Inside a world leader Down Under

Australia's CSIRO became a major talking point earlier this year when it won a multimillion-dollar settlement in a US dispute over WLAN patents. But while the pay-out grabbed headlines around the world, there is a whole lot more than litigation driving this unique institution

By **Helen Sloan**

In April this year, Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) emerged victorious from a long-term dispute in the United States when it won a US$220 million settlement from a group of high-profile telecommunications companies. The case revolved around a wireless local area network (WLAN) patent, which related to work done in the 1990s by five of the organisation's scientists - John O'Sullivan, Terry Percival, Diet Ostry, Graham Daniels and John Deane – and followed another large settlement secured from other companies in 2009. The technology – which was developed from CSIRO's research in radio astronomy – provided a solution for the wireless transmission of data and is used in an estimated 3 billion devices worldwide today.

The protracted battle pitted CSIRO against Acer, Atheros, AT&T, Broadcom, Gateway, Lenovo, T-Mobile, Verizon and Sony. When the outcome was announced, the response from some quarters was furious. "Australian government patent troll collects from Wi-Fi vendors", read one headline; while another stated, "US does not give a XXXX about Aussie patent win; it was not fair dinkum". The ArsTechnica report on the case began: "US consumers will be making a multimillion dollar donation to an Australian government agency in the near future, whether they like it or not. The great majority won't even know about it—the fee will be hidden within the cost of a huge array of tech products." And the tone did not improve much from there.

But while the idea of a nationally funded patent troll might appeal to the minds of some conspiracy-obsessed journalists and commentators, the reality is that CSIRO is nothing of the sort. Instead, for close to 90 years it has been at the forefront of scientific research in Australia and has helped to roll out any number of important new technologies.

Established as a publicly funded agency in 1926, today CSIRO is one of the world's largest and most diverse scientific institutions. It has 56 sites - mostly in Australia, but including a laboratory in France and a research station in Mexico - and 6,500 staff. It conducts research in areas ranging from agriculture to information technology, and from climate change to pharmaceuticals. CSIRO is structured in divisions that cover such varied areas as astronomy and space science, and materials science and engineering.

The CSIRO IP ecosystem

Like all research-driven entities, CSIRO needs an effective and efficient IP function to protect new discoveries and inventions. However, as a non-profit organisation, its objectives are very different from those of a purely commercial company: CSIRO's primary aim is to conduct research that will benefit society. Working towards this goal, while also ensuring that the intellectual property generated through this research is

Challenges of going green

A quick look at the CSIRO website makes it evident that ecological issues are a primary concern. The organisation is a world leader in solar research and is also working in fields such as climate change, sustainable farming and biodiversity conservation. IP manager David Lambourne explains the challenges that it faces in this area: "Many green technologies are years from commercialisation due to the comparative costs of energy, with regulation playing a significant role in determining what technologies will be commercially adopted. As a result, government-based R&D spending is driving research, with commercial companies willing to sit on the sidelines and wait for regulatory certainty before committing to R&D spending. This has reduced CSIRO's ability to leverage IP generated in some green technologies to further progress the technology towards commercialisation."

And while established companies may be reluctant to get involved in a relatively risky new field, other parties can also create problems. For example, as Lambourne explains, opportunistic venture capital-backed start-ups often file patents of scant scientific merit in order to gain a strong commercial foothold in the market. "Some of these patents get granted as there is little prior art covering some of the 'obvious' implementations of a technology and examiners are not aware of the common general knowledge in the field," he says. This means that CSIRO must devote resources to monitoring applications and filing third-party observations when required.

Commercialisation manager Stephen Lynch outlines some of the issues when conducting research in this area. "Renewable energy technologies are different from many other R&D programmes, in that they are creating techniques that deliver solutions to a problem where a solution already exists," he says. Due to the significant consequences of failure of a new technology, adopters are generally risk averse. "This is combined with an industry where there has been very little change in hundreds of years and the average time to market for new technologies has often been greater than the length of time that IP can be protected for," Lynch states. So while significant government incentives do exist worldwide, administrations can fall and policies can be reversed – making investors reluctant to commit.

protected, is an IP and licensing (IPL) team some 30 strong. Staff include IP managers, commercialisation managers, an investment portfolio team and a database administration team. Although all are part of the same IPL group, five IP executive managers each lead individual teams that are aligned with specific divisions of CSIRO. The IPL team is supported by lawyers, including corporate patent counsel, all specialists in IP transactions.

The way that the department currently operates is the result of thoughtful fine tuning in recent times, as Christine Emmanuel, executive manager intellectual property, explains. "The structure and capability of this team has been developing over the last five years, culminating in a significant repositioning and altered structure of the IP team two years ago," she says. Previously, the various IP managers reported to their own divisional managers and developed their own portfolio management systems. At the same time, an external management company oversaw the CSIRO portfolio and there was extensive reliance on external patent attorney firms.

In 2007 an IP management improvement plan was implemented to streamline the structure: the major impact of this brought the external management company in-house to CSIRO, while three new patent attorneys were additionally employed. It also led to the hiring of Emmanuel herself: a patent attorney with experience both in industry and in private practice, she was brought on board to boost the group's IP expertise. More recently, further changes have also been made. "Another restructure two years ago saw the centralisation of the IP team," Emmanuel explains. "Significantly, this included the realignment of the patent attorneys from the legal function to a single IPL. All the IP managers from around CSIRO also moved to this team."

Today, the team is led by IPL general manager Jan Bingley, who highlights how the changes have increased efficiency. "The benefit of having all the IP managers in a single team - albeit aligned to different parts of the organisation - means we can coordinate IP management and IP transactions across the organisation," she says. "Platform technologies that are relevant and important to different parts of the organisation can be handled in a manner such that all interested parties are considered in decision making around IP

Christine Emmanuel, executive manager intellectual property, CSIRO
"Commercialisation is front and centre to the way in which we connect with industry to bring solutions and deliver impact for Australia"

and transactions involving that IP." With a centralised unit handling all IP issues, systems and processes can be rolled out consistently across the entire organisation.

The role of IPL

Although members of the group operate across a broad spread of scientific areas, they all ultimately share the same goal. "Working together, the team is focused on driving outcomes that lead to innovation that benefits Australian industry and the public," says Emmanuel. As well as general IP management and commercialisation activities, specific tasks allotted to the IPL team include managing CSIRO's investment portfolio, which includes equity in spin-off companies and unincorporated joint ventures. The department also engages with small and medium-sized enterprises (SMEs) through a programme that provides funding so that they can actualise innovation; and it manages the Technology Acceleration Fund, a small internal pot aimed at providing funding to projects that have reached the end of the research lifecycle.

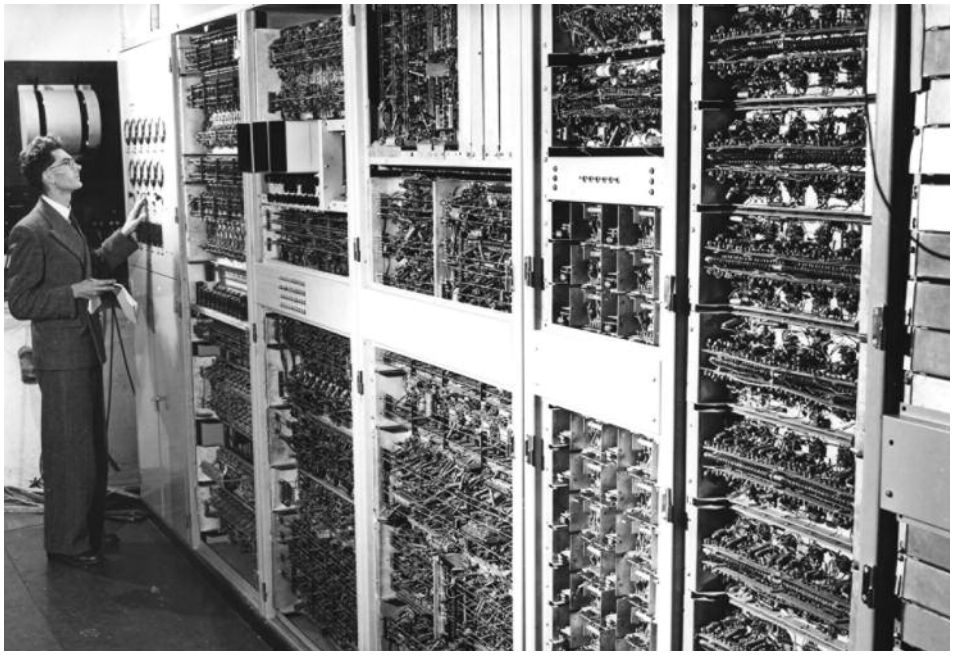
The IPL team offers a variety of services to CSIRO's different science groups. Strategic advice is a key function: this involves advising on appropriate forms of protection, investigating freedom to operate issues and distinguishing between registrable and unregistrable intellectual property. Other services include managing intellectual property throughout its lifecycle, as Emmanuel explains: "We conduct the process for managing IP from identification of the IP, application and registration through to managing renewals, addition of territories and reporting outcomes of IP management to the business units." The team also develops and implements standards for IP management and commercial licensing, and collaborates with the research groups to prepare revenue forecasts and technology pipeline reviews. "This is all aimed at meeting the objective of planning for commercialisation and executing against those plans to achieve revenue for CSIRO and impact through innovation for Australia," Emmanuel states.

An appreciation of the importance of intellectual property is woven through the organisation, helped by the fact that the board is, as Emmanuel confirms, "sophisticated in its understanding of the issues". We aim to contribute IP managers and commercialisation managers expertise in all stages of the R&D process, even prior to project funding in some cases. "We see value in utilising IP expertise at very early stages in the project lifecycle," she continues. "In some parts of CSIRO, IP managers are integrated into project and theme reviews, and are therefore kept up to date with the current status of projects, keeping communication open regarding the development of new IP." One example of how this works in practice is CSIRO's invention disclosure form, which pulls together the skills of a range of different departments, including IPL. This form must first be filled in by the inventor; it is then discussed with the relevant IP committee to decide the best next step, whether this be a patent application, trade secret or some other form of protection. "The intention is that IP decisions are not taken in isolation, but always require business development and science input, as well as IP specialist advice, a multidisciplinary approach" Emmanuel explains.

The commercialisation question

CSIRO aims to develop technology for the advantage of Australia and its people. However, this does not mean that commercialisation takes a back seat: as Emmanuel points out, the "I" in CSIRO is very important. "Commercialisation is front and centre to the way in which we connect with industry to bring solutions and deliver impact for Australia," she says. In practice, this means building strong links with industry. In 2011, for example, CSIRO worked with 1,700 Australian companies, from SMEs to some of Australia's biggest names, as well as 400 international companies such as Bayer, GE and Boeing (which CSIRO has partnered with for over 20 years). CSIRO grants around 80 licences each year that allow others to access its intellectual property; many of these go to SMEs in Australia. So, explains Emmanuel, along with the research groups the IPL team strives "to grow a diverse commercialisation revenue stream over time".

CSIRO's IP mission statement focuses on the importance of generating "impact" – in other words, the work done by the organisation should make a profound difference to people's lives. Part of this brief involves ensuring that scientific and technical knowledge is accessible and utilised, including through contractual means such as licensing, spin-offs and the sale or exchange of rights. CSIRO has managed to ensure that this ideal of working for the public good is compatible with the commercialisation of IP. The mission statement includes the following: "Where the knowledge and technology being transferred has a market application and is expected to generate commercial returns, an equitable return from the



The CSIR Mk 1, one of the world's first computers, in a photo taken in 1952

commercial exploitation of intellectual capital should be expected... Proceeds from licensing IPR are applied to the advancement of further scientific research, thus underpinning CSIRO's sustainability and the nation's research capabilities."

And while social benefit may be a difficult concept to quantify, the IPL department is judged by more grounded metrics that might be recognised in any commercial company. "We are measured by our performance in managing our IP portfolio and ensuring new developments are recognised, extracted and protected appropriately, and then engaging within our team and outside our team to achieve impact via a commercial or other pathway," Emmanuel explains. "This needn't be external IP revenue, as our IP is often an indicator of our capability and attracts investment in our research services - either 100% investment or co-funding arrangements. Our level of strategic engagement with our science portfolios and capability groups is a measure of our performance. Our equity portfolio value is assessed and is also a measure of our performance." Innovation outcomes by which the group's performance is assessed include licensing, spin-outs and the identification and strategic management of platform IP.

Key CSIRO achievements

A number of widely used products have their origins in CSIRO labs and research centres. They include:

- Polymer banknotes - first used in Australia in 1988, these plastic banknotes are more secure and durable than their paper-based predecessors and are now in use in over 20 countries worldwide.
- Aerogard - this market-leading insect repellent was developed to protect sheep from blowflies, but was adapted for use by humans and became a household name in the 1960s.
- Starpharma - Australia's third largest publicly listed biotech company was founded on technology spun out from CSIRO relating to dendrimers – a type of synthetic polymer.
- Black tiger prawn - CSIRO scientists and the Australian prawn industry have bred an improved black tiger prawn, which is producing record yields in aquaculture farms.
- Reditus - this financial software is in use in two of Australia's biggest banks; sales to a number of banks in Europe, Japan and the United States have also been completed.

CSIRO Entomology's new environmentally friendly research facilities in Canberra

A unique proposition

One issue for CSIRO in establishing best practice is that there are no equivalent organisations against which to compare itself. "CSIRO is unique and it is difficult to benchmark against another organisation in Australia," Emmanuel acknowledges. "We look to our global research alliance partners, as well as national institutes in the US. I try to keep abreast of how things are being done elsewhere, including companies and not limited to government-funded organisations. Having moved from private practice to CSIRO, it is quite mind blowing the range of issues that need to be dealt with when managing a portfolio for an organisation of this size."

Something else that makes CSIRO unique is its location. Australia's geographic isolation has often been seen as a disadvantage in general business terms. But, as Emmanuel explains, the very fact that Australians have long had to deal with this issue has given them certain advantages. "From an IP professional perspective, Australians are very used to having to conduct our IP practice and build IP expertise with very much a global view," she says. "Our clients are always interested in markets overseas. Our drafting is done with the European, US and Asian markets in mind, and we develop expertise accordingly."

CSIRO's IP portfolio is global and its licensing arrangements require worldwide IP protection, so international expertise is highly valued. That said, some problems do remain. "From an IP management perspective, access to specialists in certain technologies can be difficult," Emmanuel says. "We invest in developing relationships with external attorneys in Australia and overseas, so we can learn from those developing the most expertise in those technologies we are most interested in." And meanwhile, CSIRO's work in Asia-Pacific is increasing: as the world's economic focus shifts eastwards, CSIRO may find that its location ultimately turns out to be a bonus.

The WLAN affair

And, of course, part of being an IP owner is that, at times, you may need to go to court to assert your rights. That is the story behind the WLAN dispute, which came to an end in April. But, explains special counsel Terry Healy, the story began a long time before that. "Initially, CSIRO aimed to use its WLAN patent portfolio to support the creation of new high-value business and employment opportunities in Australia," says Healy, CSIRO's former general counsel, who in recent years has spent much of his time focused on the WLAN patent case.

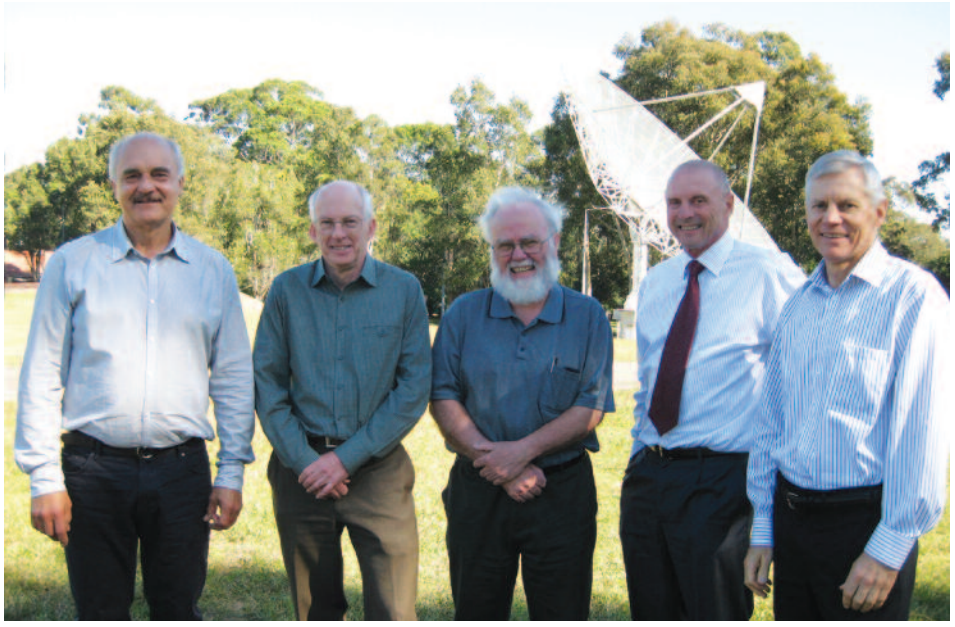
Remarkably – from today's perspective at least – no one jumped at the opportunity CSIRO presented. "The industry generally expressed scepticism that the technology would even work; and only IBM showed real interest," Healy states. "Later, IBM pulled out for unrelated reasons, and it became obvious that other industry players would not take up the challenge."

Aerogard: commercialisation in a different era

Aerogard insect repellent was initially developed to protect sheep from blowflies. Its inventor, Douglas Waterhouse, was a renowned entomologist who later acted as CSIRO's chief for over 20 years. The product was first used by humans during the Second World War, but it became a household name in the 1960s after it was used by a visiting royal party.

According to the CSIRO website: "Journalists following the Queen noted the absence of flies around the official party, and word about CSIRO's new fly-repellent spread. A few days later the good people at Mortein [an insect repellent manufacturer] called Doug Waterhouse for his formula, which he passed on freely, as was CSIRO's policy at the time. The rest, as they say, is history, with Mortein's Aerogard going on to become an Australian icon." This completely free transfer of such a valuable invention seems remarkable today, but as Australian patent attorney Mark Summerfield points out, this was a sign of the times. "That would be true everywhere, not unique to Australia," he says.

While CSIRO and other research agencies may have a rather different attitude today, the Aerogard story is a reminder that the principal aim of non-profit organisations the world over is to make their discoveries available. "We think of the US, for example, as being very commercially and technology transfer oriented," Summerfield says. "But among academics and publicly funded research generally, there is still a very strong belief that the primary objective of creating new knowledge is to make it available to the public."



The WLAN inventors (l-r): Diet Ostry, Graham Daniels, John Deane, John O'Sullivan and Terry Percival

Richard D Kelly, senior partner, Oblon Spivak
"*CSIRO v Buffalo* appears to be a unique situation involving a unique entity and a unique judge"

Terry Healy, special counsel, CSIRO
"If CSIRO had simply accepted widespread infringement of its important WLAN patent portfolio, this could have adversely impacted perceptions of its willingness to stand up for its patent rights across the board"

CSIRO's next move was to join forces with a start-up, Radiata; but despite promising beginnings, the company was subsequently acquired by Cisco and exited the Australian market. This left CSIRO with the WLAN patent portfolio, which it recognised was a very valuable asset in its own right. "CSIRO therefore went about trying to license it non-exclusively to the industry on terms that were reasonable and non-discriminatory," Healy says.

Increasing popularity ... and infringement

But as Wi-Fi-enabled products became increasingly popular, CSIRO began to see that companies might be using technology which its patents underpinned. When approached to take licences, they were reluctant to do so. Litigation was the next option, so CSIRO decided to initiate a test case in the United States to establish the enforceability of the rights that it owned. Mark Summerfield, Australian patent attorney and author of the Patentology blog, has followed the suit closely. He observes that the decision to go to the US courts will not have been taken lightly. "The reason that it is quite surprising for an organisation like CSIRO to do that is because it is substantially government funded," he says.

However, Healy did not struggle to make his case to the necessary people: "The CSIRO board and the government readily understood and accepted the need for CSIRO to stand up for its rights and supported the initiation of the test case." CSIRO's ability to license its portfolio of thousands of patents and patent applications is crucial, he explains, as this presents a strong incentive for commercial operations to invest in new technology. "If CSIRO had simply accepted widespread infringement of its important WLAN patent portfolio, this could have adversely impacted perceptions of its willingness to stand up for its patent rights across the board," Healy says. CSIRO did thorough homework before embarking on such a radical course of action, taking extensive legal advice from US counsel before deciding to proceed.

***Buffalo Technology* – the first case**

CSIRO's target was Buffalo Technology – a relatively small Japanese company – and its destination the Eastern District of Texas. Richard D Kelly and his team at Oblon Spivak represented Buffalo Technology on appeal; he recalls that it was apparent even at this early stage that the action would be the start of something much bigger. "It was clear from the beginning that CSIRO initiated litigation against Buffalo because it was, at that time, a small player in the market, having just begun the sale of Wi-Fi devices in the US. Everyone expected litigation against the major players would ensue eventually," he says. However, success for CSIRO was far from assured, even after it won the case at first instance: a recent Supreme Court decision involving eBay had

CSIRO is a world leader in solar research: an array of mirrors at the CSIRO Energy Centre, Newcastle NSW

Mark Summerfield, patent attorney and author of the Patentology blog
"It was fairly clear from the outset that a significant number of very well-known companies felt that this Australian research institute was not a threat"

established that injunctive relief was unlikely to be available for non-practising entities (NPEs). But Judge Leonard Davis made an exception for CSIRO - allowing for the fact that it was "a research institution and relies heavily on the ability to license its intellectual property to finance its research and development" - and granted a permanent injunction against Buffalo Technology.

"We were both surprised and disappointed," Kelly says of the decision. "CSIRO was not suffering any loss of sales or reduction in profit margins, since it was and is an NPE. Under *eBay*, no one expected the injunction." However, CSIRO's team may have had reason to feel confident: Healy explains that one particular highlight of the process for him was discovering that the judge assigned to the case was "not only an eminent jurist, but also a trained mathematician who knew what a Fourier Transform was" (a mathematical operation that formed part of the WLAN technology).

While the *Buffalo* decision was a success for CSIRO, there were some concerns at the time that it could have wider repercussions and allow other NPEs to benefit from similar treatment. However, this has not come to pass. "This case is an anomaly as far as NPEs are concerned," Kelly explains. "NPEs subsequently have been unable to obtain injunctions, which has led them to begin to use the US International Trade Commission (ITC) as a forum where injunctions (exclusion orders) remain available to them. However, even the ITC is tightening its procedures regarding what is needed for commercial exploitation by NPEs, which the ITC uses to determine jurisdiction. *CSIRO* appears to be a unique situation involving a unique entity and a unique judge."

The field widens

In the wake of the *Buffalo* decision, an ideal outcome for CSIRO would have been for other companies that were using its technology to agree to license. But this was not to be; in fact, a number of them subsequently sued CSIRO themselves. "It was fairly clear from the outset that a significant number of very well-known companies felt that this Australian research institute was not a threat," Summerfield says, "and that all they needed to do was to hold out and they wouldn't have to pay." This counterattack was, Healy admits, an unexpected development that prolonged the case more than he had anticipated. "I was fortunate in having the support of very competent US counsel who helped keep us on track throughout this long, tortuous and ultimately successful process," he says. Eventually, CSIRO's opponents were vanquished: HP was the first to agree to settle, with the rest soon following suit.

The "troll" question

As the case played out over the years, it has generated a considerable amount of publicity, not all of it positive. In some respects this was inevitable: by filing in Texas, CSIRO courted attention. When the settlement deal was announced this year, many celebrated the recognition and financial reward that CSIRO was finally receiving for its ground-breaking work. However, others took a different view and essentially accused CSIRO of being a troll. The story run by ArsTechnica on the settlement attracted a great deal of criticism both the United States and Australia, but it nonetheless reflects a point of view that is growing in prevalence in today's environment, where hi-tech patent disputes are becoming increasingly common. "Another story of someone managing to get a large sum of money from asserting their patent rights is obviously of broader interest," Summerfield acknowledges. However, he reports that in his experience, even those who are dubious about the merits of software patents can see the virtues of CSIRO's WLAN patent. "It's a kind of technology that people recognise," he says. "It's not an e-commerce application; it's not a business method or an Amazon

Large saltwater ponds at Gold Coast Marine Aquaculture where black tiger prawns are raised

one-click; it clearly does something."

According to Healy, those levelling accusations of patent trolling discredit themselves when they fail to discriminate between the very different types of NPE in the market. "Certain commentators have lumped CSIRO in with a variety of litigious patent aggregators that have been branded by the industry as 'patent trolls'," he says. "However, by including a public-benefit research entity such as CSIRO in the 'troll' category, they undermine the very image that the industry is trying to paint - that all members of the category are somehow evil. A cynic might say that the industry, in furtherance of its campaign, should instead have worked hard to limit the troll category to its primary targets and taken pains to distinguish universities and research institutions."

The present and the future

Capping off what has already been a good year for CSIRO is widespread acclaim for the work of the WLAN patent developers. On 14th June the European Patent Office (EPO) awarded O'Sullivan and his team the European Inventor Award in the non-European category – its highest distinction for international inventors. "The EPO award was doubly important to me because it honoured a very important invention, but also recognised explicitly the use of IP rights by CSIRO," Healy says. "The independent report commissioned by the EPO cited a 'well laid out and executed IPR strategy which did not fail at enforcing the IP rights'." Indeed, EPO President Benoît Battistelli said at the awards ceremony that the work done by the CSIRO team " perfectly demonstrates how a publicly funded research centre can use patent protection and licensing revenue to finance further innovation."

The destination of the funds raised through licensing confirms this assessment: some US$150 million of the WLAN royalties have been injected into the Science and Industry Endowment Fund (SIEF). Founded alongside CSIRO in 1926 by government mandate, it provides grants for research projects. The importance of SIEF had faded over the years, but the WLAN money has now breathed new life into this initiative. "The licence income is being used to fund research through SIEF into important public interest areas such as health (Alzheimer's disease), the environment (Great Barrier Reef), energy and new wireless technologies," Healy explains. A crown-jewel patent developed in the radio astronomy sphere will thus help to ensure that CSIRO's trailblazing work in diverse scientific fields can continue long into the future. *iam*

Helen Sloan Asia-Pacific Editor

Action plan

CSIRO shows how non-profit organisations can successfully protect and monetise their intellectual property:

- Even if commercialisation is not the chief aim, strong IP protection of new inventions is attractive to investors and potential industry partners.
- Look into streamlining processes to ensure that all IP staff work to the same high standards throughout the organisation.
- Licensing patents to industry partners not only provides a revenue stream, but also helps to achieve the goal of ensuring that new developments are accessible to the public as soon as possible.
- Recruiting patent attorneys and other IP professionals with outside experience will broaden the skillsets and knowledge available.
- Do not be afraid to fight infringement. While non-profit organisations may traditionally be wary of taking legal action, a strong case should secure the support of senior managers.