



Australian Government  
IP Australia



Patents



Trade Marks



Designs



Plant Breeder's  
Rights

# AUSTRALIAN INTELLECTUAL PROPERTY REPORT 2022





# Enhancing access to innovation



## Welcome to the Australian IP Report 2022

I am pleased to introduce the 2022 Australian Intellectual Property (IP) Report.

Published annually, the IP Report presents the latest statistics on the use of registered IP rights in Australia and what that means in Australia's global economic context.

The latest IP trends illustrate how Australians have adapted to the change in our social and work environment during COVID-19. Demand has surged in pharmaceuticals patent filings, given the need for novel vaccines and treatments, as well as computer and audiovisual technology, as the economy has moved to a virtual model. Trade mark and design filings have grown for products that households invest in when upgrading their homes to create comfortable living and workspaces. The report shows how IP data can provide real-time insight into changing economic conditions.

For Australia to sustain its positive economic momentum, it is vital that all Australians can realise their innovation potential. This year's report presents evidence that IP activity is a significant forward indicator of employment growth for Australian small and medium enterprises (SMEs). The report highlights recent reforms to make the IP system more accessible for different users, and it finds that participation by SMEs in the IP system is increasing.

In 2022, the Australian IP Report is in its 10th edition. The report continues to provide a vital platform for discussing trends in the economy, the IP system's role, and the value of encouraging innovation to Australia's benefit.

Michael Schwager  
Director General, IP Australia



# CHAPTER 01

## Introduction



Change to the global economy has accelerated. The disruption caused by COVID-19 – to daily life, travel, business and health – goes beyond what can be captured in statistics, in gross domestic product (GDP), employment and trade. The crisis brought forward challenges, to adapt the way we live and work.

Intellectual property (IP) rights facilitate creativity, innovation and the diffusion of ideas. The Australian IP Report documents the latest developments in IP. Patents (Chapter 2) protect technological innovations, the outcomes of scientific and technical progress. Trade marks (Chapter 3) protect signs that indicate the origin of goods and services. Design rights (Chapter 4) protect new and distinctive visual forms of products.

Plant breeder's rights (PBRs) (Chapter 5) encourage investment in new varieties of plants. Copyright (Chapter 6) protects the expression of ideas founded in creative effort.

IP data provides an important lens across the state of the economy and how it is changing. In 2021, record numbers of patents, trade marks and designs were filed in Australia (See Table I1). Patent applications increased 11% on 2020, with filings from Australian residents up 25%. Trade mark applications grew 9%. Trade mark registrations rose 10%, driven by a 15% increase in resident filings. Design applications rose 13%, the steepest year-on-year growth this decade. Design certifications were up 38%. Applications for PBRs fell 6%, likely reflecting the continued impacts of drought, Australia's devastating bushfires in 2019–20, COVID-19 lockdowns and border closures.

Table I1. 2021 IP statistics at a glance

		Australia applicants			Overseas applicants			Total	
		Number	Share	Growth	Number	Share	Growth	Number	Growth
Patent	Filed	2,996	9%	+25%	29,401	91%	+9%	32,397	+11%
	Granted	1,092	6%	+13%	16,063	94%	-4%	17,155	-3%
Trade marks	Filed	53,339	60%	+3%	35,386	40%	+18%	88,725	+9%
	Registered	40,307	57%	+15%	30,300	43%	+4%	70,607	+10%
Designs	Filed	2,595	32%	0%	5,516	68%	+21%	8,110	+13%
	Certified	477	35%	+36%	900	65%	+39%	1,377	+38%
Plant breeder's rights	Filed	124	42%	-9%	173	58%	-1%	297	-6%
	Registered	50	43%	-52%	66	57%	-38%	116	-45%

Companies file trade marks to announce new offerings, provided demand for different and higher quality products.<sup>1</sup> As a result, trade mark filings are highly responsive to changes in household disposable income.<sup>2</sup>

In 2021, gross disposable income reached its highest level on record, boosted by COVID-19 lockdowns, remote work arrangements, reduced transport costs and government assistance.<sup>3</sup> Australians have invested to upgrade their living environments and create comfortable workspaces at home. In 2021, the strongest growth in trade mark applications (+28%) was for household and kitchenware products (Chapter 3). The strongest growth in design applications was for lighting apparatus (+39%), as Australia's renovation boom drove lighting industry revenues to their highest level since 2008 (Chapter 4).<sup>4</sup>

The pandemic has fundamentally altered Australia's social and work environment. People have been spending more time at home, leading them to consume more online content, for example via online subscription services (Chapter 6). As the global economy has moved to a virtual model, organisations have been forced to redesign and digitise their operations. In 2021, patent applications for audiovisual technologies grew 85% and those for computer technologies grew 27% (Chapter 2). Applications grew 26% for trade marks over telecommunications services, such as virtual conferencing, video-on-demand and data sharing platforms.

For many established businesses, start-ups and entrepreneurs, the ready availability of computing power and data is reshaping competition and the innovation process.

Artificial intelligence (AI) is enabling new methods of inventing and could drive productivity gains across sectors. This year, we present analysis by IP Australia's Patent Analytics Hub, which gauges the uptake of key AI technologies in Australia and globally (Chapter 2).

This year's report highlights reforms underway to broaden access to the IP system and ensure it meets the needs of innovators from diverse backgrounds. Chapter 7 summarises research by IP Australia which shows that, after filing for IP rights, Australian SMEs are more likely to achieve high growth and tend to employ more people than their peers with no recent filings. In 2021, SME patent filings grew 27% from 2020, and the SME share of patent applicants has reached a decadal high, reversing a downward trend in recent years. The IP statistics in this report are derived from IP Australia's publicly available data product, IPGOD<sup>5</sup>. Developed by IP Australia's Centre of Data Excellence, IPGOD consolidates over 100 years of application data at the applicant level, allowing for analysis of their stocks and flows of IP rights.

Celebrating the 10th year of the Australian IP Report, the 2022 edition presents a rich account of IP activity in Australia to inform engagement between government, industry, academia and our wider community. The report profiles some of the many ways that IP data can be used for insight. We welcome your ideas, comments and feedback.

Web: [www.ipaustralia.gov.au/economics](http://www.ipaustralia.gov.au/economics)

Email: [chiefeconomist@ipaustralia.gov.au](mailto:chiefeconomist@ipaustralia.gov.au)



## Endnotes

1. Castaldi C, J Block & MJ Flikkema (2020), 'Editorial: why and when do firms trademark? Bridging perspectives from industrial organisation, innovation and entrepreneurship'. *Industry and Innovation*, 27: 1–2, 1–10.
2. An Australian study estimated that a 10% increase in household income is associated with a 20% rise in trade mark filings by local companies. Jensen PH & E Webster (2004), 'Patterns of trademarking activity in Australia'. *Australian Journal of Intellectual Property*, Melbourne Institute Working Paper 2(4).
3. ABS (2021), *Australian National Accounts: National income, expenditure and product*, September 2021, Australian Bureau of Statistics, Commonwealth of Australia.
4. IbisWorld (2021), 'Australia industry (ANZSIC) report G4229: Electrical and lighting stores in Australia'. IbisWorld.
5. In its latest version, improvements have been made to IPGOD which has resulted in modifications to the time series data that was published in previous IP reports.



# CHAPTER 02

## Patents



A patent is an exclusive right granted for an invention. Standard patents protect inventions that are novel, useful and involve an inventive step beyond the normal progress of technology.

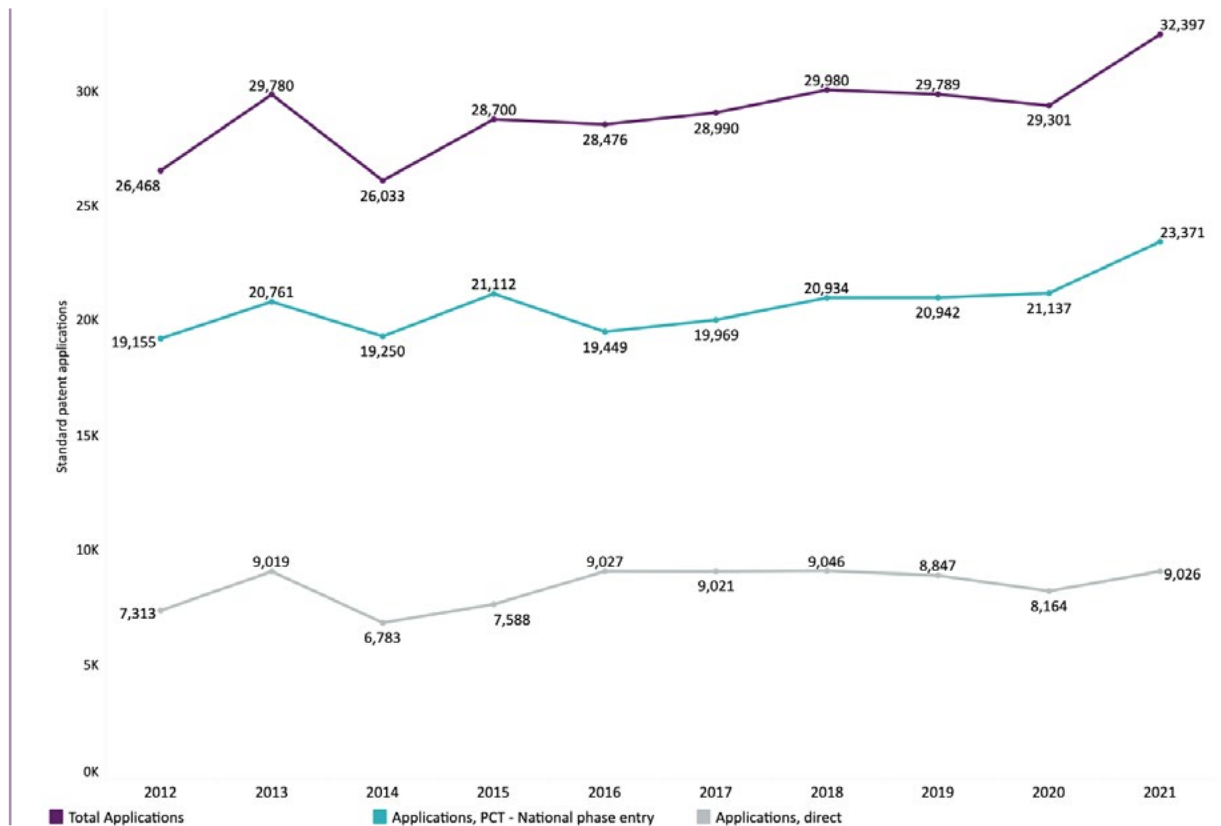
A patent grants its owner a temporary exclusive right to prevent others from commercially exploiting the invention. Patented IP can also be transferred or licensed to other parties.<sup>1</sup> The possibility to obtain a patent encourages inventive activity that inventors might not otherwise have been willing to undertake.

In exchange for the patent right, the invention must be disclosed to the public in full, ensuring public access to new technologies so follow-on innovation can occur.

### Standard patent applications and grants

In 2021, a record high 32,397 standard patent applications were filed in Australia, an 11% increase on 2020 filings. The marked growth in applications represents a historic break from the positive but flattening growth trend observed over 2014–2020 (see Figure P1).

Figure P1: Standard patent applications in Australia grew by 11% in 2021





Most (91%) standard patent applications filed in Australia are from non-residents, the remaining 9% filed by Australian residents. In 2021, non-resident applications grew 9%, from 26,900 in 2020 to 29,401 in 2021. Patents are a partial indicator of the success of research and development (R&D) in generating innovation outputs.<sup>2</sup> Early data indicates that global innovation investments were more resilient during COVID-19 than during past global economic recessions. National governments (including Australia) and top private businesses that have disclosed their R&D budgets for 2020 show sustained growth in R&D investments that year.<sup>3</sup>

In 2021, 72% of standard patent applications were filed in Australia via the Patent Cooperation Treaty (PCT). This international system, through which applicants can file patents simultaneously in multiple countries, is popular among businesses that operate internationally and file patents in Australia. The remaining 28% of applications were filed directly with IP Australia (see Figure P1). In 2021, a consistent rate of growth was observed for filings via each route.

After declining 10% in 2020, standard patent applications from Australian residents have rebounded, rising 25% (from 2,401 in 2020 to 2,996 in 2021). As a result, the resident share of applications increased by a percentage point, to 9%.

For 2020, data on business expenditure on R&D in Australia is limited. Data on government budgetary support for R&D shows that Australia increased its R&D investment by 24% in 2020. This was the highest growth rate observed for governments that have already disclosed their R&D budgets for 2020, ahead of peers including the United States and Germany.

A significant proportion of the overall increase in resident filings occurred in August 2021 when Australians filed three times as many standard patent applications as in the same period the year prior (see Figure P2). The August peak likely reflects Australian residents bringing new applications forward before 25 August 2021, the final date to file an innovation patent in Australia. The innovation patent is Australia’s second-tier patent, having a lower threshold for acquiring protection than the standard patent, lower cost and a shorter (8-year) protection term. The system was phased out in 2021, based on evidence that the innovation patent was not meeting its policy objective of supporting SMEs. Existing innovation patent holders retain their rights. In addition, applicants who filed for new standard patents before 25 August retained the option to obtain an innovation patent by converting or dividing the earlier standard patent filing.<sup>4</sup>

**Figure P2: Australian residents filed three times as many patent applications per week in August 2021 than in the same period the year prior**



In Australia in 2021, 94% of standard patent applications were filed by organisations and 6% were filed by individuals, down from 8% in 2012. Focusing only on organisational applicants with Australian operations, 68% are small and medium enterprise (SMEs) and 23% are large entities. In 2021, SME filings grew 27% and the SME share of organisational applicants has reached a decadal high, rising 7 percentage points over 2020 and 2021.

Patents are enforceable only after they are granted, meaning they have been assessed as novel, industrially useful and non-obvious by IP Australia. In 2021, 17,155 standard patents were granted in Australia, down 3% on 2020. Due to the lag between a patent’s filing date and grant, patents granted in 2021 correspond to pre-2020 applications.



# Countries of origin

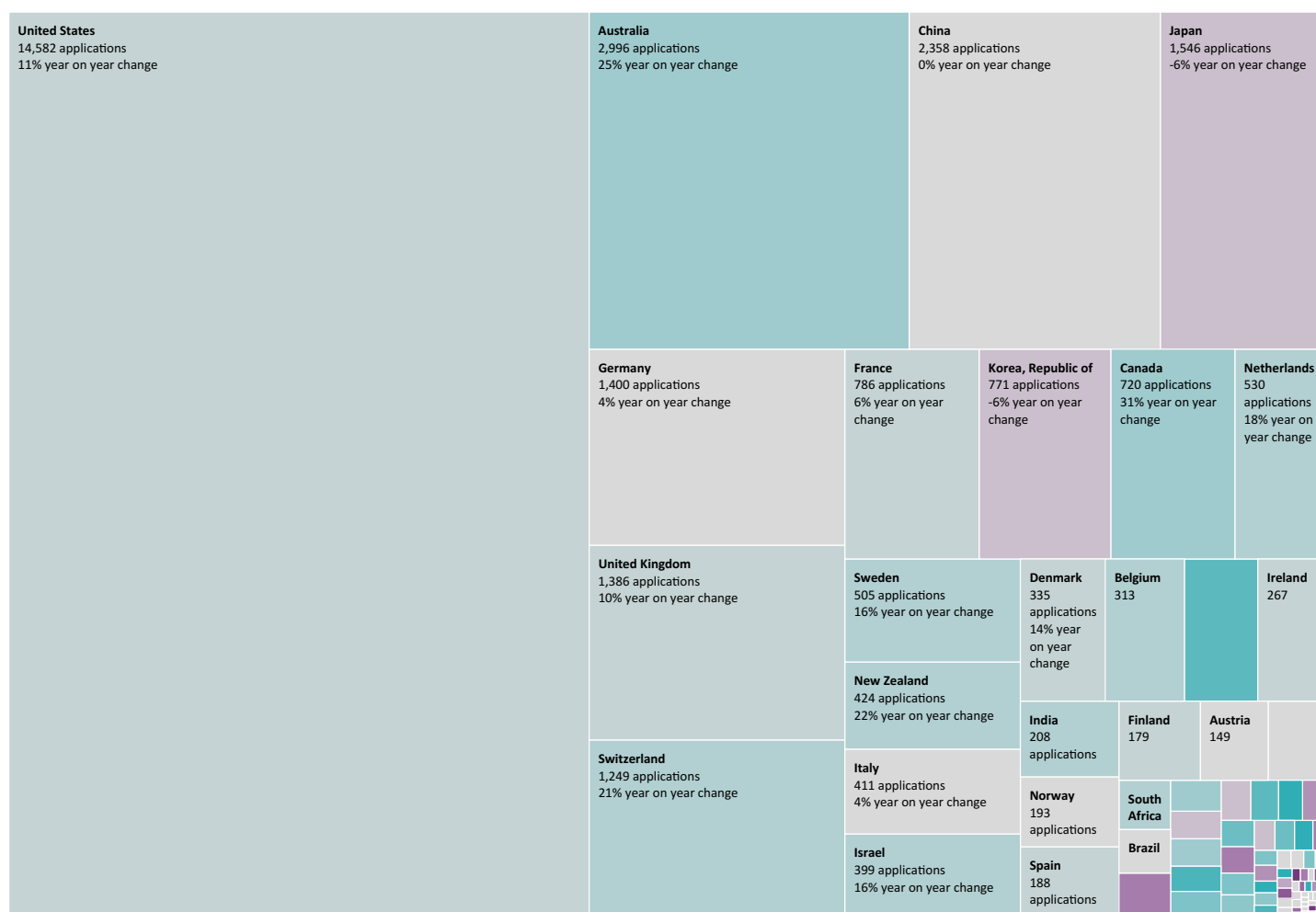
The top five foreign countries of origin for standard patent applications in Australia were the United States (US), China, Japan, Germany and the United Kingdom (UK).<sup>5</sup> In 2021, applicants from the US were named on 14,582 applications, or 45% of all applications filed in Australia. Applications from the US grew 11% on 2020 (see Figure P3).

In the same period, standard patent applications naming applicants from China were stable (0% change, at 2,358 in 2021). This has halted a run of steep continuous growth that lasted from 2011 to 2020. Over that period applications

from China grew at a compound annual growth rate of 20%. Applications from Japan fell by 6% in 2021 (from 1,649 to 1,546), while applications increased from Germany (+4%, from 1,348 to 1,400) and the UK (+10%, from 1,258 to 1,386).

Focusing on ‘high-volume’ countries of origin (in the top quartile of countries for total applications in 2021), the greatest growth was in applications from Singapore – at 292, these were 62% above their 2020 level – then Canada (+31%, to 720) and New Zealand (+22%, to 424).

Figure P3: Number and growth of standard patent applications by country of origin



-100% 100% Size of the blocks are proportional to the number of filings. Shading of the blocks indicates the year on year change.



# Is R&D collaboration becoming more localised?

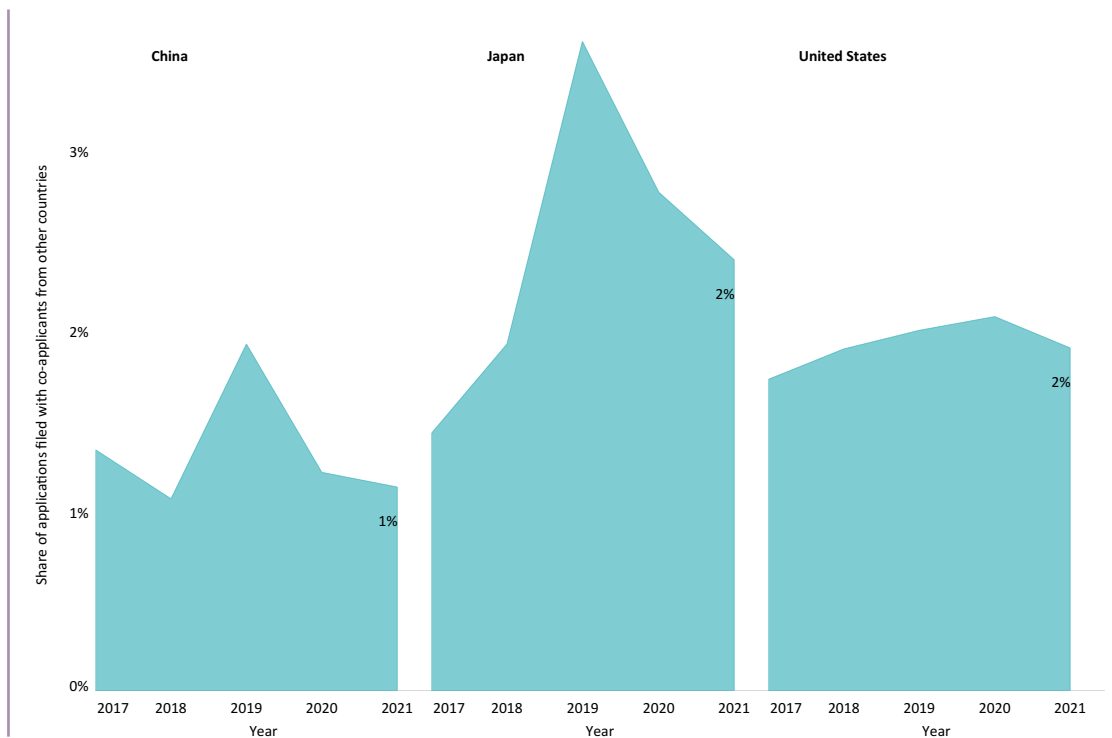
The development and diffusion of knowledge between countries is core to economic development. International research collaboration allows countries to learn and build capability to respond to unique social and economic challenges. In recent decades, digital technology and cheap travel have enabled greater international collaboration in science and technology production.

A patent application can be filed by a single applicant or by multiple applicants. Those applications filed by multiple applicants can be single-origin – filed by two or more Australian co-applicants – or mixed-origin – filed by Australian applicants with co-applicants from outside Australia.

Co-filing provides a partial indicator of international collaboration behind potentially patentable inventions, though interpreting co-filing data requires care.<sup>6</sup>

Averaging across all countries of origin for standard patents in Australia, over the period 2016–20 around 7% of patents from a given country involved at least one co-applicant from outside that country. In 2021, the proportion decreased 2 percentage points to 5%. Figure P4 shows that, Japan and China reached local peaks in 2019 then declined over the pandemic period. For European countries (France, Germany, Switzerland), international collaboration reached a local peak in 2020 then declined in 2021.

**Figure P4: For many leading countries of origin, their share of standard patent applications that indicate international partnerships fell during the pandemic period of 2020–21.**



In Australia, most (93%) standard patent applications by residents are filed by single parties only. In 2021, 5% of resident applications indicated domestic partnerships and 2% indicated international partnerships, down a percentage point from 2020.

The initial onset of COVID-19 prompted efforts to harness global science. However, the pandemic has intensified challenges to international cooperation. For example, after the initial outbreak of the pandemic, international collaboration in coronavirus research declined below pre-pandemic levels.<sup>7</sup>

Estimates from one study indicate that after the first report of a COVID-19 case within a country, that country’s international

collaboration rate shrank by 6%.<sup>8</sup>

However, there is evidence that research is becoming more localised and this trend pre-dates the pandemic. For example, analysing data on scientific publications studies have found that regional research collaborations have strengthened while international collaborations have declined.<sup>9</sup>










## Technology classes

Patents protect technologies, which are assigned into technology classes.<sup>10</sup> In 2021, the leading class for standard patent applications in Australia was Pharmaceuticals (Class 16), with 3,967 filings, followed by Medical technology (Class 13) and Biotechnology (Class 15), as shown in Table P1.

Table P1: Top five patent technology classes

	 Pharmaceuticals	 Medical technology	 Biotechnology	 Organic fine chemistry	 Computer technologies
Applications	3,982	3,912	3,120	1,840	1,799
Annual change 2020-21	+27%	+6%	+9%	+1%	+27%

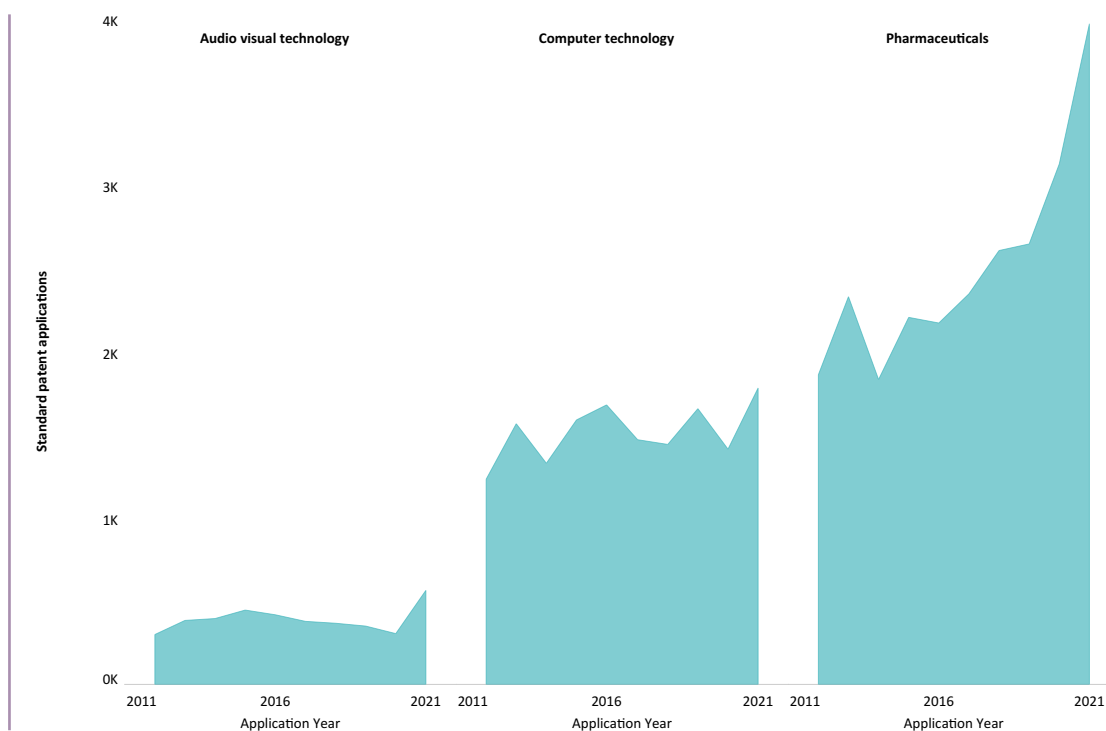
Patent applications for Pharmaceuticals (Class 16) grew 27% in 2021; this followed 18% growth the year prior. The current pandemic has created an unprecedented need for novel coronavirus vaccines and treatments. By providing temporary exclusive rights, the patent system encourages investment in innovative pharmaceutical research, despite its significant expense, risk and lead times. Applications in Medical technology (Class 13) were up 6% in 2021, and filings for Biotechnology (Class 15) were up 9% in 2021.

The COVID-19 pandemic has fundamentally altered Australia's social and work environment, and organisations have been forced to rapidly digitise and redesign their operations.

In 2021, patent filings for Computer technologies (Class 6) grew 27% from 2020 and exceeded those for Civil engineering (Class 35), traditionally the 5<sup>th</sup>-ranked class.

Figure P5 charts application activity for classes that recorded the highest growth in 2021, excluding 'low-volume' classes (below the mean for total applications in 2021). The strongest growth in applications was for Audiovisual technology (Class 2). Applications in this class rose 85% (from 305 in 2020 to 563 in 2021) as the global economy has moved to a digital model and people have embraced new communication services. Other high-growth classes included Food chemistry (Class 18, +31%, to 766) and Other consumer goods (Class 34, +30%, to 852).

Figure P5: In 2021, Computer technologies (Class 6) became the fifth-leading class for standard patent applications, and patent filings for Audiovisual technology (Class 2) grew by 85%



## Leading applicants

Table P2 lists Australia’s top applicants for standard patent applications, separately focusing on resident and non-resident filers. As with previous years, the leading non-resident applicants include major providers of information and communications technology, infrastructure and smart devices.

These include the South Korean tech powerhouse, LG Electronics (259 applications); Chinese smartphone manufacturers, Huawei Technologies (255) and Guangdong Oppo Mobile Telecommunications (197); Swiss food and beverage multinational, Nestlé (157) and Apple (151), which became the first US company to reach a US\$3 trillion market capitalisation in early 2022.<sup>11</sup>

Table P2. Top domestic and international applicants for patents in Australia, 2021

Top domestic applicants			Top international applicants		
Rank	Applicant	Total applications	Rank	Applicant	Total applications
1	Aristocrat Technologies Australia Pty Ltd	71	1	LG electronics Inc.	259
2	Commonwealth Scientific and Industrial Research Organisation	52	2	Huawei Technologies Co Ltd	255
3	NewSouth Innovations Pty Ltd	29	3	Guangdong Oppo Mobile Telecommunications Corp Ltd	197
4	ResMed Ltd	28	4	Nestle SA	157
5	Breville Pty Ltd	27	5	Apple Inc	151



Among domestic applicants, Aristocrat Technologies led with 71 applications. Commonwealth Scientific and Industrial Research Organisation (CSIRO) followed with 52 applications, a 13% increase on their 2020 filings. NewSouth Innovations – the commercialisation arm of the University of New South Wales – filed 29 applications.

New to the list of top resident filers was ResMed, the Australian-born global leader in sleep technology and respiratory medical products (28 filings). With 27 applications, Breville, an Australian manufacturer of home appliances, rounded out the list of top patent filers.

## The evolution of AI in patents

Artificial intelligence (AI) – machines that simulate human intelligence processes – has the potential to drive productivity improvements across sectors. As its scope of applications expands, AI is reshaping competition by removing historical constraints on the ability of organisations to learn, invent and scale.<sup>12</sup> For established businesses, start-ups and entrepreneurs, the ready availability of computing power and increased data availability could reshape the innovation process.

How to gauge the uptake and impact of AI within Australia and its global context? Analysing AI-related patents provides one indicator of AI’s development and diffusion. AI is not a single technology but rather encompasses a collection of interrelated technologies. The Australian Government has identified three critical AI technologies of national interest under [the Government Action Plan for Critical Technologies](#). These are (1) AI algorithms and hardware accelerators, (2) machine learning and (3) natural language processing.

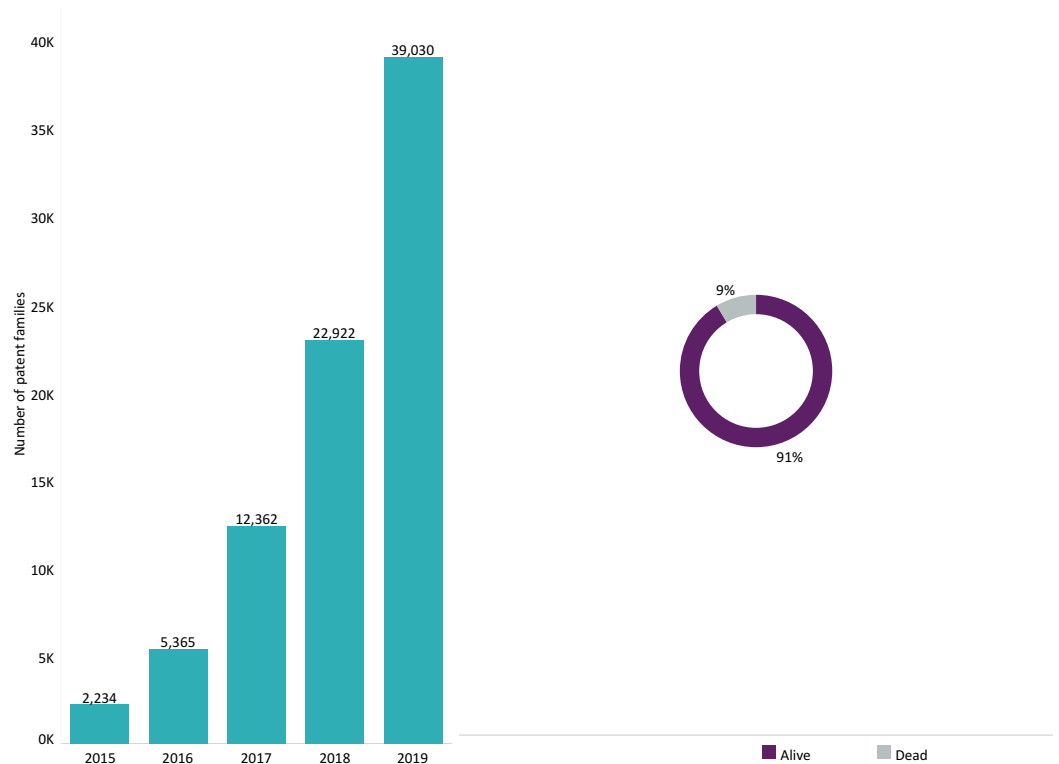
For the 2022 IP Report, IP Australia’s Patent Analytics Hub has analysed the evolution of patents for these key AI technologies in the aggregate.

The Hub’s analysis on each of the key technologies can be found in the [Action Plan for Critical Technologies Tech Cards](#). While Australian patent filings in key AI are growing from a low base they are growing at a fast rate, on average doubling each year. The global development of key AI is being driven by computing technology leaders like IBM. Australian patentees are applying key AI technologies to healthcare, productivity, energy and agriculture.

### Global patent filings in AI nearly double each year

From 2015 to 2019, 81,913 unique patent families were filed worldwide relating to the three identified AI technologies (a patent family is a set of patent applications relating to the same or similar technical content that share one ‘priority’ application). The total number of AI patent families has roughly doubled each year over the period. Just over 90% of patent families filed during this period are today in force or currently being sought. The strong growth in mostly active patents (shown in Figure P6) suggests a vibrant and rapidly developing commercial sector that has likely not yet peaked.

**Figure P5: In 2021, Computer technologies (Class 6) became the fifth-leading class for standard patent applications, and patent filings for Audiovisual technology (Class 2) grew by 85%**



Source: PATSTAT Autumn 2021 edition.  
 Notes: 2019 data is not complete due to the lag in patent publication; ‘Alive’ indicates patents currently being sought or in force, and ‘Dead’ indicates lapsed, expired or withdrawn patents.

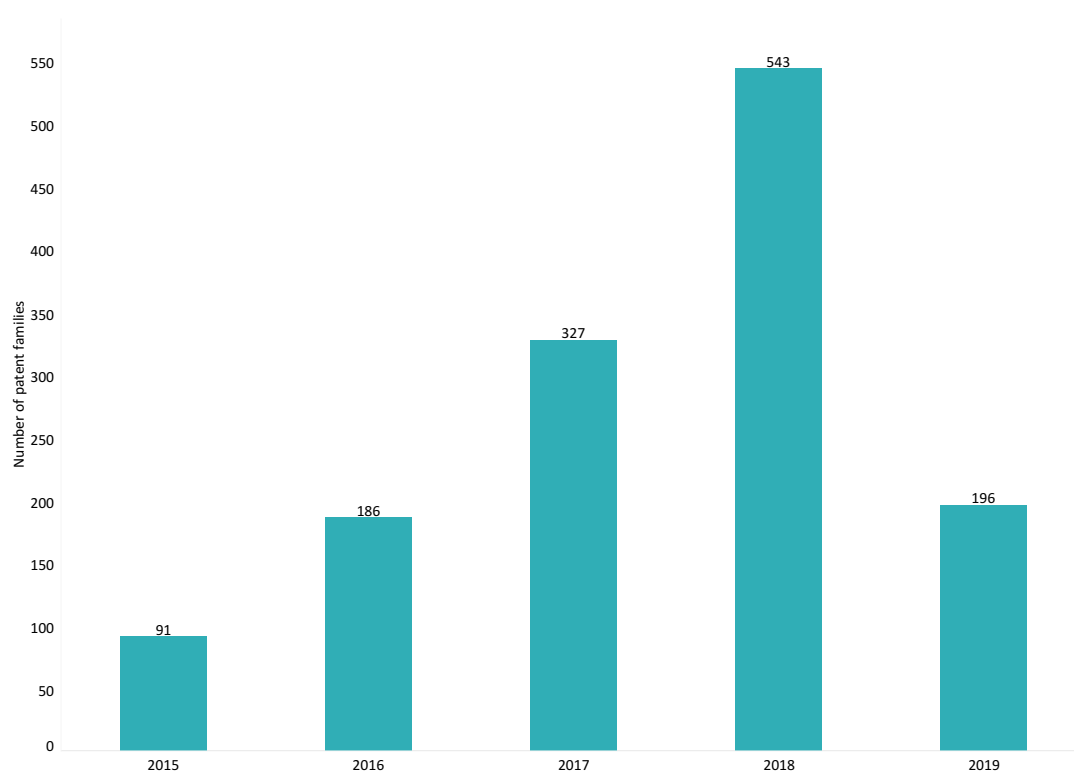


## From a low base, Australian patent filings in AI are growing rapidly

As shown in Figure P7, the global growth trend in the select AI areas was mirrored by strong growth in patent filings in Australia from 2015 to 2019. In the analysis reported here, patent families are assigned to years based on the priority application. As of the time of analysis, many patent families with a priority application filed in other jurisdictions will not yet have been filed in Australia and so these patent families are not yet reflected in Australia’s value for 2019.

While AI patenting in Australia exhibits a strong growth trend, only 1,343 patent families have been filed in Australia, less than 2% of global filings. Based on these figures, Australia has been a relatively minor destination for AI patent protection and there is an opportunity for growth. Patents are not the only way in which AI inventions can be protected, so the low Australian filing activity may reflect the particular application domains or business strategies around which Australian innovators are focused.

Figure P7: Filings in Australia of patent families in select AI technology areas, by priority year, 2015–19



Source: PATSTAT Autumn 2021 edition.

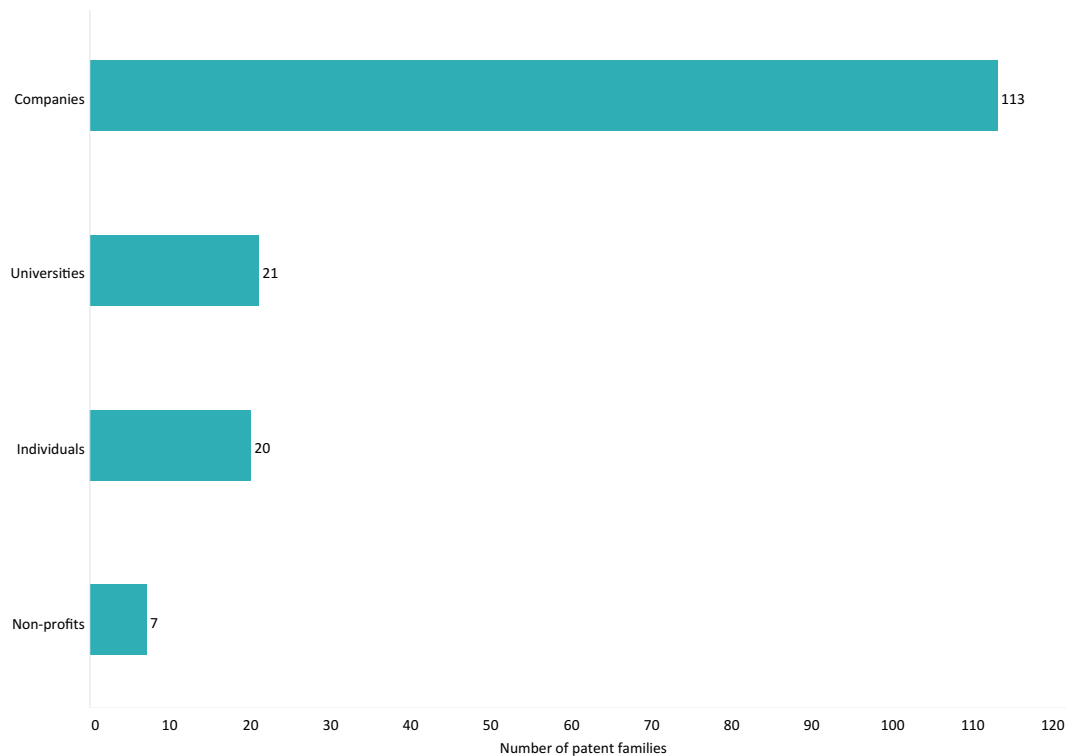


## Most Australian patent filings in AI are from the private sector

Focusing on Australian applicants and comparing across sectors (companies, universities, individuals and non-profit organisations), companies are the most prolific filers of patents relating to the selected AI technologies, filing more than 5 times as many AI patents as universities.

Companies account for 113 patent families, compared to only 21 filed by universities (see Figure P8). No collaborations between parties or across sectors were identified in AI patents filed by Australians.

Figure P8: Total patent families filed by Australian applicants in select AI technology areas, 2015–19



Source: PATSTAT Autumn 2021 edition.





## Leading Australian applicants have applied AI to enhance productivity, healthcare, energy and agriculture

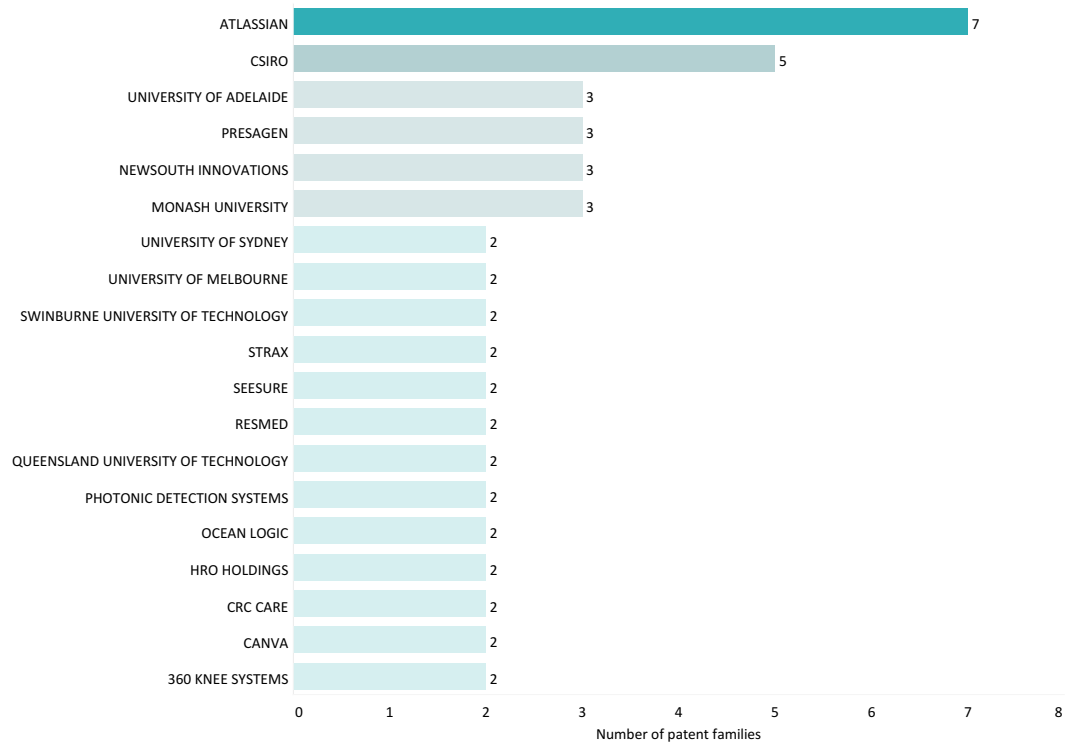
Australian applicants filed a total of 156 patent families in AI technologies over the period 2015–19, with 86 (just over half) of these filed in Australia. As shown in Figure P9, the lead applicants include companies from the private sector (e.g., Atlassian with 7 patent families filed) and public research organisations (e.g., CSIRO with 5 patent families).

Atlassian is a Sydney-based project management software provider that achieved a record initial public offering for an Australian company when it was listed on the Nasdaq in 2015, valued at US\$4.4 billion.

By 2021, the company’s valuation rose to US\$101.8 billion (A\$140 billion), following 53% average annual growth in its stock price and as the shift to remote work boosted demand for its software.

Atlassian has filed patent applications in machine learning for gesture and text recognition and querying databases using neural network models. The company has not filed any of its AI-related patents in Australia, possibly indicating a lack of technological rivalry in the market.

**Figure P9: Patent families filed by Australian applicants in select AI technology areas, 2015–19**



Source: PATSTAT Autumn 2021 edition.  
Notes: Figure lists applicants with more than one patent family.

Many other Australian companies that lead in AI patent filings operate in health care and medical devices. For example, Presagen (3 patent families) is applying AI to advance women’s medicine, including improving the selection of embryos that will lead to successful pregnancies. Strax (2 families) has developed an AI-powered software platform to rapidly integrate bone density images and gauge fracture risk. Seesure (2 families) provides a mobile application that monitors the health of epilepsy patients and applies algorithms to detect and predict seizures.

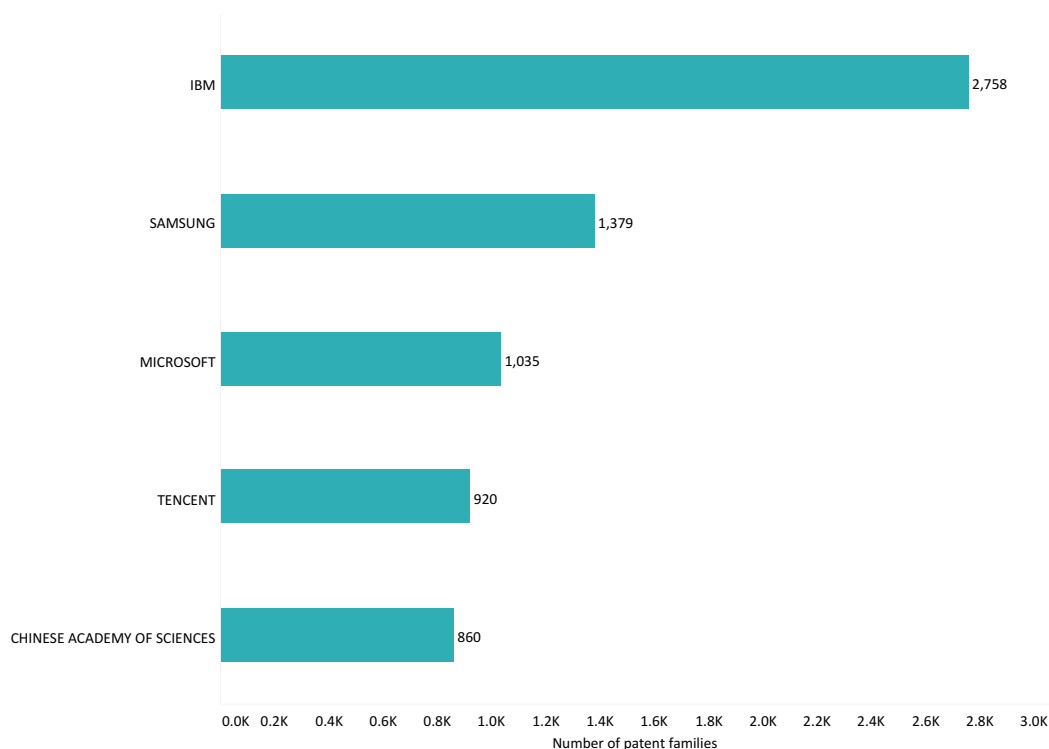
Leading domestic filers are also applying AI to improve agricultural practice. Photonic Detection Systems (two families) has patented technology that mimics the human eye to distinguish plants from weeds and reduce herbicide application.

The top Australian filers include universities and public research organisations. For example, CSIRO has filed AI patents for machine vision algorithms to track and predict cloud motion for solar power forecasting.

## Global patent applicants in AI

IBM is the global leader in AI patent applications across the 3 key AI technologies, with 2,758 patent families recorded from 2015–19. IBM's filings are more than twice the number of its nearest competitor, Samsung, with less than 1,400 patent families (see Figure P10).

Figure P10: Patent families filed by top global applicants in select AI technology areas, 2015–19



Source: PATSTAT Autumn 2021 edition.

## States and territories

Large growth in standard patent applications was observed for all states and territories in 2021. As in previous years, New South Wales (NSW) was the leading source of patent applications (1,119 applications) followed by Victoria (769 applications). New South Wales also led among populous states for applications per capita.

Table P3. Patent applications, Australian states and territories, 2020–21

	NSW	VIC	QLD	WA	SA	ACT	TAS	NT
Total 2021	1,119	769	528	334	152	85	35	8
Change, 2020–21	+30%	+24%	+19%	+21%	+15%	+29%	+59%	+33%
Applications per capita (thousands)	0.14	0.12	0.10	0.12	0.09	0.20	0.07	0.03

Sources: Australian Bureau of Statistics (ABS). Australian Demographic Statistics, June 2021. Retrieved 27 January 2021.



## Provisional applications

Filing a provisional patent application gives applicants 12 months to decide whether they want to file a complete patent application while establishing a priority date. The priority date determines the prior art that will be considered in assessing an invention's novelty or non-obviousness when examined for a standard patent.

The number of provisional applications filed in Australia has been trending downwards since 2016 and fell a further 12% in 2021, from 4,864 in 2020 to 4,297). Australian residents are overwhelmingly the primary users of the system, with residents listed on 94% of all filings (4,031) in 2021. Applications were also received from New Zealand, the US, the UK and Singapore, among other origin countries.

A provisional application is one of several options available to businesses to establish a foothold in the patent system both in Australian and in key export markets. The reasons for choosing one particular pathway over another will vary based on the commercial strategy of the applicant and current conditions both in Australia and their export markets. On average, over the past 5 years applicants have filed 6 standard patent applications for each provisional patent, and that proportion increased to 8 standard applications per provisional in 2021.

Individuals account for 35% of all provisional patent applicants, a share that has declined 10 percentage points from 45% in 2012. The remaining 65% of applicants are organisations, 55% of which are SMEs, a proportion that has increased from 44% since 2012.

A small but growing number of provisional applications are filed by partnerships involving large organisations and smaller entities. From 2012 to 2021, the share of applications filed by large organisations that involve multiple parties has risen from 3% to 10%, and nearly all (94%) of these applications are co-filed with smaller entities. The finding is consistent with evidence that provisional patents are used, for example, by universities to aid research commercialisation and technology transfer.<sup>13</sup>

## Innovation patents

Anticipating the phase-out of the innovation patent, innovation patent filings have grown dramatically in recent years. In 2021, applications (including new filings and standard patents converted to innovation patents) grew 71% on 2020 (from 4,585 to 7,844), their level in 2020 being 2.5 times their level in 2019. Non-residents accounted for 78% of the growth in applications in 2021, primarily due to increased filings from China (+26%, to 3,318) and India (at 2,371, nearly 4.5 times their 2020 level).<sup>14</sup>

## Australian filings overseas

IP rights granted in Australia do not provide protection in other countries. To protect IP in other countries, Australian inventors must file patent applications abroad. Based on the latest data from the World Intellectual Property Organization (WIPO), the number of patents filed overseas by Australians decreased 5% in 2020, with a total of 9,106 applications.<sup>15</sup> Despite the decrease, the number of Australian applicants abroad remained above the 2018 level.

Australians can seek patent protection in other countries by filing through the Patent Cooperation Treaty (PCT). This provides an alternative route to filing applications directly with overseas IP offices. Through the PCT an applicant can file a single "international" patent application instead of filing several national or regional applications. Granting of patents remains under the control of national IP offices. The approach provides applicants more time to assess the value of an invention and its most profitable markets to better target their patent protection strategy.

The PCT route is a major vehicle for Australian applicants to file patent applications overseas. Most (73%) Australian applications abroad are filed via the PCT. The share of Australian applications abroad filed direct has fallen 7 percentage points since 2014 (from 34% to 27%) as Australians have increasingly preferred the PCT route.

The United States continues to be the most popular destination for Australian filings abroad in 2020, with 3,469 Australian-origin applications. The US accounts for 38% of overseas filing activity by Australians. The next-ranked destinations were the European Patent Office, China and New Zealand at 11%, 8% and 7% respectively. The largest increase in filings abroad occurred in Saudi Arabia (25 more filings), with the share of filings increasing to 5%.



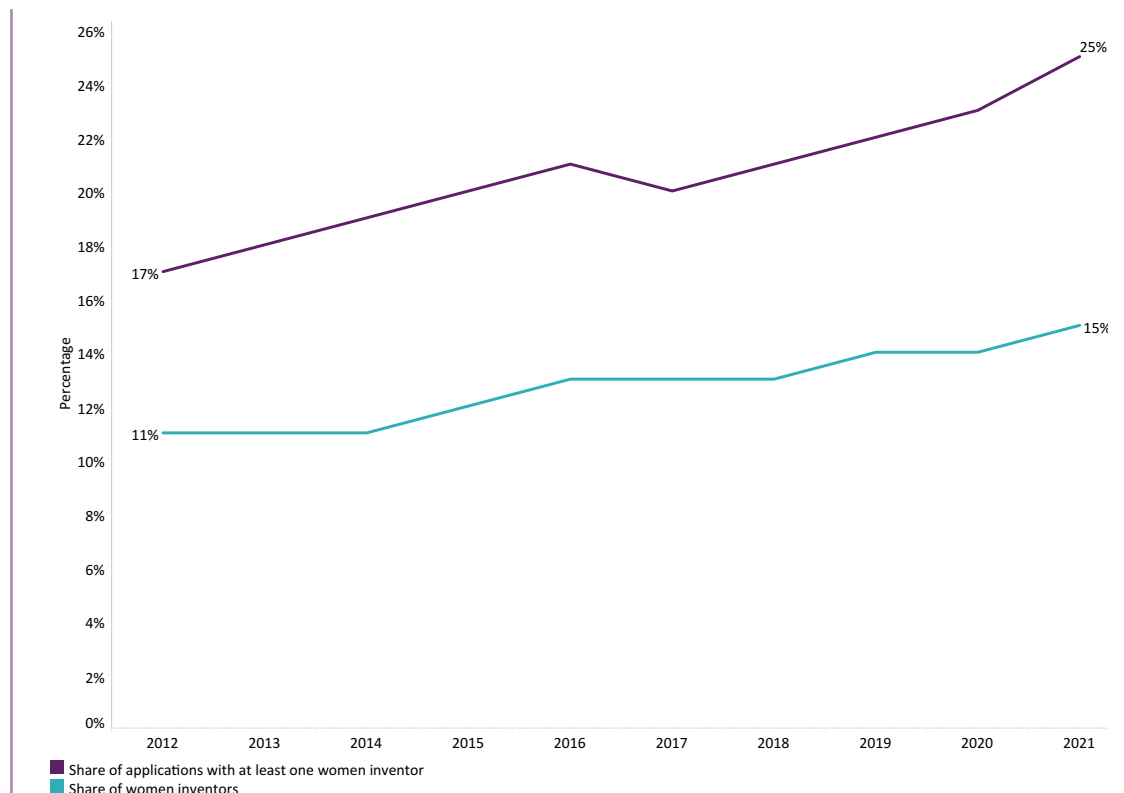
# Despite an upward trend in participation, the gender gap in patenting persists

For Australia to realise its potential for innovation and growth, it's vital to increase the supply of innovations from people of diverse backgrounds and ensure Australia is not losing potential innovators. An enduring concern is the under-representation of women and girls in science, technology, engineering and mathematics (STEM) fields. Evidence suggests there are no systematic productivity differences between women and men in creative and innovative endeavours. Women can face many impediments to their activity and success.<sup>16</sup>

Studies on the gender of inventors on patents show that gender imbalances persist, with substantial differences across countries and technology fields. However, women's participation in patenting is rising.<sup>17</sup> Female inventors comprised around 12% of unique Australian inventors listed on patent applications in Australia in 2016, up from 4% in 1980. Over that period, the female inventor share of Australian filings in civil engineering remained low, at just over 10%, but in biotechnology and organic fine chemistry rose from less than 20% to more than 50%.

Most patent applications filed globally by Australian residents are filed via the PCT route. WIPO data on PCT applications featuring Australian inventors shows that female participation is increasing: around 25% of PCT applications from Australia list at least one female inventor, a share that has steadily increased over the last 5 years and rose 2 percentage points in 2021. That increase in participation is primarily due to growth in applications attributed to mixed teams, involving both men and women inventors. The results could reflect change in the team composition of inventors or, alternatively, shifts in organisational practice with women inventors more likely to be recognised on patent applications for their contributions.

**Figure P11: Women participation in patents from Australia filed via the PCT**



An increasingly central question in IP research and policy is how individuals' histories and demographics influence their likelihood of engaging in innovation. IP Australia's Office of the Chief Economist is developing a program of research

to understand the barriers to participation in IP, including gender and education (see Chapter 8). The findings will inform IP Australia's ongoing efforts to broaden access to the IP system.



## Endnotes

1. Once granted, a patent allows the holder to exclude anyone else from using their patented invention in Australia for a prescribed maximum period, up to 20 years for standard patents and eight years for innovation patents. Pharmaceutical substances that have experienced a delay in market approval can receive standard patent extensions, granting up to 25 years protection.
2. Although patenting typically occurs early in the life of a research project, R&D also tends to produce lagged effects on firm patenting. Pakes A, & Z Griliches (1984), 'Patents and R&D at the firm level: A first look.' In Griliches Z (ed.), R&D, patents and productivity. University of Chicago Press, Chicago: 55–72. For a review of existing literature and new evidence on the gestation lag of patented knowledge production, see: Wang, N & J Hagedoorn (2014), 'The lag structure of the relationship between patenting and internal R&D revisited.' *Research Policy*, 43: 1275–1285.
3. See WIPO (2021), *Global Innovation Index 2021 – Australia*. Accessed 17 September 2021. See also: OECD Directorate for Science, Technology and Innovation (March 2021), *OECD main science and technology indicators: Highlights on R&D expenditure*, March 2021 release. OECD.
4. For additional analysis of how the phase-out of the innovation patent has affected Australian patent filings in 2021, see Summerfield, M (26 January 2022), 'Australian patent filings up in 2021, aided by innovation patent's demise'. Patentology. Accessed 21 February 2022, <https://blog.patentology.com.au/2022/01/australian-patent-filings-up-in-2021.html>.
5. We count an application as originating from a country if at least one applicant on the application is a resident of that country, as indicated by the applicant's address.
6. R&D and commercialisation partnerships can involve technology transfer and IP trading that is not reflected in co-filing data. Further, foreign entities listed on resident applications may be parents or subsidiaries of Australian companies, so interpreting co-filing as evidence of international collaboration requires some care.
7. See Maher B & R Van Noorden (2021), 'How the COVID pandemic is changing global science collaborations'. *Nature*. Accessed 7 February 2022, <https://www.nature.com/articles/d41586-021-01570-2>.
8. Liu M et al. (2021), 'Pandemics are catalysts of scientific novelty: Evidence from COVID-19'. *Journal of the Association for Information Science and Technology*, 1–14.
9. Fitzgerald J, S Ojanperä & N O'Clery (2021), 'Is academia becoming more localised? The growth of regional knowledge networks within international research collaboration.' *Applied Network Science*, 6:38.
10. We analyse application trends across classes using a scheme maintained by WIPO The WIPO technology concordance groups various International Patent Classification (IPC) classes and subclasses into 35 technology fields. For details, see <https://www.wipo.int/ipstats/en/>.
11. Nicas J (2022), 'Apple becomes first company to hit \$3 trillion market value'. *New York Times*, 3 January 2022. Accessed 16 February 2022, <https://www.nytimes.com/2022/01/03/technology/apple-3-trillion-market-value.html>.
12. Iansiti M and K Lakhani (2020), *Competing in the Age of AI: Strategy and Leadership When Algorithms and Networks Run the World*. Boston: Harvard University Press.
13. Nugent A, H Chan & U Dulleck (2022), 'Government funding of university-industry collaboration: Exploring the impact of targeted funding on university patent activity'. *Scientometrics*, 127: 29–73.
14. A report published by the United States Patent and Trademark Office (USPTO) suggests the high rate of Chinese patent and trade mark filings may be influenced by government subsidies and other non-market factors. Mangelson M, ETL Wu, M Diehl, L Lian, Q Sheng & D Wilson (2021), *Trade marks and patents in China: The impact of non-market factors on filing trends and IP systems*. USPTO. India has similar policies. See <https://www.meity.gov.in/content/support-international-patent-protection-electronics-information-technology>. Further investigation is required into the full set of behavioural drivers.
15. Data on Australian filings abroad is derived from WIPO IP Statistics Data Center 2021. Retrieved 04 February 2022.
16. Astegiano J, SG Esther and CC de Toledo (2019), 'Unravelling the gender productivity gap in science: a meta-analytical review.' *Royal Society Open Science*, 6(6).
17. See Martinez GL, J Raffo & K Saito (2016), 'Identifying the gender gap of PCT inventors.' WIPO Economic Research Working Paper 33.



# CHAPTER 03



## Trade marks

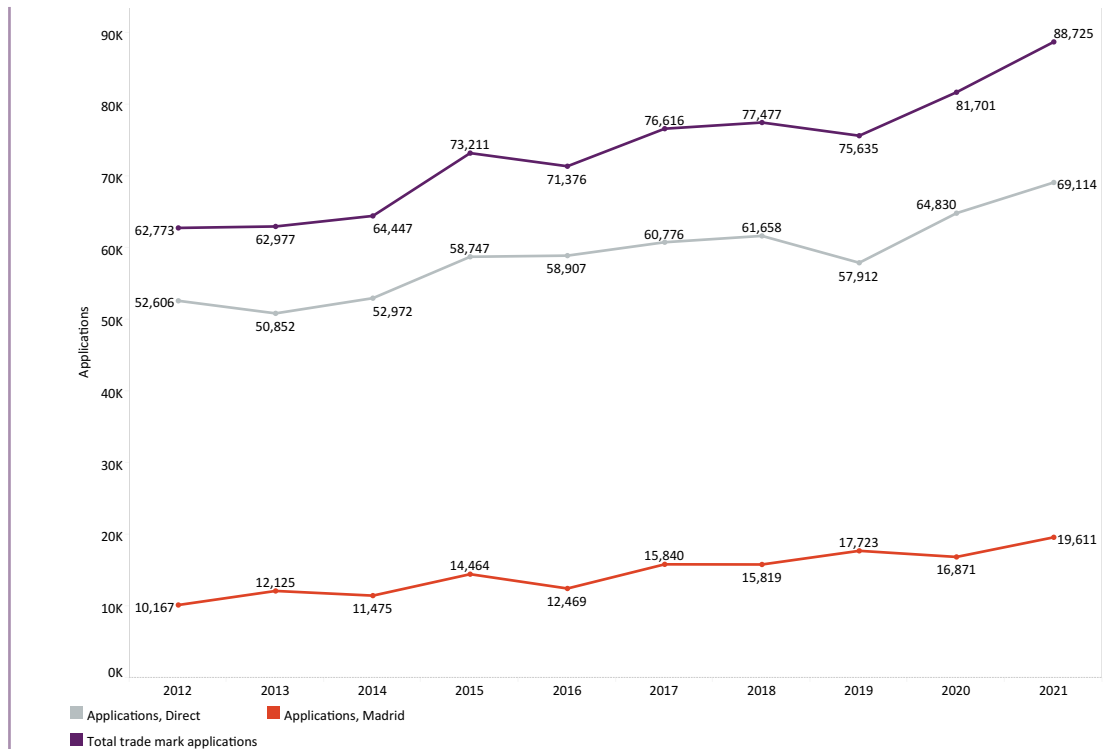
Trade marks are signs that act in the market as a badge of commercial origin for producers, products and services. Registering a trade mark provides its owner the exclusive rights to use that mark, or authorise others to use it, as well as an avenue to seek relief for infringement.<sup>1</sup> By insulating a mark from copying, trade mark protection enhances transparency between consumers and producers and enables producers to command a premium for quality.

### Trade mark applications and registrations

In 2021 a record total of 88,725 trade mark applications were filed in Australia, up 9% on 2020. The growth adds to the 8% increase in trade mark applications in 2020 – despite Australia’s economy having entered recession for the first time in 30 years.

In 2020 growth in trade mark applications was entirely attributed to increased applications by Australian residents, who account for 60% of applications in Australia. Non-resident filings fell 4%. In 2021, non-resident applications rebounded, rising 18% (to 35,386) while resident applications grew 3% (to 53,339).

Figure T1: Trademark applications in Australia grew by 9% in 2021





The growth in trade mark activity over 2020 and 2021 was unexpected in some respects: Trade mark activity tends to be procyclical, rising during periods of economic growth and falling when the economy contracts. However, at an aggregate level, trade mark registrations are positively related to opportunistic entrepreneurship – associated with the creation of growth-oriented businesses – and average household income.<sup>2</sup> In Australia, despite ongoing COVID-related restrictions, 2021 saw the highest rate of business entry in a decade (ABS, 2021) and gross disposable income reached its highest level on record.<sup>3</sup>

Before trade marks can be registered and rights granted, they are examined against certain legislative criteria. These include whether registration would unfairly restrict others from using a mark they legitimately need to distinguish their products or services, and whether there would be a conflict with earlier registered marks for similar goods or services.

Trade marks registered in 2021 in Australia reached 70,607, a record number and up 10% on 2020. Residents saw the strongest growth in trade mark registrations, up 15% (from 35,030 in 2020 to 40,307). Registrations from non-residents grew 4% (from 29,051 to 30,300).

Businesses file trade marks to announce new offerings, provided demand for different and higher quality goods.<sup>4</sup> The latest trade mark data indicates strong domestic economic activity and interest in Australia as a trading destination. If seeking international protection, applicants have a choice of filing directly with IP offices in the countries of interest or using the Madrid System. The Madrid route provides applicants a simplified route for filing for trade mark protection in multiple countries. In 2021, 22% of applications in Australia were filed via Madrid (19,612 in total), and 78% were filed directly (69,113). The Madrid share of total filings has steadily increased over the past decade.

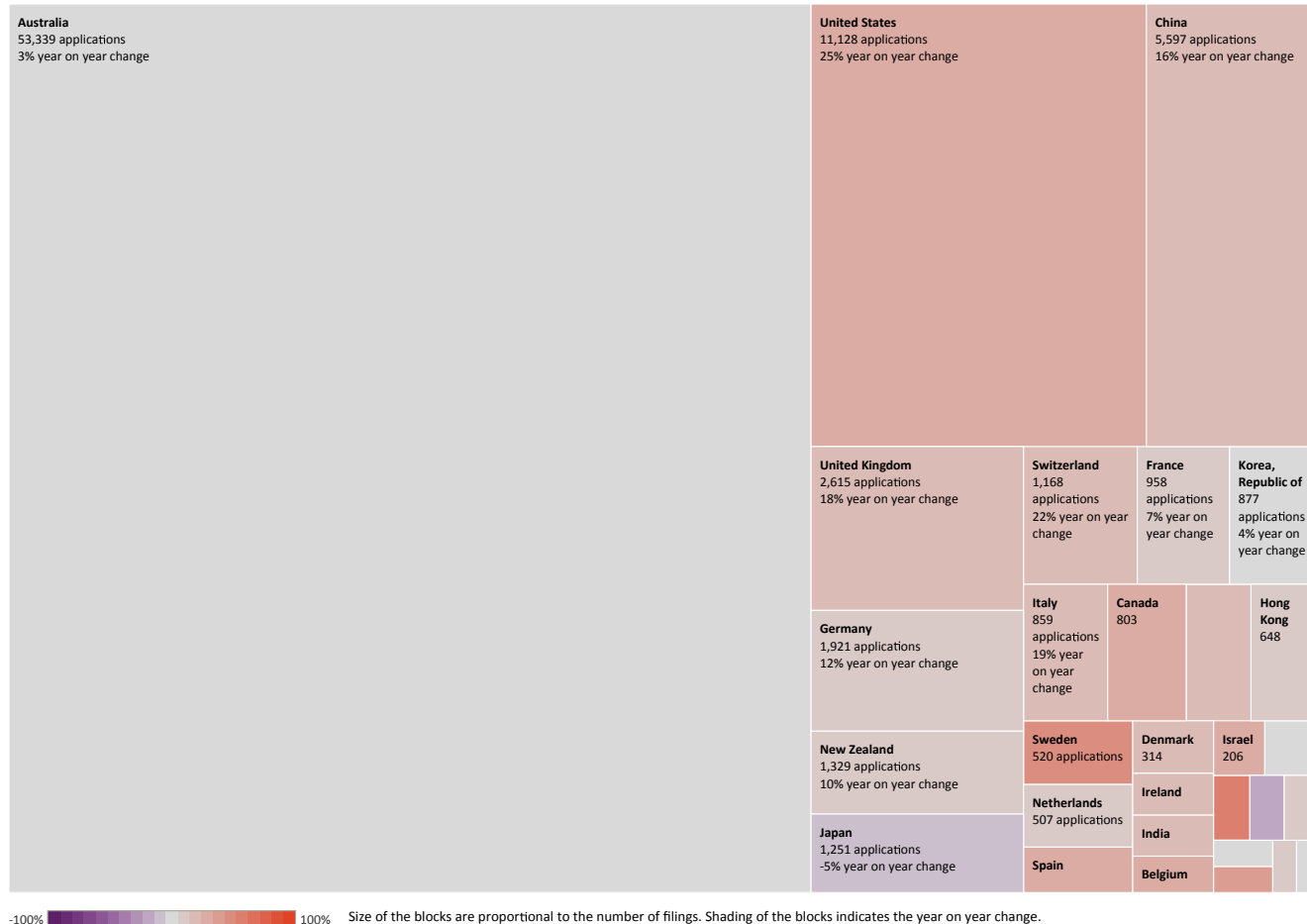
## Countries of origin

The leading foreign countries of origin for trade mark applications in Australia were the US (11,128 applications), China (5,597), the UK (2,615), Germany (1,921), and New Zealand (1,329) which surpassed Japan (1,251). For each of these countries of origin, applications grew in 2021, in the US case, by 25% (see Figure T2).<sup>5</sup>

Focusing on ‘high-volume’ countries of origin (those in the top quartile for total filings in 2021), Turkey recorded the strongest growth in 2021, with a 56% increase in application, followed by Sweden (+43%) and Israel (+33%).

Compared to patents, trade mark applications are less likely to be filed by international co-applicants. None of the top countries of origin for trade mark applications list international co-applicants on more than 2% of their total filings.

Figure T2: Number and growth of trade mark applications by country of origin





## Trade mark classes

Trade mark applications are assigned to product and service categories using the Nice Classification, an international system of 45 product and service classes.<sup>6</sup> Applicants can nominate one or several Nice classes for their trade marks. In 2021, applicants filed 166,355 classes, an average of 1.9 classes per application.

The distribution of trade mark filings across Nice classes has remained relatively stable since at least 2002, with most applications concentrated in 5 classes (see Table T1). Trade mark activity is more diffuse throughout the economy than patenting but not randomly distributed: high-tech manufacturing industries are heavy users of trade marks, as are information-intensive services.<sup>7</sup> In 2021, strong growth in applications was observed for all 5 top classes, led by Scientific and technological services (+22% on 2020).

Table T1: Top five trade mark classes






	 <b>Technological and electrical apparatus and instruments</b>	 <b>Advertising</b>	 <b>Education, training and entertainment</b>	 <b>Scientific and technological services</b>	 <b>Clothing, footwear, headgear</b>
<b>Total applications</b>	16,352	16,192	12,240	11,816	8,405
<b>Change in applications, 2020–21</b>	17%	14%	14%	22%	18%

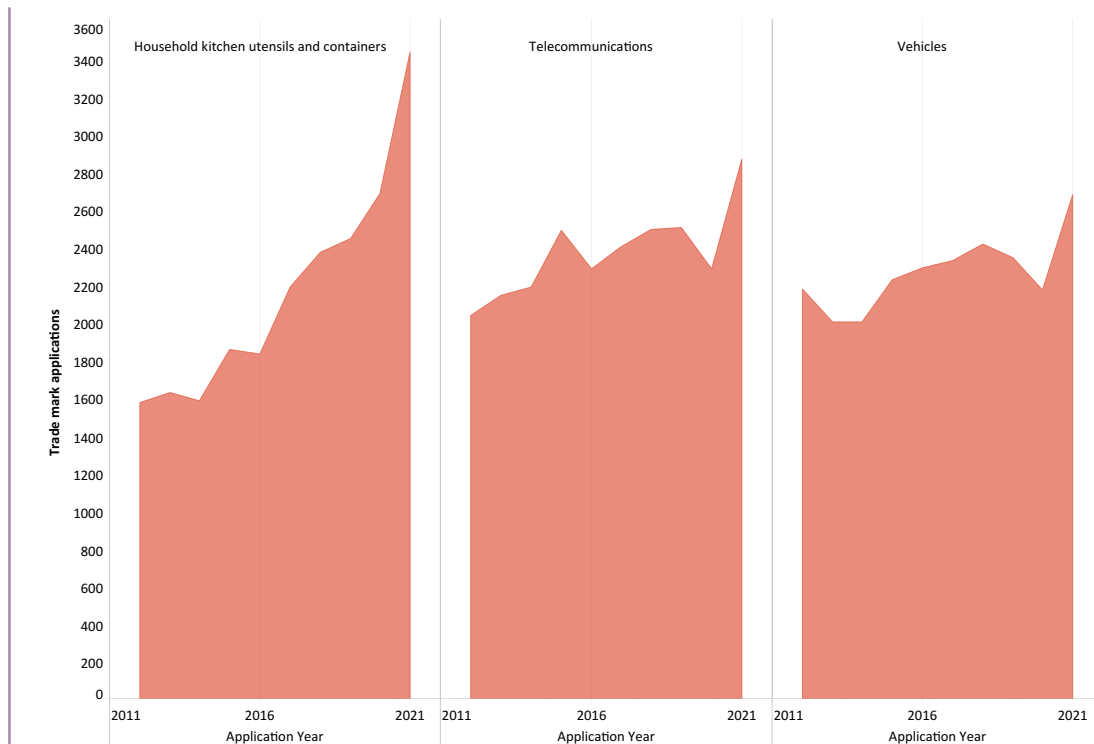
Figure T3 charts the classes with the highest application growth in 2021, excluding ‘low-volume’ classes (below the mean for total applications in 2021). The strongest relative growth (+28%) was in Household or kitchen utensils and containers (Class 21). Demand for homeware and kitchenware is positively related to household discretionary income and capital expenditure on private dwellings (the amount spent on homes). Over 2020 and 2021, high discretionary income prompted many households to upgrade their homes.

Trade mark applications for Telecommunications (Class 38) were up 25% on their 2020 levels (from 2,282 in 2020 to 2,868 in 2021). The Telecommunications class includes telephone and voice mail services and services that provide virtual conferencing, video-on-demand, data sharing and email, internet chatrooms and forums, radio, television and user access to global computer networks.

Social distancing and remote work have dramatically increased reliance on these services through the pandemic period.

Aggregate bank data shows that while expenditure in discretionary categories (like furnishings, household equipment, transport, clothing and footwear) declined significantly when restrictions were in place, it rebounded sharply when they eased especially after the shorter lockdowns from late 2020.<sup>8</sup> As with Household or kitchen utensils (Class 21), Vehicles (Class 12) and Clothing, footwear and headgear (Class 25) appear in the top trade mark growth classes for 2021.

Figure T3: In 2021, strong growth was observed in trade mark applications for Household kitchen utensils and containers (Class 21), Telecommunications (Class 38) and Vehicles (Class 12)



## Leading applicants

The top domestic and international applicants for trade marks come from a broad range of industries (see Table T2). The leading domestic trade mark filer in Australia was gaming machine manufacturer Aristocrat Technologies (110 applications). Ranked second was Endeavour Group, the retail drinks and hotels business formed by Woolworths Group in 2019.

Endeavour Group was listed separately on the Australian Securities Exchange in June 2021 in one of the largest demergers in Australian history. The food and groceries sector was further represented in the top 5 resident filers, including Coles Group (57 applications), Aldi Foods (47) and Southcorp Brands (45).

Table T2. Top domestic and international applicants for trade marks in Australia, 2021

Top domestic applicants			Top international applicants		
Rank	Applicant	Total applications	Rank	Applicant	Total applications
1	Aristocrat Technologies Australia Pty Ltd	110	1	Glaxo Group Ltd	110
2	Endeavour Group Limited	108	2	Apple Inc	103
3	Coles Group Limited	57	3	Novartis AG	94
4	Aldi Foods Pty Ltd	47	4	Samsung Electronics Co Ltd	85
5	Southcorp Brands Pty Ltd	45	5	Philip Morris Products SA	84



## States and territories

In 2021, New South Wales was the leading source of trade mark applications (with 19,287) followed by Victoria (15,915). Strong growth was observed in trade mark applications from all Australian states and territories except Victoria (-1%) and the Northern Territory (NT) (-12%). Applications for the NT are low in number and volatile year-on-year.

Prolonged COVID-19 shutdowns in Victoria caused its economy to contract by 0.4% in the 2021 financial year, the only state to record an economic contraction.<sup>9</sup> Despite the interruption to its economy, Victoria retained its lead position for the most trade marks per capita.

Table T3. Trade mark applications, Australian states and territories, 2020–2021

	NSW	VIC	QLD	WA	SA	ACT	TAS	NT
Total 2021	19,287	15,915	9,760	3,949	3,051	744	549	149
Change, 2020–21	+5%	-1%	+4%	+11%	0%	+4%	+13%	-12%
Applications per capita (thousands)	2.4	2.4	1.9	1.5	1.7	1.7	1.0	0.6

Sources: Australian Bureau of Statistics (ABS). Australian Demographic Statistics, June 2021. Retrieved 27 January 2021.

## Australian filings overseas

IP rights granted in Australia do not provide protection in other countries. To protect IP in other countries, Australian applicants must file trade mark applications abroad in those countries. Before the pandemic, trade mark applications filed by Australians overseas exhibited strong continuous growth. Based on latest data from WIPO, Australian residents filed a total of 20,452 trade mark applications abroad in 2020, an increase of 1% on 2019 (from 20,198 filing).

Trade mark applicants can obtain and maintain protection for their marks in multiple countries by filing a single international registration via the Madrid system. For the first time ever, more Australian applications abroad were filed via the Madrid system than directly with foreign IP offices. Of Australian applications abroad 53% were filed using the Madrid system, while the remaining 47% were filed directly with overseas IP offices.

At a global level, Australian IP owners use the Madrid system less intensively than the Patent Cooperation Treaty (PCT), the international patent system. However, the Madrid system covers fewer countries than the PCT.

As the Madrid system has expanded over the past decade to cover a larger number of countries, the system's use by Australian applicants has intensified. In 2009, 84 countries were party to the Madrid system. By the end of 2020, Madrid covered 123 countries, or 64% of all countries worldwide.<sup>10</sup> The Madrid share of Australian filings abroad has risen 24 percentage points since 2012, from 29% to 53% in 2021.

The total trade mark applications filed abroad by Australian residents contained 47,466 class nominations, up 1% from 2019. Despite a 13% decline, China remained the primary destination for these filings (19% of all class nominations in applications abroad), followed by the US (16%), New Zealand (15%) and the UK (7%). Growth in class nominations was observed across each of these destinations in 2021.

Of the 'high-volume' destination countries (those in the top quartile for class nominations in 2020), Canada experienced the strongest growth in filings from Australian residents (+96%), followed by Brazil (+91%) and Malaysia (+44%).





## Endnotes

1. Trade marks can be renewed every 10 years in perpetuity so long as they are in use, on the basis that the need to prevent consumer confusion does not lessen over time.
2. See Lyalkov S, M Carmona, E Congregado, A Millán, and J M. Millán (2019), 'Trademarks and Their Association with Kirznerian Entrepreneurs,' *Industry and Innovation*, 27(1-2): 1-10. See also Jensen PH and E Webster (2011), 'Patterns of trademarking activity in Australia,' *Australian Journal of Intellectual Property*, Melbourne Institute Working Paper 2(4).
3. ABS (2021), *Counts of Australian businesses, including entries and exits, December 2021*, Australian Bureau of Statistics, Commonwealth of Australia.
4. ABS (2021a), *Australian National Accounts: National income, expenditure and product, September 2021*, Australian Bureau of Statistics, Commonwealth of Australia.
5. Castaldi C, J Block & MJ Flikkema (2020), 'Editorial: why and when do firms trademark? Bridging perspectives from industrial organisation, innovation and entrepreneurship'. *Industry and Innovation*, 27: 1–2, 1–10.
6. We count an application as originating from a country if at least one applicant on the application is a resident of that country, as indicated by the applicant's address.
7. For more information, see <https://www.wipo.int/classifications/nice/en/>.
8. Mendonca S, T Pereira & M Godinho (2004), 'Trade marks as an indicator of innovation and industrial change'. *Research Policy* 33: 1385–404.
9. ABS (2021), 'Impact of lockdowns on household consumption – Insights from alternative data sources'. *Australian national accounts: National income, expenditure and product, September 2021*. Accessed 19 February 2021, <https://www.abs.gov.au/articles/impact-lockdowns-household-consumption-insights-alternative-data-sources>.
10. ABS (2021), *Australian National Accounts: State Accounts, 2020–21 financial year*. Accessed 22 February 2021, <https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-state-accounts/latest-release>.

# CHAPTER 04

## Designs



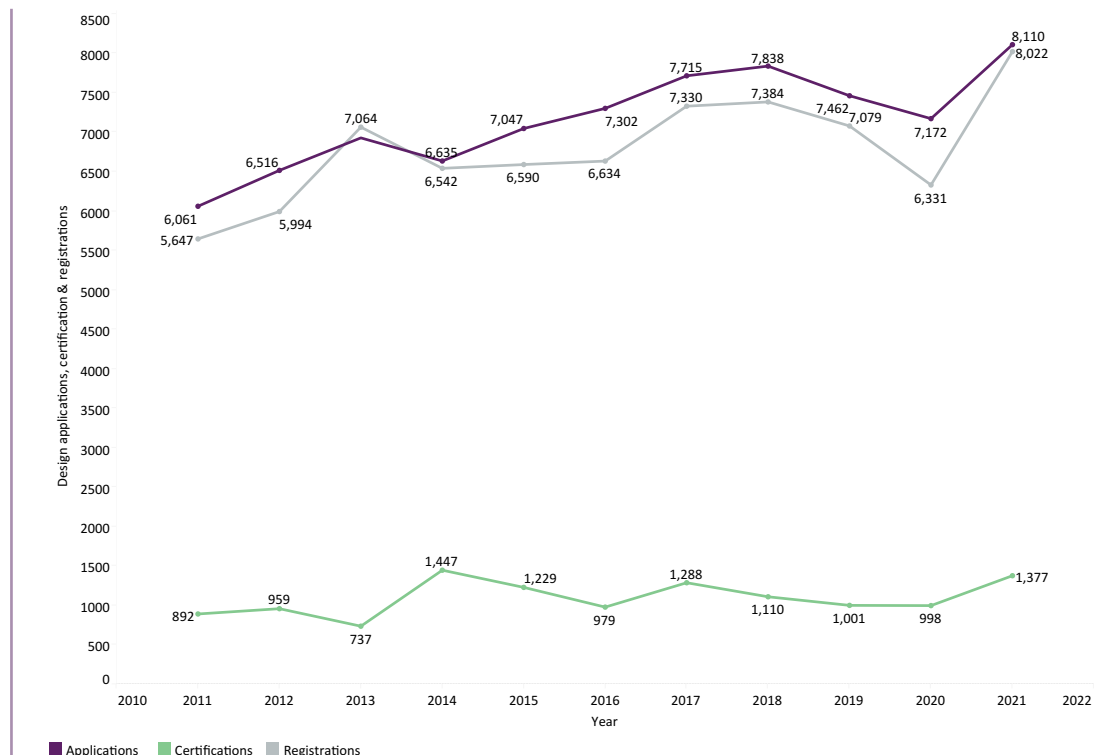
Design rights protect the visual features of a product, which give it a unique appearance, such as its shape, pattern, configuration or ornamentation. When design concepts are made public, they may be easily copied by imitators, in which case the original producers may not financially benefit from their work as much as they could otherwise. The owner of a certified design has exclusive rights to use, license and/or commercialise the design for up to 10 years. For designs to be eligible for protection, they must be new and distinctive – that is, they must be dissimilar in overall impression to designs that constitute prior art.

### Design applications, registrations and certifications

Design applications in Australia grew 13% in 2021, the steepest year-on-year growth observed over the past decade, reaching a record 8,110 applications. The strong growth reversed a downward trend, applications having fallen 5% in 2019 and a further 4% in 2020 (see Figure D1).

The 2021 growth can entirely be attributed to an increase in applications by non-residents. Non-resident applications grew 21% in 2021 (from 4,568 in 2020 to 5,516), while applications by Australian residents were stable, declining by less than 1% (from 2,604 to 2,595). Non-residents account for 68% of total applications, a proportion that has increased 9 percentage points since 2012.

Figure D1: Design right applications in Australia grew by 13% in 2021



In Australia, designs can be registered without substantive examination. In 2021, design registrations reached a record high number, at 8,022 up 27% on 2020. For design owners to enforce their rights in a design, it must be examined and certified by IP Australia.

IP Australia granted 1,377 design certifications in 2021, up 38% – stronger proportional growth than for applications and registrations. Consistent growth was observed for resident and non-resident certifications: those for residents rose 36% (from 351 in 2020 to 477 in 2021); those for non-residents rose 39% (from 647 to 900).

## Improving IP protections for Australian designers

In March 2022, several improvements to the design system will come into effect. Most significantly, a 12-month grace period has been introduced to ensure designers can register their designs after inadvertently disclosing them. Designs law in many other jurisdictions, such as the United States, Japan and Europe, provides 12-month grace periods, so this change will make it easier to coordinate IP protection across jurisdictions. The changes also streamline and improve the designs registration system and give more flexibility to designers in how they protect their products.

IP Australia is exploring a program of further reforms to ensure the Australian design rights system is fit for purpose and supports the Australian economy now and in the future. We are considering how the design rights system could accommodate non-physical or ‘virtual’ products and parts of products, and how to give more flexibility to designers to adapt their protection as their products change during development.

In addition, in principle agreement has been reached between Australia and the UK on a free trade agreement (FTA). Australia has agreed to make all reasonable efforts to join the Hague Agreement on Industrial Designs as part of that agreement. Accession to the Hague Agreement will provide new benefits for Australian designers by allowing them to protect their original creations overseas more easily and extending the term of protection available for designs in Australia from 10 to 15 years. The agreement allows time to consider legislative and system changes after entry into force of the FTA.

The ongoing reforms build on a 12-month review that involved extensive research into Australia’s design economy, the drivers of design innovation and the role of design rights.





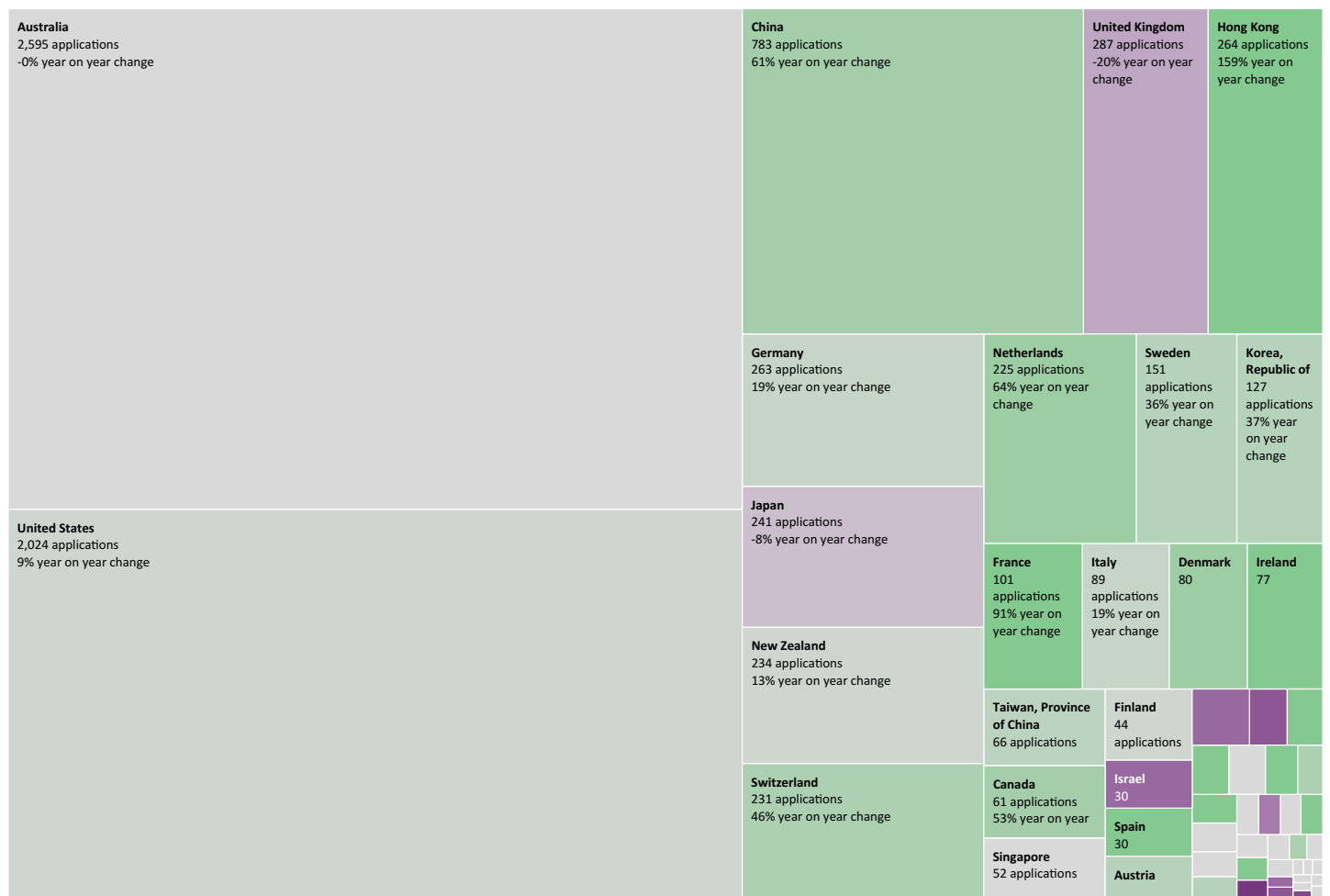
# Countries of origin

The leading foreign countries of origin for design right applications in 2021 were the US (US applicants were named on 2,024 applications), China (783), the UK (287), Germany (263) and Japan (241).<sup>1</sup>

In 2021, applications from China grew 61%, accelerating a growth trend observed over the past decade. From 2012 to 2021, applications from China have grown at a compound annual growth rate of 24%. Applications listing US applicants increased by 9%. However, the US share of total applications in 2021 is a percentage point lower than its 5-year moving average of 26%.

Focusing on ‘high-volume’ countries of origin (those in the top quartile for design applications in 2021), the strongest growth was observed in design applications from Hong Kong: these increased to 2.6 times their level in 2020. Strong relative increases also occurred in applications from France (+91%), Denmark (+70%) and the Netherlands (+64%).

Figure D2: Number and growth of design applications by country of origin



-100.0% 100.0%

Size of the blocks are proportional to the number of filings. Shading of the blocks indicates the year on year change.



## Design classes

In Australia, registered designs are classed in relation to products using the Locarno Classification, comprised of 32 product categories.<sup>2</sup>

In 2021, as in previous years, the leading product class for design applications was Means of transport and hoisting (704 filings), which encompasses all land, sea, air and space vehicles and their component parts (see Table T1). The second leading class was Recording, telecommunication or data processing equipment (658 filings).

Design has a visual language that can help communicate what a product or feature does. In this way, clever design can help build market acceptance for new technologies.<sup>3</sup> Design can also excite users and encourage them to form strong attachments to products.

For this reason, design can play a pronounced role in mature industries, helping to create difference between products that are functionally similar.<sup>4</sup> The third leading class for design filings in 2021 was Packaging and containers, with applications in this class up 19% from 2020.

Focusing on ‘high-volume’ countries of origin (those in the top quartile for design applications in 2021), the strongest growth was observed in design applications from Hong Kong: these increased to 2.6 times their level in 2020. Strong relative increases also occurred in applications from France (+91%), Denmark (+70%) and the Netherlands (+64%).

Table T1: Top five design classes






					
	Means of transport or hoisting	Recording, telecommunication or data processing equipment	Medical and laboratory equipment	Packaging and containers	Furnishing
Total applications	704	658	593	584	557
Change in applications, 2020–21	+20%	+25%	+13%	+20%	+21%

Figure D3 charts design activity in ‘high-volume’ classes (those above the mean for total applications in 2021). The strongest growth in 2021 was in applications for Lighting apparatus (+39%, from 199 in 2020 to 276). Australia saw a record boom in home renovations in 2021, with over A\$1 billion spent each month between January and September.<sup>5</sup> As Australians invested to upgrade their living environments and create comfortable workspaces at home, demand surged for lighting industry products, driving industry revenue to its highest level since 2008.<sup>6</sup>

Strong growth for design applications was also recorded for Machines not elsewhere specified (Class 15, +25%), including refrigerators, washing and drying machines, construction and agricultural machinery, engines, pumps and compressors and miscellaneous machinery like industrial robots. Applications for Games, toys, tents and sports goods (Class 21) grew 33% in 2020 and a further 23% in 2021 as millions of people at home searched for new forms of entertainment.



Figure D3: In 2021, design applications for Lighting apparatus (Class 26) grew by 29% as Australians invested to upgrade their homes



## Leading applicants

Table D2 lists Australia's leading resident and non-resident applicants for design rights. Australian-based fashion house Zimmermann Wear retained its top position in 2021 with 61 applications. New to the list of top filers was Phoenix Industries, a producer of tapware, showers and bathroom accessories, with 40 applications.

The 3<sup>rd</sup>-ranked resident filer was Vuly (36 applications), a Brisbane-based company that designs and manufactures outdoor play products.

In 2020, Vuly won two Good Design Awards – Australia's peak international design awards – in the Product Design and Lifestyle category.

Ranked 4<sup>th</sup>, Frankie 4 is an Australian shoe brand that has sought patent and design right protection for its podiatrist-designed footwear (29 applications). Australian fashion label With Jéan (28 applications) was ranked 5<sup>th</sup>.

Table D2. Top domestic and international applicants for designs in Australia, 2021

Top domestic applicants			Top international applicants		
Rank	Applicant	Total applications	Rank	Applicant	Total applications
1	Zimmermann Wear Pty Ltd	61	1	Koninklijke Philips NV	152
2	Phoenix Industries Pty Ltd	40	2	Beijing Xiaomi Mobile Software Co Ltd	97
3	Vuly Property Pty Ltd	36	3	Apple Inc	95
4	Frankie4 IP 1 Pty Ltd	29	4	Aussie Union Group Hongkong Ltd	62
5	With Jean Pty Ltd	28	5	Fisher & Paykel Healthcare Ltd	61

The list of top international applicants includes Dutch health technology company Philips (152 applications); consumer electronics and software brands, Xiaomi (97) and Apple (95); furniture seller Aussie Union Group (62); and Fisher & Paykel Healthcare (61), a manufacturer, designer and marketer of products and systems for use in respiratory care.



## Australian filings overseas

Research commissioned by IP Australia found that Australian design innovators and users of domestic design rights tend to be more globally active than the average Australian business.<sup>7</sup> However, IP rights granted in Australia do not provide protection in other countries. Australian designers must file design right applications abroad to protect IP in other countries.

In 2020 (most recent WIPO data), the design count in applications by Australians abroad fell for the second consecutive year, to a total of 2,225 designs. Despite the 9% fall, total designs filed abroad remained at their 3<sup>rd</sup>-highest level since 2012.

Australians can seek design registration in other countries by filing applications directly with other IP offices or via the international Hague system.

Joining the Hague would enable Australian designers easier access to international markets, including key destinations for design exports. The top destinations for Australian designs are the US (634 designs), European Union Intellectual Property Office (399), New Zealand (277) and China (260). The European Union became a member of the Hague Agreement in 2006, the US in 2015 and China joined in 2022.

Of the 'high-volume' destination countries (those in the top quartile for Australian-origin designs in 2020), Mexico experienced the strongest growth in designs from Australian residents (up 146% to 32 designs), followed by India (up 46%) and Singapore (up 26%).

### Endnotes

1. WIPO, 2021.
2. We count an application as originating from a country if at least one applicant on the application is a resident of that country, as indicated by the applicant's address.
3. For details about the Locarno System, see <https://www.wipo.int/classifications/locarno/en/>.
4. Eisenman M (2013), 'Understanding aesthetic innovation in the context of technological evolution'. *Academy of Management Review*, 38(3): 332–351.
5. Chan TH, J Mihm & ME Sosa (2018), 'On styles in product design: An analysis of U.S. design patents'. *Management Science*, 64(3): 1230–1249.
6. Williams S (2021), 'How much longer can the renovation boom last?' *Sydney Morning Herald*. Accessed 6 February 2022, <https://www.smh.com.au/property/news/how-much-longer-can-the-renovation-boom-last-20211217-p59ihd.html>. *Madrid yearly review 2021* – international registration of marks
7. IbisWorld (2021), 'Australia Industry (ANZSIC) Report G4229: Electrical and Lighting Stores in Australia'. IbisWorld.



# CHAPTER 05

## Plant breeder's rights



PBRs provide plant breeders with a form of legal protection for new varieties of plants, up to a maximum term of 25 years. A plant variety must be clearly identified, distinguishable from other varieties, uniform and stable upon propagation to be eligible for protection.

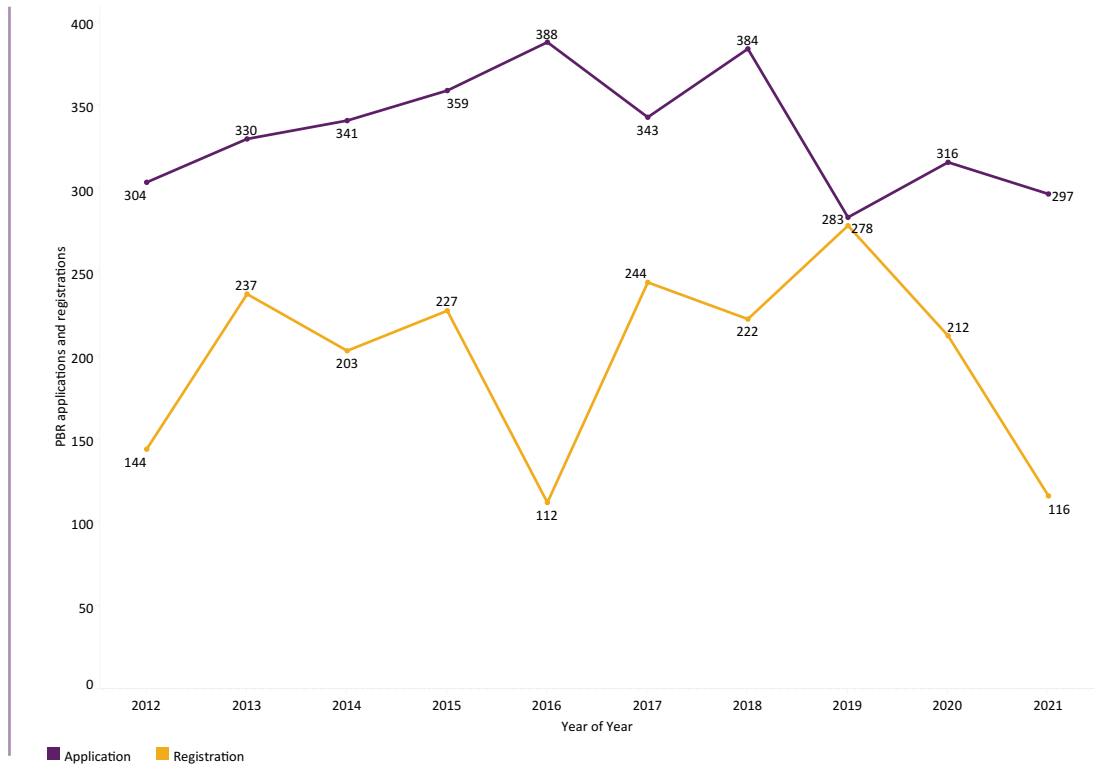
PBRs are designed to encourage private investment in the breeding of new plant varieties, and to encourage international transfer of new varieties into Australia. A PBR gives its owner exclusive rights to exclude others from commercially using or selling a variety.

This provides the opportunity for the right holder to collect royalties while directing the production, sale and distribution of varieties.

### PBR applications and registrations

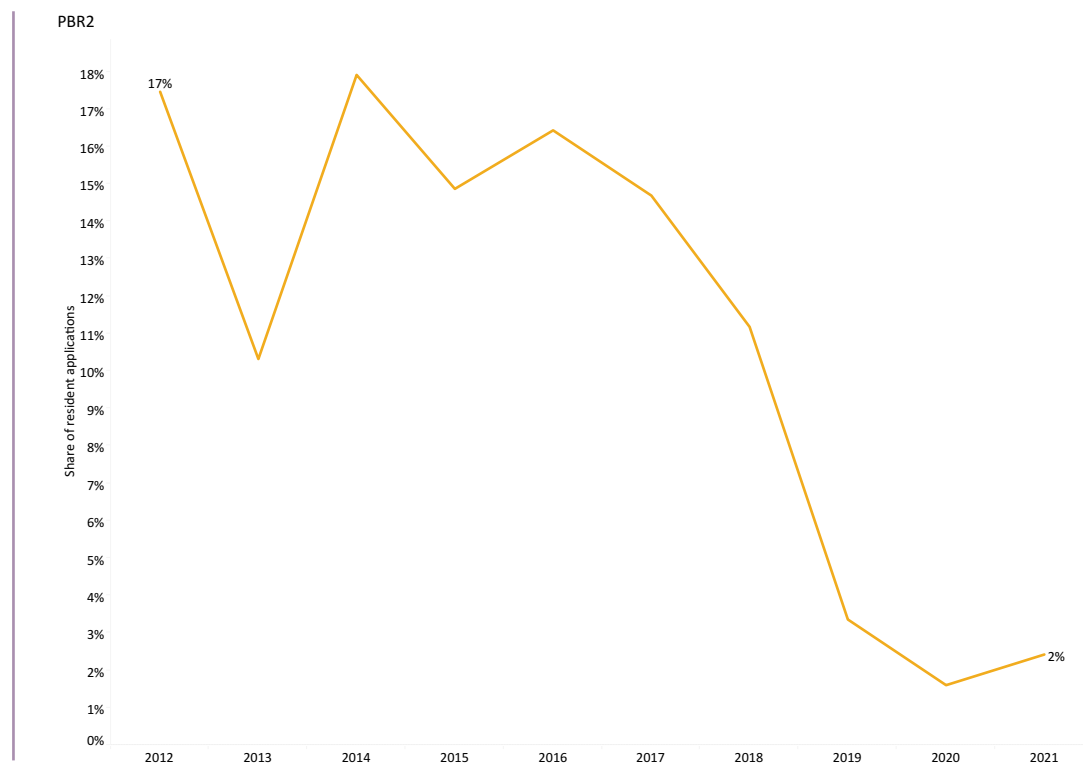
In 2021, 297 PBR applications were filed at IP Australia, down 6% on 2020. Following a relatively stable growth trend between 2012 and 2016, annual filings have been on a declining trend over recent years (see Figure PB1).

Figure PB1: In 2021, PBR applications fell 6% from their 2020 level



Non-residents remain the dominant source for PBR filings in Australia, with 58% of total filings, a position maintained for most of the past decade. Applications by non-residents fell 9% in 2021 (from 191 in 2020 to 173) and non-residents accounted for 94% of the decline in total applications. Applications by Australian residents fell 1% from 2020 (to 124), though the difference was just one application.

**Figure PB2: The proportion of PBR applications filed by multiple parties has declined markedly over the past decade**



PBR applications can be filed by single parties or by multiple parties. In practice, no PBR applications are filed by Australians in partnership with international co-applicants. In the case of PBRs, multi-party applications are produced by Australian co-applicants. As Figure PB2 shows, the share of resident applications involving multiple parties has significantly declined over the past decade, from one in every six in 2012 to one in every 41 in 2021.

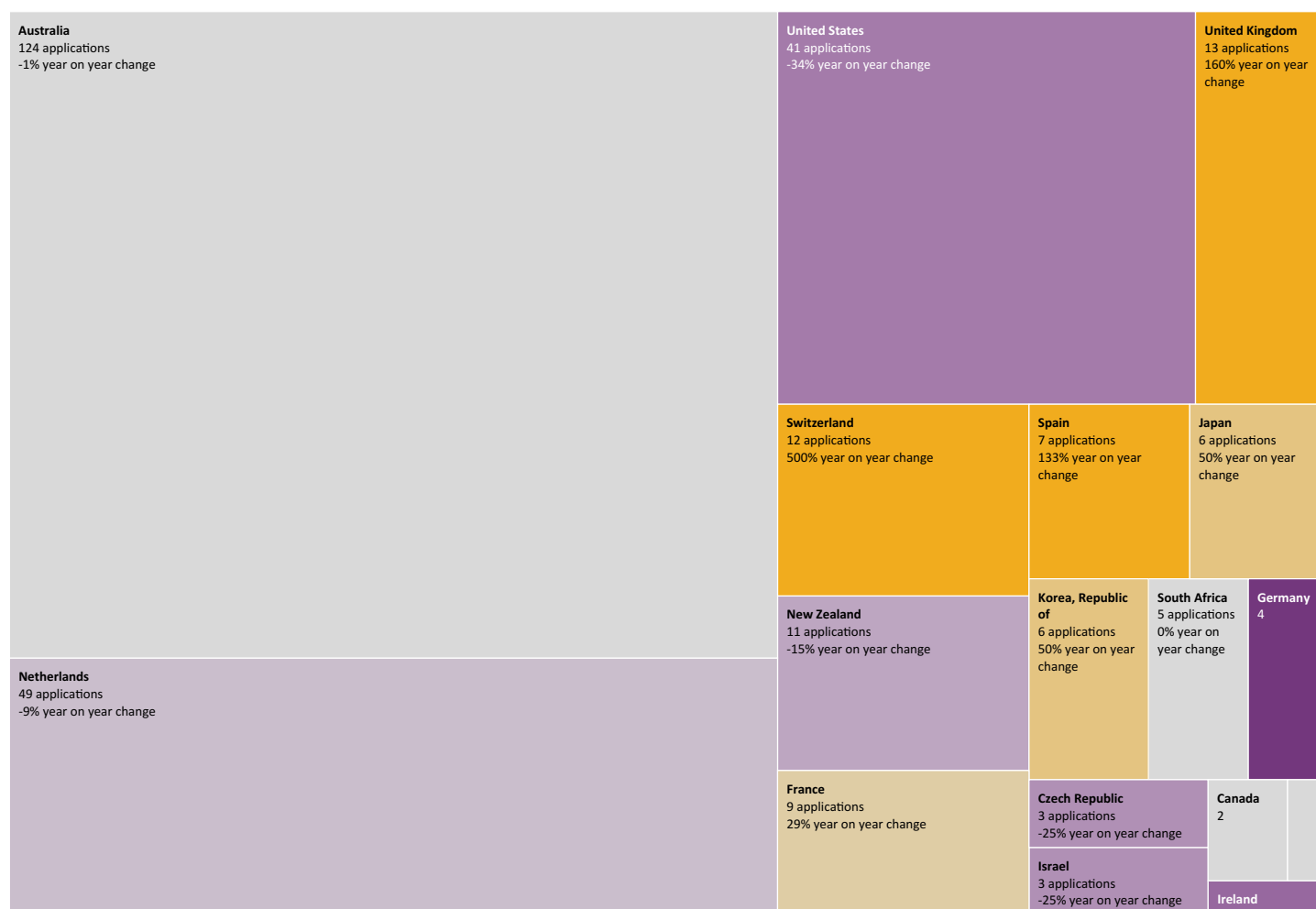
A PBR application must pass a substantive examination process and a comparative growing trial to be registered.<sup>1</sup> PBR registrations fell 45% in 2021, to 116. A variety of factors likely caused the decline. The drop in registration numbers likely reflects constraints on examination, including travel restrictions during COVID-19 which affected the ability of examiners and plant group experts to attend growing trials. In addition, Australia's devastating bushfires in 2019–20 caused economic losses equivalent to 6–8% of Australia's national agricultural output, including loss of crops, impacting breeders and downstream users.<sup>2</sup>

In 2021, a notable decline in PBR registrations was observed for both Australian and non-resident applicants. Australian residents registered 50 PBRs, down 52% on 2020, and these accounted for accounting for 43% of all registrations. Registrations by non-residents fell 38%, from 107 to 66.

## Countries of origin

The Netherlands and the US retain their status as the two major foreign countries of origin for PBR filings in Australia.<sup>3</sup> In 2021, the Netherlands surpassed the US as the leading source for the first time, with 49 total applications. Filings from the US fell 34%, from 62 in 2020 to 41 in 2021. Applications from the Netherlands also fell but at a lesser rate than the US (-9%, from 54 to 49).

Figure PB3: Number and growth of PBR applications by country of origin



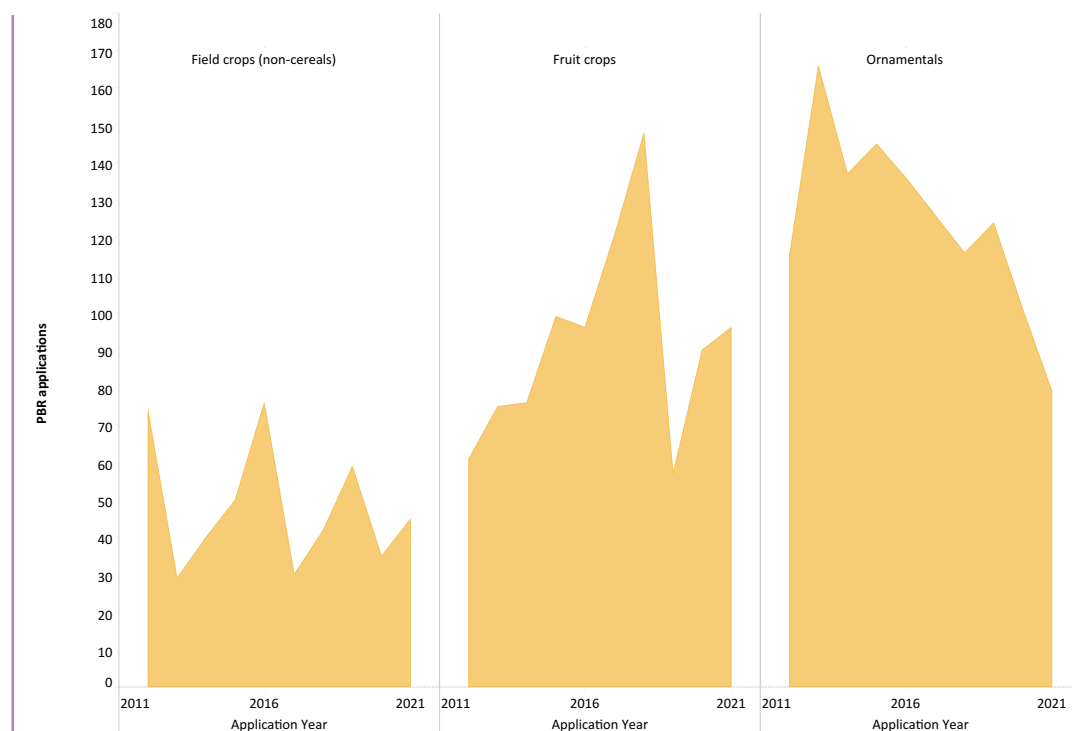
-100% 100% Size of the blocks are proportional to the number of filings. Shading of the blocks indicates the year on year change.

## Plant varieties

Ornamental plants and fruit crops have been the two major PBR varieties attracting the most applications in Australia (see Figure PB4). Fruit crops became the strongest performing plant group in 2021, with 96 applications, or 32% of applications. Fruit crop applications have shown an overall increasing trend since 2012, reaching a peak of 148 in 2018 before sharply dropping to 57 in 2019. Fruit crop filings have rebounded to their 10-year average in the years since.

Applications for ornamental varieties have steadily declined since 2013 and fell 22% in 2021, from 101 in 2020 to 79 (see Figure PB4). The decline in applications for Ornamentals has been steady since 2001, when a peak of 259 applications was recorded. As a share of total applications, Ornamentals have fallen from 50% in 2013 to 27% in 2021.

Figure PB4: Number of PBR applications for varieties of Ornamental and Fruit crop varieties, 2012–21



## Leading applicants

Table PB1 lists the leading resident and non-resident applicants for PBR applications in Australia. Among domestic applicants, Botanic Gardens and Parks Authority (WA), OZ Pash Pty Ltd and Nuflora International Pty Ltd all filed 8 applications in 2021.

NuFlora was formed as a cooperative enterprise by the University of Sydney through its Plant Breeding Institute (38% ownership). Costa Berry filed 7 applications, followed by Australian Grain Technologies, with 6.

Table PB1. Top domestic and international applicants for PBRs in Australia, 2021

Top domestic applicants			Top international applicants		
Rank	Applicant	Total applications	Rank	Applicant	Total applications
1	Botanic Gardens and Parks Authority (WA)	8	1	Nunhems B.V.	13
1	OZ Pash Pty Ltd	8	2	Syngenta Crop Protection Agency	11
1	NuFlora International Pty Ltd	8	3	International Fruit Genetics	8
2	Costa Berry International Pty Ltd	7	4	Rijk Zwaan Zaadteelt en Zaadhandel B.V.	7
3	Australian Grain Technologies Pty Ltd	6	5	David Austin Roses Limited	6
4	Sugar Research Australia	5	5	J Frank Schmidt and Son Co.	6
4	The University of Sydney	5			
4	Hidden Valley Plantations	5			
5	Terence Charles Keogh	4			
5	State of Queensland Horticulture Innovation Australia Limited	4			

Nunhems was the top PBR filer among international applicants in Australia with 13 applications. Nunhems is a multinational company headquartered in the Netherlands that provides a wholesale supply of vegetable seeds and crops. Syngenta, a global provider of agricultural science and technology with its headquarters in Switzerland, ranked 2<sup>nd</sup> with 11 applications. International Fruit Genetics, a US-based fruit breeding company, was 3<sup>rd</sup> with 8.

The top filer in 2020 was Rijk Zwaan, a vegetable breeding company based in the Netherlands. Filings from this company dropped from 19 in 2020 to 7 in 2021, placing it 4<sup>th</sup> in the rankings. Austin Roses, a British company that breeds English roses, and J Frank Schmidt and Son Co., a US wholesale nursery, each filed 6 applications.

## The economic contribution of PBR users in Australia

New plant varieties make a crucial contribution to output and productivity growth in Australian agriculture, including horticulture and nurseries. The Australian Government has committed to supporting the agricultural industry to reach its Ag2030 goal of \$100 billion in production by 2030. IP Australia has set up a dedicated program to explore Australia's plant breeding ecosystem and the role of PBR. We are researching the current landscape, challenges and opportunities associated with PBR. From this, we will make recommendations for future improvements.

We have partnered with the [Centre for Transformative Innovation](#) (CTI) at Swinburne University of Technology to investigate the economic context for the PBR system including the industries for which it has direct or downstream impacts and the economic contribution of PBR users. This is the first step toward understanding the economic impacts of registering new plant varieties.

To enable this research, the CTI team connected data about PBR applications with information about the filing firms from the [ABS Business Longitudinal Analysis Data Environment](#) (BLADE).

Early findings from the CTI study suggests that the annual number of PBR applications filed in Australia increased rapidly after plant variety protections were first introduced in 1987, reached their peak in 1999, and then experienced volatile change afterwards with an overall declining trend.

Cultivars used in Australian agriculture often reflect the result of local breeding efforts to improve or build on germplasm sourced from abroad (e.g., from international breeding organisations, public research institutes or multinational firms). PBR creates an incentive to invest in domestically bred cultivars and encourages private firms' international transfer of varieties and germplasm. Since the PBR system was first introduced in 1987, approximately 55% of all applications have come from foreign applicants, among which the US and the Netherlands are the major source countries.

The aggregate economic activity attributable to Australian PBR applicants was estimated by identifying all companies with an Australian Business Number (ABN) that have applied for at least one PBR. This data has important caveats that mean aggregates should be treated with caution.<sup>4</sup> With these caveats in mind, the aggregates across all firms for which data are available are presented in Table PB2 below. These firms have a total annual turnover of \$12.8 billion (average over all years) and employ 78,000 full-time workers.

Table PB2. Key metrics of economic activity for PBR applicants

	Number of firms with data	Average	Aggregate
PBR Applications	235	5	1,085
R&D Investment (\$1,000s)	25	2,054	51,350
Turnover (\$m)	160	80	12,816
Annual Capital Investment (\$m)	160	10	1,578
Total Assets (\$m)	235	3	742
Employment (FTE)	112	699	78,316

Source: BLADE. Notes: Averages are across all years reported and across firms. All units in real 2020 dollars (price index from ABS 6427.0 division A). Firms with enforceable PBR for which economic aggregates are taken are fewer than 265 reflecting firm entry and exit to BLADE as well as PBR non-renewals.

The economic impact of the PBR system comprises both the value captured by PBR holders themselves and the value that their new cultivars generate when used in downstream sectors. Further research by the project team will map PBR filings against the value of different classes commodities that benefit from creating PBR-protected varieties.

Throughout 2022, IP Australia's PBR Reform Program will publish further research and data, including findings from interviews with over 70 stakeholders, most directly involved in breeding new plant varieties or bringing new varieties into Australia. To keep updated, visit the program online or contact the program team.

## Endnotes

1. As most applications take more than 12 months to register, the number of PBR registrations in a year is not strongly correlated with the number of applications that year.
2. Bishop J, T Bell, C Huang & M Ward (2021), *Fire on the farm: Assessing the impacts of the 2019–2020 bushfires on food and agriculture in Australia*. WWF Australia.
3. We count an application as originating from a country if at least one applicant on the application is a resident of that country, as indicated by the applicant's address.
4. Most importantly, only 213 PBR-owning ABNs have been linked to accounting data. This compares to the 439 organisations identified. The 213 ABNs account for a total of 1,409 PBR applications (as of 2018). This accounts for only 48% of the 2,915 applications by Australian organisations up until 2018. It should also be recognised that for many firms that register PBR, much of their economic activity is not directly related to the breeding and distribution of new plant varieties. For example, well-known biscuit manufacturer Arnott's has applied for PBR.

# CHAPTER 06

## Copyright



Copyright is a form of unregistered intellectual property that is founded on a person's creative skill and labour and protects the original form or way an idea or information is expressed. Copyright material generally includes items such as books, artwork, software, film and sound recordings.

Copyright provides exclusive economic rights that allow the copyright owner to do certain acts with their copyright material. These acts include copying, publishing, communicating (e.g., broadcasting, making available online) or publicly performing the copyright material.

Copyright owners may also licence another person to do some or all of those acts. Copyright law also provides non-economic rights, known as moral rights, which are designed to protect the creative integrity of copyright creators.

In Australia, copyright is granted automatically from the time an original work is created and does not need to be registered. With no formalities and low barriers to protection, copyright is easily accessible to different sectors, including small to medium enterprises (SMEs).

The Department of Infrastructure, Transport, Regional Development and Communications is responsible for managing the Copyright Act 1968. The Department develops Australian copyright policy and represents Australia's interests in relation to international copyright issues.

### The contribution of copyright to Australia

Copyright has a central role in content-based industries, as a driver of economic value. Collectively, these industries are sometimes referred to as the 'creative economy' as a way of recognising the economic value of creativity and innovation underpinned by IP rights.<sup>1</sup>

Measuring the contribution of the content-based industries is one way to gauge the value of economic activity enabled by copyright. A study commissioned by the Australian Copyright Council and conducted by PriceWaterhouseCoopers (PWC) found that Australian industries that rely on copyright protection contributed \$124.1 billion to the Australian economy in 2018.<sup>2</sup> This estimate included \$7.5 billion contributed by non-dedicated industries<sup>3</sup> which support 'core' copyright industries. The study used a methodology developed by the World Intellectual Property Organization (WIPO).

A more recent publication by the Department of Infrastructure, Transport, Regional Development and Communications estimated that 'cultural and creative activity' contributed \$115.8 billion to the Australian economy in 2018–19 (Figure C1).<sup>4</sup> The economic contribution was equivalent to 6% of Australia's gross domestic product (GDP). The analysis captured smaller sectors (such as zoological and botanical gardens operations) not directly underpinned by copyright though it excluded non-dedicated industries.<sup>5</sup> The publication found that industries with the greatest contribution to cultural and creative activity included design at \$45.3 billion, fashion at \$14.7 billion, and broadcasting, electronic or digital media and film at \$9.2 billion. Findings from the PWC study showed that these industries were supported by copyright to some degree.





Figure C1: Cultural and creative activity (value and share of GDP)



\$0.00B \$45.26B Shading of the blocks indicate the value.

Source: The economic contribution of Australia's copyright industries – 2006-2018, PwC, June 2020. Notes: \* 'Other' includes museums, libraries and archives, performing arts, environmental heritage, music composition and publishing, visual arts and crafts, culture goods manufacturing and sales and supporting activities. \*\* 'Compensation of employees' is income received by individuals working in cultural and creative occupations that are outside industries identified as cultural and creative.

## Access to copyright content

Copyright law provides creators important incentives to create new content and facilitates access to that content for users. The copyright framework also provides mechanisms by which creators can maintain control over access to their work.

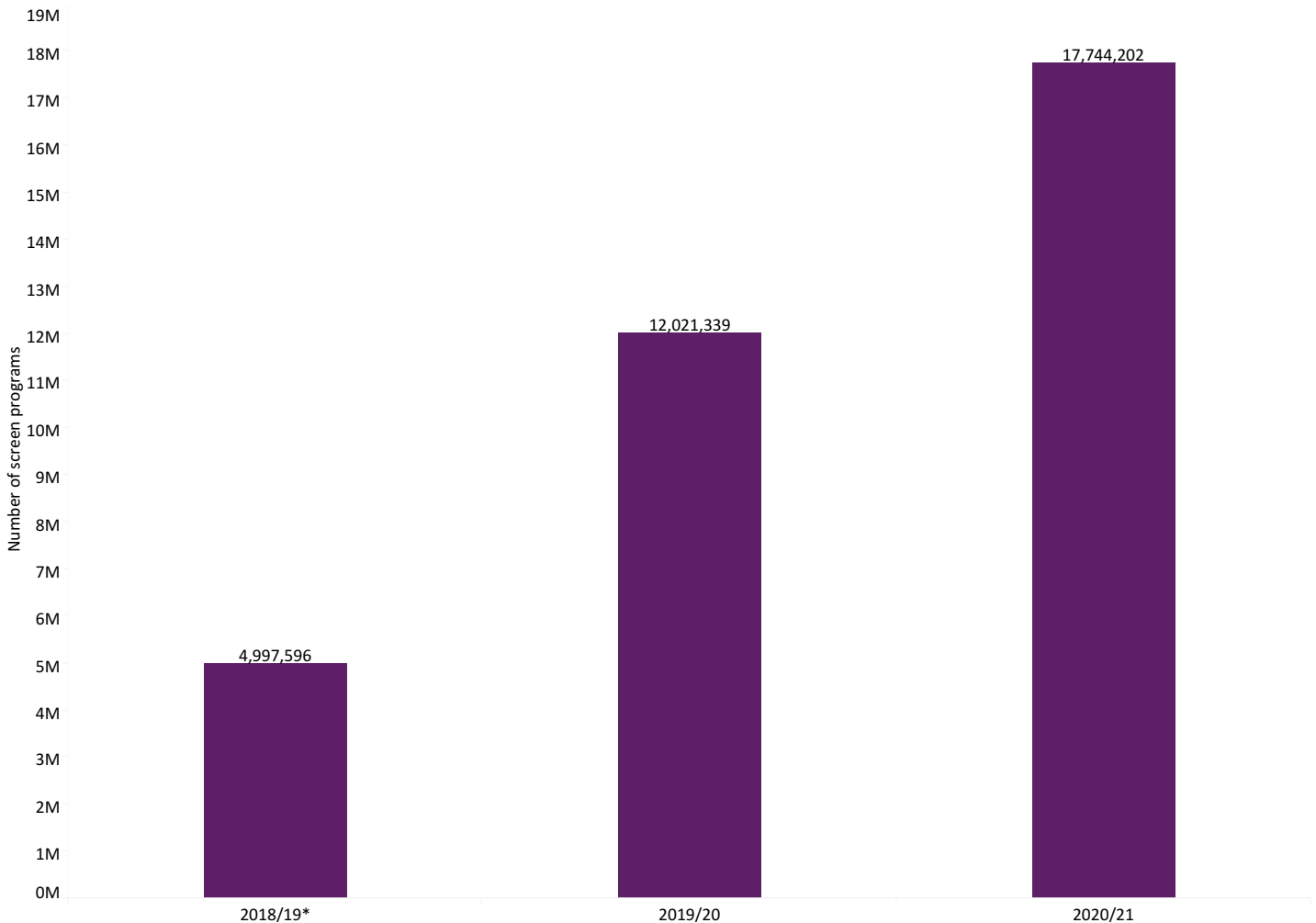
## The value of licencing through collecting societies

Direct licensing arrangements between copyright owners and users comprise a significant portion of the economic contribution attributable to copyright. Australia's copyright arrangements also include collecting societies. These bodies collect fees from licensing arrangements that allow uses of large numbers of copyright material, and distribute the fees to the owners of the creative works. For users and owners of creative content, negotiating individual licences can be a burdensome and costly process, potentially outweighing their value. Collective licensing reduces these costs and is commonly relied upon by educational institutions, governments and businesses for access to copyright material.

The annual reports of collecting societies provide insight into the levels at which copyright material is being used. In 2020-21:

- \$430.7 million was distributed to over 409,000 copyright owners in the music industry, including musicians, composers, songwriters and publishers, by the Australasian Performing Right Association (APRA) and Australasian Mechanical Copyright Owners Society (AMCOS), together known as APRA AMCOS.<sup>6</sup>
- \$102 million in revenue was distributed to more than 17,000 rights holders including writers, artists, publishers and agents by Copyright Agency Limited (CAL).<sup>7</sup>
- \$36.4 million was distributed to registered artists and licensors by the Phonographic Performance Company of Australia (PPCA).<sup>8</sup>
- \$45.3 million was distributed to 4,900 copyright owners in the audiovisual sector such as producers, directors, broadcasters and agents by Screenrights.<sup>9</sup>
- Screenrights reported significant growth in the use of members' content, with record levels of usage for 2020–21 due to COVID-19 (see Figure C2).

Figure C2: Total number of screen programs that have been used in Australian educational institutions, as reported by Screenrights for the Australian Educational Licence, 2018/19 to 2020/21



Source: Media content consumption survey: Analytical Report, Department of Infrastructure, Transport, Regional Development and Communications, December 2021

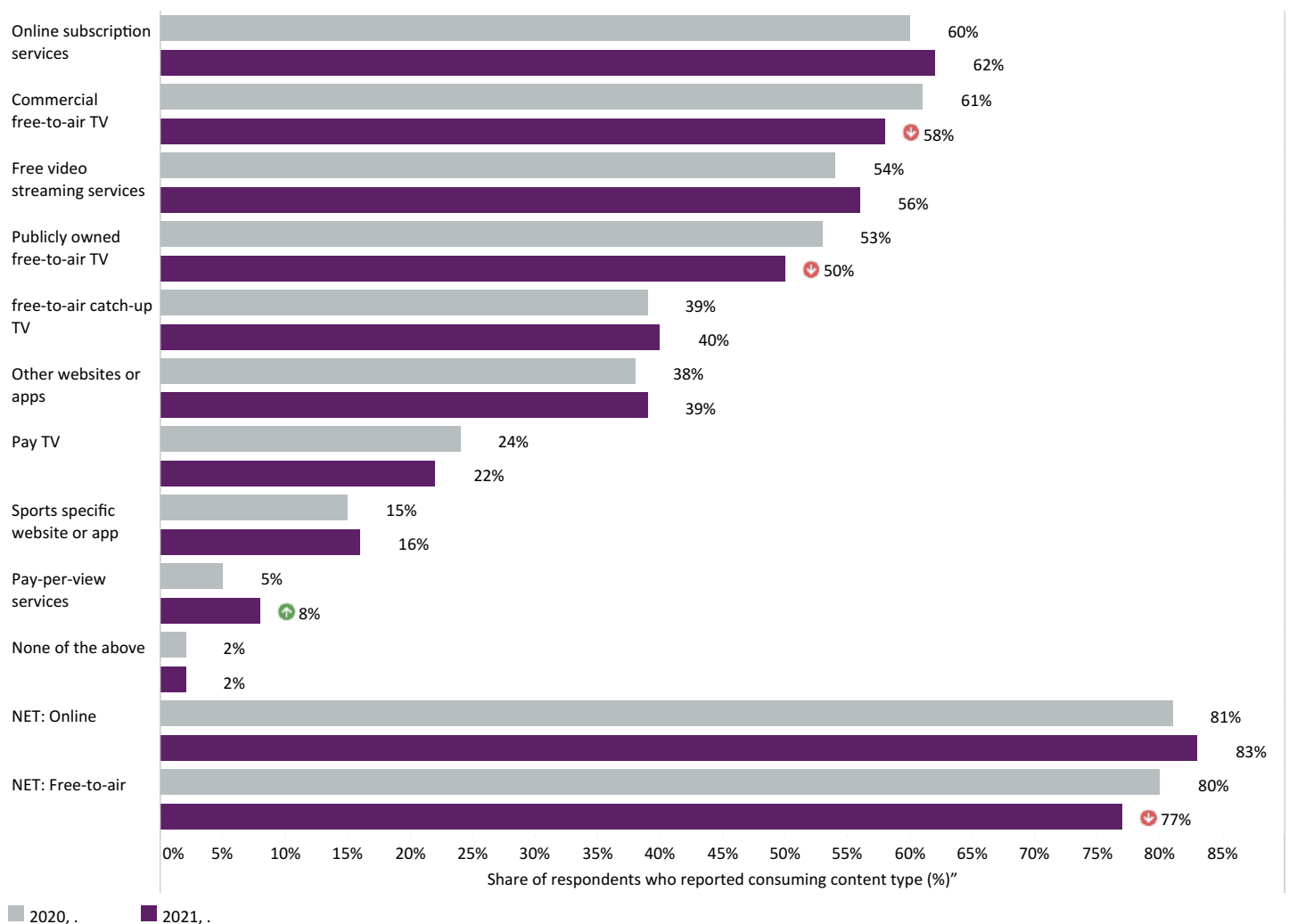
## Consumption of screen content

Screen content is one of the most common formats in which Australians consume licensed copyright material. The ways in which Australians consume screen content are continually evolving. Australians’ media content consumption behaviours are explored in the Media Content Consumption Survey, commissioned by the Department of Infrastructure, Transport, Regional Development and the Arts.<sup>10</sup> In 2021, more Australian adults consumed screen content through online subscription services than through any other individual types of service (62% of respondents report using these services, up from 60% in 2020).

At the same time as use of online subscription services has grown, a long-term decline has occurred in rates of online infringement (see Copyright Infringement section below).

In 2021, commercial free-to-air television was the second leading source of screen content for Australian adults (58% of respondents, slightly down from 61% in 2020). See Figure C3 for further details.

Figure C3: Means of consuming screen content



Source: Consumer Survey on Online Copyright Infringement 2021, Department of Infrastructure, Transport, Regional Development and Communications, December 2021. Notes: ▲ Significantly different to the other sub-group at the 95% confidence level. Notes: Significantly different to the other sub-group at the 95% confidence level.



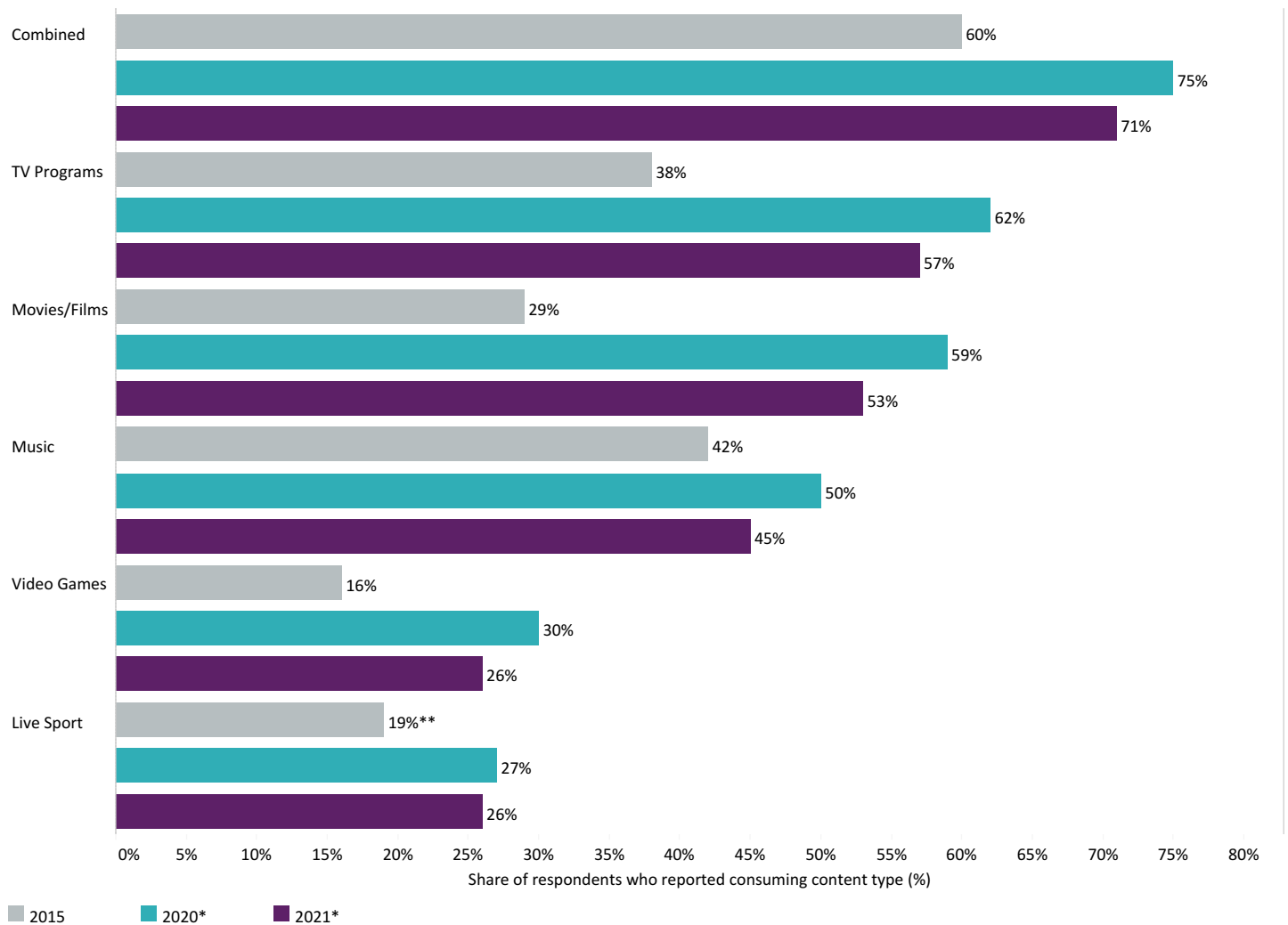
## The impact of COVID-19

Since the outset of the COVID-19 pandemic in 2020, people have been spending more time at home, leading them to consume more online content.

The Consumer Survey on Online Copyright Infringement (the ‘Consumer Survey’), an annual publication by the Department of Infrastructure, Transport, Regional Development and Communications, analyses ongoing trends in online copyright infringement.<sup>11</sup>

According to the 2021 Consumer Survey, overall consumption of content online was slightly lower than was reported in the 2020 survey, and is much higher than when the survey began in 2015. The 2020 survey was conducted in the initial stages of the COVID-19 pandemic, while the 2021 survey took place during the pandemic but at a time when no major travel restrictions were in place – see Figure C4.<sup>12</sup>

Figure C4: Online content consumption across five content types (television, film, music, video games and live sport) over a three-month period



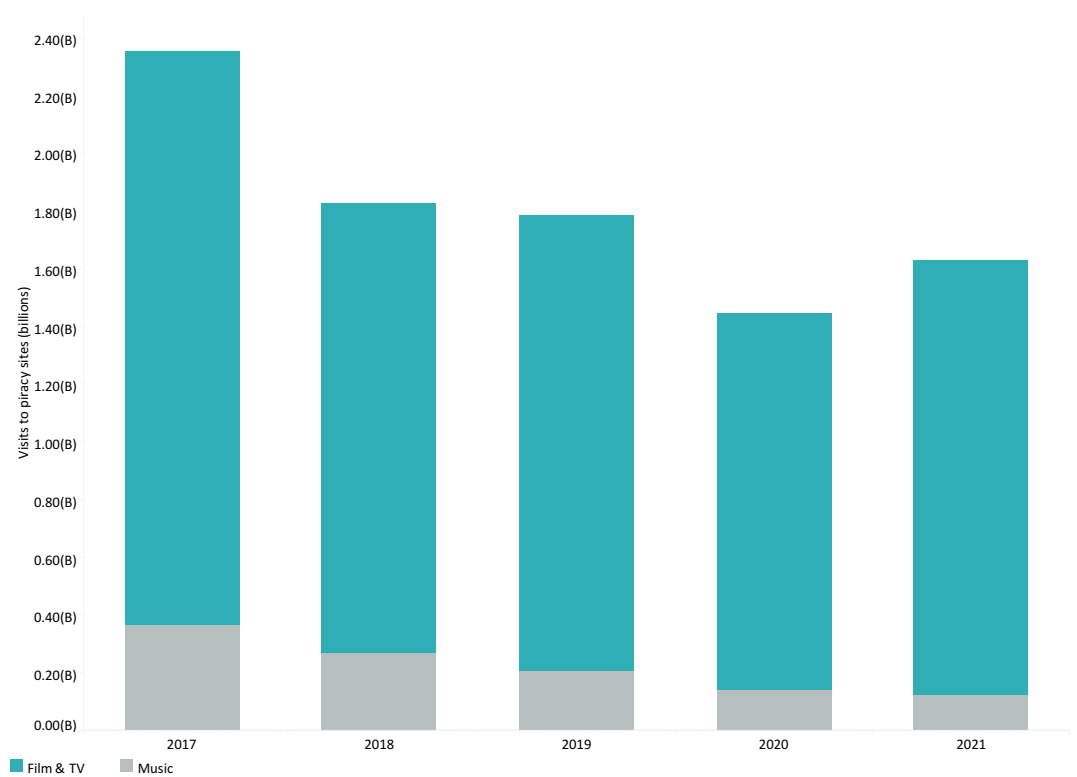
Source: MUSO Piracy by Industry data, 2021. Notes: \*Comparisons of 2020 and 2021 results against previous years’ results should take into account changes in approach to data collection, including movement to entirely online surveys (rather than including a small proportion of telephone surveys with non-internet users), and the later timing of the 2020 survey (March-June) compared to other years (January-April). \*\*The 2019 figure has been presented for live sport in place of a 2015 figure, as live sport was not measured until 2019.



## Copyright Infringement

According to industry data, Australian traffic<sup>13</sup> on piracy sites for film, TV and music has been trending downwards since at least 2017 (the earliest year for which this data is available to the Department). Traffic to these piracy sites reached its lowest level in 2020 and moderately increased in 2021 (see Figure C5).<sup>14</sup>

Figure C5: Australian traffic to piracy sites<sup>15</sup>

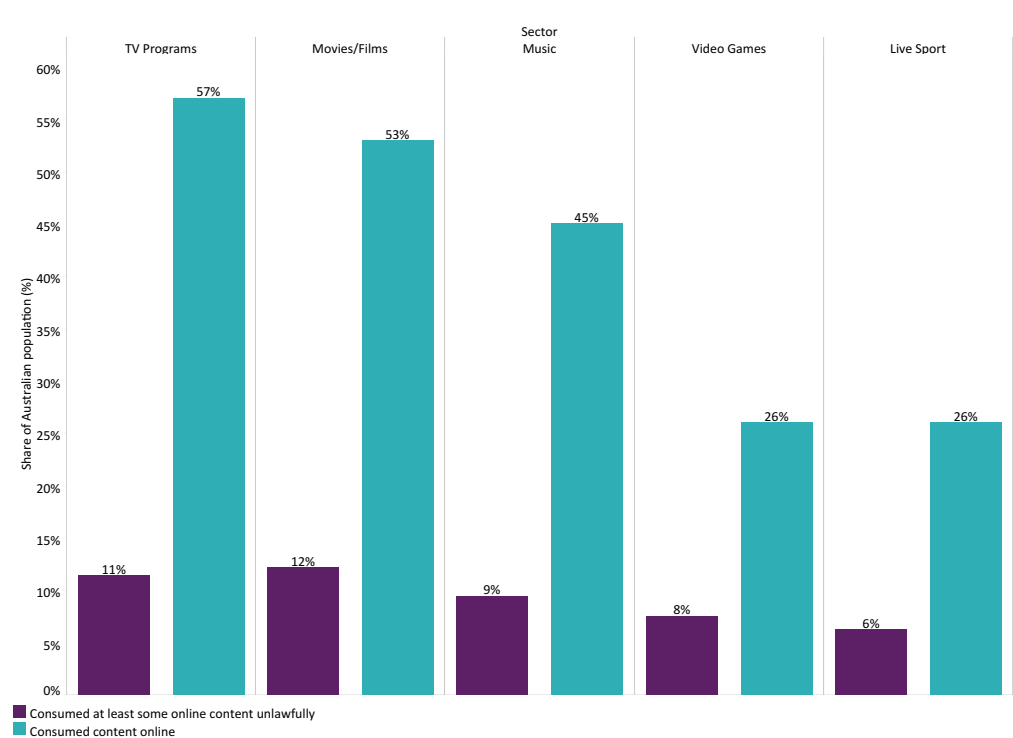


Source: MUSO Piracy by Industry data, 2021

Broadly, however, the Consumer Survey shows, there has been a long-term decline in the unlawful consumption of copyright material since at least 2015, when the survey began, and copyright infringement decreased in 2021 from 2020 levels.<sup>16</sup> The survey finds that the proportion of Australians

consuming some copyright material unlawfully continues to be dependent on the type of content (Figure C6). For example, with 57% of Australians consuming TV programs online, 11% of Australians report consuming at least some of this content in ways that are likely to be unlawful.

Figure C6: Share of Australian population who consumed online content in 2021



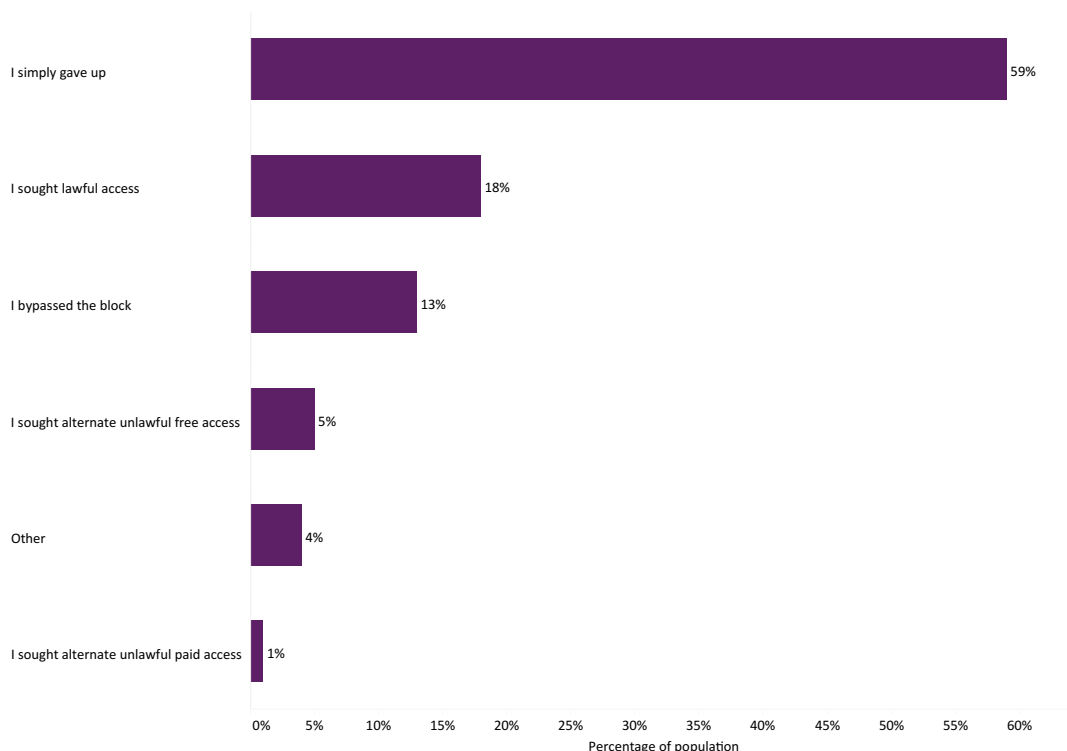
Source: Consumer Survey on Online Copyright Infringement 2021, Department of Infrastructure, Transport, Regional Development and Communications, December 2021.



Australia’s website blocking scheme allows copyright owners to apply to the Federal Court of Australia to block an online site that operates outside Australia with the purpose of infringing copyright material. As of December 2021, a total of 1,387 websites have been blocked since 2015 when the

scheme commenced. In the 2021 Consumer Survey, most respondents that had encountered a website blocked by the scheme reported either that they ‘gave up’ or sought lawful access (Figure C7).<sup>17</sup>

**Figure C7: Actions taken when encountering a blocked website**



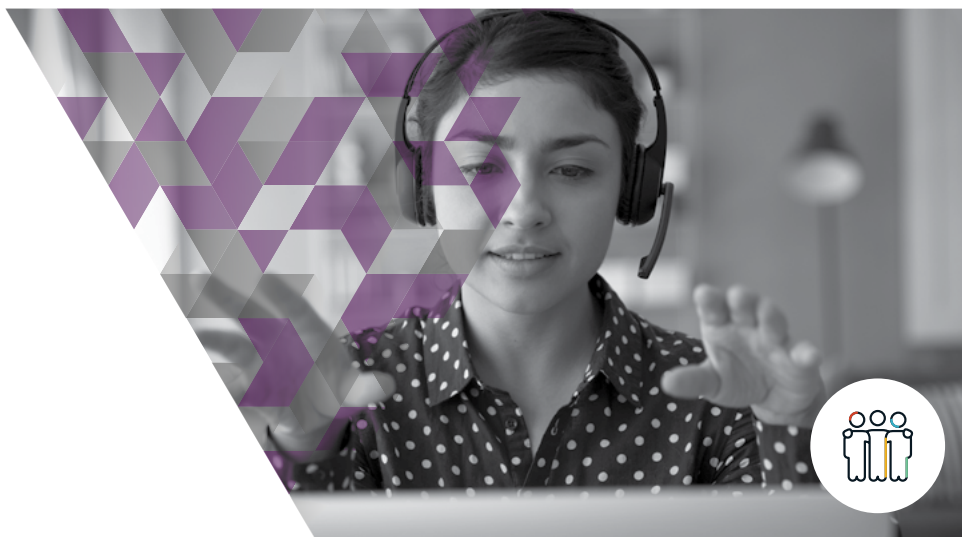
Source: Consumer Survey on Online Copyright Infringement 2021, Department of Infrastructure, Transport, Regional Development and Communications, December 2021.

**Endnotes**

1. Guide on Surveying the Economic Contribution of the Copyright-Based Industries, WIPO, 2015.
2. The economic contribution of Australia’s copyright industries – 2006-2018, PwC, June 2020.
3. ‘Non-dedicated’ includes industries in which a portion of the activities are related to facilitating broadcast, communication, distribution or sales of works and other protected subject matter, and whose activities have not been included in the core copyright industries.
4. At a glance: Cultural and Creative Activity estimates 2009–10 to 2018–19, Bureau of Communications, Arts and Regional Research, September 2021.
5. The analysis uses the same approach taken by the Australian Bureau of Statistics in their Cultural and Creative Activity Satellite Account and includes a broad range of industries where cultural and creative activity occurs.
6. APRA AMCOS Year In Review 2020-21, APRA AMCOS, 2021.
7. Copyright Agency Annual Report 2020-21, Copyright Agency Limited, 2020.
8. PPCA Annual Report 2021, Phonographic Performance Company of Australia, 2021.
9. Screenrights 2019-20 Annual Report, Screenrights, 2020.
10. Media content consumption survey: Analytical Report, Department of Infrastructure, Transport, Regional Development and Communications, December 2021.
11. Consumer Survey on Online Copyright Infringement 2021, Department of Infrastructure, Transport, Regional Development and Communications, December 2021.
12. Consumer Survey on Online Copyright Infringement 2021, Department of Infrastructure, Transport, Regional Development and Communications, December 2021.
13. Traffic is defined to include a visitor accessing one or more pages within a piracy site. Subsequent page views are included in the same visit until the user is inactive for more than 30 minutes. If a visitor becomes active again after 30 minutes, this is counted as a new visit.
14. MUSO Piracy by Industry data, 2021.
15. Total Australian traffic to piracy sites in years prior to 2021 has been adjusted (increased) since this data was presented in the Australian IP Report 2021 as methodology improvements have more accurately accounted for mobile traffic.
16. The Consumer Survey employs a different methodology to MUSO, including timing of data collection, which was conducted over a three month period prior to the COVID-19 lockdowns in the second half of 2021.
17. Consumer Survey on Online Copyright Infringement 2021, Department of Infrastructure, Transport, Regional Development and Communications, December 2021.

# CHAPTER 07

## IP rights and enterprise growth



Small businesses contribute disproportionately to job creation and aggregate productivity growth – by one estimate up to 60% of growth – through their innovative activity.<sup>1</sup> A dynamic business environment featuring the influx of small businesses has the potential to limit the economic impact of crises such as COVID-19 and alleviate their employment effects.<sup>2</sup> Strengthening business dynamism and an inclusive recovery relies on broad access by business to the tools for entrepreneurship and for creating high-growth businesses.

Firm-level studies using US data have shown that patents can cause substantial increases in employment, wages and labour productivity. A recent study estimates a 22% increase in firm size following the grant of a patent.<sup>3</sup> Studies of entrepreneurship show that for start-ups, obtaining patents and trade marks can increase investors' estimates of a company's value, especially during early investment rounds.<sup>4</sup> Such investment allows start-ups to invest in advance of profits and access resources critical for growth.

IP Australia has conducted research to understand the role of registered IP rights (patents, trade marks and designs) in the growth of Australian small and medium enterprise (SMEs). The study used business microdata provided in the Business Longitudinal Analysis Data Environment. Administered by the Australian Bureau of Statistics, this data covers the full population of Australian businesses active since 2002. The present study focused on around 600,000 SMEs active over the period 2002 to 2017. High-growth SMEs were identified as those that achieve at least 20% annual growth in employment over 3 consecutive years. The results reveal that Australian SMEs that file for registered IP rights are more likely to achieve high growth and employ more people than their peers with no recent filings.

### After filing for IP rights, Australian SMEs are more likely to achieve high growth than their peers

A simple comparison of Australian SMEs that own or do not own IP rights, based on their median number of full time equivalent (FTE) employees, implies that IP-owners are 3.5 times as large as non-owners (7 employees compared to 2). Rights owners also pay a higher median annual wage (\$53,755 per employee compared to \$43,304 for non-owners).

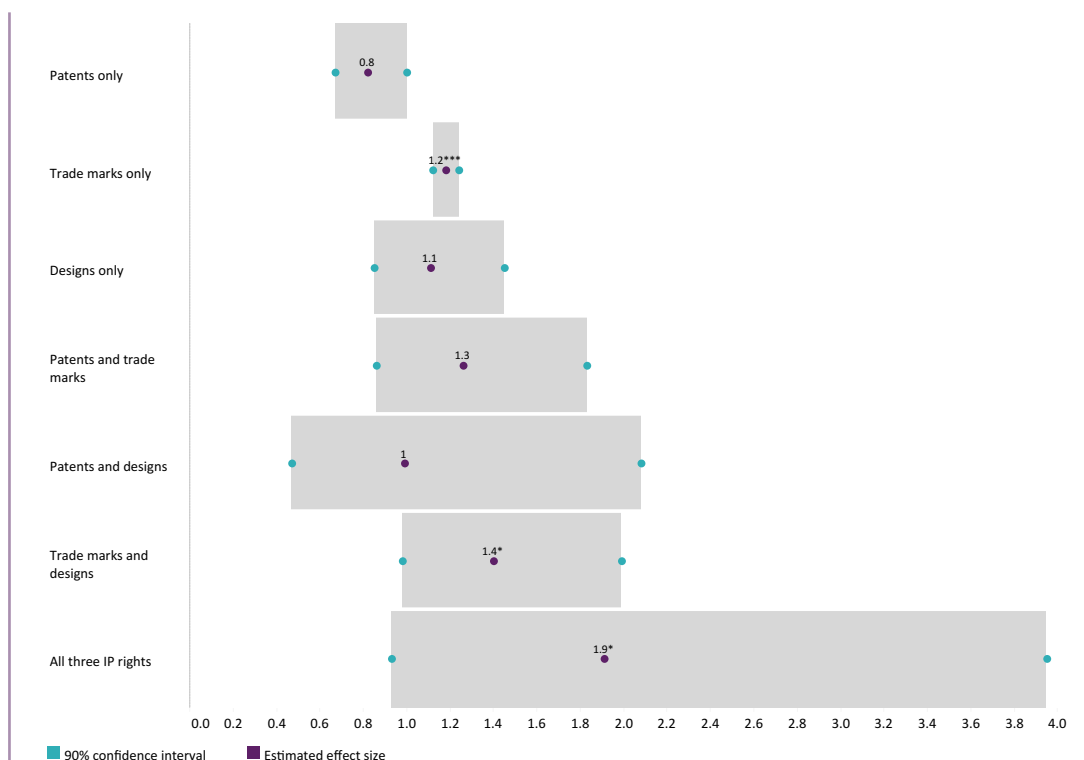
Regression model estimates suggest that SMEs filing for at least one IP right in a year are 16% more likely to achieve high employment growth than non filers. Focusing just on start-ups, those that file for at least one IP right in their first year are twice as likely to achieve high growth than their peers with no rights in their first year.

Figure 7.1 shows the estimated effects of SMEs obtaining bundles of different rights. SMEs that filed for patents, trade marks and design rights have the highest estimated growth probability – nearly twice as likely to achieve high employment growth than peers with no recent filings. When added to a portfolio, trade marks and designs can act in complement to patents in helping businesses capture returns from innovation through compelling branding.





Figure 7.1



Source: PATSTAT Autumn 2021 edition.

## After filing IP rights, SMEs employ more people

Based on economic modelling, we simulated the effect on employment of an SME adding a given right to its initial stock of that right, all else being equal. (Note that the greater a business’s stock of a given right, the smaller the marginal benefit from obtaining an additional right.) Table 7.1 presents the estimated marginal effects on employment of an SME moving from having one to 2 of a given right for firms of different sizes.

- For a business with 50 employees, adding a trade mark is associated with an increase in its number of employees by 6 in the 12 months after. The increase is 12 extra persons for a business with 100 initial employees.
- For a business with 50 employees, adding a design right is associated with an increase in its number of employee by 2 in the 12 months after. The increase is 4 extra persons for a business with 100 initial employees.
- For a business with 50 employees, adding a patent is associated with an increase in its number of employee by one in the 12 months after. The increase is 3 extra persons for a business with 100 initial employees.

Table 7.1: Simulation of the employment effect of an additional right, for given values of employment and stocks of patents in force, trade marks in force and registered design rights

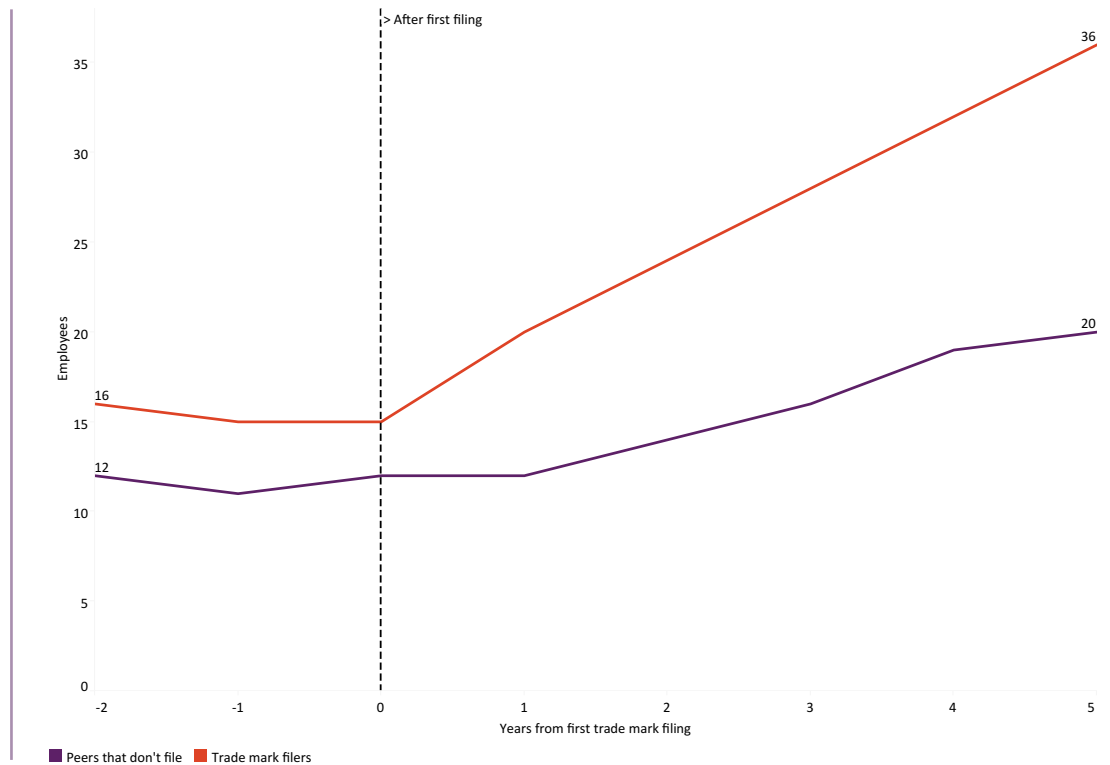
Firm size (FTE employees)	Marginal effect of a patent (FTE employees)	Marginal effect of a trade mark (FTE employees)	Marginal effect of a design right (FTE employees)
2	0.1	0.3	0.1
20	0.7	2.5	0.9
50	1.7	6.3	2.3
100	3.3	12.7	4.6
150	5.0	19.0	6.9



The above estimates suggest that IP activity is a significant forward indicator of employment growth for Australian SMEs. The results are consistent with previous ‘event studies’ showing that significant increases in size, skill and capital intensity within a firm coincide with the grant of a patent,<sup>5</sup> though a business may take up to 3 years to scale to its new level.<sup>6</sup>

Using BLADE data on Australian firms, Figure 7.2 plots average employment before and after a firm’s first trademark filing, for “treated” companies that file the mark and a group of “control” companies that do not use trademarks but are matched to the treated companies for age, size and industry. Based on this descriptive data, employment growth is flat in the years before trademark filing both for the filers and non-filers. After filing there is continuous growth in employment for the trademark filers but much less growth for the control group.

Figure 7.2. Trademark filers grow larger than their peers after filing their first trade mark



## Enhancing access to the tools for innovation

While the share of Australian SMEs with an active right is low it has doubled over recent decades, from 2% in 2002 to 4% in 2017. As reported in Chapter 2, the SME share of patent applicants with Australian operations (excluding individuals) reached a decadal high in 2021, following 27% growth in SME filings that year. Even as use of patents has grown, the key driver of growth in the use of IP by SMEs has been an upsurge in the use of trade marks.

IP rights including trade marks provide a vital set of tools for innovation, entrepreneurship and for creating high-growth businesses. Based on the available evidence, IP Australia is working to embed consideration of IP early in a company’s

life, to ensure that small businesses have the information they need to make informed decisions about IP protection.

IP Australia offers a range of services and practical guidance to help SMEs apply for IP rights. Our SME Case Management service connects potential applicants with a dedicated subject matter expert to help guide them through the application and examination process. SMEs are also eligible to fast track their patent applications to progress through examination faster. Fact sheets, case studies, online education, tools and checklists are available at [www.ipaustralia.gov.au](http://www.ipaustralia.gov.au).

The full report of this chapter’s study, ‘Intellectual Property Rights and Enterprise Growth: The role of IP rights in the growth of SMEs’, was published in December 2021 as part of IP Australia’s [Economic Research Paper Series](#).



**Disclaimer:** The results of these studies are based, in part, on ABR data supplied by the Registrar to the ABS under A New Tax System (Australian Business Number) Act 1999 and tax data supplied by the Australian Taxation Office (ATO) to the ABS under the Taxation Administration Act 1953. These require that such data is only used for the purpose of carrying out functions of the ABS. No individual information collected under the Census and Statistics Act 1905 is provided back to the Registrar or ATO for administrative or regulatory purposes. Any discussion of data limitations or weaknesses is in the context of using the data for statistical purposes and is not related to the ability of the data to support the ABR or ATO's core operational requirements. Legislative requirements to ensure the privacy and secrecy of this data have been followed. Only people authorised under the ABS Act 1975 have been allowed to view data about any firm in conducting these analyses. In accordance with the Census and Statistics Act 1905, results have been confidentialised to ensure that they are not likely to enable the identification of a particular person or organisation.

## Endnotes

1. Klenow, PJ and H Li (2020), *Innovative growth accounting*. NBER Working Paper Series 27015.
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# CHAPTER 08

## Research Program



### Office of the Chief Economist (OCE)

IP Australia's OCE produces evidence and advice to inform intellectual property policy relating to registered rights, support IP Australia's operational effectiveness, and develop insights into the IP system's role in addressing economic challenges.

A key challenge for Australia is the significant slowdown in productivity growth experienced in recent decades. Across many advanced economies and industries, businesses are falling behind global leaders. Large businesses have the capacity to finance intangible investments – like investments in new designs, software, data and brands – and benefit from their inherent 'scalability'. Many people can simultaneously use these assets and they can be replicated at low marginal cost. The average business is often less able to carry out these types of investments.

Appropriating value from intangibles can be challenging. Once they are created, it can be difficult to exclude others from copying and exploiting them. In 2021, the OCE published a report, IP Rights and Enterprise Growth, showing that, for Australian SMEs, the use of IP rights is a strong indicator of their future growth potential. The findings of that study are summarised in Chapter 7 of this report.

For small and large businesses, AI is removing historical constraints on the ability of companies to learn and scale. The OCE is investigating the drivers of AI innovation, investment and adoption by Australian businesses, focusing on the role of the IP registration system.

Aggregate productivity growth depends on talented people realising their potential, for example, by moving away from less productive employers to more productive employers. In 2022–23, the OCE continues our research program looking at how IP activity relates to employee outcomes. The OCE has worked with the ABS to link data on the IP activity of Australian businesses to anonymised demographic, income and tax data for their employees. Analysed at an aggregate level, the linkage will provide a valuable picture of how IP activity impacts employee mobility and earnings.

For Australia to realise its innovation potential, it's vital to increase the supply of innovations from disadvantaged backgrounds and ensure Australia is not losing potential innovators. An increasingly central question in IP research and policy is how demographic factors influence people's likelihood to innovate. The OCE is researching the barriers to participation in IP, such as education, age and gender, to inform IP Australia's ongoing efforts to expand education and access to the IP system.

### Centre of Data Excellence

IP Australia's The Centre of Data Excellence (CODE) was formed in late 2020. CODE includes the establishment of a new data 'front door' service to broker data requests for Australian IP rights data, available to the public via email to [data@ipaustalia.gov.au](mailto:data@ipaustalia.gov.au). The service supports the growing demand to use information from multiple business sources to provide insights and support decisions.

CODE supports end-to-end data processes for analytics and reporting, bringing together capabilities in data engineering, data development, analytics, visualisation and data governance. New data capabilities and services will be developed iteratively to meet the changing needs of our stakeholders.

Throughout 2021 the methods for producing the IPGOD dataset have been improved, with a particular focus on integrating the data across all IP rights. New machine learning techniques have been applied to match the organisations and entities that play a role in the right's life cycle. This will allow us to provide integrated data more regularly.

### Patent Analytics Hub

IP Australia's Patent Analytics Hub uses global and Australian patent data to derive insights and business intelligence in specific technology areas. This information is used by policy- and decision-makers across government, universities and publicly-funded research organisations.



In 2021, the Patent Analytics Hub supported the development of the Australian Government's Action Plan for Critical Technologies (the 'Action Plan'), which protects and promotes critical technologies in Australia's national interest. In particular, the Patent Analytics Hub provided patent searches and analytics on each of the 65 listed Critical Technologies in the National Interest, from advanced materials and manufacturing to biotechnology. For an initial 23 priority areas, this data is shown, together with bibliometric and investment data, on 'Tech' Cards accompanying the Action Plan. To accompany this work, the Patent Analytics Hub assisted the Australian Strategic Policy Institute with patent data and analytics for their associated paper on Benchmarking critical technologies.

Using information on countries of origin and filing jurisdictions in the global patent data, the Patent Analytics Hub published reports on The power of innovation: A patent analytics report on the Australian Battery Industry and A growing south: Patent analytics on plant biotechnology in Latin America. The report on batteries highlights strong international collaboration shown by Australian innovators in co-filed patents in battery technologies, while the report on agricultural biotechnology showed that Australia is a significant destination market for Latin American agriculture. These insights demonstrate Australian capability and market demand that can be leveraged for the benefit of the broader Australian economy.



# 2022 AUSTRALIAN INTELLECTUAL PROPERTY REPORT



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