



Strategic Priority

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- › Engage with industry more effectively and in novel ways to deliver research solutions and exploit technological opportunities





WHAT WE HAVE DONE

In 2008/09, IRL has actively engaged with key industry groups, in particular the country's main industry body, Business New Zealand, and through membership of its Major Companies Group.

We have also established new relationships with a range of industry associations and organisations that promote the value of research and can assist in technology transfer to the business sector.

Key industry partnerships have been established that will bring new technologies to established industry sectors and open up new opportunities for others in global markets.

Links have been established with Māori business which will see IRL R&D help raise the return on Māori assets.

The launch of a competition for up to \$1m in R&D services from IRL has been an important aspect of our drive to expand our engagement with industry still further and provide important market intelligence on New Zealand's R&D needs.

IRL is linked into organisations that provide vital intelligence on current and future technology market developments to guide decision making on research and alert us to commercialisation opportunities and priorities.

The science and engineering groups were reduced from nine to six and the disciplines within them realigned to ensure a better fit with industry needs.

As a follow-on from formal customer satisfaction surveys, processes are in place to review project progress and performance with clients at key stages of a project.

Strong ties have been developed at all levels of the company with the Foundation for Research, Science and Technology (FRST), which accounts for around 60% of IRL's revenue.



< Paul Polata
– Receptionist

Industry engagement

During 2008/09, IRL has repositioned itself with industry through active engagement with the country's premier business organisation, Business NZ, and this relationship gives IRL full access to each of the employer and manufacturers groups throughout the country. IRL is also a member of Business NZ's Major Companies Group (MCG) – a body established in 2008, bringing together around 30 of New Zealand's largest companies and providing a forum for important policy, business and economic issues for the country. As part of this exercise, IRL has developed new relationships with a number of industry groups, including the New Zealand Manufacturing Group, the New Zealand Wireless Research Network, the Plastics and Marine Industry Associations, and the New Zealand Biomedical Cluster. IRL has also been involved in Auckland Metro and Innovation Centre projects. IRL is a member of the Capitalising on Research and Development Action Group (CRAG), which promotes greater awareness of the role R&D plays in the growth of individual businesses and the economy in general. It also fosters links between researchers and the business community.

What's Your Problem New Zealand?

In March 2009, IRL launched *What's Your Problem New Zealand?* This was a chance for a New Zealand-based company to win up to \$1m in IRL R&D services for the best idea for a new product or process or an improvement to an existing product or process that would increase their competitiveness nationally and internationally. The competition

was sponsored by intellectual property firm A J Park, which is working with the 10 finalists to ensure they have a strategy in place to protect their intellectual property for their idea. The success can be measured by the response to the competition. It attracted 105 entries, the competition website (www.whatsyourproblemnz.co.nz) recorded 2,484 hits between the launch and entries closing and, as well as entries from a number of established IRL clients, ideas for R&D projects came from companies that had not previously had contact with IRL. Small and medium-sized companies (in other words those employing up to 20 staff) were also well represented, reflecting the fact that nearly 97% of New Zealand businesses are in this category. The competition, and IRL's science and engineering expertise, was promoted during a series of Survive and Thrive workshops organised by Technology NZ and economic development agencies around the country and attended by more than 700 people.

Promoting New Zealand medical technologies

Diana Siew, Group Manager Engineering and Applied Physics, is one of the founding members of the Emerging Medical Technologies Group set up recently to represent New Zealand's growing medical devices sector. The steering committee is chaired by F&P Healthcare and, besides IRL, includes representatives from Spark Dental Technologies, Adept Medical, Enztec, Telemetry Research, Medical Technologies Association New Zealand, Canterbury Development Corporation and New Zealand Trade and Enterprise (NZTE). Its remit is to expand global opportunities for New Zealand medical technology, foster investment in the sector, support entrepreneurs with new ideas, and



“What's Your Problem New Zealand? is the most productive idea to contribute to the bottom line of New Zealand.”

> Glidepath

“It's the direct response of scientists learning of these unmet needs of industry that can spur invention and competitive advantage for companies.”

> Garth Carnaby
President RSNZ and Chief Judge,
What's Your Problem New Zealand?





< Andreas Luxenburger
– NZBIO Young Biotechnologist of the Year

work with clinicians to support the development of medical technologies that improve the outcome for patients. The committee recognises that collaboration in the health industry between companies, researchers, clinicians/health providers and government is paramount to the success of this industry and is developing programmes to address this. A recent NZTE report found the medical technologies sector employs more than 2,800 New Zealanders full-time and in the 2007/08 year accounted for exports of \$487m.

FOMANA agreement

IRL has signed an R&D partnership agreement with FOMANA Capital Ltd, the commercial arm of the Federation of Māori Authorities, to develop a range of commercial products from fish and other natural products. The initial focus is on developing lipids rich in omega-3 that have a wider range of health benefits than those currently on the market. Other research will seek to develop high-value nutraceutical and cosmeceutical products from a range of bio-materials to increase the income generated from Māori interests in horticulture, seafood, aquaculture, and sheep and beef production. In 2005/06, Māori commercial assets were estimated at \$16.5b, with 52% of that investment in the primary sector and subject to fluctuations in global commodity prices.

“This collaboration is an important step forward to make sure that emerging and established Māori enterprises maintain and strengthen their globally competitive positions,” says FOMANA Chief Executive Officer Wayne Mulligan. “In essence this is where IRL plays a role to ensure science and technology forms part of growing their export success.”

Meat industry R&D initiative

In 2007, IRL first approached the New Zealand meat industry suggesting a joint initiative to automate certain jobs on the meat processing chain and alleviate major problems facing the industry, including an aging workforce, competition from low-cost competitors and a significant drop in sheep numbers due to falling returns. In 2009, this vision became reality when nine companies signed up to form an R&D consortium to automate sheep meat production. IRL and Millers Mechanical (a Dunedin-based company specialising in automation for the

global meat industry) are the R&D partners in the research consortium – Ovine Automation Ltd (OAL). Investment in the project of \$17.4m over five years is shared equally between FRST and the meat processing industry. The industry expects a return of \$43m a year on its investment in automation within five years. The first products to be commercialised are IRL’s Y-cutter (which makes the initial cut into the sheep carcass) and the gas de-pelter, which gently removes the fleece from the carcass.

Richard McColl, Innovation Programme Manager with the Meat Industry Association and manager of the new consortium, stresses the importance of the consortium to the industry.

“OAL shareholders recognise the need for collaboration to make the large step-wise improvement in productivity that is required to help ensure the ongoing success of the industry, and in doing so we also recognise the opportunities that IRL has presented in the area of gas de-pelting and automated pelt removal as an integral part of this process.”

Building an HTS industry sector

Two decades of HTS research and development at IRL has led to the formation of an internationally competitive HTS industrial sector in New Zealand. Now a private/public research partnership has been formed to bring in more companies to build the sector further and produce ground-breaking new products for export. The partnership includes companies such as American Superconductor Ltd and General Cable Corporation that have played a key role in commercialising IRL’s research, and long-standing HTS research partners such as the University of Canterbury. Other partners are IRL associate company HTS-110, which specialises in advanced HTS magnets for research and industry; US-based infrastructure company Parsons Brinckerhoff; energy company Vector Ltd; transformer manufacturer ETEL; Wilson Transformers of Australia; Christchurch-based Fabrum Solutions, which designs and builds cryostats for the cooling systems required by HTS products; and education institutions Wellington Institute of Technology (WelTec) and Auckland University of Technology (AUT). The research partnership is receiving \$8.4m in FRST funding for two specific applications. One is an MRI using HTS magnets that will be small enough to use in a range of clinical situations but produce images that



< Geoff Willmott >
– new tools for small-scale fluidics



Bridget Ingham >
– promoting Synchrotron Science

meet the high quality standards demanded for diagnosis and for use in surgical treatments. The other is to design, build and install in an electricity grid the world's first 1,000 volt-ampere (1MVA) transformer using Roebel cable developed by IRL researchers and manufactured in New Zealand by General Cable Superconductors Ltd. Besides being smaller than those using conventional copper wire technology, the new products will also be more energy efficient.

IRL is also a founding member of the HTS Industry Association set up to publicise and promote the development of the New Zealand HTS industry. The association supports research into the development of enabling technologies, ensures resources are available for the growth of the industry, and facilitates projects using HTS technologies to demonstrate their feasibility. Members include companies in the utilities, engineering and manufacturing sectors, research and education organisations, business consultancies, and representatives from venture finance and local and central government agencies involved in economic development.

New Zealand's leading status in HTS research and product manufacture worldwide was endorsed when the HTS Industry Association was invited to join the International Superconductivity Industry Summit (ISIS) at the invitation of the founding members, Europe, the US and Japan. New Zealand is the first country to be invited to join the ISIS since it was formed in 1992. The next ISIS summit, in February 2010, will be held in New Zealand.

Market intelligence

The 105 entrants in *What's Your Problem New Zealand?* came from a wide range of industries – from biotech companies, ICT and specialist manufacturers to businesses in the agricultural, medical, food and beverage, construction and energy sectors. New Zealand's small and medium-sized enterprises (which account for around 97% of New Zealand companies) were well represented, with nearly half of the entries coming from companies with 10 or fewer staff. There was also a good geographical spread among entrants. While a number of the entries came from Auckland-based businesses and those in other major cities, regional centres were also represented, including Cambridge, Wanganui, Timaru, Wellsford, Gisborne, Invercargill and New Plymouth. The competition has helped us

identify a number of areas where IRL's technical capabilities match up with the research and development needs of New Zealand enterprises.

IRL is working with NZTE to gain deeper insight into how some of our technologies can play a role in New Zealand's long-term economic development. To date, NZTE has commissioned relevant industry experts to develop technology reports on two areas of IRL science and engineering – supercritical fluid extraction and HTS. These experts review the state of the research and the resulting technology and identify the industries in New Zealand that can benefit from the technologies and the market opportunities they open up. They also tell NZTE what actions are needed to be sure the benefits of the R&D flow through to New Zealand companies and to the wider economy.

At the international level, IRL taps into market intelligence through global market research company Frost and Sullivan and through our membership in the Girvan Institute of Technology. This provides us with vital information on market size and growth and the competitive and technology landscapes we are working in. Market insight reports provide real-time alerts that help us to focus our research work in areas where there is opportunity for novel breakthroughs to be made.

A postgraduate MBA student from Stanford School of Business spent a month undertaking a critical review of one of IRL's commercialisation projects. This is part of an ongoing programme to establish links with leading international business schools.

Reorganisation of science and engineering

From 1 July 2008, the number of science and engineering groups at IRL was reduced from nine to six to ensure a better alignment with the industries we serve. The groups are: Energy and Materials; Carbohydrate Chemistry; Integrated Bioactive Technologies; High Temperature Superconductors; Measurement Standards Laboratory; and Engineering and Applied Physics.

Customer satisfaction

In the early part of the financial year we commissioned an independent survey of a range of IRL clients to get a clear



picture of how they felt about our processes and services. As a result of that survey, we are now putting much more emphasis on ongoing communication with clients in the course of R&D contracts. The aim is to ensure our service is meeting customer expectations.

With nearly two-thirds of our funding coming from the government funding agency FRST, we have also put great emphasis on establishing strong relationships and open lines of communication at all levels in both organisations. The result of this has been a greater understanding of IRL's part of FRST's priorities and funding strategies while giving IRL the chance to communicate its strategies and advise the Foundation on future research trends.



Lai Yeap Foo >
– 2009 Marsden medal winner