



Australian Government

IP Australia

# Australian Intellectual Property Report 2017



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## WELCOME TO THE AUSTRALIAN INTELLECTUAL PROPERTY REPORT 2017

As Assistant Minister for Industry, Innovation and Science it is my pleasure to introduce the 2017 edition of the Australian Intellectual Property (IP) Report.

This report outlines data, trends and analysis developed to stimulate discussion and assist with decision-making on IP and innovation policy settings.

IP provides a foundation for innovation which in turn creates new knowledge, builds businesses and contributes to economic growth. IP and innovation play a crucial role in maintaining and enhancing our economic competitiveness.

Figures in this year's report show an encouraging increase in Australian patent activity, with demand for patents by Australian residents up 15 per cent in 2016. This is in contrast to a decline in non-resident patent filings. Trade marks filed by Australians largely maintained the level achieved through the previous year's record growth, despite a drop in non-resident filings.

These trends are indicative of the level of innovative and entrepreneurial activity by Australian business and researchers. They provide positive signals about the Government's focus on creating an environment conducive to innovation and entrepreneurship in Australia

In recent years we've seen increasing recognition of the economic importance of IP for trade, investment and growth. It is now more crucial than ever that our IP system strike the right balance between enabling innovation and fostering the sharing of new knowledge.

It is my hope that the data, research and analysis produced by IP Australia, and summarised in this year's Australian IP Report provides valuable insights to help drive a productive and informed IP discussion and decision-making.

A handwritten signature in blue ink that reads "Craig Laundry". The signature is fluid and cursive.

Craig Laundry

Assistant Minister for Industry, Innovation and Science

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# 1 INTRODUCTION

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The overall story on IP applications in 2016 was mixed, following a year of significant growth in 2015. Overall, demand declined for patents and trade marks, but Australia saw record growth in patent applications from Australian residents, and resident trade mark applications remained high after a record year in 2015. Design rights and plant breeder's rights both recorded overall growth of three and eight per cent respectively, albeit driven by non-resident filings.

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This report focuses on the data related to IP, and each IP right administered by IP Australia. We also present the IP research and analysis being undertaken by IP Australia's Office of the Chief Economist. In particular, this year, we focus on a new look at the data on university-industry collaboration. Using IP data we take a fresh look at the collaboration story in Australia and find that in contrast to previous studies, Australia's performance is reasonably good when compared to other countries. We also highlight some of these collaborative IP applications in the illustrations used throughout this report at the start of each chapter.

The Productivity Commission (PC) inquiry into the IP system stimulated much discussion over the past year on IP policy settings and Chapter 7 focuses on this inquiry. There was also a continued focus on free trade agreements and IP, following the publication of the Trans-Pacific Partnership agreement. International trade is likely to continue to be an important aspect of IP considerations in 2017, and IP Australia will continue to support

international IP negotiations and engagement with research, analysis and advice.

IP Australia plays a key role in identifying IP trends and changes in the international and domestic IP landscape, and providing advice to the Australian Government on the development of IP policy. IP Australia administers the system of patents, trade marks, designs and plant breeder's rights, contributes to international negotiations and cooperation to support the global IP system, and promotes awareness of IP. Copyright is administered separately by the Department of Communications and the Arts, and is therefore not discussed in this report.

In publishing the fifth annual Australian IP Report our aim is to promote awareness of IP rights and discuss the latest IP trends and statistics. As part of the work to better enable evidence-based policy, we are also releasing the latest version of the IP Government Open Data (IPGOD) 2017 with this report, which contains all of IP Australia's administrative data, linked to business numbers on [www.data.gov.au](http://www.data.gov.au). A live version, updated weekly, is also available on [www.data.gov.au](http://www.data.gov.au).

The data, graphs and statistics used in this report can be found online at: [www.ipaustralia.gov.au/economics](http://www.ipaustralia.gov.au/economics)

We welcome all comments, questions and suggestions. Please get in touch with us at

- Email: [ipreport@ipaustalia.gov.au](mailto:ipreport@ipaustalia.gov.au)
- Twitter: [@IPAustralia\\_OCE](https://twitter.com/IPAustralia_OCE)

# 2 PATENTS

A patent is an exclusive right granted for an invention. Inventions can be broadly described as a new way of doing something, or a new technical solution to a problem. For a patent to be successfully granted in Australia, the invention must be examined by IP Australia and found to:

- be novel - the idea or technology must not already exist elsewhere
- be patentable subject matter, as some things cannot be patented
- demonstrate an 'inventive step' so that the invention is not obvious or minor
- have a specific, substantial and credible use.

An Australian patent holder can exclude anyone else from using their patented invention in Australia for up to 20 years.<sup>1</sup>

Patent protection means the invention cannot be commercially produced, used, distributed, imported or sold by others without the patent owner's consent. There are two types of patents available in Australia: the standard patent and the innovation patent.

**Patent applications:** IP Australia received 28 394 standard patent applications in 2016, a one per cent decline compared to 2015. During the past 10 years, there have been years of decline as in 2009, following the events of the Global Financial Crisis. Since 2009 the overall trend in filings has been upward. This trend was interrupted by a surge in filings in 2013 prior to the implementation of the *Raising the Bar* reforms of 2012, followed by a corresponding decline in filings in 2014.

**Australian application number:** 2013243238

**Patent application type:** Standard

**Invention title:** Supervisory control of automated irrigation channels

**Applicant:** Rubicon Research Pty Ltd  
and The University of Melbourne

**Filing date:** 2013-04-05

**Expiry date:** 2033-04-05

**PCT number:** PCT/AU2013/000355

**WIPO number:** WO2013/149304

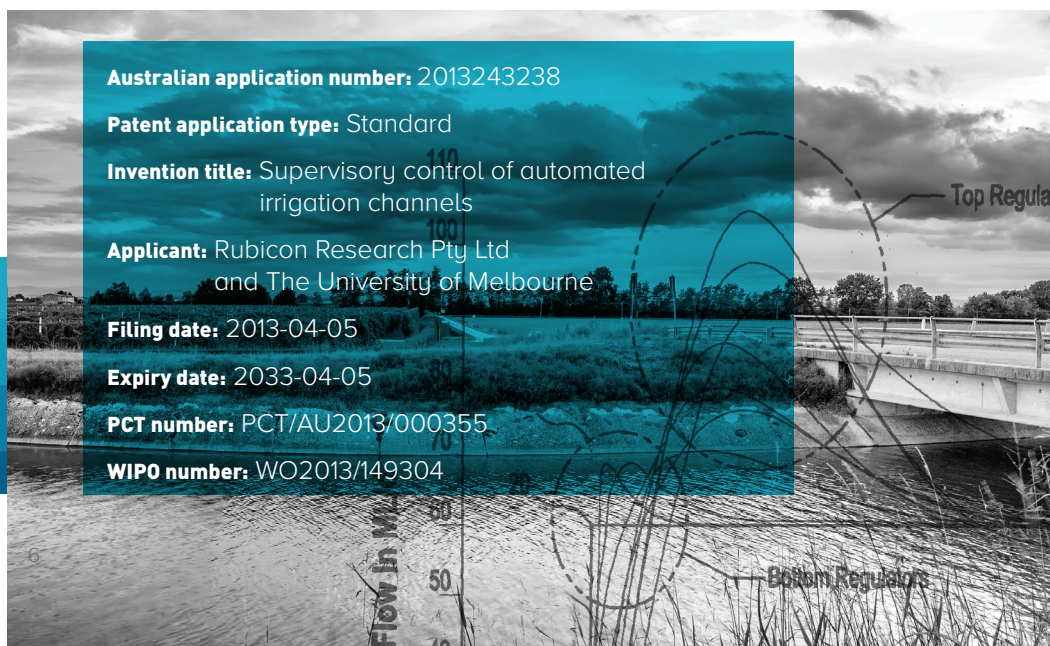
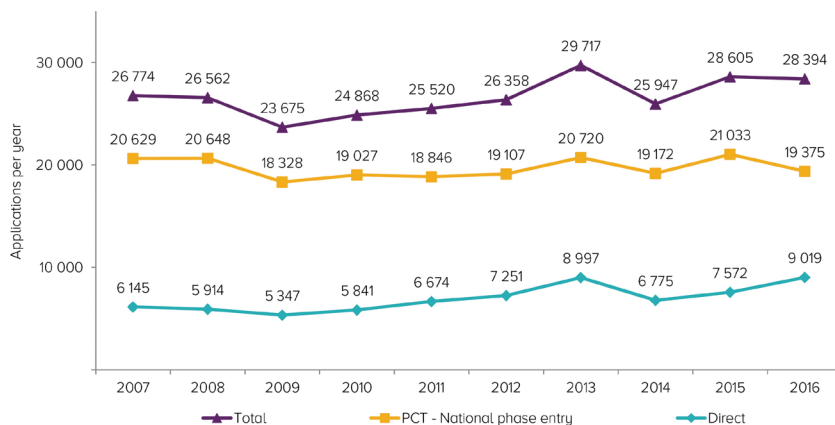


Figure 1: Patent applications filed with IP Australia, 2007-2016



Using IPGOD 2017 released with this report, we estimate more than 75 per cent of Australian resident patent applicants in 2016 were private individuals or small to medium enterprises (SMEs).<sup>2</sup>

Global patent filings rose from 2.68 million in 2014 to 2.89 million in 2015, consistent with the movement in Australian filings from 2014 to 2015.<sup>3</sup> The growth in global patent filings since 2009 has significantly exceeded that of patents filed in Australia. Australian applications grew by three to four per cent per annum from 2009 to 2015, compared with an average of eight per cent per annum worldwide in the same period.<sup>4</sup> The global growth was largely driven by an increase of approximately 320 per cent in applications from China.

**Applicant origin:** The decline in patent applications in 2016 was due to a fall in non-resident applications, which make up the bulk of patent applications in Australia. Most applications made by non-residents are filed using the system established by the Patent Cooperation Treaty (PCT).<sup>5</sup>

Despite the overall decline in applications in 2016, applications by Australian residents increased by 15 per cent from 2284 in 2015 to 2620 in 2016. This includes those who filed directly with IP Australia and those who entered through the PCT route, and together account for around nine per cent of total patent applications.

Filings by non-residents in Australia declined by two per cent to 25 774, accounting for 91 per cent of filings. The main source of the overall decline in application numbers was filings by applicants from the United States (US) to 12 909. US applicants filed around 45 per cent of applications for Australian patents in 2016, a decline of six per cent from 2015.

Of the other major filing nations, Japanese applications decreased by seven per cent to 1604, German applications increased by four per cent to 1394, UK increased by two per cent to 1176 and Swiss applications increased by five per

cent to 1151. Applications from these five jurisdictions (US, Japan, Germany, UK and Switzerland) made up 65 per cent of total patent applications in 2016.

**Patent grants:** 23 743 patents were granted in 2016, representing an increase of three per cent from 2015. Grants to Australian residents represented six per cent of the total, similar to previous years, as noted in Table 1.

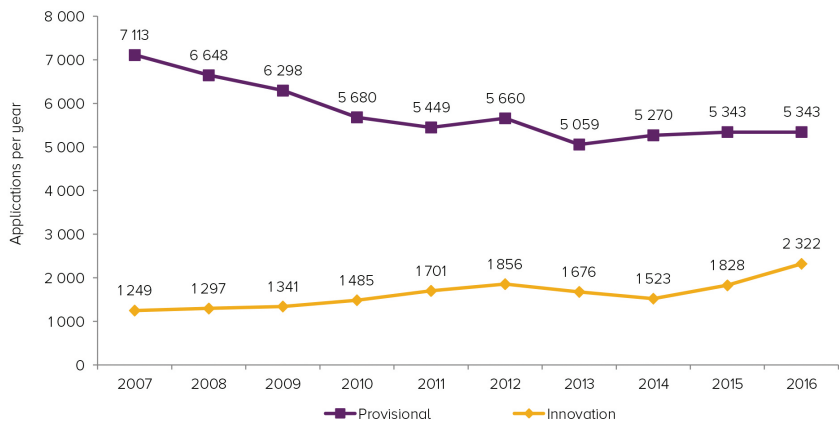
**Table 1: Patents granted by IP Australia**

	2012	2013	2014	2015	2016
Resident	1 262	1 311	1 110	1 199	1 433
Non-resident	16 611	16 413	16 002	18 105	22 310
Total	17 873	17 724	17 112	19 304	23 743

**The provisional patent:** A provisional application allows applicants to claim a priority date before filing a standard or innovation patent. Provisional patent applications have been in decline over the last 10 years, falling by an average of three per cent per annum over this period. Provisional filings appear to have stabilised since 2014 with 2015 seeing a modest increase of one per cent on 2014 and filings in 2016 remaining stable.

Australian residents remain overwhelmingly the primary users of Australian provisional applications, filing 96 per cent (5142) of such applications in 2016.

**Figure 2: Provisional and innovation patent applications, 2007-2016**



**The innovation patent:** An innovation patent has a lower application fee, a lower requirement for inventiveness (requiring an ‘innovative’ rather than an ‘inventive’ step), lasts up to eight years in contrast to the 20 year term of a standard patent, and does not require examination unless the patentee wishes to enforce it. In other countries, similar IP rights are often called ‘utility models’.



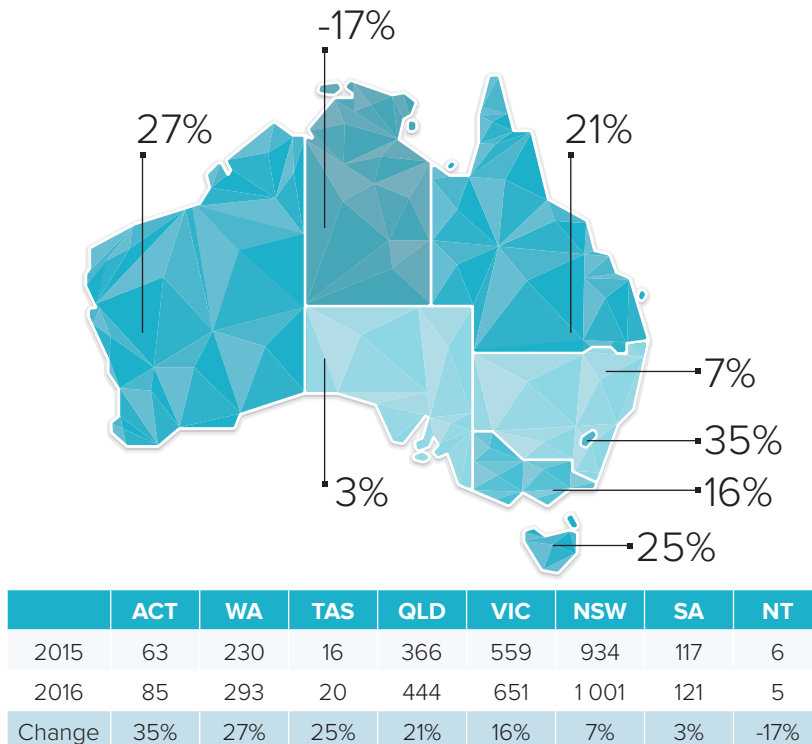
Last year saw an increase in applications for innovation patents with 2322 applications filed in 2016. This represented a 27 per cent increase on 2015. This change reflects a significant increase in non-resident applications of some 79 per cent from 2015, whereas applications from Australian residents declined by five per cent.

Although Australian residents remain the main users of the innovation patent system, for the first time since its inception, non-residents made up the majority of innovation patent applicants with 54 per cent of the total in 2016.

The increase in international applications is attributable almost exclusively to an increase of some 142 per cent in applications from Chinese residents to 871 applications. This accounts for around 93 per cent of the overall increase in non-resident applications, and represents 38 per cent of total filings. US residents filed 145 applications, representing six per cent of the total, while all other non-resident applications totalled 239 (10 per cent of total applications).

**State level:** Applications for standard patents increased in all states and territories in 2016, with the exception of the Northern Territory (where one less application was filed than in 2015). Residents of the Australian Capital Territory (ACT), Western Australia (WA), Tasmania, Queensland and Victoria all filed over 15 per cent more applications than in 2015.

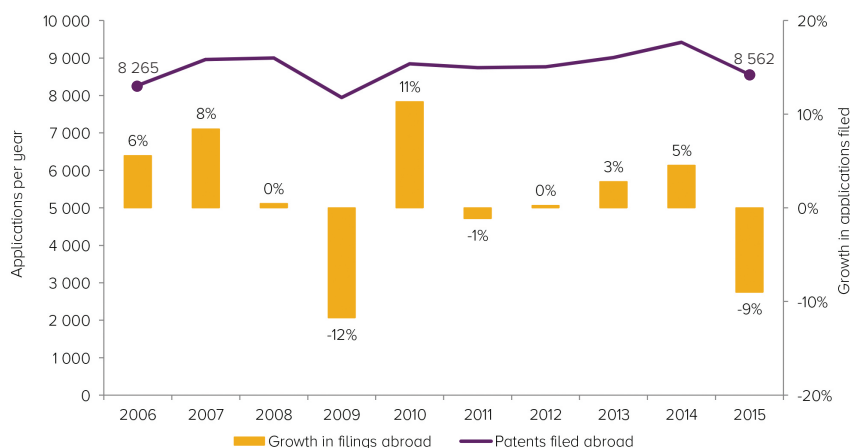
Figure 3: State-by-state patent applications 2015-16



**Australians filing overseas:** IP rights are granted on a national basis, so to acquire rights in other countries, Australian inventors need to file abroad. As a result, Australian residents file more patent applications overseas than they do domestically.

The latest data from the World Intellectual Property Organization (WIPO), which is available until 2015, shows a decline of nine per cent in applications from Australians filing in overseas jurisdictions from 2014 to 2015, with a total of 8562 applications filed in 2015.

**Figure 4: Australian patent filings overseas, 2006-2015**



Source: World Intellectual Property Organization, IP Statistics data center

As in 2015, the US was the most popular destination for Australians filing abroad, accounting for 43 per cent of applications. This was followed by filings with the European Patent Office (EPO) at 10 per cent and China at seven per cent.

Applications from Australians for New Zealand patents fell sharply in 2015, representing six per cent of overseas applications in 2015, compared with nine per cent in 2014. Similar to the phenomenon experienced in Australia in 2013-14, legislative changes in New Zealand brought about by the *Patents Act 2013* (NZ) resulted in an increase in total filings in New Zealand in 2014 and a subsequent decline in 2015.

Of the 8562 applications filed by Australians overseas, 33 per cent were directly filed with overseas patent offices while 67 per cent used the PCT route, which allows a single application to be filed in multiple countries. This level of usage of the PCT route is similar to that observed over the last 10 years.

# 3 TRADE MARKS

A trade mark uniquely identifies a product or service and is used to distinguish goods and services from those of competitors. It can be a symbol, letter, number, word, phrase, sound, smell, shape, logo, picture and/or an aspect of packaging. A registered trade mark gives the owner the exclusive right to use and authorise other people to use the trade mark. To remain registered, a registered trade mark must be renewed every 10 years. Registered trade marks are the only marks legally allowed to use the ® symbol, and it is an offence to use ® if the trade mark is not registered.

**Trade mark applications:** IP Australia received 71 344 applications for trade marks in 2016. This represented a three per cent decline from the record high of 2015, despite exceeding the 2014 figure by 11 per cent. This was almost entirely due to a reduction in filings by non-residents of seven per cent.

The reduction in applications by non-residents in 2016 is due to a fall in applications through WIPO's Madrid system for filing trade mark applications in multiple jurisdictions. In Australia the Madrid system is used almost exclusively by non-residents. Filings using the Madrid system declined by 14 per cent in 2016, more than accounting for the overall reduction. Direct applications to IP Australia increased by one per cent year-on-year in 2016.



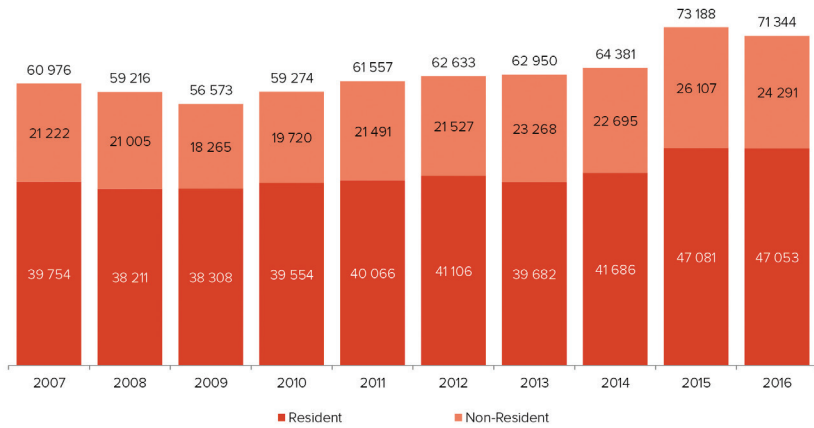
**Number:** 1582286  
**Words:** FORCITE HELMET SYSTEMS  
**Status:** Registered  
**Priority date:** 25 Sept 2013  
**Class:** 9  
**Kind:** Fancy  
**Owner:** FORCITE HELMET SYSTEMS PTY LTD  
**Collaboration:** Licensed University of New South Wales patent on video compression (AU2002215709) after discovering on Source IP.

**ALPINE**

 **SMART HELMET FOR SNOW SPORTS**

11

Figure 5: Trade mark applications by origin, 2007-2016

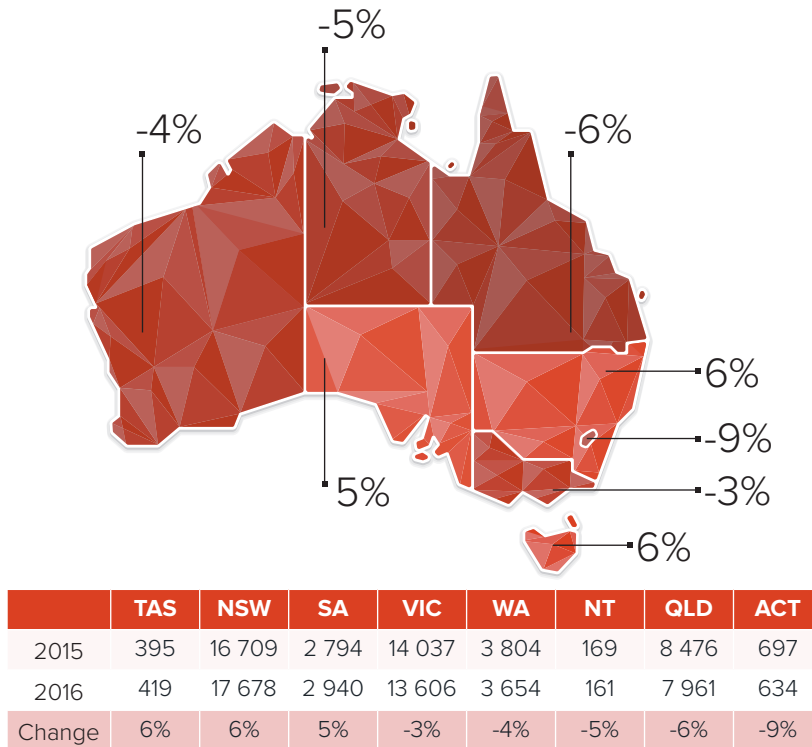


**Applicant origin:** The majority of trade mark applicants are Australian residents, and the vast majority of these domestic applicants are SMEs and private individuals who filed more than 90 per cent of domestic applications in 2016.<sup>6</sup> This has been a consistent feature of trade mark applicants over the last 10 years.<sup>7</sup>

Non-resident applications made up 34 per cent of total applications in 2016. This is consistent with the last 10 years, where non-resident applications represent between 32 and 37 per cent of total applications every year between 2007 and 2016. The decline in non-resident applications of seven per cent in 2016 is in contrast with an increase of 15 per cent in 2015. As in previous years, the US was the largest source of non-resident applications in 2016 with 7540 applications, representing 11 per cent of total filings and a 12 per cent reduction from 2015.

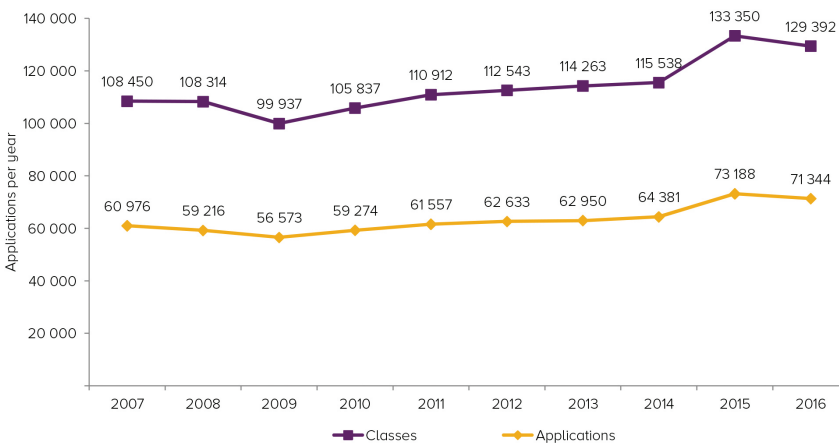
**State level:** Applications from residents remained steady in 2016 with 28 fewer applications filed by Australian residents than in 2015 out of a total of 47 053. Applications from New South Wales, South Australia and Tasmania increased by five to six per cent, whereas applications from the other states and territories experienced a decline.

Figure 6: Trade mark applications by state, 2015-2016



**Trade mark classes:** The Nice Classification system is an international classification of goods and services which categorises trade marks into 45 classes. Different firms can protect the same trade mark in different classes. As a trade mark can be requested for more than one Nice class, there are typically more filings in trade mark classes than the number of trade marks filed. In 2016, there were 129 392 classes filed compared to 71 344 trade mark applications, an average of 1.8 classes per application.

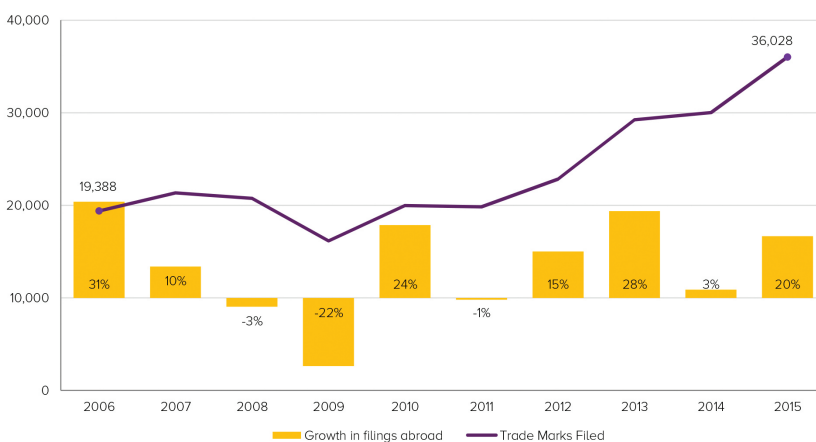
Figure 7: Trade mark classes and applications filed, 2007-2016



As in previous years, the three classes with the most applications in 2016 were advertising and business functions with 12 604 applications (Class 35, down four per cent on 2015), apparatus and instruments for various practical purposes with 11 606 applications (Class 9, down eight per cent), and education and entertainment services with 10 426 applications (Class 41, down four per cent). Together, these three classes represented 27 per cent of total classes for which applications were made and accounted for a significant proportion of the decline in applications in 2016.

**Australians filing overseas:** Worldwide, applications for trade marks increased to an estimated 5.8 million in 2015, a fifteen per cent increase on the estimate of 5.2 million of 2014.<sup>8</sup> As the *IP Report* went to press, the latest WIPO figures (2015) for trade mark filings were unfortunately incomplete but the number of classes filed by Australians abroad was complete. Therefore we report the number of classes filed abroad, which was 36 028 in 2015, or a 20 per cent increase on 2014. The methodology WIPO uses to aggregate trade mark applications has changed, meaning the data has changed since last year, but WIPO has updated the entire series so we can compare 2015 to previous years.<sup>9</sup>

**Figure 8: Australians filing trade mark classes abroad, 2006-2015**



Source: World Intellectual Property Organization, IP Statistics data center

China has been the main destination for Australians filing trade marks abroad, but it is the United States that is the main destination for trade mark classes filed by Australians. In 2015, Australian applicants claimed protection in 5405 classes in the US, 5316 classes in China and 5216 classes in New Zealand. The fourth and fifth most popular destinations were the EU (2902) and Singapore (1571).

# 4 DESIGNS

A design right protects the overall appearance of a product and allows the holder to exclude others from using the design in any commercial way in Australia for up to 10 years. The protection covers the shape, configuration or pattern that gives a product its unique visual appearance but excludes the feel of the product, what it's made from or how it works.

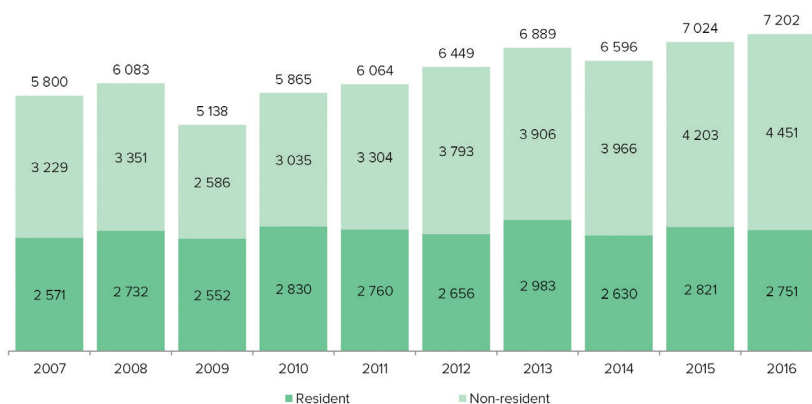
Only designs that are found to be both new and distinctive are protected in Australia. Examples of Australian registered designs include the Sand Wedge beach chair, Speedo's Fastskin swimsuit, and the shape of the Holden Monaro.

**Design right applications:** IP Australia received 7202 applications for registered designs in 2016, which was the highest on record and a three per cent increase on filings in 2015. This figure is in line with recent growth in designs filings in Australia; the average rate of growth in filings over the last five years was also three per cent.

Non-residents filed 62 per cent of design applications in 2016, which is the highest proportion over the last 10 years (which have ranged from 50 to 60 per cent of total applications during this period). Of applications from Australian residents, approximately 90 per cent were filed by private applicants and SMES.<sup>10</sup>



Figure 9: Design right applications by origin, 2007-2016



The latest data from WIPO shows a global increase in applications for industrial designs of two per cent from 2014 to 2015.<sup>11</sup> As with the Australian figures, world filings have fluctuated over the last five years, with world filings peaking in 2013. The general trend has been upwards over the last 10 years with an average world growth rate of eight per cent per annum.

#### Box 1: The Hague Agreement on international designs – cost and benefits to Australia

The Hague Agreement is an international system for filing design rights administered by WIPO with over 60 signatories that allows for a streamlined application system. In 2015 the Government accepted a recommendation, by the Advisory Council on IP (ACIP),<sup>1</sup> for IP Australia to undertake a cost-benefit analysis of joining the Hague Agreement.<sup>2</sup> In its inquiry, the Productivity Commission noted this intent to undertake a cost-benefit analysis as a “positive step”, and noted that IP Australia would complete this analysis in 2017.<sup>3</sup>

We have completed a draft of this cost-benefit analysis and will look to share the draft and seek feedback on the research later in 2017.

<sup>1</sup> ACIP. 2015. *Review of the Design System*. Canberra: ACIP, recommendation 2 [accessed 1/3/17] [https://www.ipaustralia.gov.au/sites/g/files/net856/f/acip\\_designs\\_final\\_report.pdf](https://www.ipaustralia.gov.au/sites/g/files/net856/f/acip_designs_final_report.pdf)

<sup>2</sup> Government response to ACIP review available at [https://www.ipaustralia.gov.au/sites/g/files/net856/f/government\\_response\\_-\\_acip\\_designs\\_review\\_-\\_final\\_pdf.pdf](https://www.ipaustralia.gov.au/sites/g/files/net856/f/government_response_-_acip_designs_review_-_final_pdf.pdf) [accessed 1/3/17]

<sup>3</sup> PC. 2016. *Intellectual Property Arrangements*. Canberra: PC; p. 331 & p. 354 [accessed 1/3/17] <http://www.pc.gov.au/inquiries/completed/intellectual-property/report/intellectual-property.pdf>

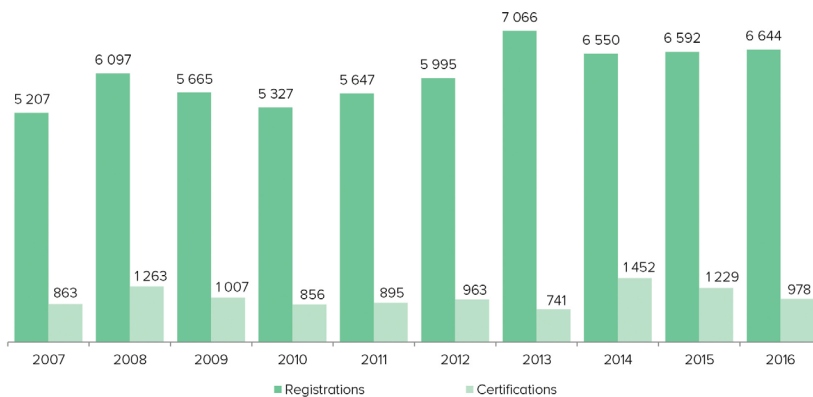


**Applicant origin:** Design right applications by non-residents increased by six per cent in 2016, in contrast with a two per cent decline in applications by Australian residents. The US remained the largest source of non-resident applications, with 39 per cent of non-resident applications and 24 per cent of all applications.

Japan, China, the UK and Germany accounted for 18 per cent of all applications, with five per cent originating in Japan and China and four per cent in the UK and Germany.

**Enforceable design rights:** A design right is only enforceable if, after registration, the design is examined and certified by IP Australia. The owner of a certified design has exclusive rights to use, license and/or commercialise the design for up to 10 years. Applicants do not usually opt for voluntary examination of design rights; often being comfortable with the shielding effect of a registration until there is a need to enforce their design right. The data consistently shows a lower number of certifications relative to registrations of design rights. In 2016, IP Australia registered 6644 applications and certified 978 designs.

Figure 10: Design right registrations and certifications, 2007-2016



# 5 PLANT BREEDER'S RIGHTS

Plant breeder's rights (PBRs) are used to protect new varieties of plants that are distinguishable, uniform and stable. Examples of PBRs in Australia include water-efficient wheat and bullseye lettuce. As well as meeting a set of criteria to pass examination, a PBR must also:

- be distinct from other varieties of the same plant
- be uniform and stable
- not have been exploited or sold outside certain time limits
- have an identified breeder and an acceptable name.

A PBR gives the owner exclusive rights to exclude others from commercially using or selling a variety. This provides the

opportunity for the right holder to collect royalties while directing the production, sale and distribution of varieties. Other plant breeders can freely use parts of a registered PBR to experiment with, use non-commercially or develop a new variety for commercial use.

**PBR applications:** The number of PBR applications received in Australia increased by eight per cent in 2016, from 359 to 387 applications. This growth was driven by a 22 per cent increase in applications by non-residents. Australian resident applications decreased by 16 from 2015, and as a result, the share of PBR applications by Australian residents decreased to 36 per cent of the total.

The majority of Australian residents who apply for PBRs are SMEs who are responsible for half



Triticale (X Triticosecale.)

**Variety:** Cartwheel

**Breeder's code:** AT674

**Application no:** 2015/337

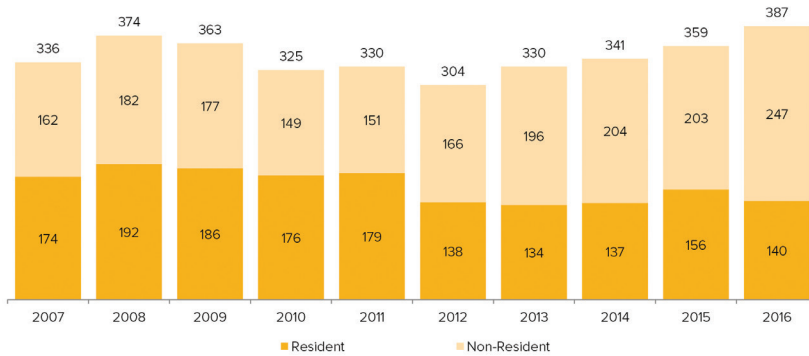
**Received:** 07 Dec 2015

**Accepted:** 18 Jan 2016

**Title Holder:**  
The University of Sydney, and  
Grains Research and  
Development Corporation

of Australian resident applications, while private applicants and large firms historically file a quarter each of the remaining applications. In 2016 that pattern appears to be repeated, with SMEs and private applicants accounting for approximately three quarters of total resident applications.<sup>12</sup>

**Figure 11: PBR applications by origin, 2007-2016**

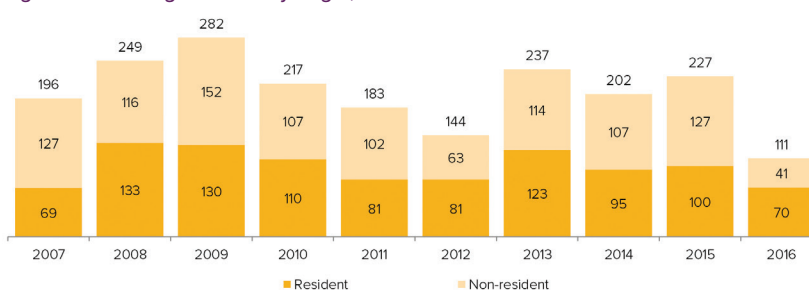


The US remains the largest non-resident origin of PBR applications, maintaining a steady share of 21 percent of applications in 2016. The other top non-resident filers were the Netherlands, New Zealand, France, UK and Germany, which is similar to 2015.

**PBR registrations:** IP Australia registered 111 PBRs in 2016, a decrease of 51 per cent compared to 2015. It is important to note that there should not be any correlation between filings in a year and registrations in the same year as most applications take more than 12 months to register. A reduction in the number of staff at IP Australia who can register PBRs in 2016 accounts for the fall in registrations per se, but the examination processes prior to grant continued as in previous years, and where applicants wanted registration to be expedited they were advanced to registration if they met the requirements for registration.

Australian resident and non-resident registrations decreased by 30 per cent and 68 per cent respectively. The largest numbers of non-resident registrations were from the US and Netherlands, together accounting for 70 per cent of non-resident registrations.

**Figure 12: PBR registrations by origin, 2007-2016**



**Plant varieties:** The development of plant varieties was largely in ornamentals and fruit crops which made up 35 per cent and 25 per cent, respectively, of total applications in 2016. Field crops and vegetable crops accounted for 19 per cent and nine per cent of PBR applications in 2016.

# 6 UNIVERSITY-INDUSTRY COLLABORATION, NOT A CRISIS

The general consensus is that Australia has a problem with collaboration between the business and research sectors.<sup>13</sup> The evidence for this comes from an often cited Organisation for Economic Co-operation and Development (OECD) statistic which measures how often innovative firms collaborate with publicly funded research organisations. On the OECD measure, Australia ranks last among OECD countries.<sup>14</sup> But using data on technology collaboration, where universities have co-filed an application for a patent or other IP right shows a different, and more collaborative, picture of Australia.

The accepted consensus sprung from a single Australian data-point: A survey used by the OECD where the Australian Bureau of Statistics asked innovative firms in 2013 how often they collaborate with research organisations. It is this single surveyed datum that we use to compare ourselves to other OECD countries.<sup>15</sup> It may be that, in a country with a small number of universities and a relatively large number of firms, asking those firms how often they collaborated with a university is likely to under-estimate the totals. There are other issues with this measure, which others have critiqued.<sup>16</sup>

We have sought to turn this question around, and ask the universities how often they collaborate. Rather than undertake a survey, we used IPGOD and our technology-level experts to look at jointly filed IP applications.

**Number:** 2013365699

**Patent application type :** Standard

**Application status:** GRANTED

**Paid to date:** 2017-12-18

**Invention title:** Method of producing polyhydroxyalkanoate compounded plastics having improved mechanical properties

**Applicant:** Veolia Water Solutions And Technologies Support and University of Queensland

There is an important policy motivation for undertaking this data-driven work. If it were to be the case that Australian universities are actively collaborating, then additional pressure to do more is likely to have disappointing returns: the universities may have already reached capacity. The economists would argue there are diminishing returns if this were to be the case.<sup>17</sup>

The Australian Government has an established policy interest in collaboration between industry and the research sector, as such collaboration has been found to more than triple the likelihood of businesses reporting annual productivity growth and increases in other performance measures.<sup>18</sup> That said, the evidence base regarding causal links between collaboration and productivity is still weak, and so it is vital to encourage an evidence-driven debate.

### **The Australian network of collaboration**

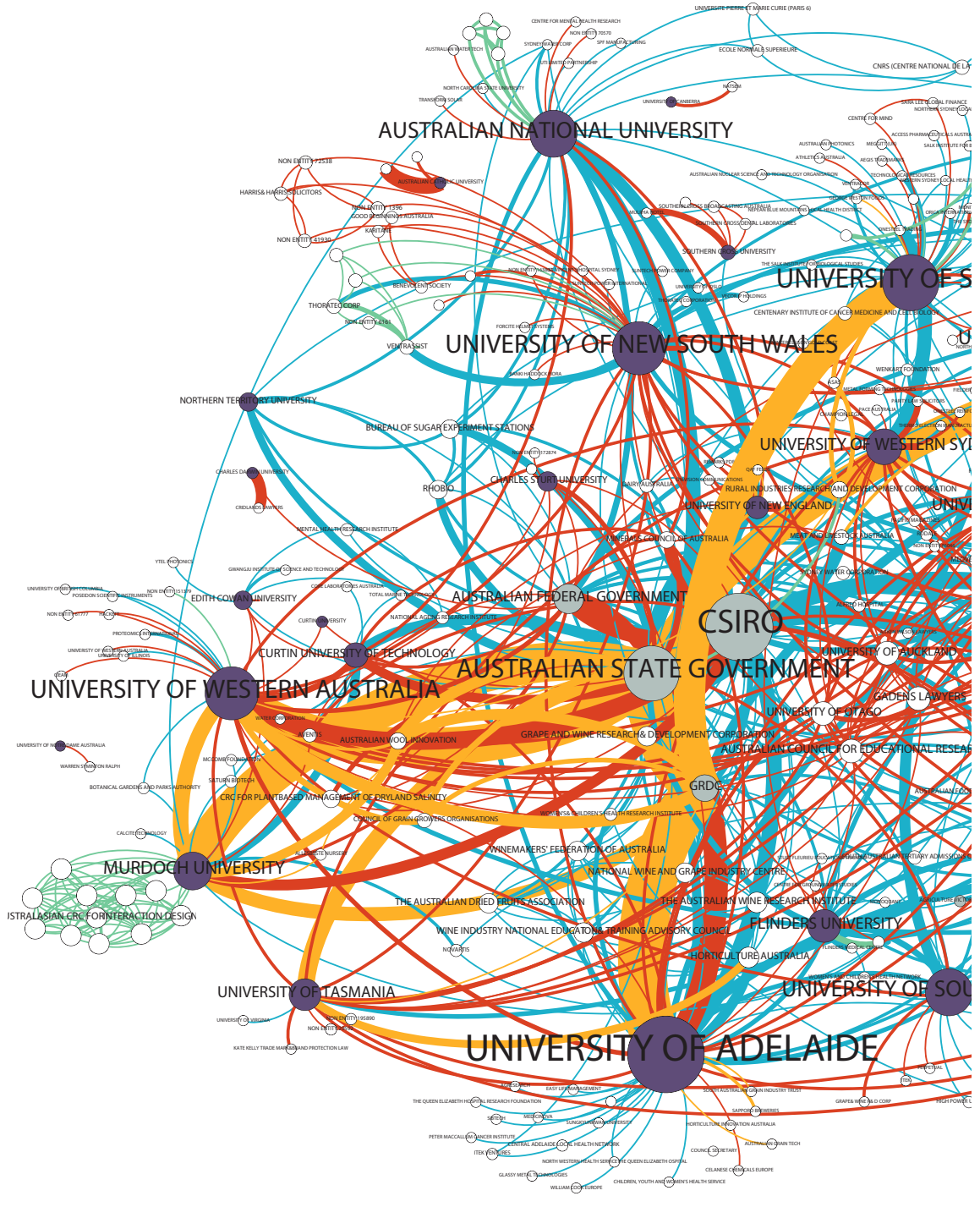
All IP rights are statements that their applicants wish to protect an idea they have developed. When a university files a patent application together with a private sector company, it implies there has been some collaborative effort - in funding, development, marketing or some other mechanism - because both parties will become registered claimants to the IP. Using IPGOD we can identify all applications co-filed with Australian universities, as the data identifies universities and tech transfer offices, allowing us to map out their collaborative IP rights.

Looking at the last 15 years of records we find every university in Australia undertook at least one collaborative IP application. They collaborated with more than 400 organisations over this period, connecting 2212 times with each other across 1037 connections, and many collaborative arrangements feature more than one collaboration partner.

Figure 13 shows the university collaboration network in Australia, including all IP rights filed by universities with a third party between 2000 and 2015. The circles in the figure, or “nodes”, represent entities. Universities are highlighted as purple, government collaborators, such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO) are grey, while all private sector and third party co-applicants are white. The size of the bubble indicates the number of IP rights co-filed by the entity.

The lines which connect the nodes are called “edges”, and represent a joint application for an IP right. Patents are indicated as blue lines, trade marks are red, design rights green and plant breeder’s rights are yellow. The thickness of the edge indicates the number of joint applications between a university and their partner, with the thinnest line indicating one joint application. Where multiple types of IP rights have been filed in the course of collaboration, the colour reflects the IP right most frequently filed. Figure 13 demonstrates a remarkably active collaborative university ecosystem in Australia.

Figure 13: Australian University Collaboration through co-filed IP applications, 2000-2015



Legend: IP right by colour

- Patents
- Trade marks
- Designs
- Plant breeder's rights

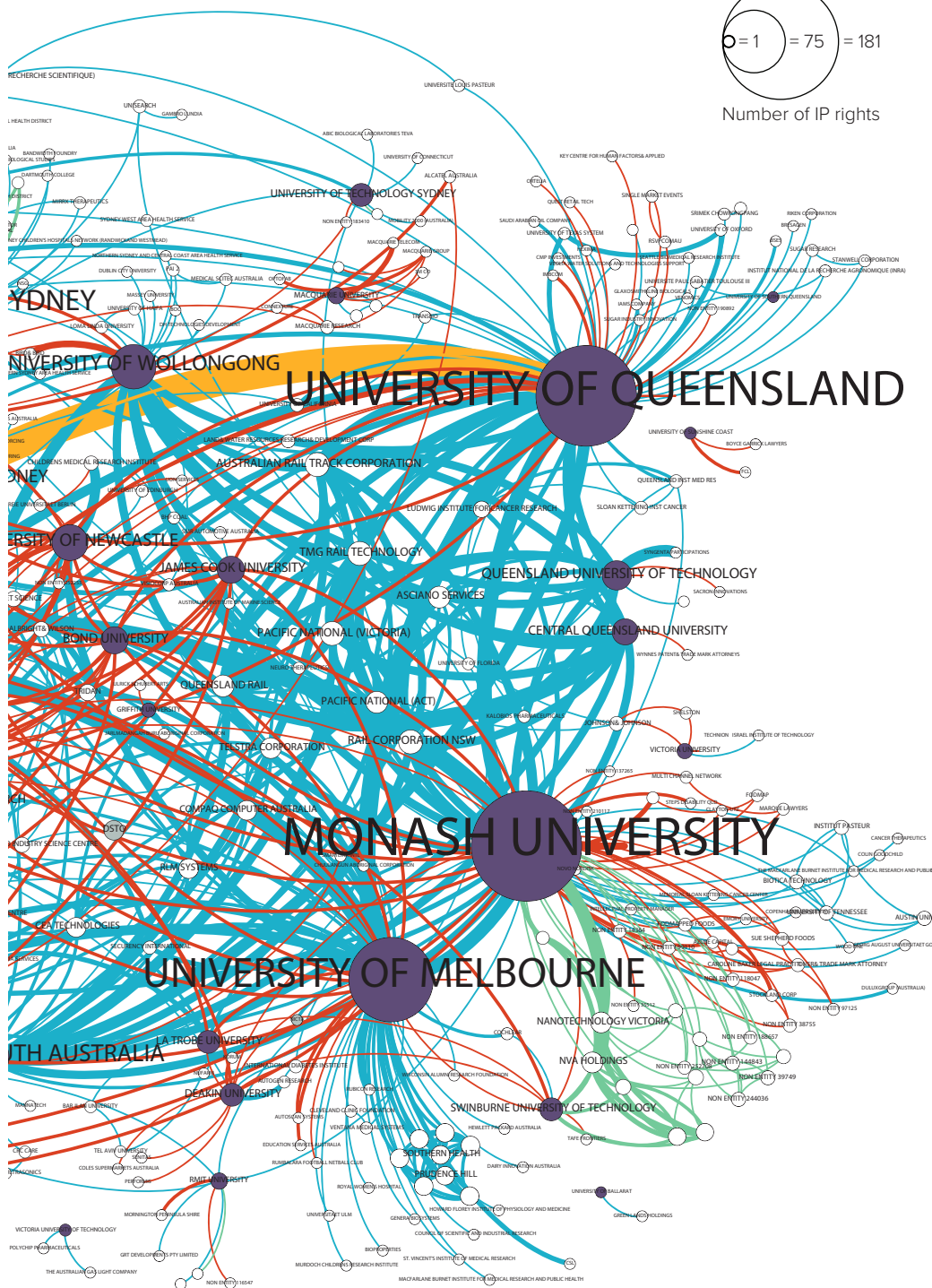
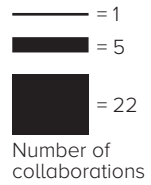
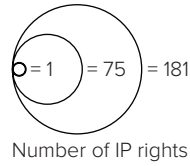






Figure 15: Trade mark collaboration by Australian universities, 2000-2015

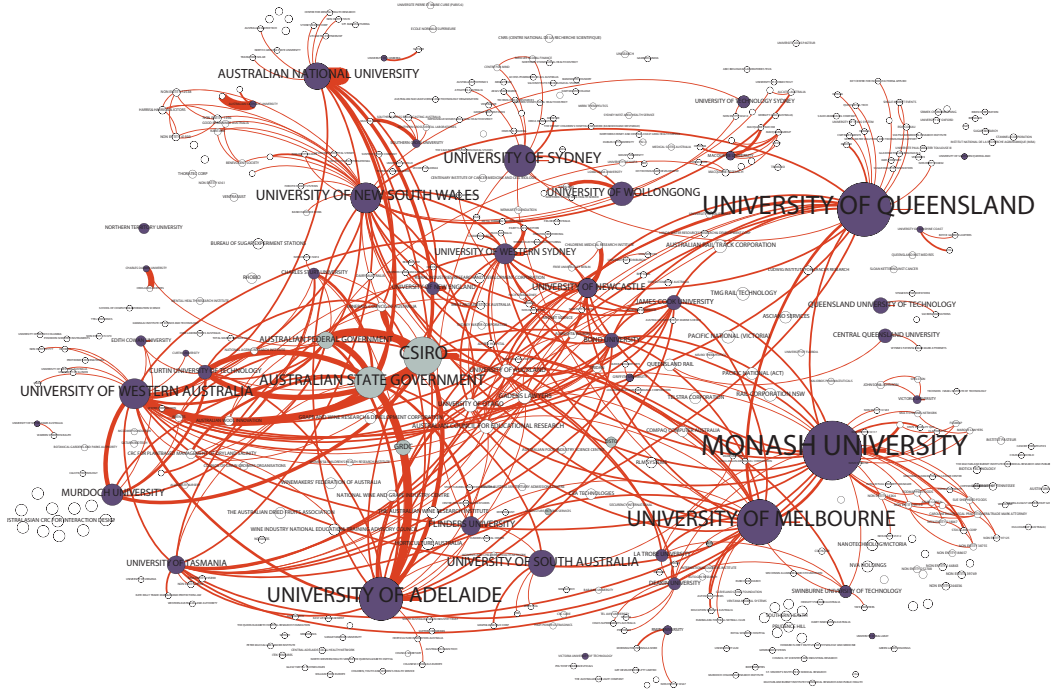
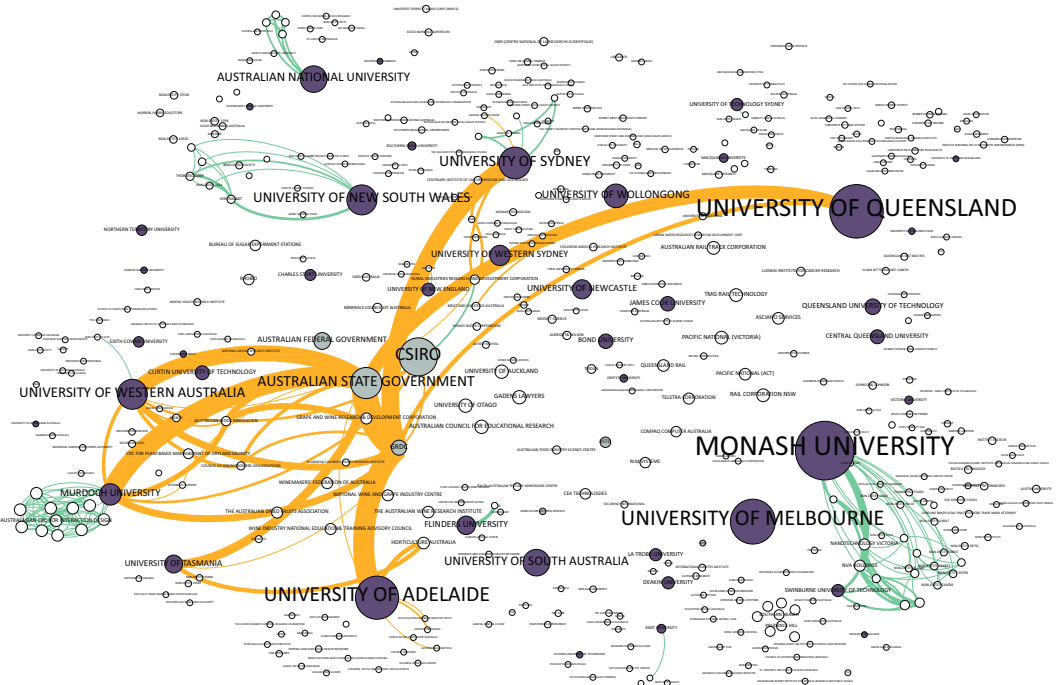


Figure 16: PBR and design collaboration by Australian universities, 2000-2015



A few other things become apparent in mapping the Australian collaboration networks. Firstly, there is a substantial evidence of successful collaboration with Government entities. The CSIRO is one of the biggest patent applicants in Australia, and it is not surprising to see it has at least 10 patent connections to universities. Secondly, there is a very active set of links between universities. The large IP filers in the Eastern part of the network - Universities of Queensland and Melbourne and Monash University are connected to between 17 and 20 other universities.

There is prior evidence that Australian Research organisations are highly collaborative with other universities: Australia ranks 7th out of 37 OECD+ countries in the share of the world's top one per cent of highly cited publications attributed to international collaboration.<sup>19</sup> These network diagrams present new evidence that this translates into IP collaboration, and that there is much more to the collaboration of universities than the OECD statistics and surveys suggest.

There is a very varied set of collaborative activity between universities and private industry. Some universities have whole clusters of their own collaboration partners, while others work with firms that partner with multiple universities. The University of Queensland, as one of the largest collaborators, appears to do both of these things with links to entities as diverse as GlaxoSmithKline Biologicals, Queensland Rail and Veolia Water Solutions, most of which have multiple collaboration partners in the Eastern part of the network.

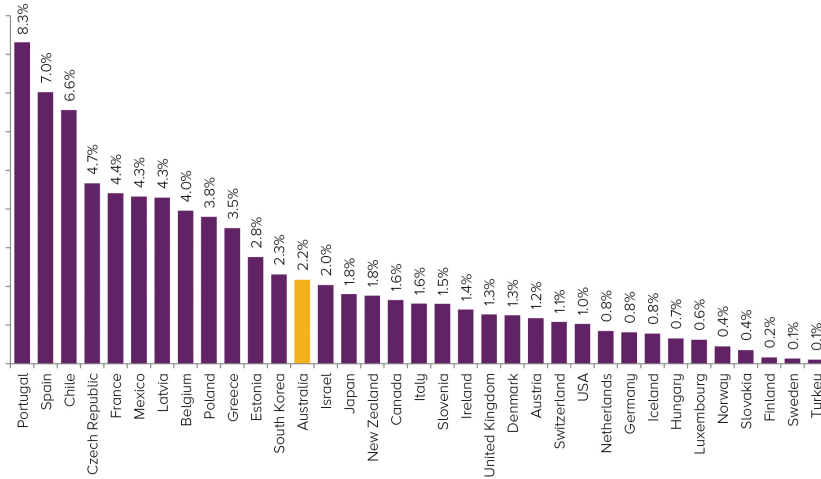
### **The international comparison — Australia is above average**

These network maps provide an indication of active collaboration by universities, however, it is important to have international comparisons. Rather than rely on survey data, the Patent Analytics Hub at IP Australia looked at patent applications filed through the international patent application route - the Patent Cooperation Treaty (PCT) route - and counted the number of applications co-filed by universities and industry collaborators.<sup>20</sup>

Patent data has the advantage of being consistently collected and available across countries. But patent data only measures a specific type of collaboration, and other forms of knowledge transfer (or links between entities) are not represented and hence this measure underestimates the total interactions.

The available data indicates what type of applicant is listed on a PCT application, so we can focus on patents filed by a university and a collaborator. Figure 17 shows the number of university-industry PCT applications filed between 2000 and 2015 as a percentage of all PCT applications filed from a country. Australia ranks 13 among the 35 countries as make up 2.2 per cent of PCT applications, well ahead of other OECD countries such as the US, UK and Germany.

Figure 17: University industry collaboration share of all PCT applications originating in an OECD country, 2000-2015



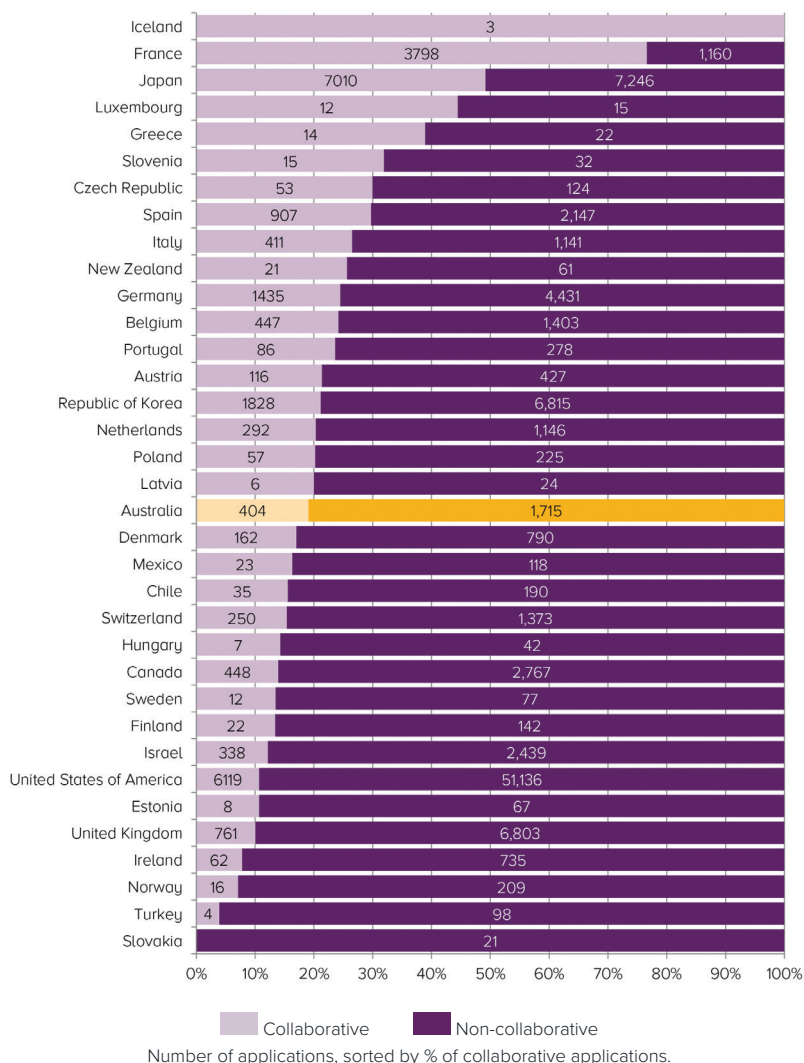
While Australia is not in the top 10, our position in 13th suggests a different story from the standard one which places Australia at the bottom of the OECD for collaboration. When we break the data down into five-year periods for 2000-05, 2005-10 and 2010-15 this result is relatively stable with Australia ranked 13th, 14th, and 13th in the OECD, with 2.1 per cent to 2.2 per cent of PCT applications co-filed by universities and industry collaborators. This suggests Australia’s universities are on par with Israel and South Korea for collaboration that leads to international patent applications.

When we analyse how many PCT filings originate from universities we find that 21 per cent of applications from Australia were collaborative. Figure 18 shows the absolute number of university PCT applications filed between 2000 and 2015 and breaks them down by whether they are collaborative applications or not. Australia’s universities rank 19 among all 35 OECD countries in terms of the proportion of PCT applications that are collaborative, placing us between Latvia and Denmark in percentage terms of PCT applications that are collaborative.

While this is a middle-of-the-road outcome, the absolute number of applications from Australian universities is 2119, which places Australian universities in the top ten for the number of PCT applications filed by universities. This suggests that not only are Australian universities a major filer of PCT applications, but they are filing international applications in collaboration.

Given that Australia files very few patents through the PCT route on a per capita basis, this emphasises the point that universities are very active in the IP and the collaboration space and are very important to Australian innovation. The majority of collaboration takes place with other Australian entities, while international collaboration most frequent with the US, Switzerland, Japan, the UK and France.<sup>21</sup>

Figure 18: University PCT applications: collaborative and non-collaborative filings, 2000-2015



The above figures demonstrate the importance of a reliable evidence base for university-industry collaboration policy. There is a rich vein of data to be analysed in the IP space that can inform wide-ranging policy insights. Hopefully this analysis can contribute to more effective approaches to optimising university-industry collaboration.

This chapter is part of a larger piece of work which the Office of the Chief Economist at IP Australia is undertaking to understand the nature of university–industry collaboration in the IP space. The Office of the Chief Economist is engaged in a research project to investigate whether grants provided by

research institutions have an effect on patenting productivity, if they are collaborative grants. Initial results suggest there is a difference in the patenting impact of collaborative grants issued by the National Health & Medical Research Council and Australian Research Council, and we discuss this further in a forthcoming research paper.

**Box 2: New research outputs: Geographical Indications Database**

Ensuring that Darjeeling Tea is in fact from the Himalayan foothills, or that Barossa wines are from South Australia, is the aim of geographical indication protection. In Australia the system is managed through the granting of certification trade marks for applicants wanting to protect a geographical aspect of their brand, and by the Australian Wine and Grape Authority for wines. Unfortunately, data on the use of geographical terms in the trade mark registry is not easily available.

To address this, IP Australia's Office of the Chief Economist worked with the University of Melbourne to develop a database that would link the trade mark registry to a global atlas of place-names, to encourage research in this space. That project has been completed, and IP Australia will look to launch this new geo-term database later in 2017.

The database will include all Australian trade marks, linked to a complete atlas of Australia, and also a range of other countries including European and North American geography. This world-first data resource will allow researchers to investigate the use of domestic and international geo-terms in Australian trade marks. Early data suggests geo-terms are frequently used in trade mark applications, but their links to products, revenue or geographical claims are not known.

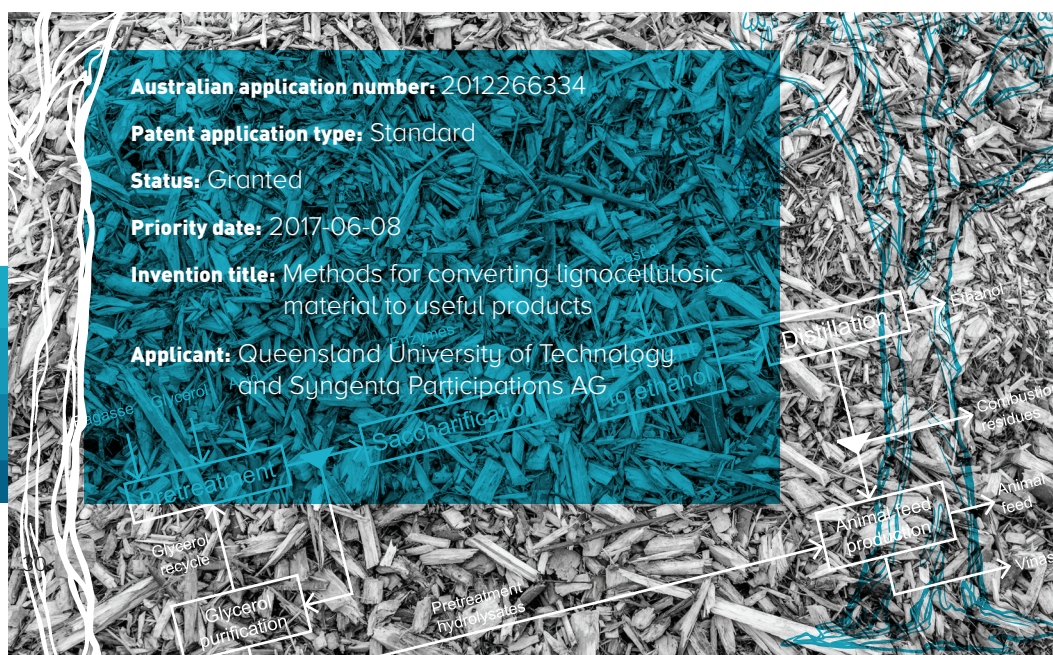
# 7 THE PRODUCTIVITY COMMISSION'S INQUIRY INTO IP

On 18 August 2015, the Australian Government asked the Productivity Commission<sup>22</sup> (PC) to undertake an inquiry into Australia's intellectual property (IP) arrangements, delivering on a key recommendation from the Competition Policy Review.<sup>23</sup> The inquiry included extensive public consultation,<sup>24</sup> with the final inquiry report publicly released on 20 December 2016.

The Government called for this inquiry to ensure that the IP system provides appropriate incentives for innovation, investment and the production of creative works while ensuring it does not unreasonably impede further innovation, competition, investment and access to goods and services.<sup>25</sup> IP arrangements have been, and continue to be, affected by a

number of developments, including the rise of cloud computing, the internet, digitisation, and globalisation including the increasingly specialised nature of production chains.<sup>26</sup> While there has been a number of reviews of IP in Australia in recent years, they have focused on specific areas of IP, such as innovation patents, pharmaceutical patents, design protection, and copyright. It has been over 15 years since the last comprehensive review of Australia's IP system, back when the internet was considered a new technology.<sup>27</sup>

The IP system provides a framework to encourage, reward and protect innovation and creativity. A well-functioning and effective IP system is important to underpin Australia's innovation, trade and investment efforts. For example, the globalisation of value chains means that Australian brands, designs and inventions have the opportunity to play a growing role in the global



economy. For Australia, predicted to remain the 13th largest economy in the world in 2017,<sup>28</sup> having access to the latest technology and developing cutting-edge innovation relies on a world-class system for IP protection.

In its report the PC recognises the importance of IP in today's economy. IP arrangements are a fundamental part of Australia's innovation ecosystem, helping to underpin growth, jobs, and investment, and supporting the Government's national innovation and science agenda.<sup>29</sup> IP rights provide economic and social value by making innovation and creative output available to the broader community, fostering further innovation and creativity. There is the need for the protection provided by IP rights to be appropriately balanced with the broader needs of the community. Australia's IP arrangements affect community welfare through their impact on productivity growth and national income.<sup>30</sup> At the same time, there are potential risks to shifting the balance of the IP system so that incentives are weakened, including acting as a barrier to Australia capitalising on future economic opportunities.

In conducting its inquiry, the PC developed an economic analytical framework for assessing the IP system, with the overarching objective of maximising the wellbeing of all Australians. The framework uses four principles as a basis for a balanced and well-functioning IP system. These principles are:

- effectiveness—that the IP system encourages the creation and dissemination of valuable ideas that would not have occurred in the absence of the system
- efficiency—that ideas are generated by the most efficient, lowest-cost creators, traded freely, and do not unduly impede competition
- adaptability—that the IP system adapts to changes in technology, markets and economic conditions
- accountability—that changes to the IP system are transparent, evidence-based and reflect community values.

This framework is the lens that the PC used to assess, and make recommendations to improve, the IP system. The inquiry report has identified some specific areas that could be improved, and found that the system needs rebalancing toward consumers. Australia's IP system is held in high regard by a number of international comparisons,<sup>31</sup> but the inquiry found that Australia may have gone further than is warranted. The PC suggested a series of changes to the IP system, and supported an evidence-based approach to those reforms. The report was supportive of Australian Government efforts to reduce transaction costs for parties using IP rights in multiple jurisdictions.

In addition to recommendations on the copyright system, recommendations related to the IP rights administered by IP Australia include:

- creating an objects clause in the Patents Act to specify the broad objectives of the Act
- raising the inventiveness threshold for patents
- reconfiguring extensions of term for pharmaceutical patents
- restructuring patent fees
- abolishing the innovation patent system
- making it easier to challenge trade marks for non-use
- increasing the scope of essentially-derived variety declarations for plant breeder's rights.

The PC also made a number of broader ranging recommendations, which include:

- introducing a specialist IP list within the Federal Circuit Court to provide a timely and low cost option for resolving IP disputes
- removing the competition law exemption from commercial transactions involving IP rights
- improving institutional arrangements to provide a more coherent and balanced approach to IP policy development and advice
- focusing international IP engagement on reducing transaction costs and encouraging more balanced policy arrangements for patents and copyright.

The inquiry report is a report to government. The Government is considering the report's recommendations, including further consultation with stakeholders, prior to a response in mid-2017.



# 8

## RESEARCH PROGRAM

IP Australia set up the Office of the Chief Economist (OCE) in November 2012. Since then it has grown from its focus on economic research to include the open data program and the Patent Analytics Hub which provides services to Government agencies and research organisations. This year the OCE organised the international IP Statistics for Decision Makers (IPSDM) conference in Sydney which brought together researchers, practitioners and policy makers to discuss and hear about the latest global evidence on IP.

Our focus as an office is to provide empirical research and data to support policy advice and operational decision-making at IP Australia. The opportunity to host the international IPSDM conference

allowed us to collaborate with practitioners and academics from across the globe on evidence to inform effective policy. Over the coming year the OCE will deliver a number of projects and will also seek to engage more actively with the IP community with increased consultation on the research program and data priorities.

### Data

Last year we released new data products, with IP Government Open Live Data (IPGOLD) now providing a weekly snapshot of IP Australia's administrative data.<sup>32</sup> We also launched IP NOVA in a beta version (see Box 3 on page 35). IP NOVA is an exploratory tool that allows anyone to utilise IPGOLD and explore data in an easy and intuitive way.

**Number:** 1245507

**Words:** RAPID-GRASS EROSION CONTROL

**Status:** Registered/Protected

**Priority date:** 11 Jun 2008 (Lodgement)

**Class:** 31

**Kind:** Word, Device

**Owner:** Central Queensland University  
and QR (Queensland Rail) Ltd



In conjunction with the IP Report we are releasing the IPGOD 2017 dataset on data.gov.au. The data follows the same structures as in previous years, but with updated documentation, better data on attorneys, representatives and applicants, as well as additional data as requested by users of the data via twitter (@IPAustralia\_OCE) or e-mail.

In 2017 we will also launch two new data products: a database of pharmaceutical substances as recorded on patent term extension applications, and patent numbers with links to public Pharmaceutical Benefits Scheme expenditure data. A new database of Geographical Terms in trade marks has also been finalised, and we are looking to launch that in the second half of 2017.

Finally, we were successful in receiving an Australian Research Council collaborative Linkage grant with the University of Melbourne and Swinburne University of Technology to build a global database of trade marks. This world-first resource is in development, and we welcome interest from those who may wish to test the database. At present it includes beta links between the US, New Zealand and Australian trade mark registries, and is set to include European Union Intellectual Property Office (IPO), United Kingdom IPO and Canadian IPO data by mid-2017.

## **Research**

Over the past year, the economic research program has been focussed on policy priorities, with input to the PC inquiry at the top of the agenda. In addition to work on the Hague agreement (as noted in Box 1 on page 16), the OCE finalised a piece of research on the impact that patent expiry has on pharmaceutical usage, in terms of scripts issued and expenditure, which we will publish as a research paper towards the middle of 2017.

The OCE also commissioned research over the past year, including a study by the University of California, Davis on patent grace periods which included a literature review and modelling to assist in testing how grace periods might affect innovation.<sup>33</sup> In addition, work analysing patent examination was undertaken by Queensland University of Technology.<sup>34</sup>

Looking forward, there is ongoing work to investigate the impact that collaborative grants have on the patent productivity of universities, as well as operational research to complete work on trade mark forecasting, and we hope to further explore the links between R&D and patenting in Australia.

## **Patent Analytics**

The Patent Analytics Hub published four reports in 2016, and produced them in a new fully digitally native form.<sup>35</sup> Reports on the patenting of the Australian research sector<sup>36</sup> and Australian textiles, clothing and footwear industry were completed for the Department of Industry Innovation and Science.<sup>37</sup> The Patent Analytics Hub was a finalist in the 2016 Public Sector Innovation Awards having beaten more than 80 other entries to the shortlist.

In 2017 the Hub will continue to focus on delivering analytics reports to publicly funded research organisations and government departments, which continue to use the services offered to make policy decisions.

The aim of IP Australia's program of economic analysis and research is ultimately to evaluate the economic impact of various components of the IP system, in order to assist evidence-based operational and policy decisions within IP Australia and other Commonwealth agencies. IP Australia's research procurement plan is published annually, with any new projects announced through our reporting structures. Academics and service providers who would like to be updated on research tenders should e-mail us via [ipreport@ipaaustralia.gov.au](mailto:ipreport@ipaaustralia.gov.au) while data requests should be sent to [ipgod@ipaaustralia.gov.au](mailto:ipgod@ipaaustralia.gov.au) or follow us on twitter (@IPAustralia\_OCE) and visit us online at [www.ipaustralia.gov.au/economics](http://www.ipaustralia.gov.au/economics).

**Box 3: IP NOVA**

IP NOVA is a new tool, available free on-line at [ipnova.ipaustralia.gov.au](http://ipnova.ipaustralia.gov.au) which makes it possible to explore our IP data and look for inventions, brands and plants that have been filed with IP Australia.

IP NOVA allows anyone to search the complete patent, trade mark and plant breeder's right registries, which is updated every week, and look for:

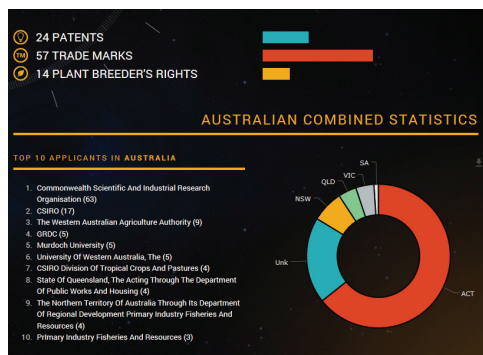
- locations, be they regions, cities, electorates or areas
- applicants, as the data is organised and cleaned by applicant information
- general terms, and suggested terms
- technology classes
- instant statistics, breakdowns of trends and download of the search result.

It is an exploratory tool where anyone can have a look for what is happening in Geelong, who is filing rights related to autonomous vehicles, or what IP Rights CSIRO has, to mention a few examples.

Searching for IP in Geelong



Looking at the CSIRO portfolio



## END NOTES

<sup>1</sup> Pharmaceutical substances which have experienced a delay in market approval can receive patent extensions, granting up to 25 years protection.

<sup>2</sup> This relates to standard patent applications filed in 2016 by Australian applicants. This is an estimate based on Australian Business Number matching produced in IPGOD 2016 with the latest data, and as such remains an estimate. SMEs are defined by the Australian Bureau of Statistics as companies with fewer than 200 employees.

<sup>3</sup> See WIPO press release PR/2016/802 available at [http://www.wipo.int/pressroom/en/articles/2016/article\\_0017.html](http://www.wipo.int/pressroom/en/articles/2016/article_0017.html) [Accessed on 13/1/17]

<sup>4</sup> WIPO IP Statistics Data Centre (Jan. 2017 update); Indicator 1: “Total patent applications (direct and PCT national phase entry)”; <http://ipstats.wipo.int/ipstatv2/index.htm>

<sup>5</sup> The Patent Cooperation Treaty (PCT) is an international patent law treaty with 152 parties providing a single route for patent applicants to lodge an application with its members.

<sup>6</sup> This relates to trade mark applications filed in 2016 by Australian applicants. This is an estimate based on Australian Business Number matching produced in IPGOD 2016 with the latest data, and as such remains an estimate. SMEs are defined by the Australian Bureau of Statistics as companies with fewer than 200 employees

<sup>7</sup> Table 3: Share of trade mark applications by residents; sorted by type of applicant.

	SME	Private applicant	Large firm
2006	66%	28%	6%
2007	67%	27%	6%
2008	67%	27%	6%
2009	67%	28%	5%
2010	67%	27%	6%
2011	69%	26%	5%
2012	68%	27%	5%
2013	70%	26%	4%
2014	68%	28%	4%
2015	69%	28%	3%

Source: *Australian IP Report 2016*, figure 16 <https://www.ipaustralia.gov.au/ip-report-2016> [accessed 31/1/17]

<sup>8</sup> See WIPO press release PR/2016/802 available at [http://www.wipo.int/pressroom/en/articles/2016/article\\_0017.html](http://www.wipo.int/pressroom/en/articles/2016/article_0017.html)[Accessed on 31/1/17]

<sup>9</sup> The data available from WIPO at the time of preparation of this report shows 925 applications filed by Australian residents in China in 2015, compared with 2 919 in 2014. The WIPO figures are a combination of Madrid filings and national filings, and WIPO informed us that the Chinese office had not provided the national application data by country of origin as of March 2017. Filings by Australians abroad, excluding China, grew by 10 per cent in 2015, compared to 2014. The Chinese trade mark office did provide the relevant data by classes filed, which is what we report.

The incomplete data is: WIPO IP Statistics Data Centre (Jan. 2017 update); Indicator 1: Total trademark applications (direct and via the Madrid system); <http://ipstats.wipo.int/ipstatv2/index.htm> [accessed 15/3/17]

The class data source is: WIPO IP Statistics Data Centre (Feb. 2017 update) Indicator: 3 - Total applications by class (direct and via the Madrid system); <http://ipstats.wipo.int/ipstatv2/index.htm> [accessed 15/3/17]

The changed methodology means the whole series of trade mark data is different. Prior to May 2016, the WIPO figures reflected the year in which the International Bureau of WIPO received the applications in question; from May 2016, the year recorded in the WIPO data is the year recorded by the office of origin (Private correspondence with Economics and Statistics Division, WIPO). The change in methodology means we now observe a fall in Australian filings abroad in 2008 and 2009, which appears to be isolated to the GFC.

<sup>10</sup> This relates to design right applications filed in 2016 by Australian applicants. This is an estimate based on Australian Business Number matching produced in IPGOD 2016 with the latest data, and as such remains an estimate. SMEs are defined by the Australian Bureau of Statistics as companies with fewer than 200 employees.

<sup>11</sup> WIPO IP Statistics Data Centre (Jan. 2017 update); Indicator 1: Total design applications (direct and via the Hague system); <http://ipstats.wipo.int/ipstatv2/index.htm>

<sup>12</sup> This relates to PBR applications filed in 2016 by Australian applicants. This is an estimate based on Australian Business Number matching produced in IPGOD 2016 with the latest data, and as such remains an estimate. SMEs are defined by the Australian Bureau of Statistics as companies with fewer than 200 employees. For the historical data, refer to table 2 below:

Table 2: Share of Plant Breeder’s Right applications by residents, sorted by type of applicant.

	SME	Private applicant	Large firm
2006	46%	25%	29%
2007	48%	25%	27%
2008	48%	20%	32%
2009	50%	25%	25%
2010	60%	23%	17%
2011	39%	29%	33%
2012	56%	16%	28%
2013	58%	23%	19%
2014	50%	28%	22%
2015	46%	30%	24%

Source: *Australian IP Report 2016*, figure 16 <https://www.ipaustralia.gov.au/ip-report-2016> [accessed 31/1/17]

<sup>13</sup> See for example DIIS & DoE. 2014. *Boosting the Commercial Returns from Research*. Canberra: Department of Education [accessed 1/3/2017] <https://submissions.education.gov.au/Forms/higher-education-research/Documents/Boosting%20Commercial%20Returns%20from%20Research%20-%202024102014.pdf> and the Department of Industry Agenda [accessed 1/3/2017] <https://industry.gov.au/industry/IndustryInitiatives/Pages/Boosting-the-Commercial>Returns-from-Research.aspx>

Glyn Davis, then Vice-Chancellor of the University of Melbourne, set out a similar point in his article for the Conversation on 10/11/2015 “Poor Research-Industry collaboration: Time for blame or economic reality at work” <http://theconversation.com/poor-research-industry-collaboration-time-for-blame-or-economic-reality-at-work-50306> [accessed 15/3/17]

<sup>14</sup> OECD. 2013. Firms collaborating on innovation with higher education or public research institutions, by firm size, 2008-10, in OECD Science, Technology and Industry Scoreboard 2013, OECD Publishing, Paris. [accessed 26/2/17]

<sup>15</sup> This is neatly pointed out by the *Australian Innovation System Report 2016*: Department of Industry (2016) *Australian Innovation System Report — 2016*, p. 59 <https://industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/Australian-Innovation-System/2016-AIS-Report.pdf> [accessed 1/3/17]

<sup>16</sup> For example other countries count a three-year basis, may focus on innovation active companies, or have broader data collection than Australia, which provides a single data-point, which the OECD amends to standardise the definition of large firm.

<sup>17</sup> Economists would argue that there should be diminishing marginal returns from most activities, and so if universities are actively collaborating the marginal return from additional collaboration would be low, and we should expect it to be low.

<sup>18</sup> Department of Industry. 2014. *Australian Innovation System Report 2014*. Canberra: Department of Industry. <https://industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/Australian-Innovation-System/Australian-Innovation-System-Report-2014.pdf> [accessed 6/2/17] p. 126

<sup>19</sup> Department of Industry. 2016. *Australian Innovation System Report 2016*. Canberra: Department of Industry. <https://industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/Australian-Innovation-System/2016-AIS-Report.pdf> [accessed 6/2/17] p. 60

<sup>20</sup> We use Patent Cooperation Treaty (PCT) applications extracted from the Spring 2016 edition of the PATSTAT database published by the European Patent Office (EPO). This database contains all patent publications to the beginning of March 2016. In order to analyse the most relevant innovations, this study was conducted in the time period on or after 1 January 2000.

<sup>21</sup> Department of Industry & IP Australia. 2016. *A Patent Analytics Report on the Australian Research Sector*. Canberra: IP Australia [https://www.ipaustralia.gov.au/sites/g/files/net856f/research\\_sector\\_report.pdf](https://www.ipaustralia.gov.au/sites/g/files/net856f/research_sector_report.pdf) [accessed 27/2/17] Figure 13, page 19

<sup>22</sup> The Productivity Commission is the Australian Government's independent research and advisory body on economic and other matters.

<sup>23</sup> Competition Policy Review Final Report March 2015. The Harper Review highlighted that Australia has no overarching IP policy framework or objectives guiding changes to IP protection or approaches to IP rights in the context of negotiations for international trade agreements. <http://competitionpolicyreview.gov.au/final-report/> [accessed 22/2/17]

<sup>24</sup> Over 600 submissions, four roundtables, six public hearings and more than 800 research references.

<sup>25</sup> See the terms of reference to the PC inquiry into Australia's IP arrangements, available on pages iv-v of Productivity Commission. 2016. *Intellectual Property Arrangements*. Canberra: Productivity Commission. <http://www.pc.gov.au/inquiries/completed/intellectual-property/report/intellectual-property.pdf> [accessed 15/3/17]

<sup>26</sup> Productivity Commission. 2016. *Intellectual Property Arrangements*. Canberra: Productivity Commission. <http://www.pc.gov.au/inquiries/completed/intellectual-property/report/intellectual-property.pdf> [accessed 15/3/17] p. 70

<sup>27</sup> IP and Competition Review Committee. 2000. *Review of intellectual property legislation under the Competition Principles Agreement*. [https://www.ipaustralia.gov.au/sites/g/files/net856/f/ergas\\_report\\_september\\_2000.pdf](https://www.ipaustralia.gov.au/sites/g/files/net856/f/ergas_report_september_2000.pdf) [accessed 15/3/17] p.36

<sup>28</sup> <http://www.austrade.gov.au/International/Invest/Resources/Benchmark-Report> [Accessed 23/2/17]

<sup>29</sup> See <http://innovation.gov.au/> for information about the National Innovation & Science Agenda

<sup>30</sup> Productivity Commission. 2016. *Intellectual Property Arrangements*. Canberra: Productivity Commission. <http://www.pc.gov.au/inquiries/completed/intellectual-property/report/intellectual-property.pdf> [accessed 15/3/17] p. 52

<sup>31</sup> For example, Taylor Wessing 'Global Intellectual Property Index' (ranked 8th out of 43 jurisdictions); US Chamber of Commerce 'Global Intellectual Property Centre International IP Index' (ranked 8th out of 38 countries); and the Property Rights Alliance 'IP Rights Index' (ranked 13th out of 129 countries).

<sup>32</sup> Available on <https://data.gov.au/organization/ip-australia> [accessed 15/3/17]

<sup>33</sup> A follow-up paper was completed in February 2017, and will be published to complete the set of papers, titled "Amazing Grace". The model is available on [https://www.ipaustralia.gov.au/sites/g/files/net856/f/reports\\_publications/ip\\_aus\\_-\\_amazing\\_grace.pdf](https://www.ipaustralia.gov.au/sites/g/files/net856/f/reports_publications/ip_aus_-_amazing_grace.pdf) [accessed 1/3/17], and the Literature Review is available on [https://www.ipaustralia.gov.au/sites/g/files/net856/f/reports\\_publications/ip\\_aus\\_-\\_grace\\_period\\_literature\\_review.pdf](https://www.ipaustralia.gov.au/sites/g/files/net856/f/reports_publications/ip_aus_-_grace_period_literature_review.pdf) [accessed 1/3/17]

<sup>34</sup> The work considered patent examination as a credence good, where the buyer does not know the quality of the product until after it has been bought, which should provide some insights into the internal operations of the office. We will look to publish the work in 2017.

<sup>35</sup> <https://www.ipaustralia.gov.au/tools-resources/patent-analytics-hub> [accessed 2/3/17]

<sup>36</sup> <https://www.ipaustralia.gov.au/tools-resources/publications-reports/patent-analytics-report-australian-research-sector> [accessed 2/3/17]

<sup>37</sup> [https://www.ipaustralia.gov.au/sites/g/files/net856/f/an\\_intellectual\\_property\\_study\\_of\\_the\\_australian\\_tcf\\_industry.pdf](https://www.ipaustralia.gov.au/sites/g/files/net856/f/an_intellectual_property_study_of_the_australian_tcf_industry.pdf) [accessed 2/3/17]

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