine staff in Rotorua contributed through mass rearing tens of thousands of insects for research and pheromone-trapping purposes. Spraying specialists at Ensis helped to design the aerial spray operations, which were seen by MAF as a major factor in the programme's success.

MAF acknowledged that groundbreaking scientific advances have been achieved during the course of the eradication programme, which will contribute significantly to New Zealand's future biosecurity response capabilities.



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Directors' Report

Principal Activities

Scion is a company registered under the Companies Act 1993 and our principal activity is to conduct research in accordance with the purpose and principles specified in Sections 4 and 5 of the Crown Research Institutes Act 1992 (the Act). Scion has met all the obligations under the Act in the year ended 30 June 2006.

Scion is a commercially focused science and technology company, delivering solutions to both commercial and Crown clients. The principal research facility is located in Rotorua.

Scion, at balance date, has ten wholly-owned subsidiaries, FHS Limited (FHS), Liro Limited, N-Fix Technologies Limited, Forest Research (Australasia) Pty Limited, Forest Research (Australasia) #2 Pty Limited, Atlas Technology Limited, SignaGen Limited, Te Papa Tipu Properties Limited, Scion Australasia Limited, Scion Group Limited, and three associates - 25% ownership of Frontline Biosecurity Limited, 20% ownership of Beacon Pathway Limited, and 33.33% ownership of Biopolymer Network Limited. Scion is also a member of two consortia WQI Limited with an 11.36% shareholding and Radiata Pine Breeding Co Limited with a 16.92% shareholding.

FHS traded as Vigil and provided a range of services to industry, government, local and regional authorities aimed at the early detection of pests and diseases. Vigil ceased trading on 1 October 2005.

Forest Research (Australasia) Pty Limited was the Australian trading vehicle but has now ceased trading. The Company is a New Zealand registered company.

Te Papa Tipu Properties Limited owns Scion's land assets.

Scion Australasia Limited is a wholly owned subsidiary incorporated specifically for the purposes of the Ensis unincorporated joint venture with a subsidiary of CSIRO, Australia's national science agency.

N-Fix Technologies Limited and Liro Limited are non-trading companies.

Atlas Technology Limited, SignaGen Limited and Forest Research (Australasia) #2 Pty Limited do not trade. Forest Research (Australasia) #2 Pty Limited is an Australian registered company, held for name protection purposes.

Frontline Biosecurity Limited is an incorporated joint venture, the purpose of which is to collaborate in the research and development and commercialisation of the heat disinfestation process and other biosecurity processes.

Beacon Pathway Limited carries out research in the area of sustainability in the built environment.

Biopolymer Network Limited is an incorporated joint venture whose purpose is to create technologies for advancing the utilisation of renewable biobased materials in industrial applications.

WQI Limited (Wood Quality Initiative) is a FRST Consortium with 16 other shareholders.

Radiata Pine Breeding Co Limited is a FRST Consortium with 17 other shareholders.

Summary of Group Financial Results to 30 June 2006

	2006 \$000	2005 \$000
Operating Revenue*	21,345	35,199
Surplus before taxation	(1,297)	1,085
Taxation expense	347	466
Net surplus attributable to the Shareholders	(1,644)	619
EQUITY		
Issued and paid up capital	15,716	15,716
Retained earnings	7,392	9,117
Total equity	23,108	24,833

* Scion Australasia Limited, a special purpose company for a new 50/50 unincorporated joint venture, was incorporated on 14 June 2004. The joint venture, Ensis, commenced operations on 1 July 2004. The parent company, New Zealand Forest Research Institute Limited transferred approximately one third of its operations into the joint venture on commencement and a further one third of its operations on 1 July 2005.

The business of Scion involves science and innovation in sustainable forestry, wood and fibre product technologies. Core activities comprise research and economics, consumer market knowledge, built environment, environmental impacts of processing and production, pulp and paper, materials science, engineered wood products, wood processing, logging and transport, tree nutrition and physiology, management decision support and harvesting systems, silviculture, propagation, molecular biology and genetics.

Remuneration and compensation

Remuneration and compensation included performance awards, superannuation benefits,

pay-outs of equity leave provisions and redundancy payments. Some other benefits were not quantified and therefore excluded, including staff parking, home telephone and fax costs, and membership of relevant professional societies.

Bands	Number in Each Band
\$250,000 - \$259,999*	1
\$220,000 - \$229,999	1
\$180,000 - \$189,999	0
\$170,000 - \$179,999	0
\$160,000 - \$169,999	4
\$150,000 - \$159,999	1
\$140,000 - \$149,999	1
\$130,000 - \$139,999	3
\$120,000 - \$129,999	3
\$110,000 - \$119,999	5
\$100,000 - \$109,999	10

* Denotes Salary of Chief Executive

Compensation and other benefits totalling \$1,070,085 was paid to 23 people who ceased to be employees.

Dividend

No dividend payment is recommended (2005: nil).

Directors' Profiles

Dr Russell Ballard, CNZM, (Chairman) is an independent, non-executive Director. Dr Ballard is Deputy Chairman of the New Zealand Correspondence School, a Director of TeamTalk Ltd, a member of the Council of Massey University and an external Director on the Audit Committees of the Ministry of Social Development and the Inland Revenue Department. Previously Dr Ballard held several Chief Executive positions in the public service including the Ministry of Forestry, Department of Education, Ministry of Agriculture and Fisheries and Land Information New Zealand. Dr Ballard holds a MAgSc and PhD (forest soils) and a Diploma in Company Direction from the Institute of Directors (UK). He is a member of the New Zealand Institute of Directors and a Fellow of the New Zealand Institute of Management.

Mr Bryce Whitcher (Deputy Chairman to 30 June 2006) is Group Director, Industrial of Beca Carter

Hollings and Ferner Ltd and the former CEO of Electronic Data Holdings Ltd. He is also a Director of several other companies in the Beca Group. Mr Whitcher previously held senior management positions with Tasman Pulp and Paper and Fletcher Challenge Paper both in New Zealand and Chile. Mr Whitcher holds a BSc in Chemistry. Mr Whitcher's term on the Board concluded on 30 June 2006.

Mr Giff M Davidson OBE, JP (Director) is a professional Company Director, Chairman of Animal Control Products Limited, Chairman of the Korea/New Zealand Business Council and Chairman/Trustee of three private forest trusts. He has been involved for over twenty years in the education area. Mr Davidson is a Trustee of the Pacific Cooperation Foundation and Honorary Consul for Romania in New Zealand. He is past and now Honorary Vice-President of the New Zealand Institute of International Affairs, past Chairman New Zealand Chamber of Commerce and Past-President of the Wellington Chamber of Commerce, and now life member. He is also past Chairman of the Energy Efficiency and Conservation Authority and had a long and successful business career with Shell NZ Holdings Ltd. Mr Davidson's term on the Board concluded on 30 June 2006.

Ms Margaret Emerre (Director) is Relationship Manager with the Leadership Development Centre. She was formerly the Manager RS&T of the NZ Forest Industries Council and CEO of the Queensland Science and Technology Council, Director of the Queensland Innovation Centre, Director of the Electronic and Electricity Industry Training Organisation, and is a Director of some small commercial companies. Ms Emerre has also managed the Master of Management Programme in the Graduate School of Business at Victoria University. She holds an MSc, a Post Graduate Diploma in Administration, and a BSc in Biological Sciences and a Diploma in Physical Education. Ms Emerre also holds a Certificate in Company Directing from the Institute of Directors.

Mr Temuera Hall (Te Arawa, Ngati Tuwharetoa) (Director) is Managing Director of a funds management company called LTF Limited. LTF is a subsidiary of the Lake Taupo Group which also holds a merchant banking company, named Lake Taupo Capital (LTC) and a direct invest company named Lake Taupo Forest Trust Investment Limited (LTI). Mr Hall is a director on Lake Taupo Group, LTC and LTI. He also holds directorships on Tuwharetoa Ltd and T3000 Financial Services, he is coordinator for the Tuwharetoa Wananga and Chair of Scion subsidiary Te Papa Tipu Properties Limited. Mr Hall has a BSocSci majoring in Geography.

Directors' Report - continued

Ms Bronwyn Monopoli (Director) is a qualified accountant with her own practice based in Nelson. She currently serves on the boards of the Cawthron Institute, Sentinel Limited, HumanWare Group Limited, the WearableArt Development Trust, the Nelson Millennium Centre Trust, the New Zealand International Arts Festival Trust and the Visitor Information Network. She has previously served as a Director of a wide range of companies and government bodies including the Rural Bank, Housing New Zealand, Landcorp, the New Zealand Wool Board, the New Zealand Merino Company, Trade New Zealand and Tourism New Zealand. Bronwyn has a BAgrSc and a BBS. She is a fellow of the Institute of Chartered Accountants in New Zealand.

Mrs Jane Taylor (Director) is a Barrister in the areas of civil law and equity, and Company Director. Mrs Taylor previously practiced as a Chartered Accountant. Her business background includes business and share valuations, corporate finance, insolvency and company reconstruction, and litigation support. Mrs Taylor has a long association with the forest industry and was previously a Director of Forestry Corporation of New Zealand. Mrs Taylor holds an LLB (Hons), an LLM with first class honours, a Post Graduate Diploma in Accountancy, a BSc (Hons) Forestry, and is a member of the Institute of Directors, New Zealand Law Society and the Institute of Chartered Accountants of New Zealand. Mrs Taylor's term on the Board concluded 30 October 2005.

Directors' Interests

Any business the company has transacted with organisations in which a Director has an association has been carried out on a commercial "arms-length" basis.

Directors' Remuneration

	Scion 30 June 2006	Ensis 30 June 2006	Te Papa Tipu Properties 30 June 2006	30 June 2005
Russell Ballard	41,750	16,000		20,347
Bryce Whitcher	23,750	16,000		42,900
Giff Davidson	22,750			21,250
Tem Hall	21,250		8,000	24,250
Margaret Emerre	21,250			21,250
Bronwyn Monopoli	22,750			20,347
Brian Armstrong (resigned 30 June 2005)	0			77,000
Jane Taylor (resigned 30 October 2005)	7,833			26,750
External Director				
John Kahukiwa			1,000	0
Dooley Kahukiwa (deceased 6 August 2005)			250	3,200
Total	161,333	32,000	9,250	\$257,294

Changes in Directors

Jane Taylor's term on the Board concluded on 30 October 2005. Bryce Whitcher and Giff Davidson's term on the Board concluded on 30 June 2006. These Directors have been replaced by Mr Peter Berg, Dr Kathy Garden and Mr John Palmer, who were appointed to the Board on 1 July 2006.

Use of Company Information

During the year no notices were received from members of the Board requesting to use Scion information received in their capacity as Directors which would not otherwise have been available to them. There have been no additions to the Interests Register.

The state of the Company's Affairs

A commentary on the year's performance is outlined in the Chairman and CEO's Report and in the opinion of the Directors, the state of the Group's affairs continues to be satisfactory and the outlook bright.

Auditor

In accordance with Section 21 of the Crown Research Institutes Act 1992, the Audit Office is Auditor for the Company and has appointed Ernst & Young to undertake the audit on its behalf.

Directors' Indemnity and Insurance

Scion has insured all Directors and the Directors of its subsidiaries against liabilities to other parties (except to Scion or a related party of Scion) that may arise from their position as Directors. The insurance does not cover all liabilities including those that may arise from criminal actions.



For and on behalf of the Board

R Ballard

Chairman

24 August 2006

MANAGEMENT STATEMENT

The following statement from management is made in accordance with Section 42 of the Public Finance Act 1989:

1. The management is responsible for the preparation of the annual financial statements and the judgements used in these;
2. The management is responsible for establishing and maintaining a system of internal control designed to provide reasonable assurance as to the integrity and reliability of the financial reporting; and
3. In the opinion of the management, the annual financial statements for the year ended 30 June 2006 fairly reflect the financial position and operations of the New Zealand Forest Research Institute Limited.



R Ballard

Chairman

24 August 2006



TE Richardson

Chief Executive

Non-financial Performance

Policies to meet provisions of the Crown Research Institutes Act, 1992

Scion complies in all respects with its obligations under the CRI Act.

Social Responsibility/Community

Over the past 12 months Scion has continued to work alongside and support its local communities.

This year Scion awarded two Suffrage Scholarships to local students Katie Clark from Rotorua Lakes High School and Kerry Charles from John Paul College. Now into its 13th year, the Suffrage Scholarship commemorates the 1993 New Zealand Suffrage Centennial and is open to local female senior students who plan to undertake a tertiary qualification that will impact the forestry or timber industry. Potential study areas include the life sciences, engineering sciences, economics, marketing and consumer intelligence. Selection is made based on academic achievement, as well as contribution to school and community life. Katie Clark is studying towards a Bachelor of Engineering degree at Canterbury University, while Kerry is studying a Bachelor of Science degree as well as a Bachelor of Arts at Massey University.

Scion also provides special leave for staff members involved in the local region's Search and Rescue activities. Ensis Technical Adviser, Tony Evanson, was involved in a successful two-day search and rescue operation in the Urewera National Park, while Energy Technician George Estcourt was involved in a two-day search in Minginui (near Murupara) as well as a two-day search and rescue training exercise.

Scion provides technical expertise as in-kind support to the Environment Bay of Plenty Technical Advisory Group for both land and water issues. This information is used for the regional council's strategic planning.

As part of its commitment to the local Rotorua community, Scion has made its grounds available for a number of community events and activities over the past 12 months. The Rotorua Dog Day was held on Scion's McQuire Oval and attended by dozens of dogs and owners. Scion also makes its Nursery Block available free of charge for a variety of Rotorua mountain biking and running events, including the annual childrens' triathlon, "Kids Jam". Scion also provides a maintained walkway on the surrounds of its grounds adjacent to the neighbouring Redwood Forest.

Scion made a unique donation to Rotorua's Riding for



Scion technologist Karen Bayne (left) with 2005 Suffrage Scholar, Katie Clark

the Disabled Association (RDA) in May - two truck loads of wood chips for use in the stables and riding facilities. While many riding schools use sawdust to line their stables, the RDA must use wood chips as certain health conditions are aggravated by dust. The wood chips provide a cleaner alternative. Scion uses wood chips as part of its pulp and paper research where the wood chips are crushed into a pulp to make laboratory scale paper and then tested for durability. The excess wood chips have traditionally been mixed into the soil of trees in the Ensis on-site nursery or have been used by staff.

Scion's Campus Care group, which involves volunteer staff members, have done their bit to clean up the local environment in the past year, cleaning up the neighbouring Puarenga Stream.

Scion's annual Children's Christmas Party was another big success in 2005. More than 80 children and their parents, grandparents and caregivers attended the event which included party games, a visit from Santa and presents.

Scion subsidises the cost of children attending a holiday programme at a local school for staff who elect to use childcare while working during school holidays.

Environmental and Sustainability Policy

The past six months have seen the development of Scion's Environmental and Sustainability (E&S) Policy, aimed at improving the organisation's environmental and sustainability performance. The development of such a policy is particularly relevant for Scion, given that much of its research and development, products and services and intellectual property generation is driven by ongoing needs for environmental improvements that are cost-efficient and which ensure long-term productivity of natural systems.

As a leader in biomaterials research in New Zealand, Scion seeks to undertake its own business in an increasingly sustainable manner, ensuring the efficient use of resources and materials while minimising costs, reducing its environmental footprint, meeting Government initiatives such as procurement schemes and energy efficiency, as well as reinforcing its product and service offerings.

The following principles will be used to establish the context and framework for the policy.

- Scion will develop and implement an E&S policy that is outcome focused and which adds value to all parts of its business.
- The E&S policy will take into account environmental, social, cultural, and economic considerations both internally and externally.
- The E&S policy will become an integral part of Scion's business and be underpinned by a commitment from all staff and stakeholders. There is an emphasis on full engagement at all levels within the organisation.
- The E&S policy is 'action' orientated and provides a framework for linking specific activities and initiatives within the organisation to Scion's goals and for identifying key performance areas.

The policy is expected to be formally implemented in October 2006.

Visionary Leadership

Leadership excellence is core to Scion's future success and the organisation is committed to investing in the growth and development of its people to foster world-class science and business leaders.

Focus this year has been on the development of the Leadership Excellence Programme in conjunction with the New Zealand Institute of Leadership at the University of Auckland. The aim of this programme

is to identify, nurture and develop Scion's talent to its true potential, focusing on developing individual and collective leadership capability to ensure Scion's success as a leading science organisation.

The first group of 26 staff members will begin the programme in November 2006, with planning for a second group commencing early in 2007. The group represents a wide cross-section of the business, including young and mature scientists and corporate staff at all levels. The programme will also incorporate CSIRO-employed Ensis staff from Australia.

In a key step to achieving the Biomaterials Strategy, the 2005/06 year saw the appointment of Dr Elspeth MacRae as the head of the Biomaterials Research Group and Scion's science leader. Dr MacRae has already made a significant impact, refining the Biomaterials Strategy and driving it forward across all areas of the business.

Individual and generic skill enhancement

Implemented in 2004, Scion's ACE Programme (Achievement and Career Enhancement) has gone from strength to strength in the past 12 months with favourable feedback from staff and managers alike.

ACE is an ongoing programme aimed at ensuring that people understand how their role aligns with the organisation's strategy and goals. It is more than just a performance review and involves comprehensive training in goal setting, along with the giving and receiving of coaching and feedback.

The reviews help identify areas of growth and development for individuals, as well as trends across the organisation. ACE allows for individual wants and needs in terms of development, with goals and developmental tools including training, attendance at specific conferences or sabbaticals.

Nearly 40 training courses were held over the past year, attended by more than 480 participants.

The courses covered a wide range of subjects, including science writing, presentation skills, project management and introduction to management.

Confidence With Clients was a new course introduced in 2005. The course was developed to equip staff with the skills to make the most of every opportunity with clients and stakeholders.

The Mentoring Programme continues to be a strong part of organisational development at Scion. Twenty-seven protégés and 23 mentors participated in the programme last year which involves one-to-one

sessions and a monthly hub meeting. The programme is based on the Royal Society of New Zealand's Leadership Pathway Model, which is designed to develop science leadership. Scion's hub meetings are aimed at provoking and inspiring through invited speakers, debates and networking, where speakers share significant moments in their science careers.

Health and Safety

Health and Safety continues to be a key focus for management and staff across the organisation, with a committee consisting of Human Resources and staff representatives meeting regularly to identify and resolve potential issues.

Initiatives in this area in the past 12 months include the development of a "one-stop shop" Health and Safety Management System located on the online portal, making the programme easy to locate and use. The system includes a manual containing all OSH policies, systems and procedures.

Scion has renewed its tertiary-level accreditation status with the Accident Compensation Corporation's Workplace Safety Management Practices Audit Programme.

Scion has recently introduced biennial health checks for all staff, to complement those already in place for new employees. These include tests for sight, hearing, blood pressure and cholesterol.

Equal Employment

Scion is a member of the Equal Employment Opportunities Trust (EEO).

In 2005 Scion was featured on a new website promoting equal opportunities in New Zealand. The website, www.neon.org.nz is operated by the National Equal Opportunities Network - a partnership between the Human Rights Commission and the Equal Employment Opportunities Trust. The site is aimed at promoting leading employment practices to employers, employees, trade unions and many others.



Support of extra-curricular activities

Scion is proud to provide financial and in-kind support for staff in their many sporting activities. Over the past 12 months support was provided to Scion teams entered in a variety of different local competitions, including the Cateye Moonride (24 hour mountain bike event) and the inter-club badminton competition.

In addition, special leave and support were provided to Katrin Walbert and Sonia Foote who represented New Zealand in international triathlon and mountain bike events, John Lee who was selected as the New Zealand Men's Mountain Bike Coach at the 2005 Melbourne Commonwealth Games, and Pamela Taylor who was selected to represent the North Island in smallbore shooting competitions.

Capability Funding - for a description of how Capability Funding has been applied, see page 24.

A: Capabilities aligned to sustaining social, environmental and economic growth from the forest industries.

Capability	Areas of activity	2005/06 forecast	2005/06 actual
1. Nationally recognised capability in social and environmental impacts and management of production and amenity forestry.	<ul style="list-style-type: none"> • Forest as a workplace. • Sustaining forest soil viability. • Reducing environmental impacts of forestry processing operations. 	<ul style="list-style-type: none"> • Enhance existing skills in workplace safety and productivity. • With other agencies build a national centre in soil science. 	Completed in full, although SLURI, which currently has an agrisoils focus, have decided not to include forestry soils science.
2. Nationally recognised capability in the core sciences to create, manage and protect New Zealand's forestry assets.	<ul style="list-style-type: none"> • Germplasm development. • Forestry diversification. • Forest establishment. • Forest management. • Fungal and insect incursion prevention and eradication. 	<ul style="list-style-type: none"> • Sustain and enhance skills in Germplasm development for wood properties. • Expand capability in forestry management - both radiata and non-radiata species. • Sustain and enhance Forest Biosecurity Research Initiatives. 	Completed in full.
3. National expertise in wood material science.	<ul style="list-style-type: none"> • Wood material science. 	<ul style="list-style-type: none"> • Build new wood material engineering capabilities to develop improved products from New Zealand's existing forests. 	Completed in full.
4. National capability to facilitate international acceptance and growth of New Zealand's forest products.	<ul style="list-style-type: none"> • Non-tariff technical trade barriers. 	<ul style="list-style-type: none"> • Build key skills to underpin the need for independent and authoritative technical response to non-tariff trade barriers. 	Owing to other financial support being realised in this area - the Capability Fund was repositioned to provide further support to B1 and B2 (below).

B: Capabilities aligned to creating new social, economic and environmental outcomes from exploitation of New Zealand's biological resources.

Capability	Areas of activity	2005/06 forecast	2005/06 actual
1. Build capability in the development of high valued materials from biological resources and waste streams.	<ul style="list-style-type: none"> • Development of polymers from biological materials. • Cell wall biotechnology. 	<ul style="list-style-type: none"> • Continue to grow the science base in the joint venture in bio-polymer and bio-composites production. • Grow capability to develop bio-based materials from non-wood resources and carbohydrate rich waste streams. • Grow the capability in cell wall biotechnology and grow national partnerships. 	Completed in full.
2. Develop and expand national capability to underpin development of a more sustainable infrastructure for New Zealand.	<ul style="list-style-type: none"> • Development of sustainable housing and neighbourhoods. • Development of biomass based energy systems. 	<ul style="list-style-type: none"> • Continue to build capabilities aligned to the Beacon Pathway Consortium strategic direction. • Build a nationwide science platform to underpin bio-energy production. • Build science capability to facilitate development of integrated biological products production (bio-refinery). 	Completed in full.
3. Develop and expand strategic capability to promote sustainable economic growth for New Zealand.	<ul style="list-style-type: none"> • Strategic insight to underpin economic decision-making. • Risk assessment and Life Cycle Analysis. 	<ul style="list-style-type: none"> • Grow capability in market and economic impacts of biomaterials development. 	Completed in full.

Non Financial Performance - continued

Performance targets

Scion's performance against the targets contained in the 2005 - 2008 Statement of Corporate Intent was:¹

	Actual 2005	Actual 2006	Budget 2006
Group Revenue (\$000) ²	35,199	21,345	28,018
EBIT Margin (EBIT % of Revenue)	3.24%	-5.13%	3.48%
Return on average equity	2.52%	-6.86%	2.67%
Return on average total assets ³	1.74%	-4.76%	1.89%
Equity ratio	68.97%	69.39%	70.94%
Quick ratio:1	1.05	0.70	0.61
Gearing	8.40%	13.33%	0.00%
Interest coverage	20.73	-5.42	N/A
Free cashflow to average total assets	2.70%	3.05%	19.39%

NON FINANCIAL PERFORMANCE MEASURES⁴

Staff Composition (FTE's)

Research	276	268	290
Management and Support	72	76	70
Total FTE's	348	344	360

Revenue per FTE (\$)⁵

	134,000	133,000	143,000
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Science Output and Excellence

Science reviews for Excellence	2	1	3
Papers in International externally refereed journals, series or books	138	139	140
Papers in local, internally or editor refereed journals, series, or books	79	75	80
Conference papers	75	131	80
New inventions patented	7	2	5
New licenses	40	12	20
Confidential client reports	314	327	350

Application and promotion of science

Number of industry seminars, incl. seminars, workshops, fielddays	126	206	90
Number of current TechNZ contracts	4	6	5
Number of MSc and PhD Students supported	55	46	50
Number of post doc programmes	7	15	6

Social Responsibility/Community

Report	Report	Report
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Environment Responsibility

Report	Report	Report
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Maori Relationships

Consultation with Maori	Report	Report	Report
Learning and development	Report	Report	Report
Maori scholarships	0	0	2
R&D proposals involving Maori	3	3	5

Benefit to NZ

Report	Report	Report
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Good Employer

Policies to meet provisions of CRI Act	Report	Report	Report
% time in training	1%	3%	3%
Number of Post Grad Students supported	23	27	30
Work days lost in work related accidents	1	7.5	0
Human Capital Protection	Stats & report	Report	Stats & report

1 Certain numbers have been reclassified to conform with current year presentation.

2 Scion Australasia Limited, a special purpose company for a new 50/50 unincorporated joint venture, was incorporated on 14 June 2004. The joint venture, Ensis, commenced operations on 1 July 2004. The parent company, New Zealand Forest Research Institute Limited transferred approximately one third of its operations into the joint venture on commencement and a further one third of its operations on 1 July 2005.

3 The Board notes that Scion's return on assets is impacted by reinvestment into the science capability of the business and the existence of surplus assets.

4 Non-Financial Performance includes outputs from the Scion component of the Ensis UJV.

5 Revenue per FTE assumes the Scion Group revenue plus 50% of Ensis revenue, less the Ensis gross margin contribution to the Scion Group. FTE numbers comprise Scion employees including those seconded to the Ensis UJV.



Chartered Accountants

**AUDIT REPORT
TO THE READERS OF
NEW ZEALAND FOREST RESEARCH INSTITUTE LIMITED AND GROUP'S
FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2006**

The Auditor-General is the auditor of New Zealand Forest Research Institute Limited (the company) and group. The Auditor-General has appointed me, David Morrow, using the staff and resources of Ernst & Young, to carry out the audit of the financial statements of the company and group, on his behalf, for the year ended 30 June 2006.

Unqualified Opinion

In our opinion:

- The financial statements of the company and group on pages 45 to 62:
 - comply with generally accepted accounting practice in New Zealand; and
 - give a true and fair view of:
 - the company and group's financial position as at 30 June 2006; and
 - the results of operations and cash flows for the year ended on that date.
- Based on our examination the company and group kept proper accounting records.

The audit was completed on 24 August 2006, and is the date at which our opinion is expressed.

The basis of our opinion is explained below. In addition, we outline the responsibilities of the Board of Directors and the Auditor, and explain our independence.

Basis of Opinion

We carried out the audit in accordance with the Auditor-General's Auditing Standards, which incorporate the New Zealand Auditing Standards.

We planned and performed the audit to obtain all the information and explanations we considered necessary in order to obtain reasonable assurance that the financial statements did not have material misstatements, whether caused by fraud or error.

Material misstatements are differences or omissions of amounts and disclosures that would affect a reader's overall understanding of the financial statements. If we had found material misstatements that were not corrected, we would have referred to them in our opinion.

The audit involved performing procedures to test the information presented in the financial statements. We assessed the results of those procedures in forming our opinion.

Audit procedures generally include:

- determining whether significant financial and management controls are working and can be relied on to produce complete and accurate data;
- verifying samples of transactions and account balances;
- performing analyses to identify anomalies in the reported data;
- reviewing significant estimates and judgements made by the Board of Directors;
- confirming year-end balances;
- determining whether accounting policies are appropriate and consistently applied; and
- determining whether all financial statement disclosures are adequate.



■ Chartered Accountants

We did not examine every transaction, nor do we guarantee complete accuracy of the financial statements.

We evaluated the overall adequacy of the presentation of information in the financial statements. We obtained all the information and explanations we required to support our opinion above.

Responsibilities of the Board of Directors and the Auditor

The Board of Directors is responsible for preparing financial statements in accordance with generally accepted accounting practice in New Zealand. Those financial statements must give a true and fair view of the financial position of the company and group as at 30 June 2006. They must also give a true and fair view of the results of operations and cash flows for the year ended on that date. The Board of Directors' responsibilities arise from the Crown Research Institutes Act 1992, the Public Finance Act 1989 and the Financial Reporting Act 1993.

We are responsible for expressing an independent opinion on the financial statements and reporting that opinion to you. This responsibility arises from section 15 of the Public Audit Act 2001, section 21(1) of the Crown Research Institutes Act 1992 and the Public Finance Act 1989.

Independence

When carrying out the audit we followed the independence requirements of the Auditor-General, which incorporate the independence requirements of the Institute of Chartered Accountants of New Zealand.

Other than the audit, we have no relationship with or interests in the company or any of its subsidiaries.

A handwritten signature in blue ink, appearing to read "David H Morrow".

David H Morrow
Ernst & Young
On behalf of the Auditor-General
Auckland, New Zealand

Consolidated Statement of Financial Performance

For the Year Ended 30 June 2006

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\$000	Note	GROUP ACTUAL	GROUP BUDGET (unaudited)	GROUP ACTUAL	PARENT ACTUAL	PARENT ACTUAL
		2006	2006	2005	2006	2005
OPERATING REVENUE	2	21,345	28,018	35,199	16,503	30,848
Surplus/(Deficit) Before Subvention Payment and Taxation	3	(1,297)	1,002	1,085	(2,098)	(82)
Subvention Payment		-	-	-	238	-
Surplus/(Deficit) Before Taxation		(1,297)	1,002	1,085	(2,336)	(82)
Taxation expense/(credit)	5	347	331	466	271	(36)
Net Surplus/(Deficit) Attributable to the Shareholders of the Parent Company	20	(1,644)	671	619	(2,607)	(46)

The accompanying notes form part of these financial statements.

Consolidated Statement of Movements in Equity

For the Year Ended 30 June 2006

\$000	Note	GROUP ACTUAL	GROUP BUDGET (unaudited)	GROUP ACTUAL	PARENT ACTUAL	PARENT ACTUAL
		2006	2006	2005	2006	2005
EQUITY AT 1 JULY 2005		24,833	24,833	24,214	23,983	24,029
Net surplus attributable to parent entity shareholders		(1,644)	671	619	(2,607)	(46)
Movement in Foreign Currency Translation Reserve	6	(81)	-	-	-	-
Total Recognised Revenues and Expenses for the Year		(1,725)	671	619	(2,607)	(46)
Equity at 30 June 2006		23,108	25,504	24,833	21,376	23,983

The accompanying notes form part of these financial statements.

Consolidated Statement of Financial Position

As at 30 June 2006

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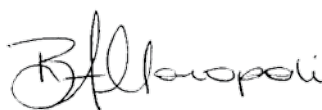
\$000	Note	GROUP ACTUAL 2006	GROUP BUDGET (unaudited) 2006	GROUP ACTUAL 2005	PARENT ACTUAL 2006	PARENT ACTUAL 2005
EQUITY						
Share capital	7	15,716	15,716	15,716	15,716	15,716
Retained earnings		7,461	9,788	9,105	5,660	8,267
Foreign currency translation reserve	6	(69)	-	12	-	-
		23,108	25,504	24,833	21,376	23,983
NON CURRENT LIABILITIES						
Term debt	8	3,555	-	2,275	3,555	2,275
		3,555	-	2,275	3,555	2,275
CURRENT LIABILITIES						
Creditors and accruals	9	5,457	8,481	9,677	6,752	10,520
Tax payable	5	-	-	188	-	93
		5,457	8,481	9,865	6,752	10,613
		32,120	33,985	36,973	31,683	36,871
NON CURRENT ASSETS						
Property, plant and equipment	10	24,729	25,492	25,074	23,572	23,911
Deferred tax benefit	11	755	834	1,074	741	989
Investments in subsidiaries	13	-	-	-	52	52
Investments in associates	13	35	2,020	20	35	30
Loan	16	182	181	294	169	240
Intangible Assets	12	-	-	-	-	-
		25,701	28,527	26,462	24,569	25,222
CURRENT ASSETS						
Cash and short term deposits	14	129	209	(1)	(24)	(109)
Debtors and prepayments	15	2,814	3,975	6,750	6,289	11,426
Investment in joint venture	13	2,549	827	3,392	-	-
Inventories	17	101	251	156	101	156
Tax receivable	5	485	-	-	448	-
Current portion of loan	16	113	113	105	72	67
Advance to Associate	24	76	83	76	76	76
Equipment for resale		152	-	33	152	33
		6,419	5,458	10,511	7,114	11,649
		32,120	33,985	36,973	31,683	36,871

The accompanying notes form part of these financial statements.

For and on behalf of the Board, who authorised the issue of these accounts on 24 August 2006.



CHAIRMAN



DIRECTOR

Consolidated Statement of Cashflows

For the Year Ended 30 June 2006

\$000	Note	GROUP ACTUAL 2006	GROUP BUDGET (unaudited) 2006	GROUP ACTUAL 2005	PARENT ACTUAL 2006	PARENT ACTUAL 2005
CASH FLOWS FROM OPERATING ACTIVITIES						
Cash was provided from:						
Receipts from customers		19,878	23,493	31,735	19,255	30,792
Joint venture distributions		5,612	9,882	-	-	-
Interest received		30	26	51	21	27
Income tax received		-	-	-	-	43
		25,520	33,401	31,786	19,276	30,862
Cash was applied to:						
Payments to employees		12,106	13,283	15,250	11,490	14,637
Payments to suppliers		11,483	12,719	15,066	7,389	12,782
Interest paid		196	-	48	196	48
Income tax paid		681	519	461	556	-
Subvention payment		-	-	-	238	-
		24,466	26,521	30,825	19,869	27,467
Net cash flows from operating activities	20	1,054	6,880	961	(593)	3,395
CASH FLOWS FROM INVESTING ACTIVITIES						
Cash was provided from:						
Proceeds from sale of property, plant and equipment		161	-	-	151	-
Proceeds from loan repayments		111	105	119	66	75
Other advances repaid		16	-	-	16	-
		288	105	119	233	75
Cash was applied to:						
Purchase of property, plant and equipment		2,480	2,500	2,154	2,470	2,154
Purchase of investments		15	2,000	-	15	-
Other advances		-	-	16	-	16
		2,495	4,500	2,170	2,485	2,170
Net cash flows used in investing activities		(2,207)	(4,395)	(2,051)	(2,252)	(2,095)
CASH FLOWS FROM FINANCING ACTIVITIES						
Cash was provided from:						
Increase in term debt		1,280	(2,275)	130	1,280	130
Net advances from subsidiaries		-	-	-	1,650	-
		1,280	(2,275)	130	2,930	130
Cash was applied to:						
Net advances to subsidiaries		-	-	-	-	1,934
		-	-	-	-	(1,934)
Net cash flows from financing activities		1,280	(2,275)	130	2,930	(1,804)
NET INCREASE (DECREASE) IN CASH HELD						
Add opening cash brought forward		(1)	(1)	962	(109)	398
Less effect of exchange rate change on foreign currency balance		3	-	(3)	-	(3)
Ending Cash Carried Forward	14	129	209	(1)	(24)	(109)

The accompanying notes form part of these financial statements.

1. STATEMENT OF ACCOUNTING POLICIES

REPORTING ENTITY

New Zealand Forest Research Institute Limited is a Crown Research Institute registered under the Companies Act 1993. The group consists of New Zealand Forest Research Institute Limited, its subsidiaries, associates, and joint venture interests.

New Zealand Forest Research Institute Limited is a reporting entity for the purposes of the Financial Reporting Act 1993.

The financial statements and group financial statements of New Zealand Forest Research Institute Limited have been prepared in accordance with the Financial Reporting Act 1993.

MEASUREMENT BASE

The group follows the accounting principles recognised as appropriate for the measurement and reporting of financial performance and financial position on a historical cost basis, with the exception that the forest asset has been revalued and FHS Limited, a wholly owned subsidiary of New Zealand Forest Research Institute Limited, is reported on a liquidation basis.

On 25 August 2005 it was resolved that FHS Limited would cease to trade. Under FRS5, Events After Balance Date, if such a decision is made after balance date but prior to the signing of the accounts, the financial statements cannot be prepared under the going concern basis. Accordingly in the prior year adjustments were made to reflect the liquidation value of the assets and liabilities of the subsidiary.

SPECIFIC ACCOUNTING POLICIES

The following accounting policies, which materially affect the measurement of financial performance and the financial position, have been applied:

a) Principles of Consolidation – Purchase Method

The consolidated financial statements include the parent company and its subsidiaries. The group financial statements are prepared using the purchase method of consolidation. All intercompany transactions and unrealised profits and losses between the group of companies are eliminated from the financial statements on consolidation. In the parent company financial statements investments in subsidiaries are stated at cost.

b) Associate Companies

These are companies in which the group holds substantial shareholdings and in whose commercial and financial policy decisions it participates.

Associate companies have been reflected in the consolidated financial statements on an equity accounting basis which shows the group's share of surpluses in the Consolidated Statement of Financial Performance and its share of post acquisition increases or decreases in net assets, in the Consolidated Statement of Financial Position.

c) Joint Ventures

The interest in the unincorporated joint venture is accounted for as a partnership and is therefore equity accounted.

d) Goodwill

Goodwill represents the excess of the purchase consideration over the fair value of the net tangible and identifiable intangible assets, acquired at the time of acquisition of a business or an equity interest in a subsidiary, or associate company. Goodwill is amortised by the straight line method over the period during which benefits are expected to be received. This is a maximum of five years.

e) Property, Plant and Equipment

All items of property, plant and equipment are valued at the cost of purchase from the Crown as at 1 July 1992 adjusted for subsequent additions at cost, disposals and depreciation. Property, plant and equipment other than land, forest assets and capital work in progress are recorded at cost less accumulated depreciation. Land and capital work in progress are recorded at cost. Forest assets were revalued by using the net present value of the after tax cash flow for each individual crop as at 30 June 2003.

Expenditure incurred on property, plant and equipment is capitalised where such expenditure will increase or enhance the future benefits provided by the asset. Expenditure incurred to maintain future benefits is classified as repairs and maintenance.

When an item of property, plant and equipment is disposed of the difference between the net disposal proceeds and the carrying amount is recognised as a gain, or loss, in the Statement of Financial Performance.

Depreciation is provided for using the straight-line method to allocate the historical cost, less an estimated residual value, over the estimated useful life of the asset.

The useful lives of the major classes of assets have been calculated as follows:

Buildings and Land Improvements	40-60 years
Plant and Equipment	4-15 years
Furniture and Fittings	10 years
Motor Vehicles	3-7 years

The database within the books and periodicals was depreciated over 5 years.

f) Debtors

Debtors have been valued at estimated net realisable value, which is considered to be fair value. Provision has been made for potential bad debts.

g) Inventories

Consumable stores are valued at the lower of cost, on a weighted average price of stock on hand, and net realisable value.

h) Research and Development Costs

Research costs are expensed in the period incurred. Development costs are expensed in the period incurred unless certain criteria for asset recognition are met. Capitalised development costs are amortised over future periods in relation to expected future revenue. Unamortised costs are reviewed at the end of each balance date to determine the amount (if any) that no longer meets the criteria. Any amount so identified is written off.

i) Employee Entitlements

Provision has been made for benefits accruing to employees for annual leave in accordance with the provisions of employment contracts in place at balance date. Long service leave and retirement leave provisions are based on an actuarial valuation.

j) Leases

Operating lease payments, where the lessors effectively retain substantially all the risks and benefits associated with ownership of the leased items, are included as an expense in the Statement of Financial Performance in equal instalments over the lease term.

1. STATEMENT OF ACCOUNTING POLICIES - CONTINUED

k) Goods and Services Tax (GST)

The financial statements are prepared on a GST exclusive basis.

l) Foreign Currencies

Transactions in foreign currencies are converted at the New Zealand rate of exchange ruling on the date of the transaction. Monetary assets and liabilities at year-end are converted to New Zealand dollars at the exchange rate ruling at balance date and exchange variations arising from these translations are recognised in the statement of financial performance.

The assets and liabilities of independent foreign operations are translated at the closing rate. Revenue and expense items are translated at the spot rate at the transaction date or a rate approximating that rate. Foreign currency exchange differences are recognised in the foreign currency translation reserve.

m) Revenue Recognition

Revenue from both Government and commercial sources is recorded when earned based on the percentage of work completed or other contractual commitments. Work completed but not invoiced is recorded as accrued revenue while work invoiced but not completed is recorded as revenue in advance.

n) Taxation

The income tax expense charged to the Statement of Financial Performance includes both the current year's provision and the income tax effects of timing differences calculated using the liability method.

Tax effect accounting is applied on a comprehensive basis to all timing differences. A debit balance in the deferred tax account, arising from timing differences or income tax benefits from income tax losses, is only recognised if there is virtual certainty of realisation.

Subsequent realisation of the tax benefit is subject to the requirements of income tax legislation being met.

o) Financial Instruments

The group is party to financial instruments with off balance sheet risk to meet financing needs. Revenues and expenses in relation to all financial instruments are recognised in the Statement of Financial Performance. The group is a signatory to the International Swap Dealers Agreement.

CHANGES IN ACCOUNTING POLICIES

There have been no changes in accounting policies during the year under review and all policies have been applied on a basis consistent with the previous year.

For the financial year ending 30 June 2005 there were no changes in accounting policies during the year and all policies were applied on a basis consistent with the prior year except for FHS Limited, a wholly owned subsidiary of New Zealand Forest Research Institute Limited. At balance date the financial statements of FHS Limited were adjusted to recognise assets and liabilities on a liquidation basis as the company was no longer a going concern. The effect of this change on the 30 June 2005 Group accounts was a decrease in profit, and accordingly in net assets of \$326,832.

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

2. OPERATING REVENUE

	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
Government revenue	8,108	16,156	8,108	16,156
Commercial revenue	8,419	15,355	8,356	14,417
50% share Ensis joint venture	4,398	3,392	-	-
Sale of IP through Ensis	371	-	-	-
Gain on disposal of fixed assets	19	-	18	-
Gain on sale of operations	-	254	-	254
Interest revenue	30	42	21	21
	21,345	35,199	16,503	30,848

Scion Australasia Limited, a special purpose company for a new 50/50 unincorporated joint venture, was incorporated on 14 June 2004. The joint venture, Ensis, commenced operations on 1 July 2004. The parent company, New Zealand Forest Research Institute Limited transferred approximately one third of its operations into the Ensis unincorporated joint venture on commencement and a further one third of its operations on 1 July 2005.

3. OPERATING SURPLUS BEFORE TAXATION

	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
After charging:				
Depreciation				
- Improvements and buildings	378	363	373	363
- Plant and equipment	1,905	1,794	1,905	1,788
- Furniture and fittings	43	47	43	46
- Vehicles	18	12	18	11
Directors' fees	203	257	193	251
Interest expense	202	55	202	55
Lease and rental costs	580	847	916	1,075
Personnel remuneration and expenses	11,194	15,283	11,080	14,818
Change in doubtful debts provision	(99)	107	(79)	97
Bad debts expensed	11	9	11	9
Loss on sale of fixed assets	-	27	-	27
Realised exchange fluctuations	(69)	-	(3)	-
Unrealised exchange fluctuations	(105)	3	(3)	3
Change in provision for impairment of assets	(38)	10	(38)	-
Restructuring costs	231	348	231	253
Provision for closure	-	307	-	-

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

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	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
4. AUDITOR'S REMUNERATION				
Amounts payable or due and payable to the auditors for:				
Auditing financial statements				
Parent entity auditor	88	68	87	66
5. TAXATION EXPENSE				
Operating surplus/(deficit) before taxation	(1,297)	1,085	(2,336)	(82)
Prima facie tax at 33%	(428)	358	(771)	(27)
Taxation effect of permanent differences	152	108	229	63
Tax losses not recognised	623	-	623	-
Tax effect of loss offsets	-	-	190	(72)
Taxation expense	347	466	271	(36)
Represented by:				
Current taxation	(605)	739	(795)	225
Tax effect of loss offsets	-	-	190	(72)
Tax losses not recognised	623	-	623	-
Deferred taxation	329	(273)	253	(189)
	347	466	271	(36)
Opening taxation (receivable)/payable	188	(178)	93	(178)
Over provision from prior year	(3)	-	-	-
Transfer from deferred tax benefit	11	120	5	118
	196	(58)	98	(60)
Current taxation	(605)	739	(795)	225
Provisional tax paid	(699)	(493)	(564)	-
Tax losses not recognised	623	-	623	-
Tax effect of loss offsets	-	-	190	(72)
Closing taxation (receivable)/payable	(485)	188	(448)	93
6. FOREIGN CURRENCY TRANSLATION RESERVE				
Balance at 1 July	12	12	-	-
Movement during year	(81)	-	-	-
Balance at 30 June	(69)	12	-	-

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

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GROUP & PARENT
2006 2005
\$000 \$000

7. SHARE CAPITAL

Issued and paid up capital

15,716,000 ordinary shares

15,716 15,716

All shares have equal rights with respect to voting, dividends and distribution on winding up.

8. TERM LIABILITIES

Term debt

3,555 2,275

The interest rate on the term debt is 7.60% reviewable daily (2005: 7.35%)

The term debt is unsecured, but subject to financial covenants being maintained.

During the year Scion informed the Bank that they were not going to meet the bank interest cover covenants. The bank agreed to suspend the interest cover covenant until October 2006. At this point the facilities will be renegotiated. The total facility available to the group is \$7,000,000 (2005: \$7,000,000).

9. CREDITORS AND ACCRUALS

Trade creditors

501 1,282 499 1,246

Accounts payable

869 2,855 841 2,790

Intercompany payable

- - 1,341 1,296

Joint venture payable

187 493 187 493

Payable to directors

31 22 30 22

Revenue in advance

530 939 530 939

Provision for employee retirement and long service leave

1,351 1,467 1,351 1,462

Provision for other employee entitlements

1,973 2,312 1,973 2,272

Provision for closure

15 307 - -

5,457 9,677 6,752 10,520

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

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	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
10. PROPERTY, PLANT AND EQUIPMENT				
Land and Improvements				
At cost	1,571	1,508	436	372
Less accumulated depreciation (improvements)	72	53	66	53
Net book value land and improvements	1,499	1,455	370	319
Forest Assets				
At valuation	164	164	164	164
Buildings				
At cost	18,474	18,245	18,474	18,245
Less accumulated depreciation	3,272	2,917	3,272	2,917
Net book value of buildings	15,202	15,328	15,202	15,328
Plant and Equipment				
At cost	31,587	29,225	31,587	29,113
Less accumulated depreciation	24,337	22,621	24,337	22,516
Less impairment	-	8	-	-
Net book value of plant and equipment	7,250	6,596	7,250	6,597
Furniture and Fittings				
At cost	1,486	1,486	1,486	1,474
Less accumulated depreciation	1,332	1,298	1,332	1,289
Less impairment	-	2	-	-
Net book value of furniture and fittings	154	186	154	185
Motor Vehicles				
At cost	225	186	225	184
Less accumulated depreciation	129	133	129	131
Net book value of motor vehicles	96	53	96	53
Books and Periodicals				
At cost	199	199	169	169
Less accumulated depreciation	30	30	-	-
Net book value of books and periodicals	169	169	169	169
Capital Work in Progress				
At cost	195	1,123	167	1,096
Total Property, Plant & Equipment				
At cost	53,901	52,136	52,708	50,817
Less accumulated depreciation	29,172	27,052	29,136	26,906
Less impairment	-	10	-	-
Net book value of Property, Plant & Equipment	24,729	25,074	23,572	23,911

The fair value of land and buildings as per Rating Valuation as at 30 June 2006 is \$36,140,000 (2005: \$28,093,000).

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

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	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
11. DEFERRED TAX BENEFIT				
Balance at 1 July	1,074	681	989	682
Current year movement	(329)	273	(253)	189
Over provision from previous year	10	120	5	118
Balance at 30 June	755	1,074	741	989

12. INTANGIBLE ASSETS

Patents

At Cost

Accumulated amortisation

Balance at 30 June

	GROUP & PARENT	
	2006 \$000	2005 \$000
At Cost	25	25
Accumulated amortisation	(25)	(25)
Balance at 30 June	-	-

13. INVESTMENTS

Investments in Subsidiaries

Shares in subsidiaries 30 June 2005

Acquired in current year

Disposed of in current year

Shares in subsidiaries at 30 June 2006

	PARENT	
	2006 \$000	2005 \$000
Shares in subsidiaries 30 June 2005	52	52
Acquired in current year	-	-
Disposed of in current year	-	-
Shares in subsidiaries at 30 June 2006	52	52

Subsidiaries	SHARES	PERCENTAGE HELD	BALANCE DATE
FHS Limited	100	100%	30 June
Liro Limited	1,000	100%	30 June
Forest Research (Australasia) Pty Limited	100	100%	30 June
N-Fix Technologies Limited*	100	100%	30 June
Forest Research (Australasia) #2 Pty Limited*	100	100%	30 June
SignaGen Limited*	100	100%	30 June
Atlas Technology Limited*	100	100%	30 June
Te Papa Tipu Properties Limited	100	100%	30 June
Scion Australasia Limited	100	100%	30 June
Scion Group Limited*	100	100%	30 June

FHS Limited provided a range of services to industry, government, local and regional authorities aimed at the early detection of pests and diseases. FHS Limited ceased trading on 1 October 2005.

Liro Limited does not trade. It earns interest from a loan arising from the sale of an investment.

Forest Research (Australasia) Pty Ltd operates a branch in Australia providing software support services. The company does not trade in New Zealand.

Te Papa Tipu Properties Limited was incorporated on 25 March 2004. The company owns the Group's land assets.

Scion Group Limited was incorporated on 2 August 2004.

* These companies were not trading at balance date and the capital was uncalled.

13. INVESTMENTS - CONTINUED

Scion Australasia Limited, a special purpose company for a new 50/50 unincorporated joint venture, was incorporated on 14 June 2004. The joint venture, Ensis, commenced operations on 1 July 2004. The parent company, New Zealand Forest Research Institute Limited transferred approximately one third of its operations into the joint venture on commencement and a further one third of its operations on 1 July 2005. The group's 50% share of Ensis operations before service charges for the year ended 30 June 2006 was \$4,397,809 (2005: \$3,392,379). Net surplus is comprised as follows:

	GROUP & PARENT	
	2006 \$000	2005 \$000
Operating revenue	57,708	29,555
Direct costs	48,541	22,770
Gross margin	9,167	6,785
Sale of IP through Ensis	(371)	-
	8,796	6,785
Scion Australasia's 50% share	4,398	3,392

Investments in Associates

Opening share of decrease in net assets
 Current year share of decrease in net assets of Frontline Biosecurity
 Closing share of decrease in net assets
 Cost of investments 30 June 2005
 Acquired during the period
 Cost of investments to 30 June 2006

	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
Opening share of decrease in net assets	(10)	(10)	-	-
Current year share of decrease in net assets of Frontline Biosecurity	-	-	(10)	-
Closing share of decrease in net assets	(10)	(10)	(10)	-
Cost of investments 30 June 2005	30	30	30	30
Acquired during the period	15	-	15	-
Cost of investments to 30 June 2006	35	20	35	30

New Zealand Forest Research Institute Limited has a 25% shareholding in a joint venture company, Frontline Biosecurity Limited. The company carries out research, development and commercialisation of biosecurity processes. The company has a balance date of 31 March.

On 28 June 2004 New Zealand Forest Research Institute Limited purchased a 20% share of Beacon Pathway Limited. The company carries out research in the area of sustainability in the built environment.

On 1 September 2005 New Zealand Forest Research Institute Limited purchased a 33.33% share of Biopolymer Network Limited, an incorporated joint venture carrying on research, development and commercialisation of biopolymers.

The parent entity undertakes research projects with the Forest and Forest Products Research Organisation (FAFPRO) through five cooperatives. Expenditure incurred on research and recoveries from the cooperatives has been included in the financial statements.

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

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	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
13. INVESTMENTS - CONTINUED				
Investment in Unincorporated Joint Venture				
Opening share of gross margin	3,392	-	-	-
Sale of IP through Ensis	371	-	-	-
Current year share of gross margin	4,398	3,392	-	-
Distributions received	(5,612)	-	-	-
Closing share of gross margin	2,549	3,392	-	-
Cost of investment 30 June 2006	-	-	-	-
	2,549	3,392	-	-
14. CASH AND SHORT TERM DEPOSITS				
Cash on hand	2	2	2	2
Bank (bank overdraft/unsecured)	119	(52)	(34)	(161)
Foreign currency account	2	44	2	44
On call account	6	5	6	6
	129	(1)	(24)	(109)
15. DEBTORS AND PREPAYMENTS				
Trade debtors	2,298	4,915	2,298	4,598
Provision for doubtful debts	(137)	(146)	(137)	(126)
Intercompany receivable	-	-	3,476	5,081
Other debtors	61	441	60	440
Accrued revenue	197	1,173	197	1,066
Prepayments	395	367	395	367
	2,814	6,750	6,289	11,426
16. LOAN TO POCKET SOLUTIONS LIMITED				
Balance 1 July 2005	399	552	307	416
Repayments	(104)	(119)	(66)	(75)
Provision for write-off	-	(34)	-	(34)
Balance 30 June 2006	295	399	241	307
Term portion of loan	182	294	169	240
Current portion of loan	113	105	72	67
Total	295	399	241	307
The loan is secured by a Deed of Mortgage over the shares of IFR Technologies Limited (68.8%) and all the shares of the purchasing company.				
17. INVENTORIES				
Consumable stores	101	156	101	156
	101	156	101	156

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

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GROUP	GROUP	PARENT	PARENT
2006	2005	2006	2005
\$000	\$000	\$000	\$000

18. FINANCIAL INSTRUMENTS

Credit Risk

Financial instruments that potentially subject the group to credit risk consist of bank balances and accounts receivable. The group generally does not require any security.

Maximum exposures to credit risk as at balance date are:

	GROUP	GROUP	PARENT	PARENT
	2006	2005	2006	2005
	\$000	\$000	\$000	\$000
Foreign currency account	2	44	2	44
Current account	119	-	-	-
On call account	6	6	6	6
Receivables	2,418	6,383	2,418	5,979
Intercompany receivable	-	-	3,476	5,081
Loans/Advances	371	475	317	383

The group is not exposed to any significant concentrations of credit risk.

The above maximum exposures are net of any provision for losses on these financial instruments.

Interest Rate Risk

The group has term debt with the National Bank of New Zealand Limited.

Amount	Maturity	Rate	2005
\$000			
\$3,555	Reviewable daily	7.60%	7.35%

The interest rate on the bank overdraft facility of \$100,000 is currently 11.85% (2005: 11.00%). The bank overdraft interest rate is based on a floating rate set by the bank.

Fair Values

Financial Instruments include:

Bank Overdraft, Foreign Currency Account, On Call Account, Short Term Deposits, Trade Debtors, Other Debtors, Accounts Payable and Term Loan.

For each class of financial instruments the carrying amount is the fair value.

At balance date the group had no interest rate swap agreements. (2005: Nil)

GROUP	GROUP	PARENT	PARENT
2006	2005	2006	2005
\$000	\$000	\$000	\$000

19. UNHEDGED FOREIGN CURRENCY DENOMINATED ASSETS AND LIABILITIES

	GROUP	GROUP	PARENT	PARENT
	2006	2005	2006	2005
	\$000	\$000	\$000	\$000
Unhedged assets	NZD	NZD	NZD	NZD
AUD - Current	359	396	359	396
USD - Current	41	192	41	192
Unhedged liabilities				
AUD - Current	12	-	12	-
USD - Current	-	11	-	11

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

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	GROUP 2006 \$000	GROUP 2005 \$000	PARENT 2006 \$000	PARENT 2005 \$000
20.RECONCILIATION OF OPERATING SURPLUS AFTER TAXATION WITH CASH FLOWS FROM OPERATING ACTIVITIES				
Reported surplus after taxation and before including share of retained surplus of associates	(1,644)	619	(2,607)	(46)
Add (less) non cash items:				
Depreciation	2,344	2,216	2,339	2,209
Bad debts	-	-	-	-
Doubtful debts	(88)	107	(68)	97
Provision for loan write-off	-	34	-	34
Movement in deferred tax benefit	319	(393)	248	(308)
Unrealised loss on foreign currency account	(3)	3	-	3
	2,572	1,967	2,519	2,035
Add (less) items classified as investing activity:				
(Gain) loss on disposal of property, plant and equipment	(19)	37	(18)	27
(Gain) loss on sale of investments	-	(254)	-	(254)
Associate company (profit)/loss	-	-	10	-
Movements in working capital items:				
(Increase)/Decrease in debtors and prepayments	4,176	(3,444)	2,908	(38)
(Increase)/Decrease in inventories	41	258	70	258
Increase/(Decrease) in creditors and accruals	(3,418)	1,379	(2,942)	1,098
Increase/(Decrease) in taxation payable	(654)	399	(533)	315
	145	(1,408)	(497)	1,633
Net cash flows from operating activities	1,054	961	(593)	3,395

21. CONTINGENT LIABILITIES

Treaty of Waitangi Issues

Two verified land claims affecting the group currently exist:

- (i) Ngati Whakaue - covering the whole Rotorua Campus
- (ii) Ngati Wahiao - covering the southern end of the Rotorua Campus

No reliable estimates can be made of the potential financial impact of these liabilities.

22. CONTINGENT ASSETS

Heritage Assets

The company has identified its herbarium collection as a heritage asset in accordance with Financial Reporting Standard No.3, Accounting for Property, Plant and Equipment. The Directors believe that there is no practical basis upon which to reliably value this collection. Therefore in accordance with Financial Reporting Standard No.15, Provisions, Contingent Liabilities and Contingent Assets, the herbarium collection meets the definition of a contingent asset.

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

60

GROUP & PARENT
2006 2005
\$000 \$000

23.COMMITMENTS

Capital Commitments:

Estimated capital expenditure contracted for at balance date but not provided for

4 87

Operating Lease Commitments:

Lease commitments under non-cancellable operating leases:

Within one year

327 585

One to two years

181 215

Two to five years

12 122

520 922

24.TRANSACTIONS WITH RELATED PARTIES

New Zealand Forest Research Institute Limited is wholly owned by the Crown. All transactions with state-owned enterprises and Government departments and agencies are at arms length, and are not considered to fall within the intended scope of related party transactions.

During the year New Zealand Forest Research Institute Limited entered into the following transactions:

GROUP & PARENT
2006 2005
\$000 \$000

Subsidiary Companies

FHS Limited

Net cash advanced/paid on behalf of

(314) 320

Supply of goods and services

38 332

Amount (payable)/receivable at balance date

- Intercompany account

196 330

- Net trade debtors/creditors

- 142

Liro Limited

Net advances

(45) (56)

Supply of services

- -

Amount (payable)/receivable at balance date

- Intercompany account

(1,341) (1,296)

Forest Research (Australasia) Pty Ltd

Net cash advanced/paid on behalf of

(11) (466)

Supply of goods and services

- -

Amount (payable)/receivable at balance date

- Intercompany account

1,438 1,463

- Trade debtors/creditors

- 15

Scion Australasia Ltd

Net cash advanced/paid on behalf of

5,537 493

Supply of goods and services

4,151 1,660

Amount (payable)/receivable at balance date

- Intercompany account

767 2,153

Te Papa Tipu Properties Ltd

Receipt of Services

(319) (319)

Paid on behalf

401 176

Transfer of land

- 1,135

Amount (payable)/receivable at balance date

- Intercompany account

1,074 992

Notes to and forming part of the Financial Statements - Continued

For the year ended 30 June 2006

GROUP & PARENT
2006 2005
\$000 \$000

24. TRANSACTIONS WITH RELATED PARTIES - CONTINUED

Associates

Beacon Pathway Ltd

Contribution to research outputs	(200)	(45)
Supplied goods and services	303	148
Receivable/(Payable) at 30 June 2006	71	33

There was an outstanding unsecured shareholders advance from New Zealand Forest Research Institute Limited to Beacon Pathway Limited of \$76,255 (2005: \$76,255).

Biopolymer Network Ltd

Supplied goods and services	1,205	-
Received goods and services	(206)	-
Receivable/(Payable) at 30 June 2006	149	-

WQI Ltd

Contribution to research outputs	-	(219)
Supplied goods and services	266	1,027
Receivable/(Payable) at 30 June 2006	-	201

Frontline Biosecurity Ltd

Subcontract Government funded contracts	-	(18)
Supplied goods and services	-	1
Receivable/(Payable) at 30 June 2006	-	-

Radiata Pine Breeding Co Ltd

Contributed research levies	-	(38)
Supplied goods and services	164	196
Receivable/(Payable) at 30 June 2006	-	181

Joint Venture

On 1 July 2004, New Zealand Forest Research Institute Limited transferred four business units, which approximated one third of its operations, into Ensis a 50/50 Unincorporated Jointed Venture with CSIRO, Australia's national science agency. On 1 July 2005 a further one third of its operations were transferred into the joint venture.

Ensis was funded \$14,467,005 (2005: \$7,453,056) by New Zealand Forest Research Institute Limited to perform an equivalent amount of New Zealand Forest Research Institute Limited's Government contracts.

Certain staff were seconded by New Zealand Forest Research Institute Limited into the joint venture. New Zealand Forest Research Institute Limited charged \$10,559,860 (2005: \$5,490,937) for those personnel.

During the year New Zealand Forest Research Institute Limited provided other goods and services to Ensis totalling \$3,063,092 (2005: \$2,555,263).

During the year New Zealand Forest Research Institute Limited received goods and services from Ensis totalling \$349,934 (2005: \$447,955).

At 30 June 2006 New Zealand Forest Research Institute Limited owed Ensis \$187,068 (2005: \$493,472).

Other

Amounts outstanding at year-end are receivable and payable on normal trading terms.

No related party debts were written off or forgiven during the year (2005: Nil).

25. PROVISIONS FOR CLOSURE

	Employee Entitlements \$000	Onerous Leases \$000	Other \$000	Total \$000
Opening Balance 1 July 2005	226	65	15	307
Expenditure incurred	(226)	(28)	-	(254)
Provision released	-	(37)	-	(38)
Closing Balance 30 June 2006	-	-	15	15

These provisions relate to the change in the basis of accounting in the 2005 financial year as detailed in the Statement of Accounting Policies Measurement Base (Page 48) and Changes in Accounting Policies (Page 50). The amounts represented the directors' best estimate of the costs that would be incurred in winding up the company. These amounts did not include anticipated operating losses incurred after balance date and up to date of closure.

26. SEGMENT INFORMATION

The group operates principally in New Zealand providing scientific research and technology to Government and commercial clients.

Company Directory

BOARD OF DIRECTORS

Dr Russ Ballard, Chairman
(From 1 July 2005)

Mr Bryce Whitcher, Deputy Chairman
(Resigned 30 June 2006)

Mr Giff Davidson
(Resigned 30 June 2006)

Ms Margaret Emerre

Mr Temuera Hall

Ms Bronwyn Monopoli

Mrs Jane Taylor
(Resigned 31 October 2005)

Ms Barbara Forbes
(Company Secretary 1 September 2005)

EXECUTIVE MANAGEMENT

Dr Tom Richardson
Chief Executive Officer

Mr Lionel Jeyaraj
Chief Financial Officer and Group
Manager Corporate Services

Dr Elspeth MacRae
Group Manager Biomaterials Research

Mr John Gifford
Group Manager Sustainable Consumer
Products

Dr Russell Burton
Group Manager Incubators &
Investments

Mr Tupara Morrison
Group Manager Maori Strategy

Mrs Sylvia Hunt
Group Manager Human Resources

Mrs Jacky James
Group Manager Marketing &
Communications

Dr John Butcher
(Left 8 May 2006)
Group Manager Strategy

Mr Mike Lee
(Left 8 May 2006)
Group Manager Commercial

Mr Larry Little
Chief Executive Ensis

AUDITORS

Mr David Morrow
Ernst & Young, Auckland, on behalf of
the Auditor-General

BANKERS

National Bank of New Zealand

SOLICITORS

Bell Gully, Auckland

REGISTERED OFFICE

Te Papa Tipu Innovation Park
49 Sala Street, Private Bag 3020
Rotorua, New Zealand

CONTACT DETAILS

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Email: enquiries@ensisjv.com
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Facsimile: +64 7 348 0952

Christchurch
Telephone: +64 3 364 2949
Facsimile: +64 3 364 2812



OBITUARY

John Firth 1946-2006

John Firth enjoyed a long and distinguished career in New Zealand forestry research. Originally from Sheffield in Yorkshire, John obtained a forestry degree at Edinburgh University and worked in Fiji for three years before going on to specialise in photogrammetry at the prestigious Institute for Aerial Survey and Earth Science (ITC) in Holland.

Serving for over 30 years as a photogrammetry specialist, John made a significant contribution to the application of aerial photography in forest management, enabling forest owners to measure and monitor their estate in cost-effective ways.

In a professional field requiring a high level of skill, combined with careful attention to detail, John was greatly respected by research colleagues. Over recent years, he contributed to the development of TreeD, a unique photogrammetric tool that enables the accurate measurement of individual standing trees. The on-going development and application of this tool is proving valuable in commercial research contracts for Ensis.

