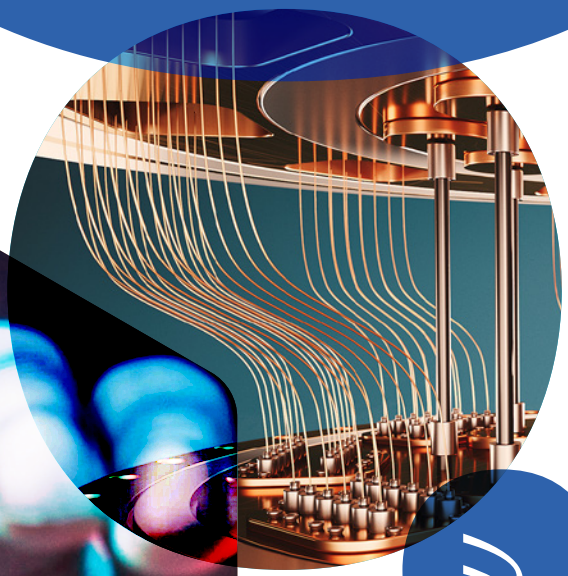
PCT Yearly Review 2023



WIPO

Patent Cooperation Treaty Yearly Review 2023

The International Patent System

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Contents

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Further information

Online resources

The electronic version of the *Review*, as well as the underlying data used to compile the figures and tables, can be downloaded at www.wipo.int/ipstats. This webpage also provides links to the IP Statistics Data Center – offering access to WIPO's statistical data – and the IP Statistical Country Profiles.

The following other patent resources are available on WIPO's website:

PCT homepage
WIPO's gateway to PCT resources for applicants, offices and the public.

PCT Newsletter
PCT monthly publication containing information about the filing of PCT applications and news about changes relating to the PCT.

PATENTSCOPE
Enables the search and download of published PCT applications and national/regional patent collections. Also provides access to related patent and technology information programs and services.

Contact information

Department for Economics and Data Analytics
Website: www.wipo.int/ipstats
email: ipstats.mail@wipo.int

Key numbers for 2022

715,200 (+7.6%)
PCT national phase entries

278,100 (+0.3%)
PCT applications filed

134 (+3)
Countries in which
PCT applications were filed

58.9% (+2 percentage points)
Share of PCT national phase entries in worldwide non-resident patent application filings

17.1% (+0.6 percentage point)
Share of women among
PCT inventors

Note: The latest available year for PCT national phase entry data is 2021.

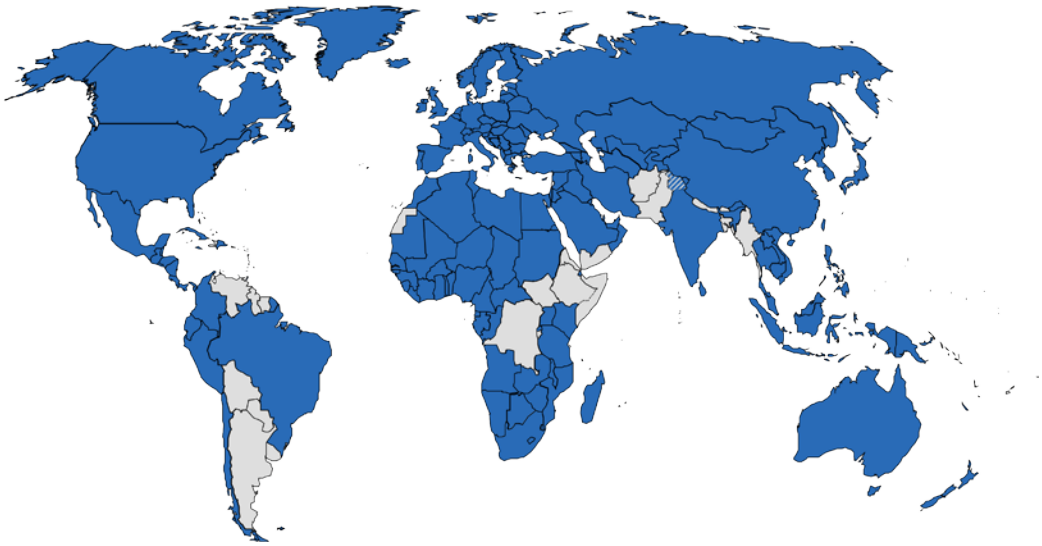
Special theme: The expansion of the PCT System over time

The Patent Cooperation Treaty (PCT) is an international patent treaty providing a unified procedure for filing and processing patent applications that facilitates the seeking of patent protection for inventions in multiple countries. The PCT System is administered by the World Intellectual Property Organization (WIPO). With its 157 member states in 2022, the PCT System has been widely adopted and is now an important tool for inventors, companies, universities and research institutions wanting to protect their innovations internationally (map S1).

Before the PCT System was established, applicants were obliged to file separate patent applications in every country where they sought to protect their innovations within 12 months of filing a first patent application on a particular subject matter – the so-called Paris route, based on the Paris Convention for the Protection of Industrial Property and administered by WIPO. The PCT innovated within the patent space by offering an alternative to the Paris route that provides a centralized application process, whereby applicants are able to file a single PCT application and have that application processed and published during the System's "international phase." Making use of the additional time made available through following the PCT procedure, together with the additional patentability information that the PCT provides, applicants are able to then decide in which countries they wish to proceed with their PCT application should they choose to enter the "national phase" of the System.

This year's Special theme provides a descriptive analysis of the PCT's expansion, from 20 member states in 1978 to today's global system covering over 80% of countries globally within the space of 44 years. However, although applicants from around the world use the PCT every year, most activity is concentrated within just a few countries; that is to say, the world's largest economies are by far the main source of and destination for PCT applications. That said, data show the PCT to be a filing route chosen by a diverse range of applicants that goes well beyond simply big economies.

S1. Map of PCT member states, 2022



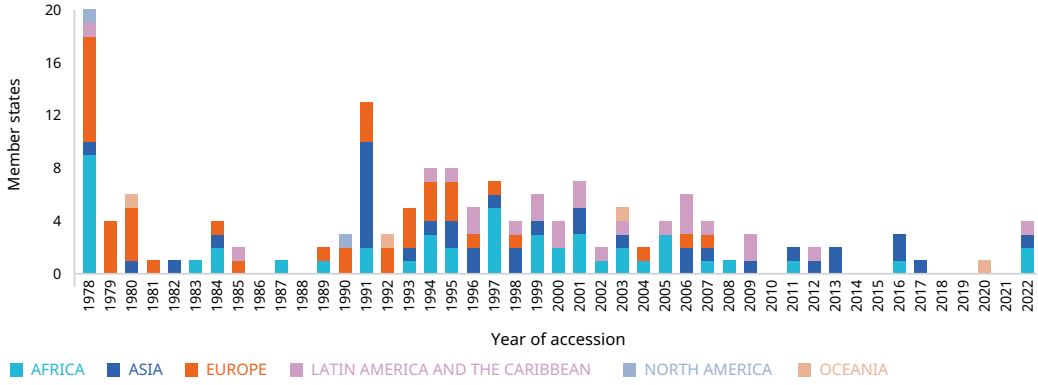
Source: WIPO, March 2023.

Trends in PCT accessions

The first PCT application was filed on June 1, 1978. On that date, 18 countries joined the PCT. Half were from Africa, including Madagascar and Togo. Seven were from Europe, including France, Germany, the United Kingdom (UK) and the Soviet Union. Latin America and the Caribbean (LAC) and North America each had a member in Brazil and the United States of America (US), respectively. During the latter half of 1978, Denmark and Japan joined the System, bringing the total number of PCT members to 20 countries spanning five of the world's six geographical regions and covering all income-groups (figure S2).

Since 1978, PCT membership has grown by an average of 3.6 new countries per year. The number of African member countries has increased consistently over time; and, since 2005, that region has had the largest number of PCT member states. European countries acceding to the PCT increased sharply during the first 20 years of the System's existence and that region has constituted the second largest grouping of PCT member states since 2005. The sharp increase in PCT membership in 1991 was largely due to the accession of new states following the dissolution of the Soviet Union. From then up to 2007, PCT membership grew markedly, particularly in Africa and Asia. Of today's top five countries in terms of PCT filings, the Republic of Korea and China joined the PCT in 1984 and 1994, respectively. PCT membership by states in the LAC region increased mainly in the period between the mid-1990s and 2012. Jamaica, which joined the PCT in 2022, was the first country from the LAC to have acceded to the System since 2012.

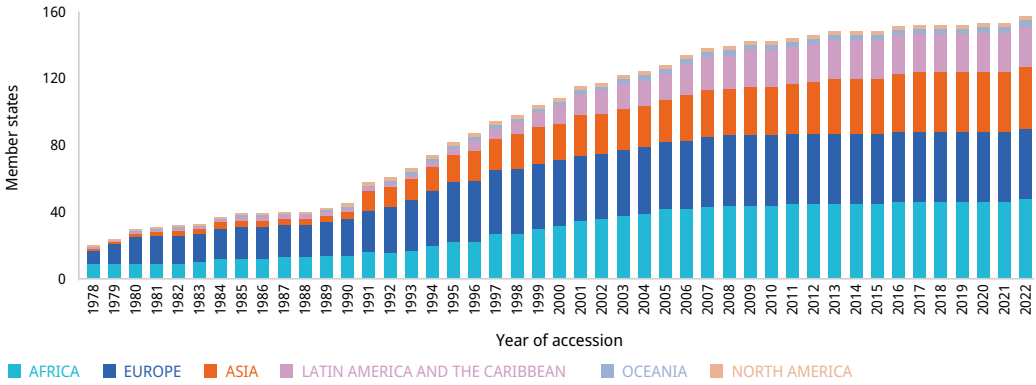
S2. PCT member states per accession year, 1978–2022



Source: WIPO Statistics Database, March 2023.

The increase in PCT membership over time can be divided into three periods (figure S3). Between 1979 and 1990, 25 countries joined the PCT, representing 2.3 new member states per year, on average. Most of these were European. From 1991 to 2007, the number of PCT member states increased sharply, with an average of 5.8 new members per year. Among the 93 countries that joined the System during this 16-year period, 29 were from Africa, 24 from Asia, 20 from Europe, 18 from LAC and two from Oceania. Since 2008, due to a by then widespread coverage, only 19 countries joined the PCT, of which nearly half were from Asia. This represents, on average, 1.4 new members per year. The four countries that became members of the PCT in 2022 made that year the most active in terms of PCT accessions since 2008.

S3. PCT member states by region, 1978–2022



Source: WIPO Statistics Database, March 2023.

In 2022, the 157 PCT member states collectively accounted for 94.1% of gross domestic product (GDP) globally and 86.3% of the world's population. Approximately 81% of the 193 United Nations member countries in 2022 were also members of the PCT (table S4). Every country in North America was a member of the PCT. With the exception of Andorra, the same was the case for Europe. Almost 89% of countries in Africa had joined the PCT by 2022. The largest economies among the six African countries yet to join the PCT are the Democratic Republic of the Congo and Ethiopia. Around 10 countries in Asia, LAC, and Oceania, respectively, are not yet members of the PCT. Of these, Argentina, Bangladesh and Pakistan have the largest GDP.

S4. World coverage of PCT members by region, 2022

Region	PCT member countries	Non-PCT member countries	Total countries	Share of PCT member countries (%)
Africa	48	6	54	88.9
Asia	37	10	47	78.7
Europe	42	1	43	97.7
Latin America and the Caribbean	24	9	33	72.7
North America	2	0	2	100.0
Oceania	4	10	14	28.6
World	**157**	**36**	**193**	**81.3**

Source: WIPO Statistics Database, March 2023.

The bulk of high-income economies (93.2%) were members of the PCT in 2022 (table S5). The only four high-income countries not part of the PCT System were Andorra, the Bahamas, Nauru and Uruguay. About 79% of upper middle-income countries had joined the PCT by 2022. PCT membership among lower middle-income and low-income groups stood at 75.5% and 71.4% of countries, respectively.

S5. World coverage of PCT members by income group, 2022

Income group	PCT member countries	Non-PCT member countries	Total countries	Share of PCT member countries (%)
High-income	55	4	59	93.2
Upper middle-income	42	11	53	79.2
Lower middle-income	40	13	53	75.5
Low-income	20	8	28	71.4
World	**157**	**36**	**193**	**81.3**

Note: Venezuela is unclassified pending release of revised national accounts statistics. In this table, Venezuela is allocated to the upper- middle-income group, as classified by the World Bank in 2020.

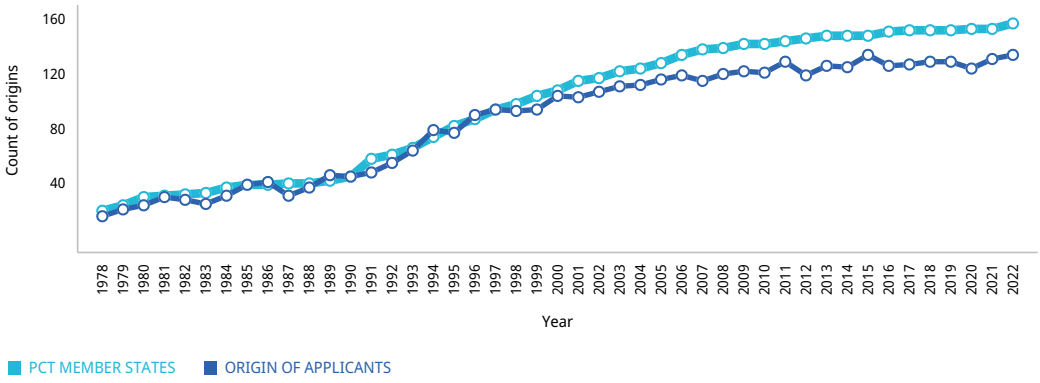
Source: WIPO Statistics Database, March 2023.

The PCT has been a global system ever since it began. Although applicants from only 16 countries filed PCT applications in 1978, every geographical region was represented; for example, through filings from applicants residing in Australia, Brazil, Canada, Japan, South Africa and the Soviet Union.

The number of countries from which applicants filed PCT applications within a given year has increased in parallel with a rise in PCT membership (figure S6). In 1978, at which time 20 countries had acceded to the PCT, applicants from 16 countries filed PCT applications. During the 20 years that followed, the trends in PCT member states and in countries of origin of PCT applications mirrored each other quite closely. In 1997, for instance, the PCT System had 94 member states, and applicants in as many countries filed PCT applications.

However, from 1998 onwards, although the origins of PCT applications continued to expand, they were outpaced by PCT membership. In 2022, applicants from 134 countries filed at least one PCT application, representing the widest spread of origins within any single year. Since the PCT System first began, applicants from 186 countries have filed PCT applications, accounting for over 96% of countries worldwide.[1]

S6. PCT member states and countries of origin of PCT applications, 1978–2022



Source: WIPO Statistics Database, March 2023.

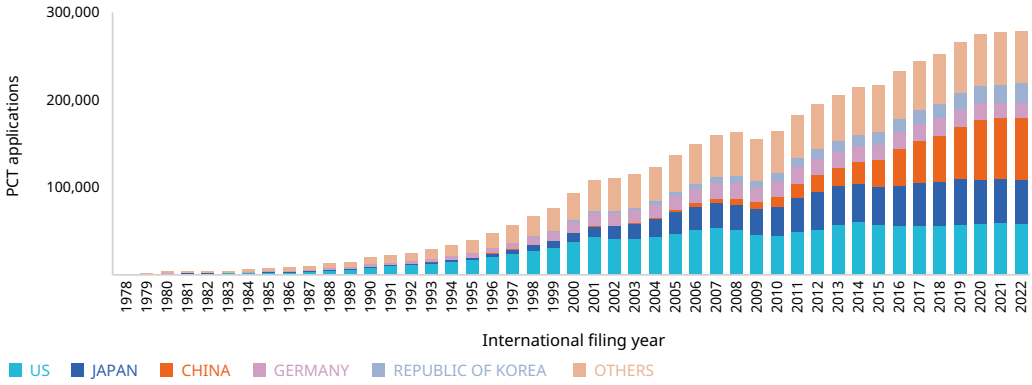
1 Under certain conditions, a first named applicant may reside in a country that is not a PCT member, which explains why the number of countries from which PCT applications originated is greater than the number of PCT member states.

Trends in PCT applications

Since 1978, PCT applications filed have increased every year, except in 2009 during the Great Recession (figure S7). Between 1979 and 2022, PCT applications grew by 11.5% per year, on average. In 2021 and 2022, however, a challenging global economic environment led to historically low growth rates close to zero. Despite this, the five millionth PCT application is due to be filed in 2023.

In 1991, the number of PCT applications filed within a single year reached the 20,000 mark. It took 13 years to hit that milestone and an additional 10 years to surpass 100,000; the 200,000 milestone was reached in 2013 and 300,000 could be reached as of 2024.

S7. Trend in filings of PCT applications, 1978–2022



Source: WIPO Statistics Database, March 2023.

Notwithstanding the diverse geographical spread of filings generally, today's top five countries of origin account for the vast majority of filings, and have done so since 1994. Almost three-quarters (73%) of the 4.8 million PCT applications filed since 1978 were filed by applicants residing in China, Germany, Japan, the Republic of Korea and the US. Their combined share has trended upwards over time, growing from around 67% in 2000 to 79% in 2022.

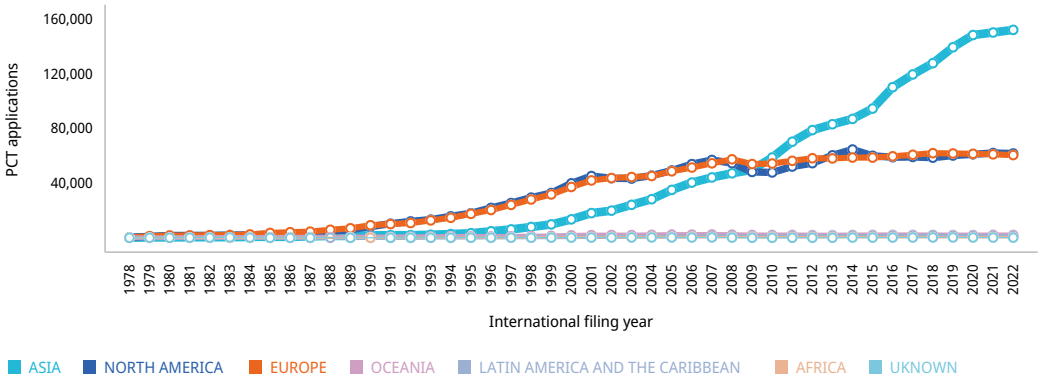
Since 2019, China has been the most active filer of PCT applications. Before that, US applicants filed the most applications year on year. Overall, applicants from the US have been responsible for 28.9% of PCT applications filed since 1978. They are followed by applicants from Japan (17.6%), China (11.9%), Germany (9.5%) and the Republic of Korea (5.2%).

In terms of geographical regions, filings from Europe and North America have followed a quite similar trend and level over time (figure S8). Between 1979 and 2001, filings from these two regions grew by around 18% per year, on average, and accounted for over 80% of total filings combined. In 2002, during the early 2000s recession, filings in North America dropped for the first time. From 2002 to 2022, the average annual growth rates for Europe and North America fell to 1.6% and 1.8%, respectively. During this period, their combined share of total filings declined to 43.9% in 2022.

Between 1979 and 2001, filings in Asia increased by 20.4% per year, on average. This rapid growth rate was mostly due to a low initial volume of filings. In 1979, only 305 PCT applications were filed in Asia. In the two decades from 2002 to 2022, filings from Asia grew constantly and sharply, averaging 10.7% per year. Most of this increase in filings originated from China (52.2%). Since 2021, during the COVID-19 pandemic, Asia's growth rate slowed to around 1.3% per year, the lowest rate in the past two decades.

In 2022, Asia accounted for 54.7% of total filings, of which 93.6% originated from China, Japan and the Republic of Korea. Together with India, Israel, Türkiye and Singapore, these seven countries accounted for 99% of Asian filings in 2022.

S8. Trend in PCT application filings by region, 1978–2022

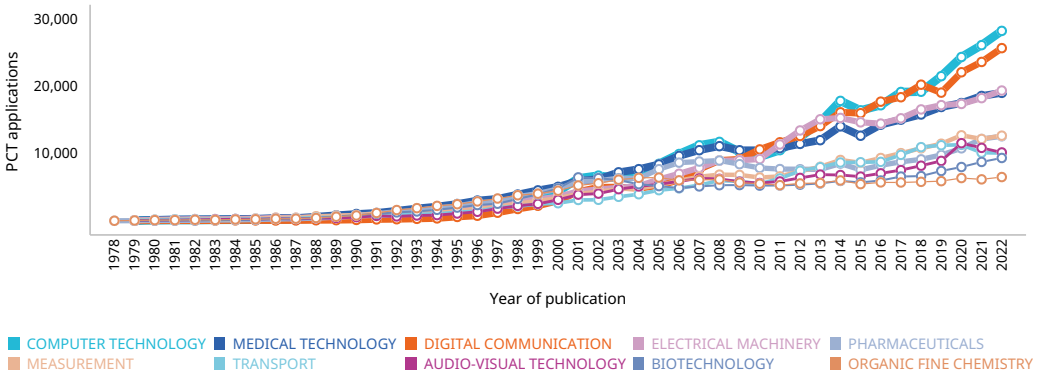


Source: WIPO Statistics Database, March 2023.

Since 1978, the technical fields of computer technology (333,737 PCT applications), medical technology (298,938), digital communication (295,081), electrical machinery (278,880) and pharmaceuticals (214,014) have had the most PCT applications published (figure S9). Combined, the top 10 technical fields represent a majority (50.9%) of PCT applications.

Since 2010, the number of published PCT applications has grown by 5% per year, on average. Within the top five fields, computer technology (+9.5%), digital communication (+7.6%), electrical machinery (+6.4%) and medical technology (+5.1%) grew the fastest. In contrast, pharmaceuticals (+4%) grew more slowly than the overall average of 5%. Since 2013, pharmaceuticals has featured among the top five technology fields once only in 2021, when the COVID-19 pandemic saw a peak in health-related technology patenting.

S9. Trend in PCT applications for the top 10 technology fields, 1978–2022



Note: For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

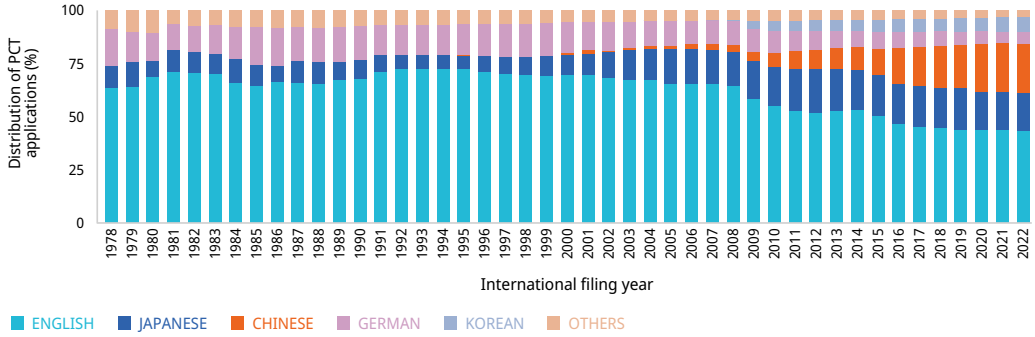
Source: WIPO Statistics Database, March 2023.

The expansion of the PCT System and the shift in usage toward Asia has led to disclosed patent literature, via the publication of PCT applications, exhibiting a greater linguistic diversity over time (figure S10). Since 1978, PCT applications have been filed in 39 different languages. The number of languages used to file PCT applications in any one year has grown from five in 1978 to a peak of 33 in 2022.[2]

2 There are 10 languages of publication under the PCT: English, French, Spanish, Russian, German, Japanese, Korean, Chinese, Portuguese and Arabic. If an application is filed in any of these languages, it will be published in that language, together with an abstract in English and French. Applications filed in languages other than these 10 will be required to be translated into one of the publication languages.

Overall, English has been by far the most commonly used language of filing, with 52.5% of the total. Its use peaked in 1993, when it represented nearly 69% of all applications filed, before steadily declining. In 2022, about 42% of applications were filed in English and nearly a quarter in Chinese (23.4%). That same year, Chinese, Japanese (17.5%) and Korean (7.3%) accounted for 48.2% of total filings, combined.

S10. Distribution of PCT applications by language of filing, 1978–2022



Source: WIPO Statistics Database, March 2023.

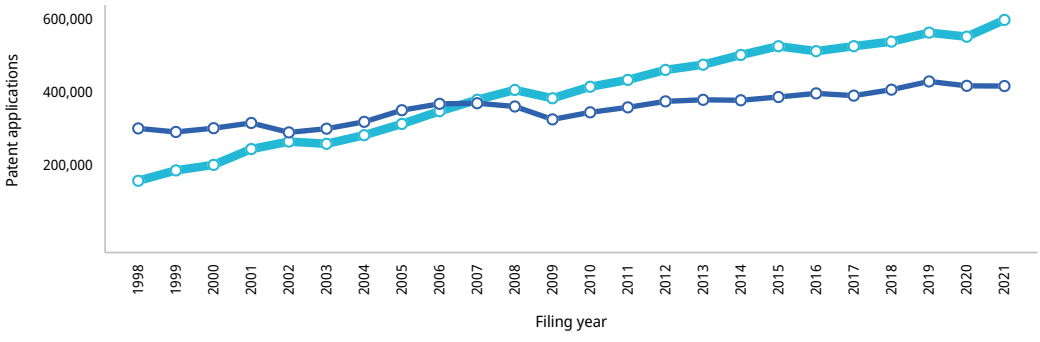
Trends in PCT national phase entries

After the PCT international phase, applicants may choose to further pursue patent protection in those jurisdictions in which they are interested by entering the national phase at each relevant national or regional patent office and complying with applicable national or regional requirements and procedures.

The overall number of non-resident patent applications filed globally more than doubled between 1998 and 2021.[3] Over this period, non-resident patent applications grew from 458,500 to over one million, representing an annual average growth rate of 3.5%.

Non-resident patent applications filed through either the Paris or the PCT route have increased over time but at a different rate (figure S11). Since 1998, non-resident patent applications filed directly at offices (Paris route) grew by 1.4% per year, on average, and PCT national phase entries (NPEs) by 6%. Since 2007, PCT NPEs have accounted for a majority of non-resident patent applications filed worldwide, peaking at 58.9% in 2021.

S11. Trend in non-resident patent applications by filing route, 1998–2021



Source: WIPO Statistics Database, March 2023.

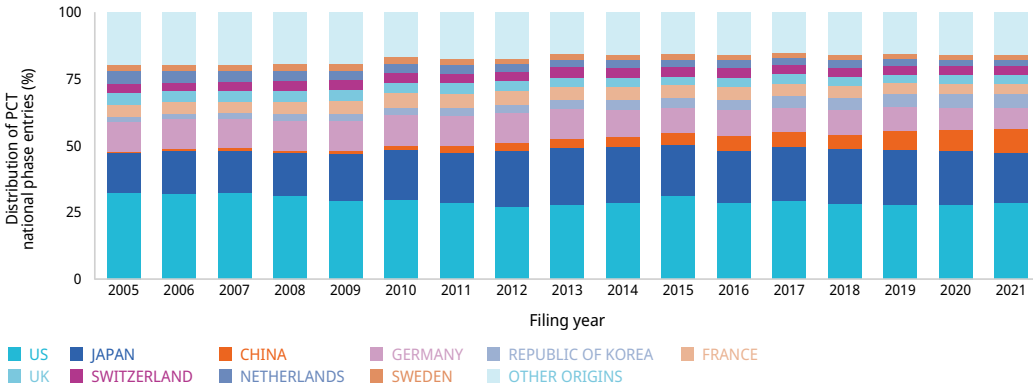
3 Patent application data are collected through WIPO's annual IP statistics questionnaire from intellectual property offices worldwide. The latest available year is 2021. The earliest available year depends on the level of detail required in the data.

Between 2005 and 2021, NPEs initiated worldwide almost doubled, to peak at 715,200 in 2021. Applicants from the US initiated the largest proportion of total NPEs (29.2%) during this period (figure S12). They were followed by applicants from Japan (19.2%) and Germany (10%).

The respective shares of NPEs from Japan and the US have remained relatively stable since 2010. Combined, they represented between 47.3% of the total in 2011 and 50.4% in 2015. Germany's share dropped from 11.5% in 2010 to 8% in 2021. China overtook Germany in 2021 to become the third biggest origin of NPEs, its share climbing from 1.6% in 2010 to 8.7% in 2021. Likewise, the Republic of Korea's share rose from 2.8% to 5.1% during the same period. Combined, the top five and the top 20 origins accounted for 69.3% and 94.4% of total NPEs in 2021, respectively.

Other top 20 origins showing a noticeable change in trend were India, Israel and Spain whose NPEs initiated between 2005 and 2021 multiplied by 2.5 to 3 times in number. In contrast, the Netherlands was the only top 20 origin to see a decrease in NPEs during this period.

S12. Distribution of PCT national phase entries for the top 10 origins, 2005–2021



Note: Figure shows the top 10 origins in 2021.
Source: WIPO Statistics Database, March 2023.

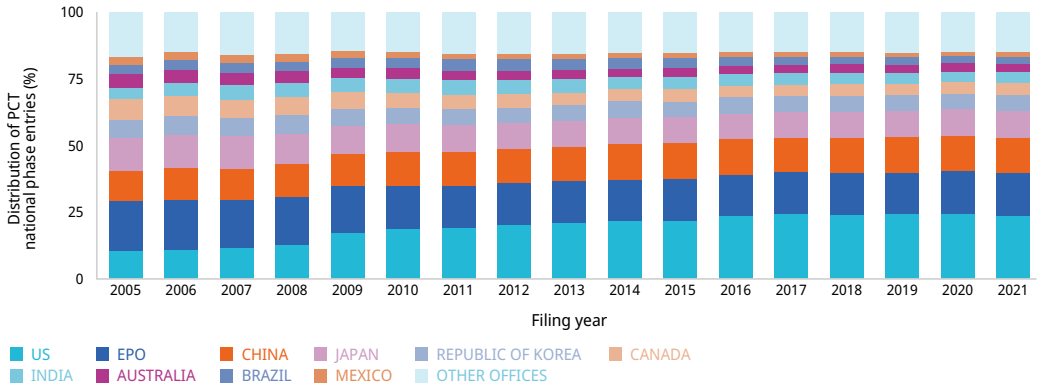
In 2005, the European Patent Office (EPO), the Japan Patent Office (JPO) and the China National Intellectual Property Administration (CNIPA) were the three main destinations for NPEs, accounting for about 19%, 13% and 11% of total NPEs, respectively (figure S13). In 2010, the United States Patent and Trademark Office (USPTO) became the main destination of PCT NPEs, mainly owing to a sharp increase in filings from Japan and the US.

In 2021, the USPTO (23.7%), the EPO (16.1%) and the CNIPA (13.1%) together accounted for a majority of NPEs initiated worldwide (52.9%). Together with the JPO (10.2%) and the Korean Intellectual Property Office (KIPO) (6.1%), the top five offices accounted for 69.1% of all NPEs in 2021.

Among the top 20 offices, those of the US, Viet Nam and Germany were the ones to see the sharpest average annual growth rates between 2005 and 2021, with 9.7%, 7.6% and 6.6%, respectively. They were followed by the Asian offices of China (+5.4%), India (+4%), Indonesia (+3.9%), Thailand (+3.7%), Malaysia (+3.6%), the Republic of Korea (+3.6%) and Singapore (+3.4%).[4]

4 Average annual growth rates between 2008–2021 for Malaysia, 2012–2021 for Thailand and 2010–2021 for Viet Nam.

S13. Distribution of PCT national phase entries for the top 10 offices, 2005–2021

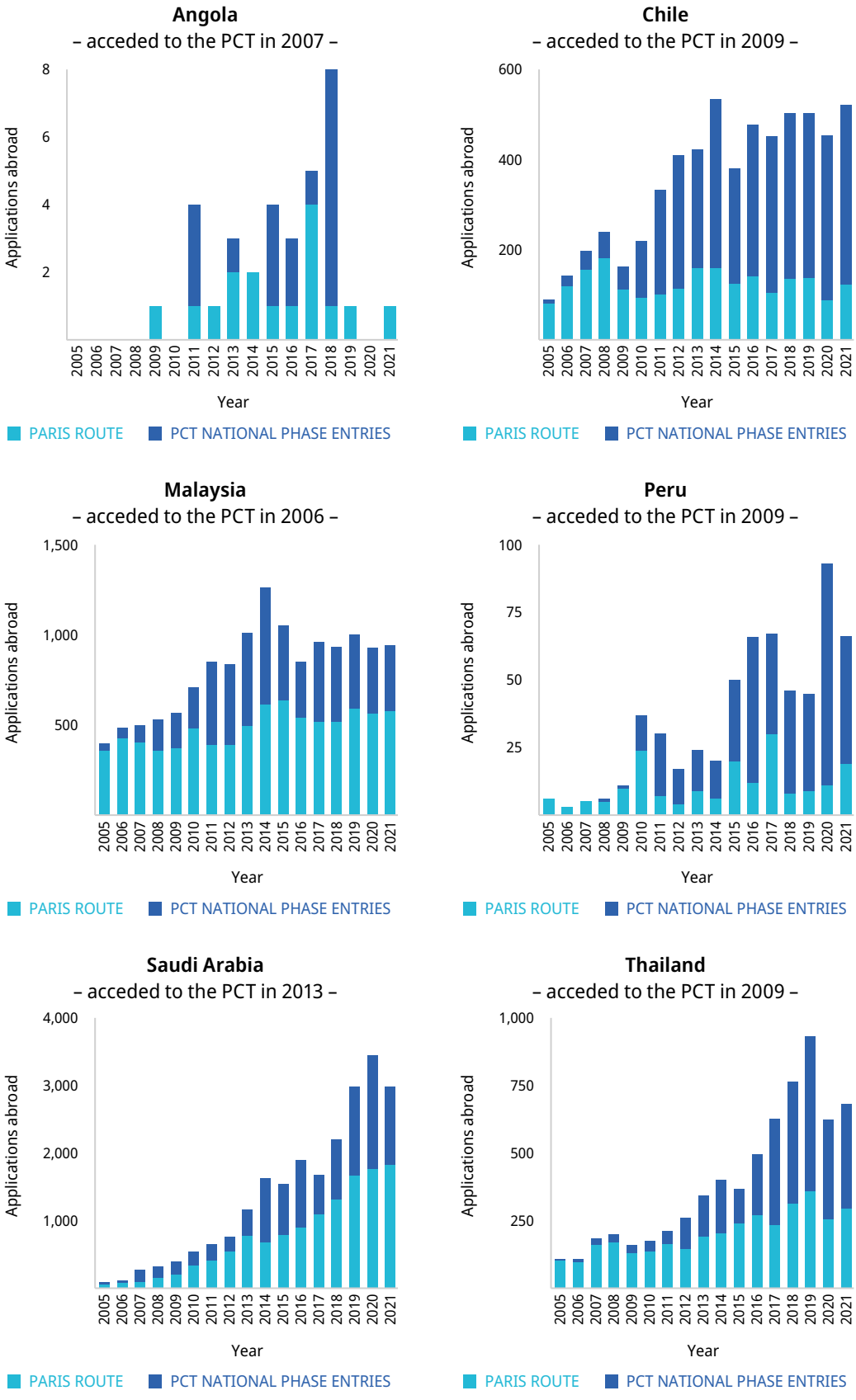


Note: Figure shows the top 10 offices in 2021. EPO is the European Patent Office.
Source: WIPO Statistics Database, March 2023.

In many cases, patent offices in PCT member countries receive a large proportion of non-resident patent applications via the PCT (figure B14). Likewise, applicants tend to use the PCT for a large proportion of their patent applications filed abroad (figure B13).

Figure S14 shows trends in patent applications filed abroad for applicants from countries having relatively recently joined the PCT and for which sufficient data are available. The year before PCT accession, selected applicants filed patent applications abroad via the PCT for between 10.3% of the total for Malaysia and 28.2% for Saudi Arabia. Five years after PCT accession, applicants from this same group of countries used the PCT route for between 40.2% for Saudi Arabia and 70.2% for Chile.

S14. Patent applications filed abroad by filing route for selected origins, 2005–2021



Source: WIPO Statistics Database, March 2023.

Conclusion

Since 1978, PCT membership has expanded by an average of 3.6 new states per year. The majority of this increase in membership took place between 1991 and 2007. By 2022, about 81% of countries globally had joined the PCT, including 93.2% of high-income economies.

Since 1978, the number of PCT member states has increased almost in parallel with the number of countries of origin of filings. Altogether, applicants from 186 countries have filed PCT applications. Notwithstanding such a wide geographical diversity, the top five origins accounted for nearly three-quarters of all PCT applications filed.

PCT application filing has grown by 11.5% per year, on average, over its 44-year history. Since 2002, PCT filings from Europe and North America have grown only slowly, which explains the decline in the respective shares of these two regions in global filings. Over the same period, mainly driven by China, filings from Asia have increased steadily by almost 11% per year, on average. Since 2018, Asia has accounted for the majority of PCT applications filed every year.

Between 2005 and 2021, the total number of NPEs initiated worldwide almost doubled. Over the same period, applicants from the US and Japan initiated the largest proportion of NPEs worldwide. In 2021, China overtook Germany to become the third largest origin of NPEs.

In 2021, the USPTO, the EPO and the CNIPA accounted for the majority of NPEs initiated worldwide, combined. Among top 20 offices, those of the US, Viet Nam, Germany, China and India are the five to have seen the sharpest average annual growth rates since 2005, in that order.

Trends in patent applications filed abroad for selected origins show that applicants started to use the PCT route for a far greater proportion of filings abroad shortly after their country had joined the PCT System.

A. Statistics on the international phase: PCT applications

Highlights

About 278,100 PCT applications were filed in 2022

Approximately 278,100 international patent applications (PCT applications) were filed under WIPO's Patent Cooperation Treaty (PCT) in 2022 (figure A1). This represents a marginal growth of 0.3% compared to the previous year, and marks the slowest rate of increase since a decline in PCT applications in 2009.

Since the PCT System became operational in 1978, the PCT System has received about 4.82 million applications. Overall, PCT filings have grown consistently every year, except in 2009, during the global financial crisis and the resultant economic downturn.

Applicants from 134 countries filed PCT applications in 2022

In 2022, the PCT had 157 member states and applicants from 134 countries filed PCT applications at 85 receiving offices (ROs). However, despite such a widespread geographical distribution, filing activity was heavily concentrated in a select number of economies.

Combined, the top 10 ROs accounted for 93.8% of applications filed in 2022. With 74,420 filings, the China National Intellectual Property Administration (CNIPA) received the most PCT applications. It was followed by the United States Patent and Trademark Office (USPTO) (55,330), the Japan Patent Office (JPO) (48,826), the European Patent Office (EPO) (38,854), the Korean Intellectual Property Office (KIPO) (21,964) and the International Bureau (IB) of WIPO (13,713) (figure A4).

The top five countries of origin accounted for over 72% of applications in 2022

With 70,015 PCT applications, applicants residing in China filed the most applications in 2022. They were followed by applicants from the United States of America (US) (59,056) and Japan (50,345) (figure A7). Together with applicants from Germany and the Republic of Korea, these top five countries accounted for 78.7% of all PCT applications filed in 2022. Driven mainly by a rapid increase in filings by applicants from China, the combined share of the top five users of the PCT System has increased by 4.2 percentage points over the past decade.

The top 20 origins included 17 high-income countries – mostly European – and three middle-income economies, namely, China, India and Türkiye (figure A8). Outside the top 20 origins, other large middle-income economies with notable numbers of PCT applications were Brazil, the Islamic Republic of Iran, the Russian Federation and South Africa, whose filings ranged between 200 and 900. Applicants from the Democratic People's Republic of Korea, Sudan, Syrian Arab Republic and Uganda accounted for most of the 14 applications filed by applicants residing in low-income countries (table A30).

Nine of the top 20 origins filed more PCT applications in 2022 compared to the previous year. India (+25.4%), the Republic of Korea (+6.2%), France (+5.9%) and Singapore (+5.3%) saw the sharpest increases in filing. In contrast, the countries that experienced the steepest falls were Israel (–7.1%), Finland (–6.6%), Italy (–6.6%) and Spain (–6.5%).

Among those large middle-income economies not to feature among the top 20 origins, Colombia (+23.5%), Mexico (+19.9%), Thailand (+19%) and Malaysia (+17.8%) underwent sharp growth in PCT filings (table A9). In contrast, Ukraine (–40.9%), the Russian Federation (–14.5%) and Brazil (–11%) all saw a marked contraction.

A majority of applications were filed in Asia in 2022

In 2022, Asian countries were responsible for 54.7% of all PCT applications filed (figure A2). This represents a sharp increase from their 40.3% share in 2012, primarily driven by higher filings from China. North America ranked as the second highest region, accounting for 22.2% of PCT applications, followed closely by Europe at 21.8%. The combined share for Africa, Latin America and the Caribbean (LAC), and Oceania amounted to no more than 1.3% of total PCT filings.

The business sector accounted for almost 88% of all PCT applications

In 2022, the IB published 272,313 PCT applications, representing a growth of 3.4% in published applications compared to 2021. The business sector accounted for 87.6% of all published PCT applications, followed by the university sector (6%), individuals (4.7%) and the government and public research organization (PRO) sector (1.7%) (figure A11).

The business sector accounted for the biggest proportion of published applications from each of the top 20 origins in the high-income group of economies (figure A12). In particular, the business sector's share comprised over 96% of the total for Finland, Japan and Sweden. Among the top 20 origins in the middle-income group, the business sector constituted the majority of published applications in nine, while individuals accounted for the majority of applications in seven. Notably, individual applicants were responsible for over 80% of applications originating from Egypt, the Islamic Republic of Iran and Ukraine.

The university sector was responsible for more than a fifth of all applications at five of the top 20 origins among middle-income economies, with a particularly large proportion of applications for Morocco (61.8%). It also accounted for relatively high shares among several high-income economies, such as Israel, Singapore and Spain. Governments and PROs were responsible for a relatively large proportion of applications originating from Malaysia (17.2%).

Samsung Electronics saw a sharp increase in published PCT applications in 2022

For the sixth year in a row, China-based telecoms giant, Huawei Technologies, was the top PCT applicant, with 7,689 published applications in 2022 (table A15). Samsung Electronics of the Republic of Korea came second (4,387), followed by Qualcomm of the US (3,855), Mitsubishi Electric of Japan (2,320) and Ericsson of Sweden (2,158).

Samsung Electronics had the fastest growth rate among the top 10 applicants, an increase of 44.3% propelling it to second spot in the ranking. The Nippon Telegraph and Telephone Corp. (NTT) also saw sharp growth, moving up five positions to seventh place in 2022, with a growth rate of 24.9%.

Outside of the top 10 applicants, four companies more than doubled their number of published PCT applications in 2022, namely, Changxin Memory Technologies, Inc., Intel Corp., LG Energy Solution and Fanuc Corp.

The top 50 applicants list for 2022 is composed of companies from only nine origins. Japan had 17 top applicants, followed by China (11), the US (9), Germany (5) and the Republic of Korea (4). Finland, the Netherlands, Saudi Arabia and Sweden each had one listed applicant.

Companies active in digital communication headed the list of top 50 PCT filers in 2022. Of the top 10 applicants, six filed mainly in digital communication, namely, Ericsson, Huawei Technologies, Oppo Mobile Telecommunications, LG Electronics, Qualcomm Inc. and Samsung Electronics (table A16).

A vast majority of applicants featuring in the top 50 university list are from China and the US

Among educational institutions, with 552 published applications, the University of California remained the biggest user of the PCT System in 2022 (table A17). Zhejiang University came second (309), followed by Suzhou University (303).

Two of the top 50 universities doubled their published applications in 2022, namely, the Nanyang Technological University of Singapore and the Jiangsu University of Science and Technology of China. Among the top 10 educational institutions, the two sharpest increases in applications were for the Republic of Korea's Seoul National University and China's Suzhou University.

Of the fifty-one universities from six countries featured in the top 50. China and the US had 19 and 18 universities, respectively. Six were located in the Republic of Korea, four in Japan, and two each in Singapore and the UK.

Shenzhen Institute of Advanced Technology remained the top PCT applicant in the government and PRO sector

With 486 published applications, the Shenzhen Institute of Advanced Technology of China remained the top government and PRO applicant in 2022. The German-based Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung was second, with 366 applications. It was followed by the Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA), the Institut National de la Santé et de la Recherche Médicale (INSERM) and the Centre National de la Recherche Scientifique (CNRS), all three based in France (table A18).

Applicants from 12 countries featured in the top 30 list for 2022. The US (7) had the highest number of top applicants, followed by China (4), the Republic of Korea (4), France (3), Germany (3) and Japan (3).

The fields of computer technology and digital communication reported sharp growth in 2022

In 2022, the electrical engineering sector comprised nearly 39% of all PCT applications filed (figure A3). It was followed by the chemistry (21.5%), instruments (17.1%) and mechanical engineering (16.2%) sectors. Electrical engineering is the technology sector to have seen its share in total PCT applications increase the most over the past decade, growing from 34.2% in 2012 to 38.9% in 2022. The top three technical fields in 2022 belong to the electrical engineering sector.

For a 10th consecutive year, the field of computer technology had the most PCT applications, with 28,224 published in 2022. It was followed by digital communication, electrical machinery, medical technology, and measurement (table A20). These top five technology fields, combined, accounted for 38.5% of all PCT applications published in 2022.

Eight of the top 10 technology fields grew in 2022, with digital communication (+8.7%) reporting the fastest rate of growth, followed by computer technology (+8.1%), semiconductors (+6.8%), biotechnology (+6.7%) and electrical machinery (+6.2%). After the particularly strong growth in health-related technology fields seen last year, in 2022, digital technology fields returned to being the fastest growing fields among PCT applications.

In 2022, women accounted for only 17.1% of inventors

In 2022, women accounted for 17.1% of all inventors listed in PCT applications and men the remaining 82.9% (figure A22). Compared to 2021, the proportion of women inventors rose by 0.6 percentage points in 2022. Since 2008, the share of women inventors has exhibited an almost continuous increase, with only a slight dip observed in 2011.

The share of women inventors has grown in each of the world's geographical regions over the past 10 years. In 2022, the LAC region (22.9%) had the largest proportion of women among PCT inventors, followed by Asia (18.1%), North America (16.9%), Europe (15%), Oceania (14.8%) and Africa (13.6%) (figure A24).

About 96% of PCT applications named at least one man as inventor in 2022, and 34.7% named at least one woman as inventor (figure A23). The share of PCT applications with at least one woman as inventor has risen from one-fifth in 2008 to over one-third in 2022, whereas the share of PCT applications with at least one man as inventor has marginally decreased within the same period, from 97.6% to 95.8%.

The gender gap among PCT inventors varied considerably between countries. Of the top 20 origins of published PCT applications, China and Türkiye had the largest proportion of inventors who were women in 2022 (figure A25). They were the only two origins among the top 20 with nearly one-quarter of women as inventors. In contrast, Austria had slightly less than one-tenth of women inventors in PCT applications.

Technology fields relating to the life sciences had comparatively high shares of women among inventors listed in PCT applications published during 2020–2022 (table A26). Overall, women represented more than one-quarter of inventors in the fields of analysis of biological materials, biotechnology, food chemistry, organic fine chemistry and pharmaceuticals.

Biotechnology was the technical field with the biggest proportion of women listed as inventors both worldwide and in Asia. Food chemistry was the field with the largest share of women inventors in Africa, Europe and North America. In LAC and Oceania, analysis of biological materials was the field with the greatest proportion of women among inventors.

The top 50 PCT geographical clusters accounted for most PCT filings

Combined, the top 50 PCT clusters represented 60.2% of PCT applications published between 2018 and 2022 (table A28). Over this period, Tokyo–Yokohama was the largest PCT cluster, with 127,418 PCT applications accounting for 10.1% of PCT applications. Tokyo–Yokohama was followed by Shenzhen–Hong Kong–Guangzhou, Seoul, and San Jose–San Francisco. The number one cluster in Europe was Paris, ranked in 11th position globally. All top 50 PCT clusters are located in Asia, Europe and North America.

Compared to 2017–2021, 37 of the top 50 PCT clusters grew during 2018–2022, nine of which saw a double-digit increase. Four of the five clusters to record the sharpest growth were in China and one in the Republic of Korea: Nanjing (+28.1%), Qingdao (+23%), Shanghai–Suzhou (+18.2%), Wuhan (+16.9%) and Daejeon (+12.5%).

Within the top 50 list, the highest number of clusters was in the US (16), China (7), Germany (7) and Japan (4). The Netherlands, the Republic of Korea and the UK each had two. China and India were the only two middle-income countries to have had clusters among the top 50 in the 2018–2022 period, with Malaysia contributing to the cluster of Singapore.

Computer technology represented over 10% of applications in nine of the top 20 clusters and was by far the main technology field for Seattle (42.3%), Hangzhou (26.7%) and San Jose–San Francisco (22.3%) (table A29). Digital communication accounted for over one-tenth of published applications in eight of the top 20 PCT clusters, notably in San Diego (44.3%), Shenzhen–Hong Kong–Guangzhou (26.1%) and Beijing (24.7%). Medical technology accounted for a high share of applications in Eindhoven (28.7%) and electrical machinery in Daejeon (27.7%).

Global trends in PCT applications

PCT applications by receiving office

PCT applications by origin

PCT applications by applicant type

Top PCT applicants

PCT applications by technology field

Participation of women inventors in PCT applications

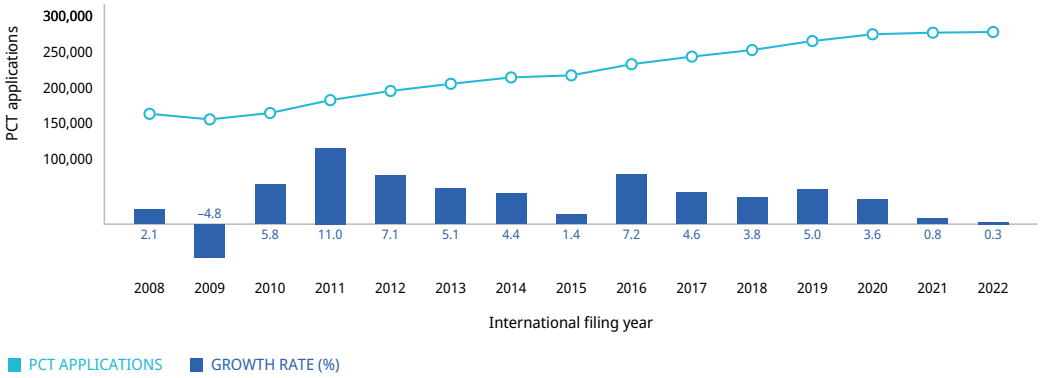
Top geographical clusters of inventors in PCT applications

Statistical table

Global trends in PCT applications

PCT applications grew by 0.3% to reach 278,100 in 2022.

A1. Trend in filings of PCT applications, 2008–2022

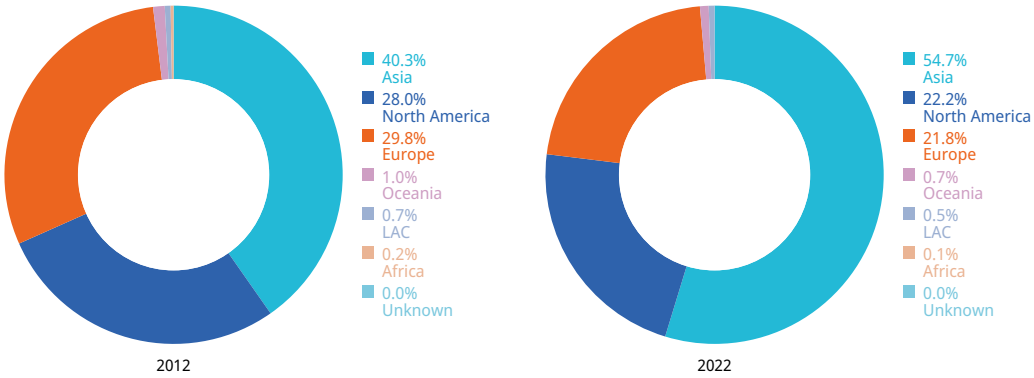


Note: Data for 2022 are WIPO estimates.

Source: WIPO Statistics Database, March 2023.

Asia was the origin of a majority of the PCT applications filed in 2022.

A2. Distribution of PCT applications by region, 2012 and 2022

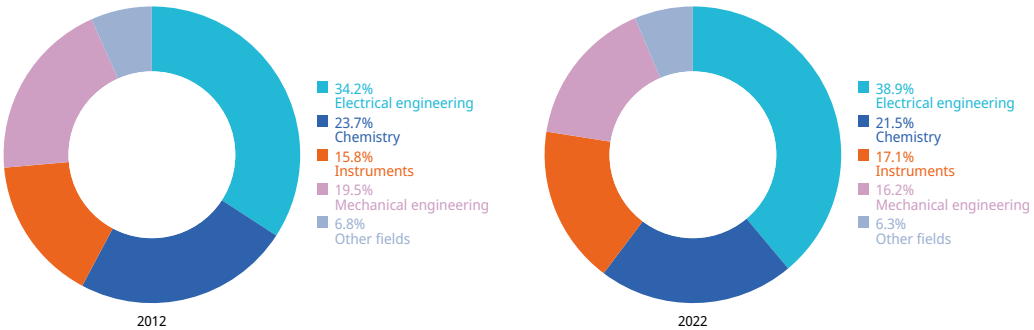


Note: Data for 2022 are WIPO estimates. Each region includes the following number of origins: Africa (22), Asia (36), Europe (44), Latin America and the Caribbean (LAC) (24), North America (3) and Oceania (5).

Source: WIPO Statistics Database, March 2023.

Electrical engineering accounted for the largest share of PCT applications.

A3. Distribution of PCT applications by technology sector, 2012 and 2022



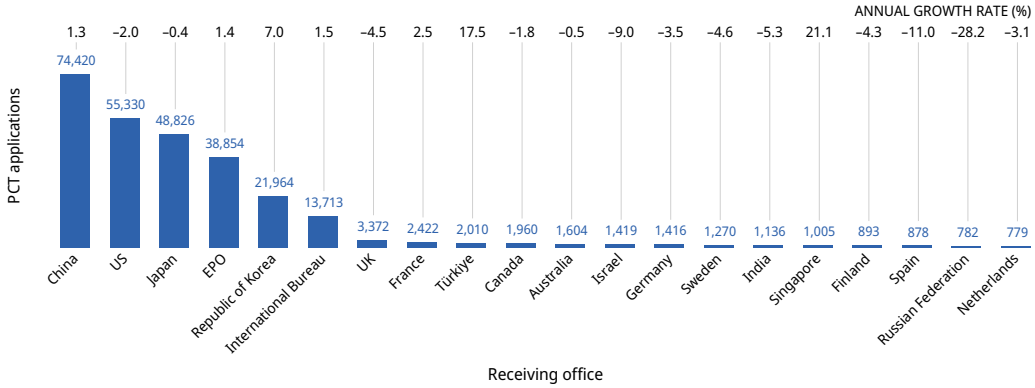
Note: For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into five corresponding sectors of technology.

Source: WIPO Statistics Database, March 2023.

PCT applications by receiving office

The office of China received the most PCT applications in 2022.

A4. PCT applications for the top 20 receiving offices, 2022

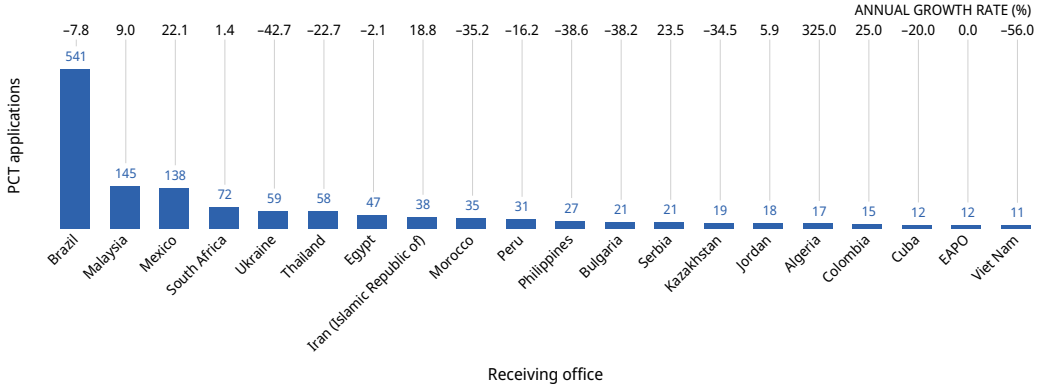


Note: Data for 2022 are WIPO estimates. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

The office of Mexico saw growth of 22.1% in PCT applications in 2022.

A5. PCT applications for selected receiving offices of low- and middle-income countries, 2022



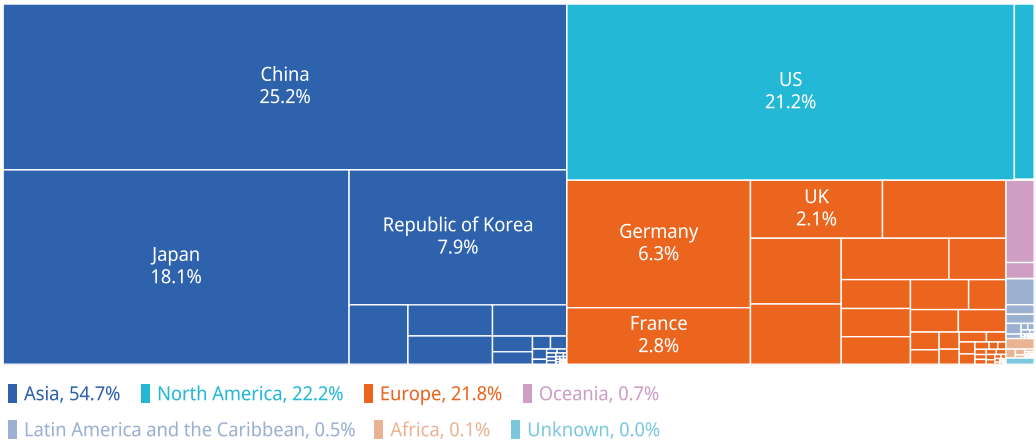
Note: Data for 2022 are WIPO estimates. EAPO is the Eurasian Patent Organization. The selected offices are the top receiving offices of low- and middle-income countries not to feature among the top 20 offices. Where available, data for all offices are presented in statistical table A30.

Source: WIPO Statistics Database, March 2023.

PCT applications by origin

PCT applications are highly concentrated in just a few origins.

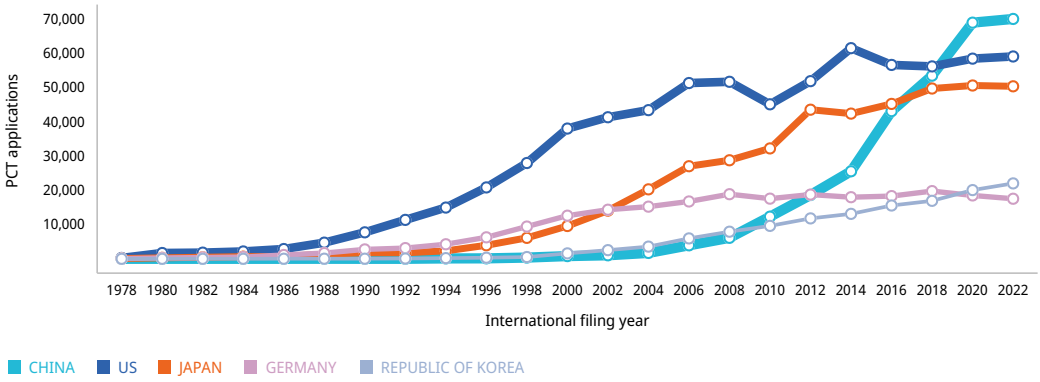
A6. Distribution of PCT applications by region and origin, 2022



Note: Data for 2022 are WIPO estimates.
Source: WIPO Statistics Database, March 2023.

Over the past decade, China, Japan and US filed the largest numbers of PCT applications.

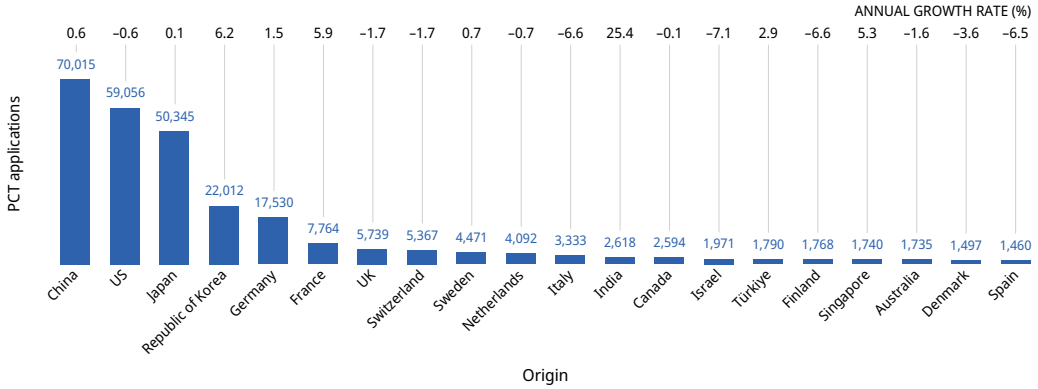
A7. Trend in PCT applications for the top five origins, 1978–2022



Note: Data for 2022 are WIPO estimates.
Source: WIPO Statistics Database, March 2023.

Among top 20 origins, India recorded the sharpest increase in PCT applications in 2022.

A8. PCT applications for the top 20 origins, 2022



Note: Data for 2022 are WIPO estimates.
Source: WIPO Statistics Database, March 2023.

Latin America and the Caribbean was the region to have had the highest growth in filings in 2022.

A9. PCT applications for the top countries by region, 2020–2022

Region	Origin	2020	2021	2022	Regional share 2022 (%)	Change from 2021 (%)
Africa	South Africa	237	226	222	54.0	–1.8
	Egypt	44	54	63	15.3	16.7
	Morocco	40	63	41	10.0	–34.9
	Mauritius	13	32	21	5.1	–34.4
	Algeria	14	7	18	4.4	157.1
	Others	45	66	46	11.2	–30.3
	Total*	**393**	**448**	**411**	**0.1**	**–8.3**
Asia	China	68,935	69,604	70,015	46.0	0.6
	Japan	50,582	50,275	50,345	33.1	0.1
	Republic of Korea	20,050	20,723	22,012	14.5	6.2
	India	1,907	2,087	2,618	1.7	25.4
	Israel	1,930	2,121	1,971	1.3	–7.1
	Türkiye	1,616	1,739	1,790	1.2	2.9
	Singapore	1,316	1,653	1,740	1.1	5.3
	Saudi Arabia	952	822	470	0.3	–42.8
	Iran (Islamic Republic of)	266	363	373	0.2	2.8
	Thailand	159	147	175	0.1	19.0
	Others	594	601	550	0.4	–8.5
	Total*	**148,307**	**150,135**	**152,059**	**54.7**	**1.3**
Europe	Germany	18,491	17,266	17,530	29.0	1.5
	France	7,788	7,334	7,764	12.8	5.9
	UK	5,892	5,841	5,739	9.5	–1.7
	Switzerland	5,135	5,461	5,367	8.9	–1.7
	Sweden	4,356	4,441	4,471	7.4	0.7
	Netherlands	4,004	4,119	4,092	6.8	–0.7
	Italy	3,399	3,568	3,333	5.5	–6.6
	Finland	1,679	1,893	1,768	2.9	–6.6
	Denmark	1,577	1,553	1,497	2.5	–3.6
	Spain	1,460	1,561	1,460	2.4	–6.5
	Others	7,621	8,003	7,477	12.4	–6.6
	Total*	**61,402**	**61,040**	**60,498**	**21.8**	**–0.9**
Latin America and the Caribbean	Brazil	690	616	548	43.5	–11.0
	Mexico	178	166	199	15.8	19.9
	Chile	244	166	194	15.4	16.9
	Colombia	122	98	121	9.6	23.5
	Barbados	38	29	50	4.0	72.4
	Peru	35	38	33	2.6	–13.2
	Argentina	38	30	31	2.5	3.3
	Antigua and Barbuda	51	3	25	2.0	733.3

Region	Origin	2020	2021	2022	Regional share 2022 (%)	Change from 2021 (%)
	Cuba	11	15	12	1.0	–20.0
	Others	69	60	47	3.7	–21.7
	Total*	**1,476**	**1,221**	**1,260**	**0.5**	**3.2**
North America	US	58,431	59,403	59,056	95.8	–0.6
	Canada	2,606	2,596	2,594	4.2	–0.1
	Bermuda	8	10	14	0.0	40.0
	Total*	**61,045**	**62,009**	**61,664**	**22.2**	**–0.6**
Oceania	Australia	1,722	1,763	1,735	83.5	–1.6
	New Zealand	298	371	338	16.3	–8.9
	Others	4	2	5	0.2	150.0
	Total*	**2,024**	**2,136**	**2,078**	**0.7**	**–2.7**
Unknown		242	193	130	0.0	–32.6
Total		**274,889**	**277,182**	**278,100**	**n.a.**	**0.3**

Note: Data for 2022 are WIPO estimates. This table shows the top countries for each region (with a maximum of 10 per region) where applicants filed more than 10 PCT applications in 2021. Data for all origins are reported in statistical table A30.

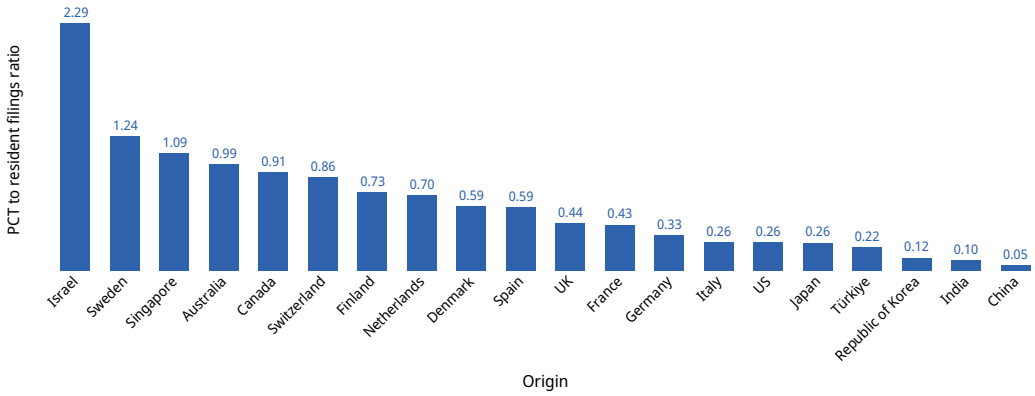
* indicates share of world total.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2023.

Israel's conversion rate of resident patent applications into PCT applications is particularly high.

A10. Conversion ratio of direct resident patent applications to PCT applications for the top 20 origins, 2022



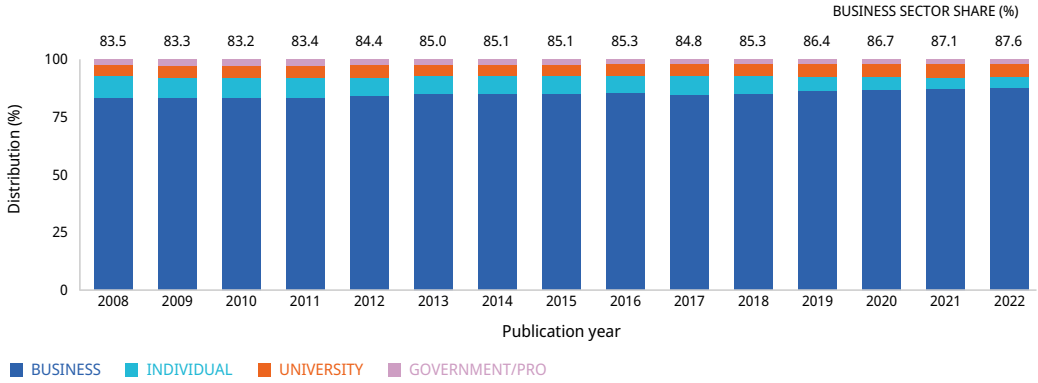
Note: Data for 2022 are WIPO estimates. This hypothetical "conversion ratio" reflects the proportion of direct resident patent applications converted into PCT applications. The ratio is defined for the top 20 origins in terms of PCT applications filed in 2022 divided by resident patent applications (including regional applications and excluding PCT national phase entries) filed in 2021. In theory, the conversion ratio ought to be between 0 and 1. However, it may exceed 1, because some applications do not have priority claims associated with prior resident filings. For example, an applicant from Israel may forego filing an application at the Israel Patent Office and opt instead to file a first application at the USPTO, then convert that prior filing into a PCT application.

Source: WIPO Statistics Database, March 2023.

PCT applications by applicant type

The business sector accounted for 87.6% of all PCT applications filed in 2022.

A11. Distribution of PCT applications by applicant type, 2008–2022

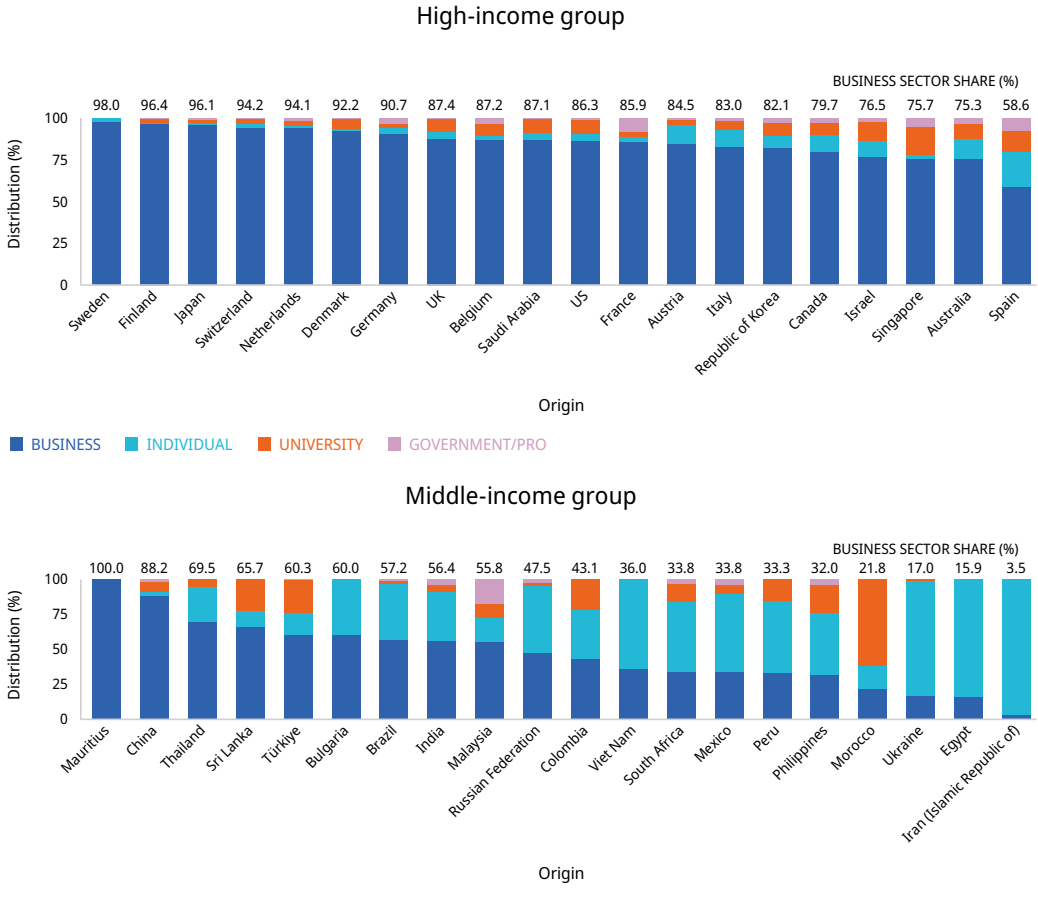


Note: The government and public research organization (PRO) sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on the publication date.

Source: WIPO Statistics Database, March 2023.

Precisely 98% of all PCT applications originating in Sweden were filed by businesses.

A12. Distribution of PCT applications by applicant type for the top 20 origins by income group, 2022

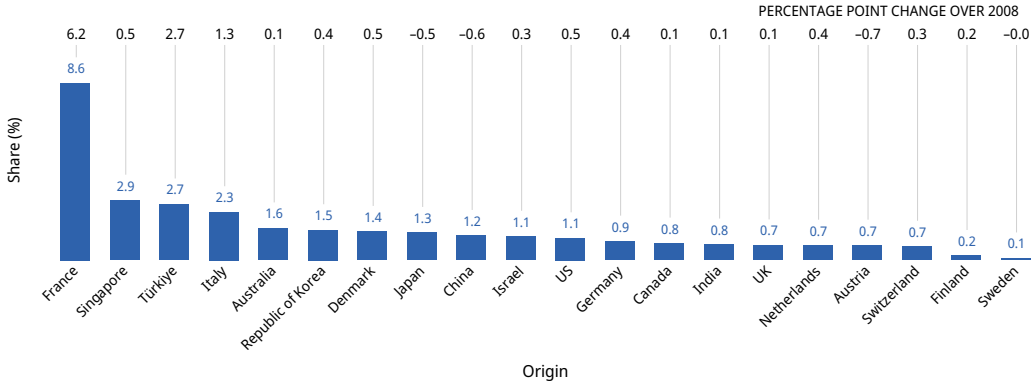


Note: The government and PRO sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. Lower and upper middle-income groups have been merged. Low-income countries are omitted due to insufficient data. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2023.

Collaboration between the business and public sectors was comparatively high in France

A13. Share of PCT applications with business and public sector co-applicants for the top 20 origins, 2022

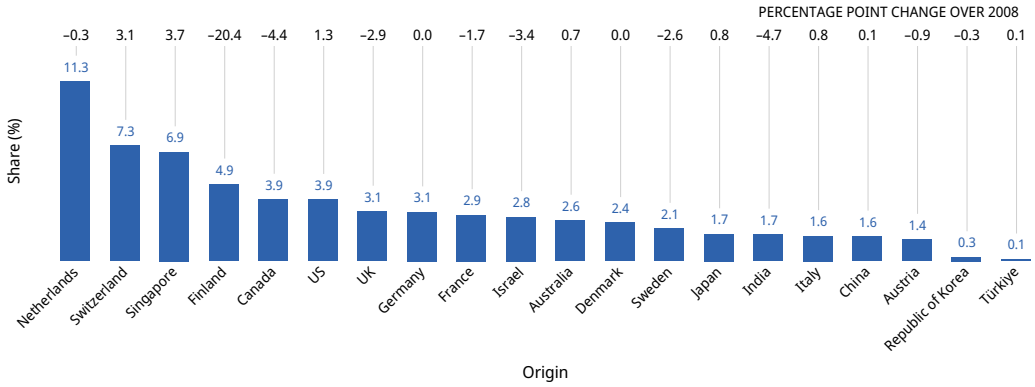


Note: The public sector comprises the university sector and the government and PRO sector. The government and PRO sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2023.

Applicants residing in the Netherlands filed a relatively large proportion of PCT applications that included foreign co-applicants.

A14. Share of PCT applications with foreign co-applicants for the top 20 origins, 2022



Note: Counts are based on corporate applicants only (excluding individual applicants) and on all applicants named in PCT applications (not only the first named applicant). For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2023.

Top PCT applicants

Huawei Technologies remained by far the top PCT applicant in 2022.

A15. Top 50 business PCT applicants, 2020–2022

Ranking	Change in position from 2021	Applicant	Origin	Published PCT applications 2020	2021	2022
1	0	HUAWEI TECHNOLOGIES CO., LTD.	China	5,464	6,952	7,689
2	1	SAMSUNG ELECTRONICS CO., LTD.	Republic of Korea	3,093	3,041	4,387
3	–1	QUALCOMM INCORPORATED	US	2,173	3,931	3,855
4	1	MITSUBISHI ELECTRIC CORPORATION	Japan	2,810	2,673	2,320
5	3	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	1,989	1,877	2,158
6	0	GUANG DONG OPPO MOBILE TELECOMMUNICATIONS CORP., LTD	China	1,801	2,208	1,963
7	0	BOE TECHNOLOGY GROUP CO.,LTD	China	1,892	1,980	1,884
7	5	NIPPON TELEGRAPH AND TELEPHONE CORPORATION	Japan	1,372	1,508	1,884
9	–5	LG ELECTRONICS INC.	Republic of Korea	2,759	2,885	1,793
10	0	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.	Japan	1,611	1,741	1,776
11	5	VIVO MOBILE COMMUNICATION CO., LTD.	China	955	1,336	1,515
12	–3	SONY GROUP CORPORATION	Japan	1,793	1,789	1,513
13	0	ZTE CORPORATION	China	1,316	1,493	1,479
14	1	NEC CORPORATION	Japan	1,121	1,350	1,428
15	3	ROBERT BOSCH CORPORATION	Germany	1,375	1,213	1,290
16	1	MICROSOFT TECHNOLOGY LICENSING, LLC	US	1,529	1,303	1,271
17	23	LG ENERGY SOLUTION, LTD.	Republic of Korea	0	548	1,186
18	1	FUJIFILM CORPORATION	Japan	1,128	1,095	1,181
19	3	MURATA MANUFACTURING CO., LTD.	Japan	1	882	1,043
20	0	SZ DJI TECHNOLOGY CO., LTD	China	1,073	1,042	920
21	27	BEIJING XIAOMI MOBILE SOFTWARE CO., LTD.	China	457	473	913
22	–8	HEWLETT-PACKARD DEVELOPMENT COMPANY, L. P.	US	1,595	1,485	894
23	–2	DENSO CORPORATION	Japan	1,062	915	857
24	12	APPLIED MATERIALS, INC.	US	1	571	856
25	0	GOOGLE INC.	US	781	763	830
26	25	APPLE INC.	US	614	428	822
27	8	INTERNATIONAL BUSINESS MACHINES CORPORATION	US	359	576	816
28	–1	SONY SEMICONDUCTOR SOLUTIONS CORPORATION	Japan	703	732	789
29	53	CHANGXIN MEMORY TECHNOLOGIES, INC.	China	61	281	786
30	–2	NTT DOCOMO, INC.	Japan	767	713	764
31	–5	KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	846	758	737
32	–1	NOKIA TECHNOLOGIES OY	Finland	618	655	718
33	9	TENCENT TECHNOLOGY (SHENZHEN) COMPANY LIMITED	China	470	511	690
34	–11	SAUDI ARABIAN OIL CO.	Saudi Arabia	435	838	680
35	–1	SIEMENS AKTIENGESELLSCHAFT	Germany	1,202	623	656
36	–7	AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.	China	298	679	620
37	–7	3M INNOVATIVE PROPERTIES COMPANY	US	789	660	609
38	81	INTEL CORPORATION	US	626	209	591
39	–15	LG CHEM, LTD.	Republic of Korea	1,374	824	587
40	7	HITACHI, LTD.	Japan	441	474	563
42	7	DAIKIN INDUSTRIES, LTD.	Japan	458	449	536
43	–32	PING AN TECHNOLOGY (SHENZHEN) CO., LTD.	China	1,304	1,564	521
44	8	HITACHI ASTEMO, LTD.	Japan	0	410	517
45	–8	KYOCERA CORPORATION	Japan	626	562	508
46	–8	BASF SE	Germany	542	552	507
46	–5	SHARP KABUSHIKI KAISHA	Japan	745	543	507
48	7	BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT	Germany	463	374	489
49	–6	SCHAEFFLER TECHNOLOGIES AG & CO. KG	Germany	529	505	488
51	54	FANUC CORPORATION	Japan	3	226	484
52	–7	NITTO DENKO CORPORATION	Japan	422	497	473

Note: For confidentiality reasons, data are based on published applications and on the publication date.
Source: WIPO Statistics Database, March 2023.

Digital communication technologies accounted for the largest proportion of PCT applications for six of the top 10 applicants.

A16. Share of technology fields for the top 10 business applicants, 2022

	Applicant									
Technology field	Huawei Tech.	Samsung Electr.	Qualcomm	Mitsubishi Electr.	LM Ericsson	OPPO Mobile Tel. Corp	BOE Tech. Group	NTT Corp.	LG Electr.	Panasonic
Electrical machinery, apparatus, energy	2.5	3.9	0.4	18.0	0.5	3.1	0.7	2.1	4.2	29.5
Audio-visual technology	5.8	13.0	3.5	3.6	1.5	12.4	25.6	3.4	6.2	7.4
Telecommunications	9.4	12.3	11.5	3.7	13.4	8.1	2.0	12.5	8.5	1.4
Digital communication	43.4	26.9	67.4	4.1	70.4	56.0	1.9	20.0	42.5	1.4
Basic communication processes	1.5	0.5	1.7	1.9	0.9	0.2	0.3	0.9	0.4	0.4
Computer technology	23.6	24.0	7.0	9.2	8.9	13.7	16.3	28.6	5.7	6.8
IT methods for management	0.4	1.1	0.1	2.2	0.7	0.2	0.5	4.8	0.3	3.5
Semiconductors	3.2	1.2	2.2	5.2	0.1	0.6	35.6	1.7	3.0	3.7
Optics	2.7	2.6	0.2	2.5	0.5	2.4	12.0	8.2	1.2	3.3
Measurement	3.0	2.5	5.4	7.7	1.9	1.7	1.3	7.2	1.2	8.0
Analysis of biological materials	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1
Control	1.1	0.5	0.4	6.2	0.6	0.3	0.3	2.9	0.4	2.8
Medical technology	0.9	1.9	0.2	0.8	0.0	0.5	0.7	3.5	0.7	3.1
Organic fine chemistry	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3
Biotechnology	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.1	0.2
Pharmaceuticals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Macromolecular chemistry, polymers	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4	1.1
Food chemistry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Basic materials chemistry	0.0	0.3	0.0	0.3	0.0	0.1	0.3	0.1	0.3	0.6
Materials, metallurgy	0.1	0.2	0.0	0.3	0.0	0.1	0.1	0.1	0.8	2.1
Surface technology, coating	0.1	0.3	0.0	0.3	0.0	0.1	0.6	0.8	0.2	1.8
Micro-structural and nano-technology	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.2
Chemical engineering	0.0	0.3	0.0	0.2	0.0	0.0	0.6	0.1	0.8	1.2
Environmental technology	0.0	0.2	0.0	0.6	0.0	0.0	0.1	0.1	0.3	1.2
Handling	0.0	1.4	0.0	4.8	0.1	0.0	0.1	0.3	1.1	1.4
Machine tools	0.0	0.1	0.0	1.6	0.0	0.0	0.1	0.1	0.9	2.9
Engines, pumps, turbines	0.0	0.2	0.0	3.3	0.0	0.0	0.0	0.0	1.2	1.4
Textile and paper machines	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.2
Other special machines	0.1	0.3	0.0	0.8	0.0	0.1	0.0	0.1	0.8	0.8
Thermal processes and apparatus	0.1	1.5	0.0	14.7	0.0	0.1	0.0	0.1	2.0	4.3
Mechanical elements	0.2	0.6	0.0	0.9	0.0	0.2	0.2	0.3	1.6	0.3
Transport	1.6	0.3	0.1	5.1	0.2	0.1	0.1	0.8	0.7	2.6
Furniture, games	0.1	1.5	0.1	0.3	0.1	0.2	0.0	0.2	5.5	1.5
Other consumer goods	0.2	2.0	0.0	0.8	0.0	0.3	0.0	0.3	7.9	3.4
Civil engineering	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.5	0.8	1.1

Note: NTT Corp. is the NIPPON TELEGRAPH AND TELEPHONE CORPORATION. For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

Source: WIPO Statistics Database, March 2023.

Since 1993, the University of California has been the top PCT applicant from the university sector.

A17. Top 50 university PCT applicants, 2020–2022

Ranking	Change in position from 2021	Applicant	Origin	Published PCT applications 2020	2021	2022
41	–2	UNIVERSITY OF CALIFORNIA	US	559	551	552
71	1	ZHEJIANG UNIVERSITY	China	209	306	309
73	112	SUZHOU UNIVERSITY	China	46	153	303
124	8	LELAND STANFORD JUNIOR UNIVERSITY	US	154	194	217
143	6	BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM	US	184	177	187
161	–36	TSINGHUA UNIVERSITY	China	231	201	174
176	–73	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	US	269	227	161
177	47	JOHNS HOPKINS UNIVERSITY	US	121	129	160
177	90	SEOUL NATIONAL UNIVERSITY	Republic of Korea	146	110	160
190	52	HANYANG UNIVERSITY	Republic of Korea	124	121	149
192	47	YONSEI UNIVERSITY	Republic of Korea	109	122	148
194	17	KOREA UNIVERSITY	Republic of Korea	118	138	147
210	–40	NATIONAL UNIVERSITY OF SINGAPORE	Singapore	96	163	138
224	18	JIANGNAN UNIVERSITY	China	131	121	128
228	98	JIANGSU UNIVERSITY	China	59	92	125
242	293	NANYANG TECHNOLOGICAL UNIVERSITY	Singapore	37	54	119
248	–61	UNIVERSITY OF TOKYO	Japan	149	150	118
251	–49	SHENZHEN UNIVERSITY	China	252	142	116
263	49	KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY	Republic of Korea	84	95	112
273	–112	SOUTH CHINA UNIVERSITY OF TECHNOLOGY	China	157	169	110
275	–20	UNIVERSITY OF MICHIGAN	US	96	113	109
276	78	UNIVERSITY OF ARIZONA	US	85	84	108
295	53	SOUTHEAST UNIVERSITY	China	125	86	99
295	–28	UNIVERSITY OF FLORIDA	US	86	110	99
298	–15	SHANDONG UNIVERSITY	China	80	105	98
304	50	NORTHWESTERN UNIVERSITY	US	108	84	96
309	–44	OSAKA UNIVERSITY	Japan	128	111	95
327	88	CORNELL UNIVERSITY	US	79	70	90
336	–52	HARVARD UNIVERSITY	US	118	104	88
336	7	SHANGHAI JIAOTONG UNIVERISTY	China	18	87	88
343	116	UNIVERSITY OF PENNSYLVANIA	US	76	63	87
349	–12	COLUMBIA UNIVERSITY	US	104	89	85
361	98	UNIVERSITY OF WASHINGTON	US	72	63	83
363	–9	DUKE UNIVERSITY	US	56	84	82
363	119	TOHOKU UNIVERSITY	Japan	70	60	82
372	19	CATHOLIC UNIVERSITY	Republic of Korea	41	75	80
378	–90	KYOTO UNIVERSITY	Japan	76	103	79
378	62	UNIVERSITY OF COLORADO	US	77	66	79
384	–192	DALIAN UNIVERSITY OF TECHNOLOGY	China	159	146	78
407	–64	HUAZHONG UNIVERSITY OF SCIENCE AND TECHNOLOGY	China	40	87	73
411	–99	PEKING UNIVERSITY	China	90	95	72
421	417	JIANGSU UNIVERSITY OF SCIENCE AND TECHNOLOGY	China	9	33	71
421	–48	UNIVERSITY OF PITTSBURGH	US	61	81	71
427	258	IMPERIAL INNOVATIONS LTD.	UK	65	41	70
442	–69	OXFORD UNIVERSITY INNOVATION LIMITED	UK	93	81	68
451	8	SUN YAT–SEN UNIVERSITY	China	33	63	67
465	–258	QINGDAO TECHNOLOGICAL UNIVERSITY	China	69	139	65
465	247	SOUTH UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA	China	33	39	65
486	–12	NANJING UNIVERSITY	China	30	61	62
497	199	GUANGDONG UNIVERSITY OF TECHNOLOGY	China	31	40	61
497	-27	PURDUE UNIVERSITY	US	47	62	61

Note: The university sector includes all types of educational institution. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2023.

The Shenzhen Institute of Advanced Technology remained the top PCT applicant for the government and PRO sector in 2022.

A18. Top 30 government and PRO PCT applicants, 2020–2022

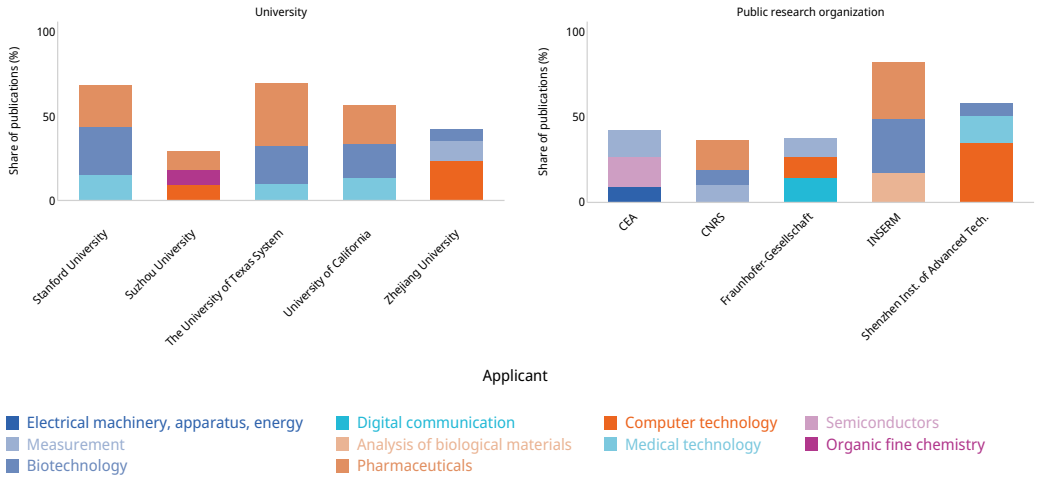
Ranking	Change in position from 2021	Applicant	Origin	Published PCT applications 2020	2021	2022
50	3	SHENZHEN INSTITUTE OF ADVANCED TECHNOLOGY	China	362	396	486
60	0	FRAUNHOFER–GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Germany	428	343	366
130	13	COMMISSARIAT À L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES ALTERNATIVES	France	208	182	209
220	–24	INSTITUT NATIONAL DE LA SANTÉ ET DE LA RECHERCHE MÉDICALE (INSERM)	France	167	144	130
242	8	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	France	121	116	119
290	102	KOREA ELECTRONICS TECHNOLOGY INSTITUTE	Republic of Korea	83	74	103
327	122	U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES	US	48	65	90
334	9	NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY	Japan	98	87	89
336	–52	AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH	Singapore	142	104	88
372	128	MAX–PLANCK–GESELLSCHAFT ZUR FÖRDERUNG DER WISSENSCHAFTEN E.V.	Germany	55	57	80
411	186	KOREA RESEARCH INSTITUTE OF CHEMICAL TECHNOLOGY	Republic of Korea	58	48	72
421	–21	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS (CSIC)	Spain	66	72	71
451	31	MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH	US	73	60	67
465	–25	SLOAN–KETTERING INSTITUTE FOR CANCER RESEARCH	US	54	66	65
482	105	RIKEN (THE INSTITUTE OF PHYSICAL AND CHEMICAL RESEARCH)	Japan	39	49	63
507	281	COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH AN INDIAN REGISTERED BODY INCORPORATED UNDER THE REGN. OF SOC. ACT (ACT XXI OF 1860)	India	46	35	59
564	43	BATTELLE MEMORIAL INSTITUTE	US	52	47	52
573	102	INSTITUTE OF MICROELECTRONICS OF THE CHINESE ACADEMY OF SCIENCES	China	33	42	51
638	200	CITY OF HOPE	US	20	33	46
638	171	DEUTSCHES ZENTRUM FÜR LUFT– UND RAUMFAHRT E.V.	Germany	26	34	46
654	–270	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST–NATUURWETENSCHAPPELIJK ONDERZOEK TNO	Netherlands	76	78	45
679	193	KOREA RESEARCH INSTITUTE OF BIOSCIENCE AND BIOTECHNOLOGY	Republic of Korea	26	32	43
730	–133	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	Australia	39	48	40
730	171	SCRIPPS RESEARCH INSTITUTE	US	26	31	40
730	–34	SHANGHAI INSTITUTE OF MATERIA MEDICA, CHINESE ACADEMY OF SCIENCES	China	29	40	40
746	252	NATIONAL INSTITUTE FOR MATERIALS SCIENCE	Japan	39	28	39
746	–6	NATIONAL RESEARCH COUNCIL OF CANADA	Canada	28	37	39
834	–46	KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY	Republic of Korea	35	35	35
959	801	DALIAN INSTITUTE OF CHEMICAL PHYSICS, CHINESE ACADEMY OF SCIENCES	China	40	15	30
988	874	CLEVELAND CLINIC FOUNDATION	US	16	14	29

Note: The government and PRO sector includes private non-profit organizations and hospitals. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2023.

Computer technology accounted for the highest share of PCT applications for the Shenzhen Institute of Advanced Technology and the Zhejiang University.

A19. Share of the top three technology fields for the top five universities and PROs, 2022



Note: CEA is the Commissariat à l'Énergie Atomique et aux Énergies Alternatives, CNRS is the Centre national de la recherche scientifique, Fraunhofer-Gesellschaft is the Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, INSERM is the Institut National de la Santé et de la Recherche Médicale and Shenzhen Inst. of Advanced Tech. is the Shenzhen Institute of Advanced Technology. PROs include private non-profit organizations and hospitals. For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

Source: WIPO Statistics Database, March 2023.

PCT applications by technology field

Computer technology and digital communication both recorded fast growth rates in 2022.

A20. PCT applications by technology field, 2018–2022

		Publication year					2022 share	Change from 2021
	Technical field	2018	2019	2020	2021	2022	(%)	(%)
I	**Electrical engineering**							
1	Electrical machinery, apparatus, energy	16,556	17,194	17,367	18,230	19,353	7.1	6.2
2	Audio–visual technology	8,187	8,900	11,534	10,839	10,157	3.7	–6.3
3	Telecommunications	6,132	5,861	6,445	6,376	6,427	2.4	0.8
4	Digital communication	20,233	19,050	22,079	23,609	25,664	9.4	8.7
5	Basic communication processes	1,712	1,554	1,610	1,647	1,697	0.6	3.0
6	Computer technology	19,181	21,496	24,344	26,109	28,224	10.4	8.1
7	IT methods for management	4,803	5,747	5,891	5,298	5,373	2.0	1.4
8	Semiconductors	7,183	8,048	8,862	8,346	8,913	3.3	6.8
II	**Instruments**							
9	Optics	7,610	8,018	8,371	7,920	7,398	2.7	–6.6
10	Measurement	10,775	11,451	12,704	12,158	12,646	4.6	4.0
11	Analysis of biological materials	1,940	1,917	2,062	2,154	2,248	0.8	4.4
12	Control	5,212	5,363	5,457	5,181	5,252	1.9	1.4
13	Medical technology	15,798	16,916	17,500	18,553	19,013	7.0	2.5
III	**Chemistry**							
14	Organic fine chemistry	5,787	5,888	6,351	6,155	6,495	2.4	5.5
15	Biotechnology	6,640	7,404	7,985	8,747	9,336	3.4	6.7
16	Pharmaceuticals	9,130	9,786	10,767	12,160	12,555	4.6	3.2
17	Macromolecular chemistry, polymers	4,249	4,425	4,656	4,479	4,653	1.7	3.9
18	Food chemistry	2,104	2,215	2,383	2,468	2,579	0.9	4.5
19	Basic materials chemistry	5,573	5,589	5,712	5,484	5,552	2.0	1.2
20	Materials, metallurgy	4,334	4,417	4,685	4,313	4,633	1.7	7.4
21	Surface technology, coating	3,680	3,852	4,014	3,834	3,980	1.5	3.8
22	Micro–structural and nano–technology	395	390	456	440	422	0.2	–4.1
23	Chemical engineering	4,886	5,074	5,285	5,230	5,504	2.0	5.2

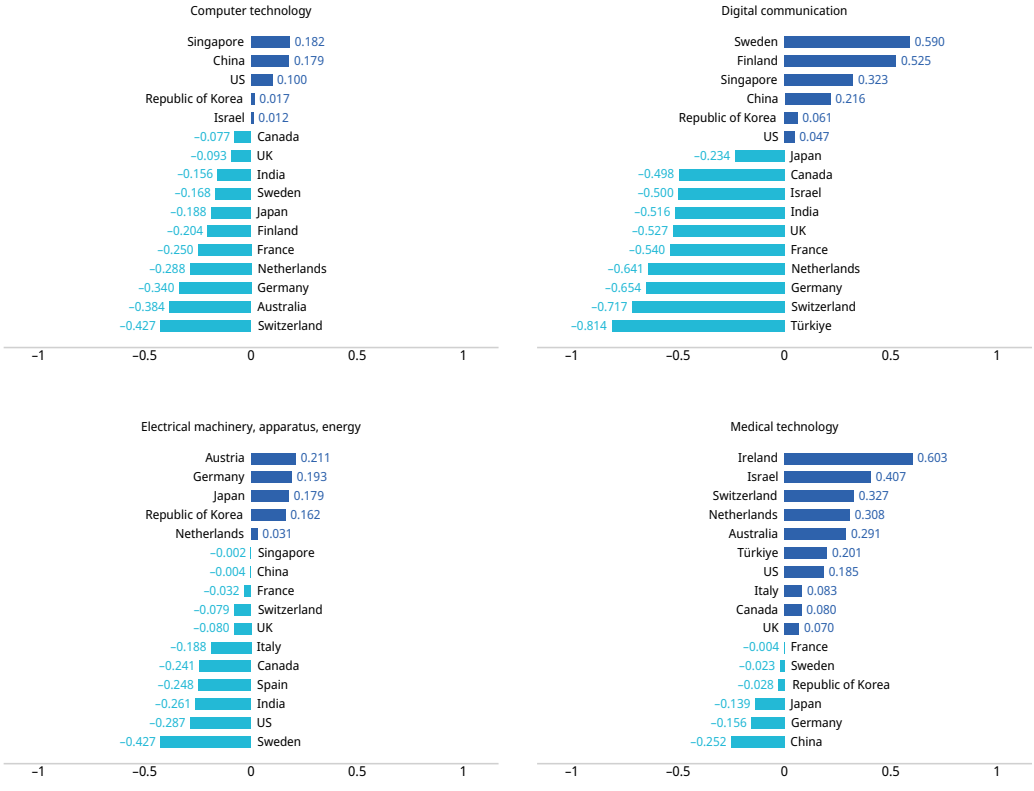
	Technical field	Publication year 2018	2019	2020	2021	2022	2022 share (%)	Change from 2021 (%)
24	Environmental technology	2,732	2,705	3,020	2,771	2,841	1.0	2.5
IV	**Mechanical engineering**							
25	Handling	5,889	5,954	6,413	6,258	6,577	2.4	5.1
26	Machine tools	4,077	4,300	4,315	4,308	4,282	1.6	–0.6
27	Engines, pumps, turbines	5,656	5,366	5,123	4,443	4,375	1.6	–1.5
28	Textile and paper machines	2,757	2,769	2,952	2,623	2,425	0.9	–7.5
29	Other special machines	6,959	7,236	7,483	7,232	7,277	2.7	0.6
30	Thermal processes and apparatus	3,866	4,085	4,306	3,928	4,035	1.5	2.7
31	Mechanical elements	6,187	5,952	5,847	5,162	5,047	1.9	–2.2
32	Transport	10,941	11,227	11,290	10,117	10,055	3.7	–0.6
V	**Other fields**							
33	Furniture, games	4,669	4,625	4,718	4,491	4,933	1.8	9.8
34	Other consumer goods	5,403	5,445	6,045	5,842	6,335	2.3	8.4
35	Civil engineering	6,121	6,387	6,502	6,319	5,941	2.2	–6.0

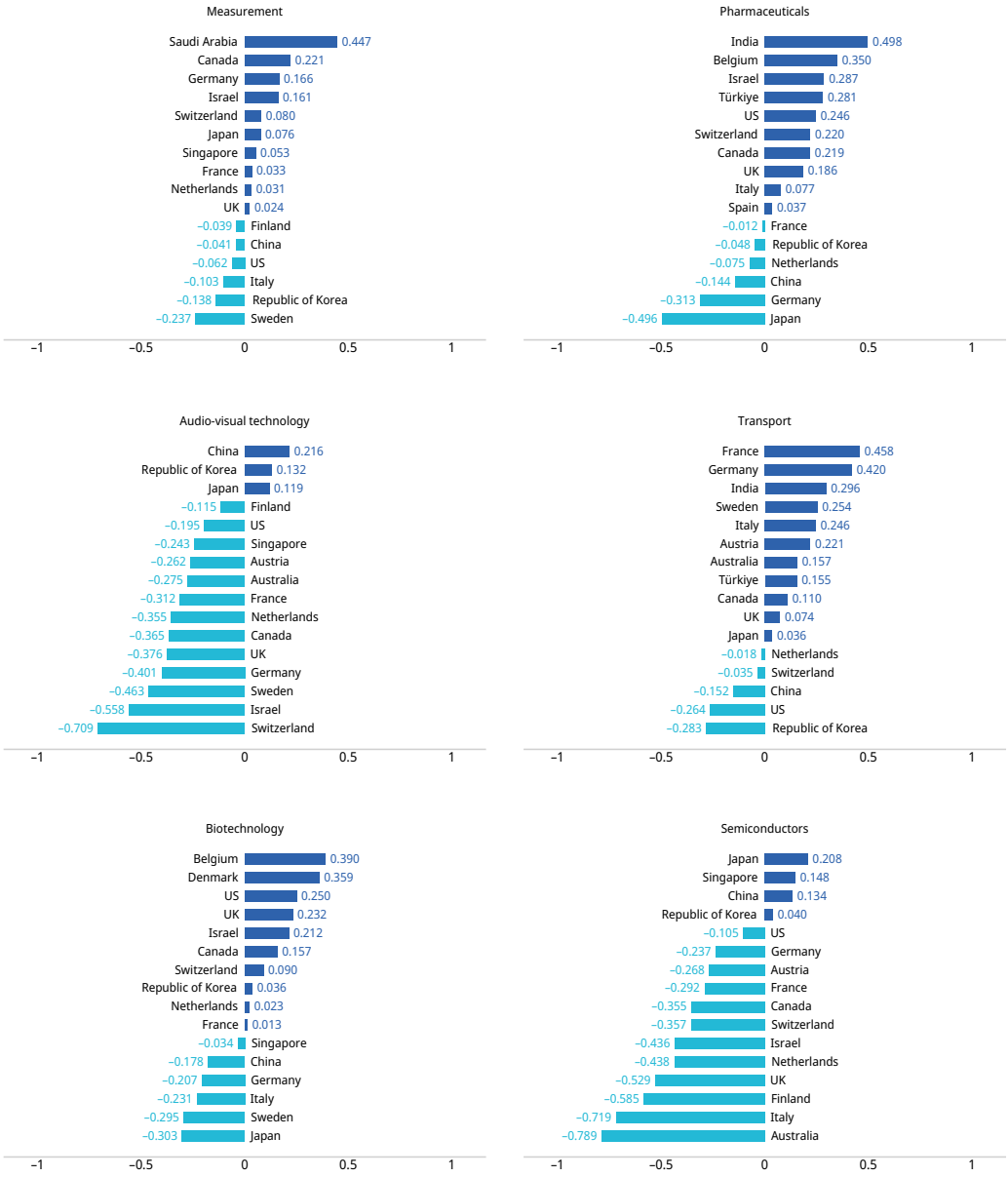
Note: For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

Source: WIPO Statistics Database, March 2023.

A large proportion of PCT filings from China and Singapore related to computer technology.

A21. Relative specialization index for the top 10 technology fields, 2022





Note: This index corrects for the effects of country size and focuses on concentration in specific technology fields; it captures whether applicants in a country tend to have a lower or a higher propensity to file in certain technology fields. It is calculated using the following formula:

$$RSI = Log\left(\frac{F_{cr}\sum F_{cr}}{\sum F_c \sum F_r}\right)$$

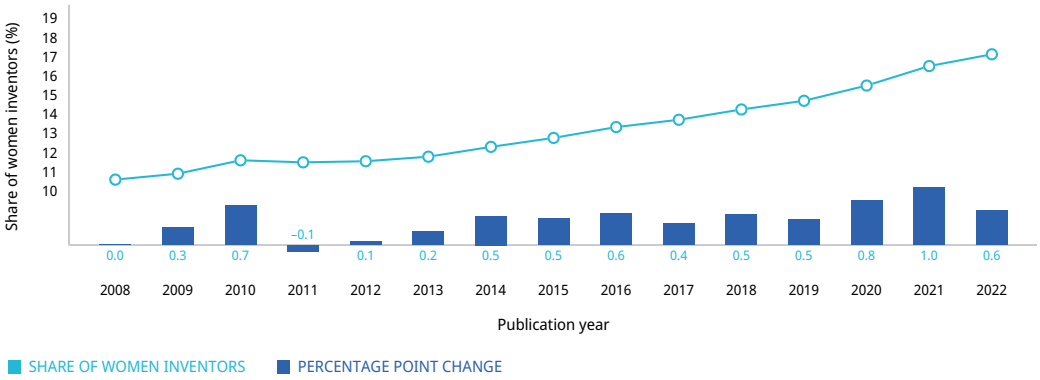
where F_c and F_r denote applications from country C and in a technology field R. A positive value for a technology indicates that a country has a relatively high share of PCT filings related to that technology field. For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

Source: WIPO Statistics Database, March 2023.

Participation of women inventors in PCT applications

In 2022, the share of women listed as inventors grew slowly to 17.1%.

A22. Share of women among listed inventors in PCT applications, 2008–2022

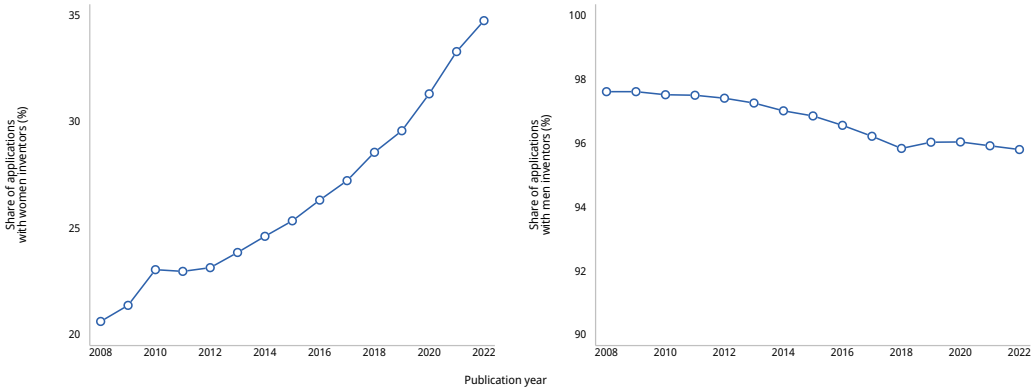


Note: Due to alterations in methodology, data may have changed compared to past reporting. For further details on methodology, refer to www.wipo.int/econ_stat/en/economics.

Source: WIPO Statistics Database, March 2023.

In 2022, about 96% of all PCT applications listed at least one man as inventor, whereas only around 35% listed at least one woman as inventor.

A23. Share of PCT applications with at least one woman as inventor and with at least one man as inventor, 2008–2022

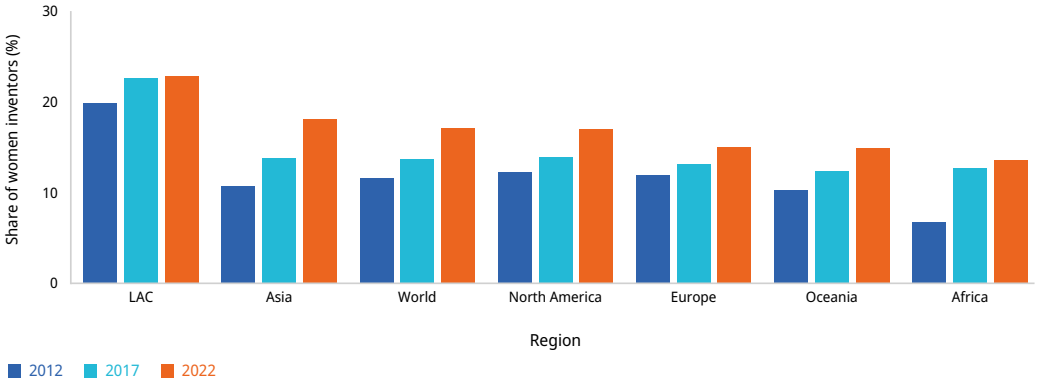


Note: Due to alterations in methodology, data may have changed compared to past reporting. For further details on methodology, refer to www.wipo.int/econ_stat /en/economics.

Source: WIPO Statistics Database, March 2023.

The share of PCT applications with women as inventors has grown in every region over the past decade.

A24. Share of women among listed inventors in PCT applications by geographical region, 2012, 2017 and 2022

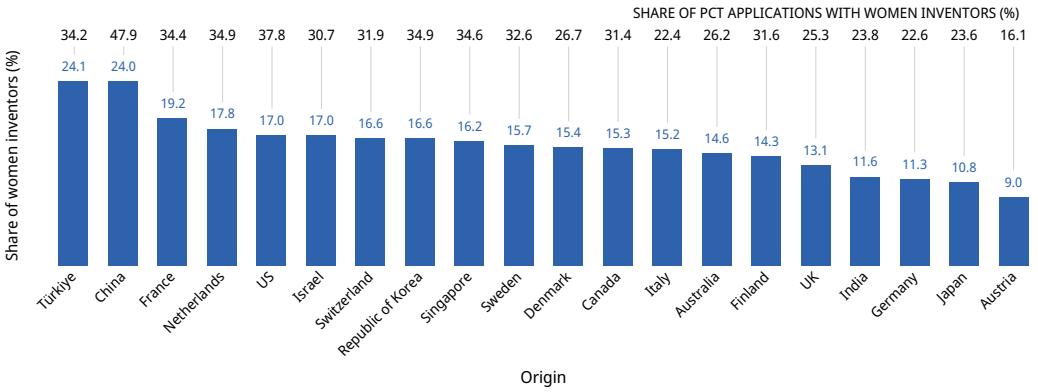


Note: LAC is Latin America and the Caribbean. Due to alterations in methodology, data may have changed compared to past reporting. For further details on methodology, refer to www.wipo.int/econ_stat/en/economics.

Source: WIPO Statistics Database, March 2023.

Almost one-quarter of inventors listed in PCT applications from China and Türkiye were women.

A25. Share of women among listed inventors and share of PCT applications with at least one woman as inventor for the top 20 origins, 2022



Note: Data are based on published applications and on the publication date. For further details on methodology, refer to www.wipo.int/econ_stat/en/economics.

Source: WIPO Statistics Database, March 2023.

Gender parity among inventors was close to being achieved in PCT applications from the LAC region related to the analysis of biological materials during the period 2020–2022.

A26. Share of women among listed inventors in PCT applications by geographical region and technology field, 2020–2022

Technology field	Region						
	Africa	Asia	Europe	Latin America and the Caribbean	North America	Oceania	World
Electrical machinery, apparatus, energy	8.5	14.0	8.3	3.5	11.0	12.7	12.4
Audio-visual technology		15.4	8.3	13.2	12.6	9.3	14.3
Telecommunications	23.1	13.7	10.2	0.0	13.2	10.1	13.1
Digital communication	6.7	22.0	14.6	7.7	17.5	5.6	19.4
Basic communication processes		10.1	5.0		8.7	5.7	8.8
Computer technology	17.9	18.2	11.9	13.8	14.4	11.3	16.1
IT methods for management	13.5	19.0	12.0	4.1	16.2	12.3	17.2
Semiconductors	20.0	15.0	10.4	0.0	13.3	16.2	14.3
Optics		14.3	10.5	1.7	13.0	10.2	13.4
Measurement	6.9	15.8	10.1	18.0	12.6	12.4	13.7
Analysis of biological materials	35.0	28.3	27.9	47.8	25.4	30.7	27.4
Control	12.1	14.5	8.6	13.8	11.2	9.4	12.5
Medical technology	14.0	18.0	16.0	19.9	16.6	14.4	17.0
Organic fine chemistry	27.3	24.1	29.1	36.0	23.1	24.0	25.1
Biotechnology	28.9	30.7	32.7	45.8	28.1	30.6	30.2
Pharmaceuticals	29.3	29.8	32.8	43.9	26.1	25.0	29.2
Macromolecular chemistry, polymers		17.9	23.1	34.6	19.8	20.8	19.5
Food chemistry	36.4	28.5	33.6	31.1	29.6	25.0	30.1
Basic materials chemistry	24.3	18.9	24.3	29.5	21.3	16.2	21.0
Materials, metallurgy	10.8	14.7	17.0	21.5	14.9	16.4	15.3
Surface technology, coating		14.4	15.4	17.2	15.7	20.6	15.0
Micro-structural and nano-technology		20.4	15.5	30.8	15.6	16.4	17.7
Chemical engineering	10.9	16.5	15.5	17.5	14.8	16.0	15.8
Environmental technology	0.0	16.3	13.4	18.2	13.8	13.3	15.1
Handling	6.1	13.4	7.3	14.8	11.2	6.3	11.1
Machine tools		12.9	5.8	6.1	8.8	10.0	10.2
Engines, pumps, turbines	9.4	11.9	5.3	6.0	7.9	3.2	8.7
Textile and paper machines		18.3	15.6	13.2	15.3	19.2	16.9
Other special machines	1.9	16.4	13.4	17.3	13.8	13.7	14.8
Thermal processes and apparatus	0.0	14.2	7.8	4.5	8.1	7.4	11.9
Mechanical elements	0.0	11.2	4.6	7.4	6.8	5.0	8.1
Transport	10.4	12.3	6.5	8.1	7.4	5.0	9.5
Furniture, games	14.3	15.8	8.1	12.6	12.0	10.1	13.1
Other consumer goods	17.2	15.7	13.2	20.1	17.3	20.2	15.4
Civil engineering	4.3	13.6	5.7	7.1	9.0	6.6	10.1

Note: This table shows the share of women inventors for every region and each technical field in which at least 10 inventors are listed. For further details on methodology, refer to www.wipo.int/econ_stat/en/economics. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

Source: WIPO Statistics Database, March 2023.

Women accounted for 43.4% of all inventors listed in PCT applications from applicants residing in Sweden and active in food chemistry.

A27. Share of women among listed inventors in PCT applications for the top 10 origins by technology field, 2022

	Origin									
Technology field	China	US	Japan	Republic of Korea	Germany	France	UK	Switzerland	Sweden	Netherlands
Electrical machinery, apparatus, energy	21.6	11.1	8.4	13.1	6.5	11.8	8.0	10.8	9.2	8.9
Audio-visual technology	23.1	12.7	8.8	12.1	7.4	10.0	4.6	9.8	9.0	12.0
Telecommunications	20.5	13.4	7.6	10.3	5.1	10.7	6.6	9.2	12.4	9.3
Digital communication	27.1	17.6	17.7	13.9	8.8	11.6	5.9	11.7	18.2	9.1
Basic communication processes	17.2	8.8	3.6	4.5	4.6	12.1	6.2	1.2	5.0	2.9
Computer technology	22.8	14.3	11.1	13.8	10.6	13.3	10.4	12.6	11.8	18.6
IT methods for management	25.8	16.1	13.5	21.1	11.2	13.3	12.5	12.0	11.7	25.2
Semiconductors	23.9	13.4	8.8	14.2	8.3	16.3	15.5	5.6	20.8	9.4
Optics	21.4	12.9	9.6	12.1	8.4	20.3	8.9	12.8	5.0	8.7
Measurement	23.3	12.6	8.7	12.9	7.5	12.5	10.7	9.6	11.0	11.3
Analysis of biological materials	36.4	25.6	17.7	30.1	26.7	31.8	23.6	26.7	20.4	27.5
Control	21.7	11.0	9.5	13.2	8.0	10.2	7.2	10.6	11.0	16.8
Medical technology	24.4	16.7	13.3	15.0	13.4	17.8	13.4	13.1	23.9	19.3
Organic fine chemistry	27.6	23.1	17.3	26.4	26.2	40.5	20.5	25.2	25.5	29.4
Biotechnology	34.5	28.2	18.0	35.0	27.7	35.8	29.2	32.0	29.8	28.7
Pharmaceuticals	32.9	26.1	18.7	31.8	28.4	39.9	25.5	31.3	29.8	32.2
Macromolecular chemistry, polymers	25.0	19.8	14.5	18.7	22.5	24.9	19.8	20.8	34.4	21.2
Food chemistry	32.1	29.7	23.4	31.7	25.8	38.3	27.7	32.9	43.4	34.3
Basic materials chemistry	28.0	21.6	15.3	17.5	23.7	29.5	18.3	22.6	23.6	23.3
Materials, metallurgy	22.9	14.8	9.4	13.5	13.0	23.3	15.4	13.4	14.1	20.3
Surface technology, coating	23.5	16.0	12.3	11.7	13.8	19.0	8.9	16.5	14.5	19.6
Micro-structural and nano-technology	26.3	15.8	10.0	19.3	12.2	17.7	15.8	7.4	9.1	4.9
Chemical engineering	22.5	14.7	9.9	14.9	14.5	19.8	14.7	13.6	9.0	18.1
Environmental technology	23.7	13.6	9.4	11.9	9.4	22.3	12.3	5.7	11.8	10.0
Handling	19.8	11.4	8.9	11.9	6.0	8.9	5.7	9.7	7.8	10.9
Machine tools	22.0	8.7	6.4	12.8	5.1	10.1	7.3	5.2	6.7	5.3
Engines, pumps, turbines	20.1	8.0	4.6	9.7	3.8	6.9	6.5	2.8	4.6	6.4
Textile and paper machines	28.4	15.7	13.0	16.8	9.7	21.9	14.0	13.8	13.2	18.6
Other special machines	23.6	14.1	10.6	16.5	11.6	15.6	9.2	16.8	10.9	16.2
Thermal processes and apparatus	20.7	8.2	7.6	12.1	8.4	10.1	3.3	1.8	10.8	11.0
Mechanical elements	17.7	6.5	6.2	9.9	4.0	4.3	3.7	6.4	5.4	5.9
Transport	19.9	7.6	6.9	10.3	5.9	9.4	5.0	5.3	5.9	5.9
Furniture, games	18.8	12.1	10.9	13.7	7.8	11.1	5.2	9.3	8.2	13.6
Other consumer goods	19.6	17.5	10.2	14.4	11.2	20.0	12.3	11.8	11.2	27.3
Civil engineering	19.4	9.3	6.2	9.6	4.5	9.5	5.2	6.0	4.3	0.8

Note: For further details on methodology, refer to www.wipo.int/econ_stat/en/economics. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

Source: WIPO Statistics Database, March 2023.

Top geographical clusters of inventors in PCT applications

Tokyo–Yokohama accounted for about 10% of all PCT applications published during the period 2018–2022.

A28. Top 50 PCT clusters, 2018–2022

Ranking	Change in position from 2017–2021	Cluster	Origin	PCT applications	Share of total PCT applications (%)	Change from 2017–2021 (%)
1	0	Tokyo–Yokohama	Japan	127,418	10.1	2.5
2	0	Shenzhen–Hong Kong–Guangzhou	China / China, Hong Kong SAR	113,482	9.0	7.0
3	0	Seoul	Republic of Korea	63,447	5.1	9.9
4	0	San Jose–San Francisco, CA	US	47,269	3.8	5.4
5	0	Osaka–Kobe–Kyoto	Japan	38,413	3.1	5.1
6	0	Beijing	China	38,067	3.0	7.6
7	0	Shanghai–Suzhou	China	32,924	2.6	18.2
8	0	San Diego, CA	US	23,261	1.9	9.8
9	1	Boston–Cambridge, MA	US	18,184	1.4	7.2
10	–1	Nagoya	Japan	17,736	1.4	–3.7
11	0	Paris	France	15,176	1.2	3.3
12	0	New York City, NY	US	13,838	1.1	1.8
13	2	Daejeon	Republic of Korea	12,275	1.0	12.5
14	0	Los Angeles, CA	US	11,556	0.9	3.9
15	–2	Seattle, WA	US	11,472	0.9	–2.4
16	0	Hangzhou	China	10,755	0.9	8.5
17	0	Munich	Germany	10,248	0.8	5.9
18	1	Stuttgart	Germany	9,342	0.7	1.9
19	–1	Houston, TX	US	8,475	0.7	–7.7
20	0	Eindhoven	Netherlands	7,982	0.6	–0.8
21	0	Cologne	Germany	7,466	0.6	–3.6
22	4	Qingdao	China	7,286	0.6	23.0
23	–1	Tel Aviv–Jerusalem	Israel	7,268	0.6	0.0
24	4	Nanjing	China	7,143	0.6	28.1
25	–2	Minneapolis, MN	US	6,625	0.5	1.6
26	4	Wuhan	China	6,250	0.5	16.9
27	–2	Stockholm	Sweden	6,069	0.5	0.8
28	1	London	UK	5,981	0.5	11.1
29	–5	Chicago, IL	US	5,763	0.5	–6.2
30	3	Washington, DC–Baltimore, MD	US	5,525	0.4	11.5
31	0	Frankfurt am Main	Germany	5,410	0.4	3.6
32	0	Philadelphia, PA	US	5,390	0.4	3.6
33	1	Singapore	Singapore / Malaysia	4,861	0.4	7.0
34	–7	Portland, OR	US	4,769	0.4	–14.8
35	3	Bengaluru	India	4,342	0.3	11.3
36	–1	Amsterdam–Rotterdam	Netherlands	4,230	0.3	–1.8
37	–1	Heidelberg–Mannheim	Germany	3,941	0.3	–0.4
38	1	Taipei–Hsinchu	Taiwan, Province of China	3,907	0.3	4.6
39	4	Zürich	Switzerland	3,759	0.3	5.1
40	–3	Kanazawa	Japan	3,687	0.3	–6.6
41	0	Berlin	Germany	3,624	0.3	0.1
42	0	Nuremberg–Erlangen	Germany	3,619	0.3	0.4
43	–3	Cincinnati, OH	US	3,460	0.3	–6.8
44	2	Dallas, TX	US	3,458	0.3	4.9
45	3	Cambridge	UK	3,146	0.3	1.3
46	3	Copenhagen	Denmark	3,123	0.2	1.2
47	4	Denver, CO	US	3,084	0.2	11.4
48	–1	Brussels–Antwerp	Belgium	3,079	0.2	–1.6
49	1	Raleigh, NC	US	3,057	0.2	0.2
50	2	Helsinki	Finland	2,841	0.2	6.6

Note: For further details on methodology, refer to the Special theme of the 2020 edition of the *PCT Yearly Review*.
Source: WIPO Statistics Database, March 2023.

San Diego had a high concentration of applications relating to digital communication in 2018–2022.

A29. Top 15 technology fields for the top 20 PCT clusters, 2018–2022

Rank	Cluster	Technology field: Digital communication	Computer technology	Electrical machinery, apparatus, energy	Medical technology	Audio-visual technology	Measurement	Semiconductors	Optics	Pharmaceuticals	Transport	Telecommunications	Biotechnology	IT methods for management	Control	Organic fine chemistry	All other fields
1	Tokyo–Yokohama	4.9	9.0	8.3	5.6	5.4	5.4	4.7	5.4	1.3	4.7	2.2	1.6	3.1	3.2	1.8	33.5
2	Shenzhen–Hong Kong–Guangzhou	26.1	19.6	5.7	2.7	7.2	3.5	2.4	3.5	1.0	2.4	5.9	1.0	2.3	2.6	0.5	13.8
3	Seoul	13.5	10.3	6.3	6.4	7.2	2.7	4.3	3.0	3.9	2.2	5.2	3.0	3.6	1.3	2.2	24.9
4	San Jose–San Francisco, CA	11.4	22.3	4.1	7.8	4.9	4.6	5.9	4.0	5.3	1.7	2.5	5.9	3.6	1.8	1.8	12.5
5	Osaka–Kobe–Kyoto	1.8	3.5	13.1	5.3	4.3	6.8	6.0	4.3	2.5	2.3	2.6	2.3	1.1	2.6	2.1	39.0
6	Beijing	24.7	17.4	3.2	2.7	9.1	4.0	8.4	4.9	2.4	1.6	2.5	2.3	2.4	2.0	1.2	11.5
7	Shanghai–Suzhou	9.6	10.5	7.8	6.1	4.7	4.5	2.8	2.9	6.8	3.2	2.2	3.9	1.6	1.9	5.3	26.3
8	San Diego, CA	44.3	7.2	1.3	4.1	4.7	3.6	1.7	1.1	5.9	0.6	8.2	4.9	0.5	1.0	2.1	8.8
9	Boston–Cambridge, MA	1.9	6.7	3.2	11.8	2.1	4.4	1.6	2.0	20.2	1.0	1.4	16.2	1.2	1.3	5.6	19.5
10	Nagoya	1.7	2.8	20.1	3.2	6.4	6.8	3.3	2.1	0.6	12.0	0.9	0.9	0.6	3.4	0.6	34.7
11	Paris	6.7	6.1	6.3	4.5	1.7	5.2	0.8	2.6	4.0	11.9	1.8	3.4	1.1	1.8	5.1	36.7
12	New York City, NY	4.3	13.0	1.9	9.9	1.1	3.4	1.6	1.3	15.5	0.8	1.6	7.5	5.3	1.8	8.8	22.4
13	Daejeon	1.5	2.9	27.7	2.2	1.9	5.3	5.1	3.2	2.9	2.2	0.9	2.5	0.9	0.6	5.2	35.0
14	Los Angeles, CA	3.4	10.4	4.0	20.9	7.6	3.7	1.2	3.4	8.2	2.9	1.9	5.1	2.9	1.7	1.7	20.9
15	Seattle, WA	13.1	42.3	2.0	3.5	3.9	2.1	0.8	2.6	4.3	1.0	2.6	4.0	6.4	1.2	0.8	9.4
16	Hangzhou	10.2	26.7	3.5	6.3	5.0	4.7	1.5	1.2	2.6	2.4	2.3	2.1	10.8	2.4	1.7	16.6
17	Munich	13.3	9.7	8.4	3.3	2.8	6.0	1.3	1.7	1.9	13.0	3.4	1.8	1.6	3.9	0.9	26.8
18	Stuttgart	3.4	5.1	13.6	2.8	1.7	11.7	1.4	2.0	0.8	13.2	1.1	1.0	0.6	3.4	0.2	38.1
19	Houston, TX	1.1	7.1	1.8	3.3	1.1	8.7	0.3	0.7	4.1	1.1	0.6	2.9	0.9	1.1	3.3	61.8
20	Eindhoven	3.2	9.6	13.9	28.7	1.9	7.7	2.1	10.1	0.3	1.2	1.9	0.5	0.8	1.4	0.1	16.2

Note: For further details on methodology, refer to the Special theme of the 2020 edition of the *PCT Yearly Review*. WIPO's IPC technology concordance table (available at: www.wipo.int/ipstats) was used to convert IPC symbols into 35 corresponding technology fields.

Source: WIPO Statistics Database, March 2023.

Statistical table

A30. PCT applications by office and origin, 2021–2022

Name	PCT applications filed in 2022 (international phase)		PCT applications filed in 2021 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
African Intellectual Property Organization	3	n.a.	3	n.a.
African Regional Intellectual Property Organization	0	n.a.	2	n.a.
Albania	2	4	0	0
Algeria	17	18	4	7
Andorra	n.a.	4	n.a.	7
Angola (c)	0	0	0	1
Antigua and Barbuda	0	25	0	3
Argentina	n.a.	31	n.a.	30
Armenia	0	7	1	4
Australia	1,604	1,735	1,612	1,763
Austria	459	1,427	516	1,579
Azerbaijan	4	4	5	5
Bahamas	n.a.	4	n.a.	4
Bahrain	0	7	0	4
Bangladesh	n.a.	0	n.a.	2
Barbados (c)	0	50	0	29
Belarus	10	14	20	20
Belgium	0	1,305	0	1,389
Belize	0	1	0	3
Benin (d)	0	1	0	0
Bermuda	n.a.	14	n.a.	10
Bhutan	n.a.	1	n.a.	0
Bolivia (Plurinational State of)	n.a.	1	n.a.	0
Bosnia and Herzegovina	4	4	10	12
Botswana	0	0	0	3
Brazil	541	548	587	616
Brunei Darussalam	0	0	0	0
Bulgaria	21	37	34	47
Burkina Faso (d)	0	0	0	0
Cabo Verde	0	0	0	0
Cambodia	0	0	0	2
Cameroon (d)	0	4	0	4
Canada	1,960	2,594	1,995	2,596
Central African Republic (d)	0	0	0	0
Chad (d)	0	0	0	0
Chile	151	194	136	166
China	74,420	70,015	73,452	69,604
Colombia	15	121	12	98
Comoros (d)	0	1	0	1
Congo (d)	0	0	0	0
Costa Rica	0	3	2	5
Côte d'Ivoire (d)	0	1	0	0
Croatia	10	19	14	38
Cuba	12	12	15	15
Curaçao	n.a.	2	n.a.	1
Cyprus	2	52	2	58
Czech Republic	187	258	220	281
Democratic People's Republic of Korea	3	4	1	1
Democratic Republic of the Congo	n.a.	1	n.a.	0
Denmark	316	1,497	390	1,553
Djibouti	0	0	0	0
Dominica	0	1	0	0
Dominican Republic	3	6	0	1
Ecuador	1	6	4	15
Egypt	47	63	48	54
El Salvador	0	0	0	0
Equatorial Guinea (d)	0	0	0	0
Estonia	1	34	2	50
Eswatini (a)	0	0	0	0
Eurasian Patent Organization	12	n.a.	12	n.a.

Name	PCT applications filed in 2022 (international phase)		PCT applications filed in 2021 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
European Patent Office	38,854	n.a.	38,322	n.a.
Finland	893	1,768	933	1,893
France	2,422	7,764	2,362	7,334
Gabon (d)	0	4	0	1
Gambia (a)	0	0	0	0
Georgia	7	8	13	18
Germany	1,416	17,530	1,467	17,266
Ghana	0	0	0	1
Greece	75	140	79	91
Grenada	0	0	0	0
Guatemala	0	1	0	2
Guinea (d)	0	1	0	0
Guinea-Bissau (d)	0	0	0	0
Holy See	n.a.	1	n.a.	2
Honduras	0	1	0	1
Hungary	109	145	90	114
Iceland	9	41	12	30
India	1,136	2,618	1,199	2,087
Indonesia	4	9	6	9
International Bureau	13,713	n.a.	13,506	n.a.
Iran (Islamic Republic of)	38	373	32	363
Iraq	3	3	0	0
Ireland	9	806	12	908
Israel	1,419	1,971	1,560	2,121
Italy	403	3,333	496	3,568
Jamaica	1	2	0	5
Japan	48,826	50,345	49,040	50,275
Jordan	18	26	17	24
Kazakhstan	19	25	29	31
Kenya	4	5	6	9
Kuwait	0	4	0	7
Kyrgyzstan	0	0	0	0
Lao People's Democratic Republic (c)	0	1	0	0
Latvia	15	45	13	39
Lebanon	n.a.	7	n.a.	3
Lesotho	0	0	0	0
Liberia	0	0	0	0
Libya	0	3	0	1
Liechtenstein (b)	0	202	0	269
Lithuania	0	39	0	47
Luxembourg	0	308	0	345
Madagascar (c)	0	1	0	1
Malawi	0	0	0	0
Malaysia	145	159	133	135
Mali (d)	0	0	0	1
Malta	0	48	0	47
Marshall Islands	n.a.	1	n.a.	0
Mauritania (d)	0	0	0	0
Mauritius	0	21	0	32
Mexico	138	199	113	166
Micronesia (Federated States of)	n.a.	1	n.a.	0
Monaco	0	15	0	20
Mongolia	0	3	0	1
Montenegro (c)	0	4	2	2
Morocco	35	41	54	63
Mozambique (a)	0	0	0	0
Namibia (a)	0	4	0	10
Netherlands	779	4,092	804	4,119
New Zealand	181	338	236	371
Nicaragua	0	0	0	0
Niger (d)	0	0	0	0
Nigeria (c)	0	4	0	5
North Macedonia	1	4	5	7
Norway	320	801	288	721
Oman	7	8	10	12
Pakistan	n.a.	2	n.a.	1

Name	PCT applications filed in 2022 (international phase)		PCT applications filed in 2021 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
Panama	1	8	0	12
Papua New Guinea	0	0	0	0
Paraguay	n.a.	0	n.a.	1
Peru	31	33	37	38
Philippines	27	31	44	50
Poland	170	382	192	381
Portugal	34	226	45	252
Qatar	25	29	23	27
Republic of Korea	21,964	22,012	20,525	20,723
Republic of Moldova	5	4	3	3
Romania	30	41	17	25
Russian Federation	782	839	1,089	981
Rwanda	0	0	0	0
Saint Kitts and Nevis	0	0	0	3
Saint Lucia (c)	0	1	0	0
Saint Vincent and the Grenadines (c)	0	0	0	0
Samoa	0	3	0	2
San Marino	0	8	0	6
Sao Tome and Principe (c)	0	0	0	0
Saudi Arabia	23	470	32	822
Senegal (d)	0	0	0	2
Serbia	21	29	17	23
Seychelles	0	2	0	2
Sierra Leone (a)	0	0	0	1
Singapore	1,005	1,740	830	1,653
Slovakia	22	44	24	39
Slovenia	41	121	31	96
South Africa	72	222	71	226
Spain	878	1,460	987	1,561
Sri Lanka (c)	0	20	0	39
Sudan	2	3	3	3
Sweden	1,270	4,471	1,331	4,441
Switzerland	45	5,367	32	5,461
Syrian Arab Republic	2	2	5	6
Tajikistan	0	0	0	0
Thailand	58	175	75	147
Togo (d)	0	0	0	0
Trinidad and Tobago	2	4	0	2
Tunisia	3	7	8	14
Türkiye	2,010	1,790	1,710	1,739
Turkmenistan	0	1	0	0
Uganda	0	2	0	4
Ukraine	59	78	103	132
United Arab Emirates (c)	0	109	0	125
United Kingdom	3,372	5,739	3,530	5,841
United Republic of Tanzania (a)	0	0	0	1
United States of America	55,330	59,056	56,454	59,403
Uruguay	n.a.	6	n.a.	5
Uzbekistan	1	1	1	3
Viet Nam	11	27	25	34
Zambia	0	0	0	0
Zimbabwe	0	2	0	1
Others	0	130	0	193
Total	**278,100**	**278,100**	**277,182**	**277,182**

Note: Data for 2022 are WIPO estimates.

(a) The African Regional Intellectual Property Organization (ARIPO) is the competent receiving office.

(b) The Office of Switzerland is the competent receiving office.

(c) The International Bureau is the competent receiving office.

(d) The African Intellectual Property Organization (OAPI) is the competent receiving office.

n.a. indicates not applicable, as it is not an office of a PCT member state, or else the office does not act as a PCT receiving office.

Source: WIPO Statistics Database, March 2023.

B. Statistics on PCT national phase entries

Highlights

PCT national phase entries increased sharply by 7.6% in 2021

The number of PCT national phase entries (NPEs) initiated worldwide reached 715,200 applications in 2021 – the latest year for which data are available. This figure represents a 7.6% increase on the previous year (figure B1) and marks the biggest surge in NPEs since 2010, mainly driven by an increase in filings from China and the US. Conversely, NPEs had declined by 1.6% in 2020, due largely to a drop in NPEs from Germany, Japan and the US.

In 2021, non-resident applications accounted for 83.5% of all NPEs, a share that has remained quite stable since 2013. Most resident NPEs originated from the Japan Patent Office (JPO) and the United States Patent and Trademark Office (USPTO), which accounted for 32% and 23.8% of global resident NPEs, respectively (figure B11).

Asian applicants initiated the most PCT NPEs worldwide

In 2021, Asia remained the top region for PCT NPEs, initiating 36% of all NPEs worldwide. This figure marks a sharp increase of nearly 10 percentage points over 2011, when Asia accounted for 26.5% of global NPEs (figure B2). In 2021, Europe and North America were the next largest regions, each accounting for around 30% of all NPEs. Africa, Latin America and the Caribbean (LAC) and Oceania, combined, accounted for nearly 2% of global NPEs.

All top 20 NPE origins experienced growth in 2021. Among top 10 origins, China saw the biggest increase in NPEs, with a growth rate of 20.1%, followed by Switzerland at 15.4% and the US at 10.1% (figure B5). Meanwhile, the Netherlands, Germany and Japan recorded more modest growth rates of 1.1%, 1.4% and 1.7%, respectively.

Of the 169,483 NPEs received at the USPTO, applicants from the US (22.1% of the total), Japan (19.3%) and China (10.3%) initiated the largest shares (figure B11). Combined, these same three economies also accounted for the majority of NPEs initiated at 17 of the top 20 offices, among which were the JPO, the EPO and the office of India.

Applicants from the US accounted for the highest shares of NPEs at 14 of the top 20 offices, while applicants residing in Japan accounted for the highest shares at the other six offices.

More specifically, US-based applicants were responsible for between 43% and 49% of all NPEs initiated at the offices of Australia, Canada, Israel, Mexico and New Zealand, while Japan-based applicants initiated a large proportion of NPEs at the offices of Germany (51.9%), Japan (38.2%) and Thailand (36.6%).

PCT System share in total non-resident patent applications globally grew to almost 59% in 2021

In 2021, the PCT route was used for 58.9% of non-resident patent applications worldwide, resulting in a total of 598,600 non-resident NPEs initiated. This marks a 2 percentage points increase on the previous year (56.9%), representing the highest concentration of non-resident filings in NPEs to date (figure B12). Compared to the Paris route, where applicants filed 417,300 non-resident patent applications directly at offices, the PCT route has grown the fastest, with an average annual growth rate of 2.9% between 2012 and 2021, as compared to 1.2% for the Paris route.

Out of the top 20 offices for non-resident patent applications, 16 received more than two-thirds of non-resident filings through the PCT route. Notably, the offices of Brazil and Israel had PCT route shares above 93%. Conversely, the offices of Germany and the UK had shares of under one-third (figure B14).

Among the top 20 origins for filing applications abroad, applicants from Australia (72.7%), Sweden (72.6%), and the US (69.6%) used the PCT route for the majority of filings. Conversely, applicants from Canada, India, Israel, the Republic of Korea and Singapore primarily filed their patent applications directly with foreign offices through the Paris route (figure B13).

Applicants residing in Australia, Denmark and Switzerland initiated a high number of NPEs for every PCT application filed, averaging between 4.5 and 4.8 NPEs per PCT application. In contrast, applicants from China and Türkiye averaged 1 and 0.9 NPE per PCT application, respectively (figure B7).

Huawei created by far the most foreign-oriented patent families using the PCT between 2017 and 2019

For a second consecutive year, Huawei of China was the company that created the highest number of foreign-oriented patent families using the PCT route, with 9,092 such families created between 2017 and 2019 (figure B16). It was followed by Samsung Electronics, Mitsubishi and BOE Technology Group, each having between 5,000 and 7,000 families. Within the top 10 companies, LG Electronics (+75.1%), Samsung Electronics (+16.5%) and Huawei (+11.3%) saw the sharpest increases in foreign-oriented patent families created using the PCT as compared to 2016–2018.

Half of the top 50 applicants in terms of foreign-oriented patent families between 2017 and 2019 relied primarily on the PCT System to protect their innovations abroad (table B17). Nippon Telegraph & Telephone and ZTE used the PCT route for over 99% of foreign-oriented patent families. Altogether, 11 of the top 50 applicants used the PCT route for over 90% of total foreign-oriented patent families. In contrast, several other applicants with a high number of foreign-oriented patent families relied for very few on the PCT System, for instance, Ford Global Technologies, Northeastern University and Toyota Motor.

Global trends in PCT national phase entries

National phase entries by origin

National phase entries by office

Patent applications by filing route

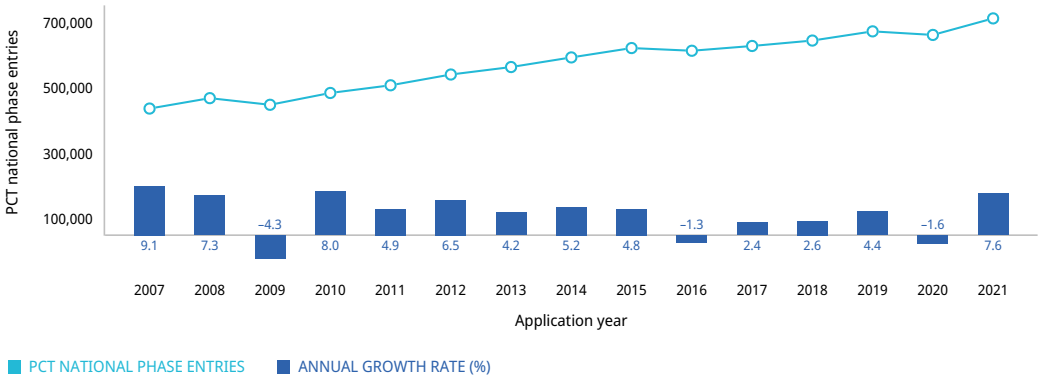
Top applicants in foreign-oriented patent families

Statistical table

Global trends in PCT national phase entries

In 2021, PCT national phase entries grew by 7.6%, the most since 2010.

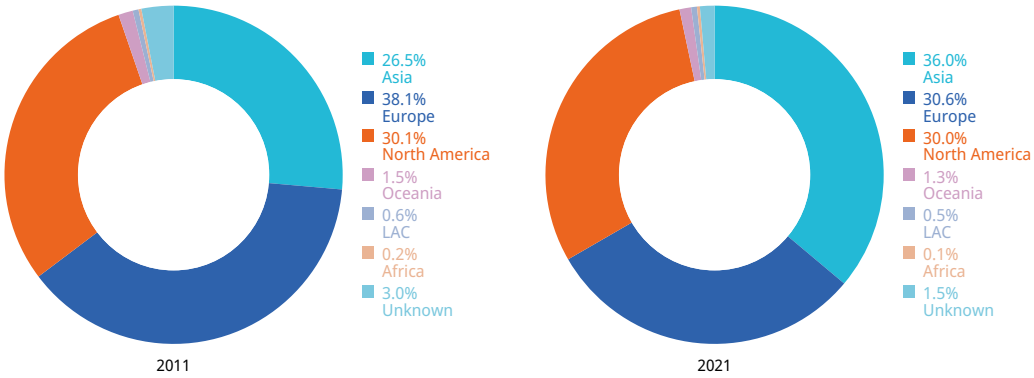
B1. Trend in PCT national phase entries, 2007–2021



Note: WIPO estimates. National phase data from patent offices are available up to 2021.
Source: WIPO Statistics Database, March 2023.

Asia accounted for the biggest proportion of PCT national phase entries in 2021.

B2. PCT national phase entries by region, 2011 and 2021

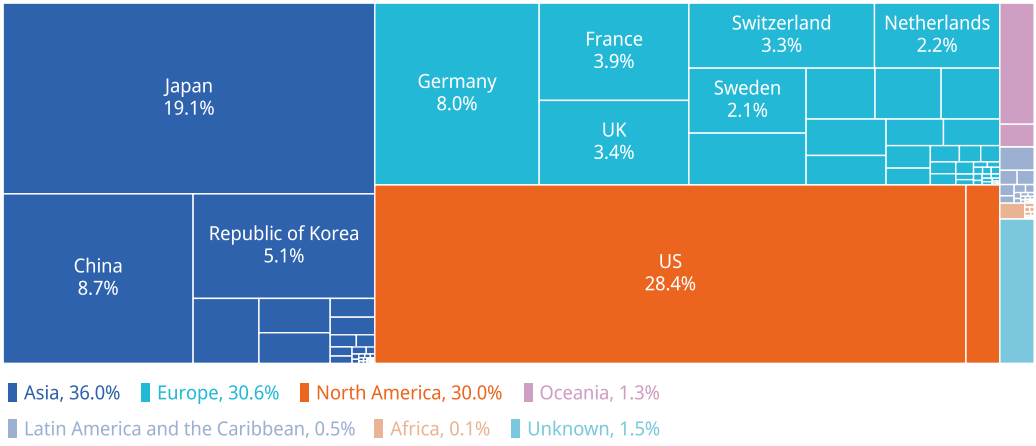


Note: Each region includes the following number of origins: Africa (31), Asia (45), Europe (45), Latin America and the Caribbean (LAC) (32), North America (2) and Oceania (5).
Source: WIPO Statistics Database, March 2023.

National phase entries by origin

Applicants from Japan and the US combined initiated 47.5% of all PCT national phase entries in 2021.

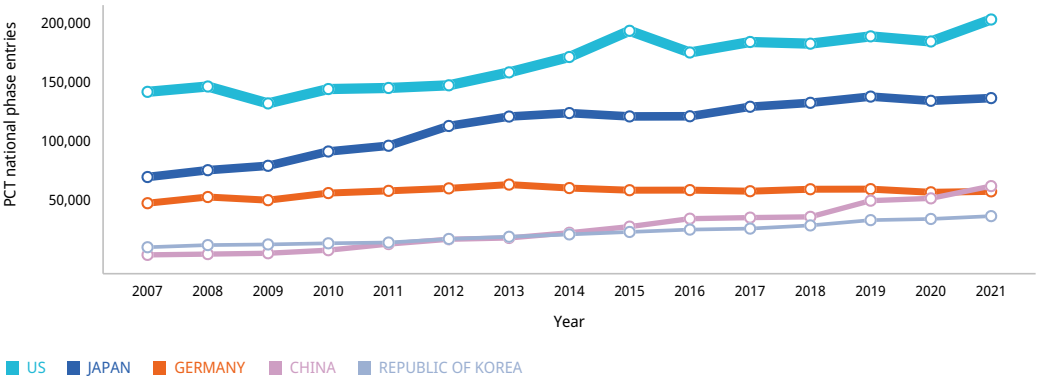
B3. Distribution of PCT national phase entries by region and origin, 2021



Source: WIPO Statistics Database, March 2023.

Ever since the PCT System began, applicants from the US have initiated year-on-year the highest number of PCT national phase entries worldwide.

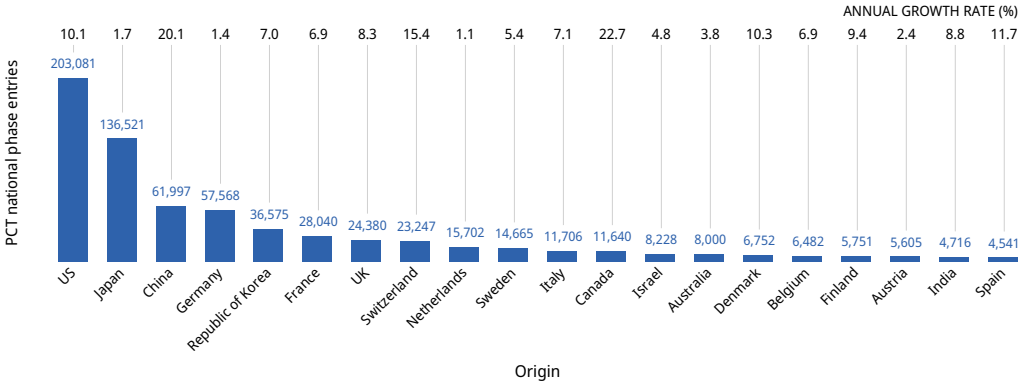
B4. Trends in PCT national phase entries for the top five origins, 2007–2021



Source: WIPO Statistics Database, March 2023.

Several origins, such as China and the US, saw double-digit growth.

B5. PCT national phase entries for the top 20 origins, 2021



Source: WIPO Statistics Database, March 2023.

Africa was the region where PCT national phase entries grew the most in 2021.

B6. PCT national phase entries for the top origins by region, 2019–2021

Region	Origin	Year			Regional share 2021 (%)	Change from 2020 (%)
		2019	2020	2021		
Africa	South Africa	743	730	761	72.6	4.2
	Morocco	48	40	70	6.7	75.0
	Togo	0	0	47	4.5	n.a.
	Egypt	53	48	42	4.0	–12.5
	Mauritius	14	39	42	4.0	7.7
	Seychelles	9	8	23	2.2	187.5
	United Republic of Tanzania	1	5	12	1.1	140.0
	Tunisia	6	11	11	1.0	0.0
	Others	80	43	40	3.8	–7.0
	Total*	**954**	**924**	**1,048**	**0.1**	**13.4**
Asia	Japan	137,808	134,237	136,521	53.0	1.7
	China	49,664	51,638	61,997	24.0	20.1
	Republic of Korea	33,185	34,192	36,575	14.2	7.0
	Israel	7,407	7,850	8,228	3.2	4.8
	India	4,113	4,333	4,716	1.8	8.8
	Singapore	2,916	3,177	4,197	1.6	32.1
	Saudi Arabia	1,641	2,132	1,612	0.6	–24.4
	Türkiye	1,168	1,146	1,510	0.6	31.8
	China, Hong Kong SAR	500	470	612	0.2	30.2
	Thailand	622	390	432	0.2	10.8
	Others	1,371	1,306	1,406	0.5	7.7
	Total*	**240,395**	**240,871**	**257,806**	**36.0**	**7.0**
Europe	Germany	59,457	56,780	57,568	26.3	1.4
	France	26,979	26,226	28,040	12.8	6.9
	UK	22,078	22,513	24,380	11.1	8.3
	Switzerland	21,020	20,138	23,247	10.6	15.4
	Netherlands	17,069	15,530	15,702	7.2	1.1
	Sweden	15,080	13,915	14,665	6.7	5.4
	Italy	11,179	10,928	11,706	5.3	7.1
	Denmark	6,054	6,119	6,752	3.1	10.3
	Belgium	6,418	6,063	6,482	3.0	6.9
	Finland	5,237	5,257	5,751	2.6	9.4
	Others	23,413	23,052	24,586	11.2	6.7
	Total*	**213,984**	**206,521**	**218,879**	**30.6**	**6.0**
Latin America and the Caribbean	Brazil	1,224	1,297	1,538	41.5	18.6
	Chile	407	414	475	12.8	14.7
	Mexico	749	540	466	12.6	–13.7
	Antigua and Barbuda	266	415	310	8.4	–25.3
	Colombia	119	138	203	5.5	47.1
	Barbados	182	128	176	4.7	37.5
	Argentina	126	119	133	3.6	11.8
	Cuba	61	100	75	2.0	–25.0
	Uruguay	44	46	59	1.6	28.3
	Peru	39	84	52	1.4	–38.1
	Others	158	164	222	6.0	35.4
	Total*	**3,375**	**3,445**	**3,709**	**0.5**	**7.7**
North America	US	188,809	184,452	203,081	94.5	10.1
	Canada	9,448	9,483	11,640	5.4	22.7
	Bermuda	69	34	97	0.0	185.3
	Total*	**198,326**	**193,969**	**214,818**	**30.0**	**10.7**
Oceania	Australia	8,188	7,704	8,000	84.2	3.8
	New Zealand	1,255	1,321	1,499	15.8	13.5
	Others	17	1	7	0.1	600.0
	Total*	**9,460**	**9,026**	**9,506**	**1.3**	**5.3**
Unknown*		8,906	9,644	9,434	1.3	–2.2
World		**675,400**	**664,400**	**715,200**	**n.a.**	**7.6**

Note: World totals are WIPO estimates. This table shows the top countries in each region (with a maximum of 10 countries per region) where applicants filed more than 10 PCT national phase entries in 2021. Data for all origins are reported in statistical table B18.

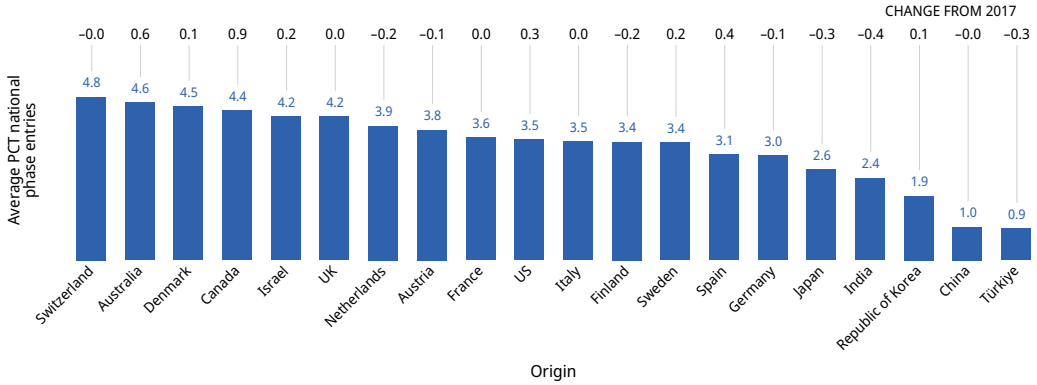
* indicates share of world total.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2023.

Applicants residing in Switzerland initiated an average of 4.8 NPEs per PCT application.

B7. Average number of national phase entries per PCT application for the top 20 origins, 2021



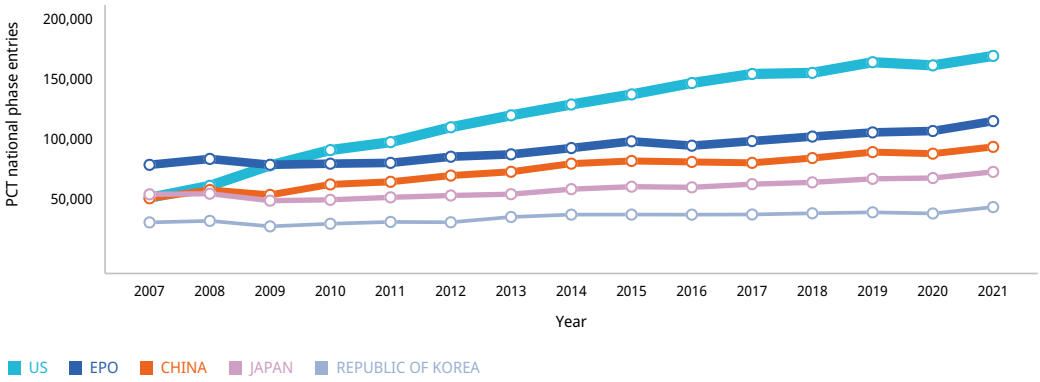
Note: The average is defined as the number of national phase entries initiated in 2021 divided by the average number of PCT applications filed in the two preceding years.

Source: WIPO Statistics Database, March 2023.

National phase entries by office

Since 2010, the US has continued to attract the most PCT national phase entries.

B8. Trends in PCT national phase entries for the top five offices, 2007–2021

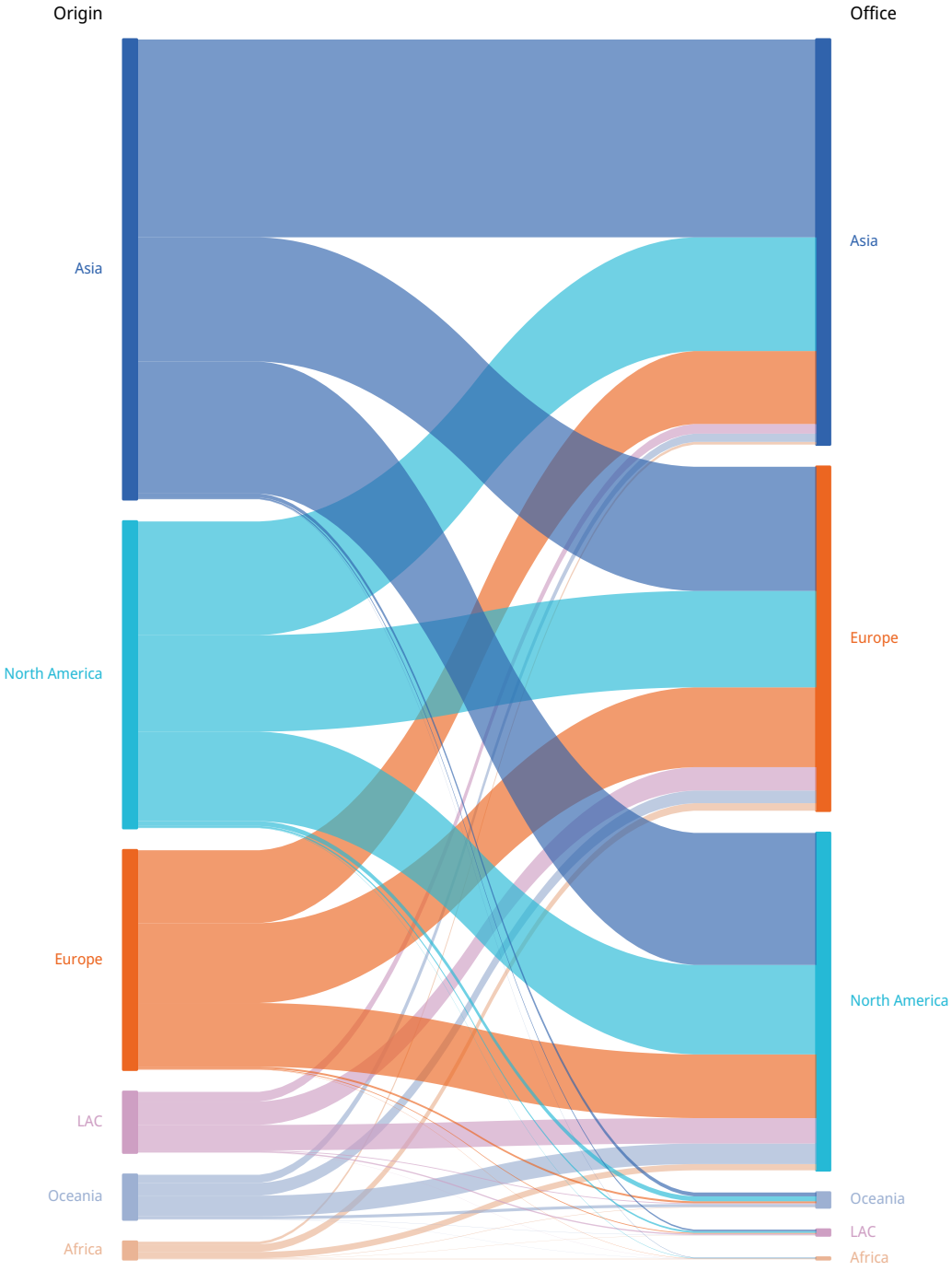


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

Applicants resident in Asia initiated a large proportion of their national phase entries in their home region.

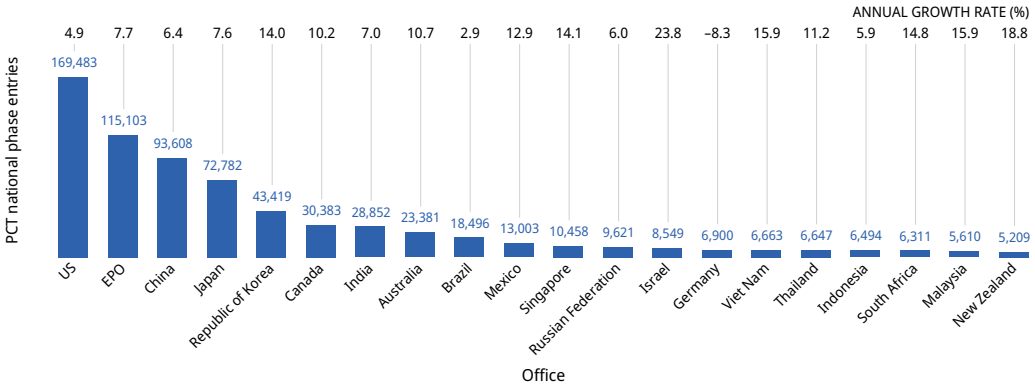
B9. Flow of national phase entries between regions of origin and regions of destination, 2021



Note: LAC is Latin America and the Caribbean.
Source: WIPO Statistics Database, March 2023.

Eleven of the top 20 offices saw double-digit growth in PCT national phase entries.

B10. PCT national phase entries for the top 20 offices, 2021



Note: This table shows data for the 20 offices to receive the most PCT national phase entries. NPE data may not be available at some offices. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

Applicants resident in Japan were responsible for a majority of PCT national phase entries initiated at the office of Germany, with almost 52% of the total.

B11. Flow of national phase entries for the top 20 offices and the top 10 origins as a percentage of total national phase entries at respective offices, 2021

	Origin										
Office	US	Japan	China	Germany	Republic of Korea	France	UK	Switzerland	Netherlands	Sweden	Other origins
US	22.1	19.3	10.3	8.7	7.0	4.3	4.1	1.9	1.8	2.3	18.2
EPO	28.2	13.8	11.4	10.1	5.1	5.0	3.3	3.0	2.4	2.7	14.9
China	27.3	28.8	1.0	10.7	7.2	3.9	2.3	3.3	2.6	2.0	10.9
Japan	22.2	38.2	9.4	5.8	4.9	2.8	2.2	3.0	2.0	1.2	8.3
Republic of Korea	31.9	23.5	11.6	7.2	3.5	3.4	2.8	3.0	2.0	1.6	9.7
Canada	47.0	4.3	5.2	5.8	1.3	4.3	4.2	3.7	1.7	1.6	20.9
India	31.3	13.0	12.7	7.0	6.1	3.2	3.3	3.6	3.2	2.6	14.1
Australia	43.3	5.4	8.5	4.7	2.4	2.7	4.6	4.2	1.7	1.8	20.6
Brazil	34.2	6.1	6.8	8.7	2.9	5.3	3.9	6.8	3.0	2.4	19.8
Mexico	47.1	5.9	5.3	6.8	2.0	3.8	2.9	5.0	2.5	2.4	16.3
Singapore	37.8	12.5	12.5	4.4	3.3	2.8	3.1	3.7	1.2	1.0	17.6
Russian Federation	22.0	8.8	11.7	10.3	3.5	6.8	4.1	7.2	4.2	2.9	18.4
Israel	48.9	3.3	2.5	4.8	0.9	3.8	5.3	5.4	2.5	1.2	21.4
Germany	18.3	51.9	4.0	12.2	3.4	0.7	0.7	1.3	0.8	0.9	5.7
Viet Nam	18.1	22.4	21.0	4.1	14.8	1.6	1.9	2.3	1.1	1.7	11.0
Thailand	15.9	36.6	12.0	4.4	3.9	2.6	1.5	3.5	1.4	1.2	17.0
Indonesia	17.4	26.6	15.5	4.9	5.0	2.6	3.1	4.4	3.9	1.2	15.4
South Africa	33.2	2.5	10.2	6.8	1.4	3.9	8.0	4.9	2.1	3.4	23.8
Malaysia	26.0	18.4	14.8	4.8	4.6	2.0	4.8	5.4	1.7	1.6	16.0
New Zealand	43.7	4.3	3.7	4.9	2.0	2.7	6.4	4.3	2.0	1.6	24.5

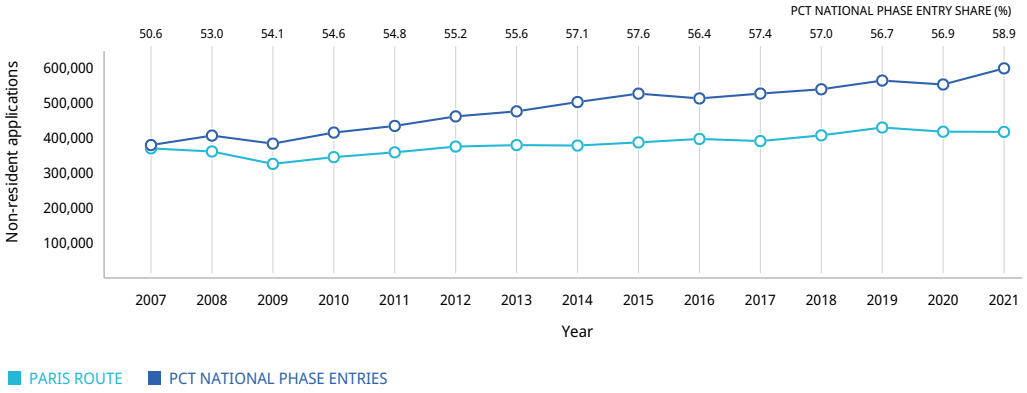
Note: This table shows data for the 20 offices to receive the most PCT national phase entries and the 10 origins to file the most applications for entry into the national phase in 2021. NPE data by origin may not be available at some offices. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

Patent applications by filing route

PCT national phase entries accounted for nearly 59% of all non-resident patent applications filed worldwide in 2021.

B12. Trend in non-resident patent applications by filing route, 2007–2021

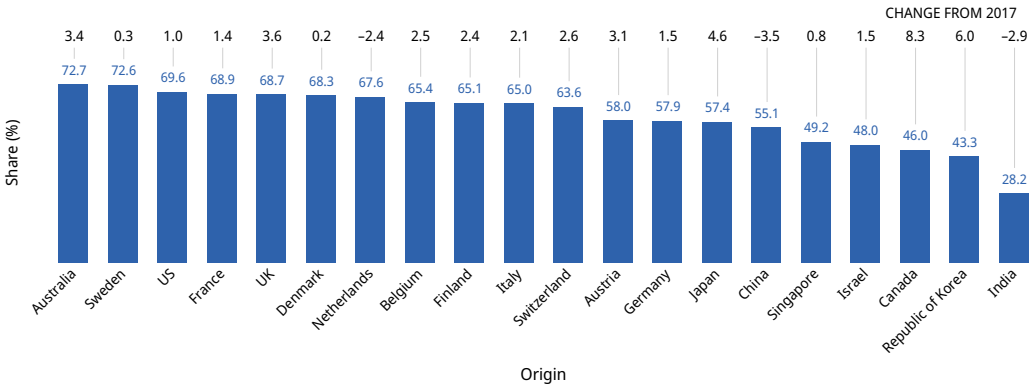


Note: These data are WIPO estimates.

Source: WIPO Statistics Database, March 2023.

Fifteen of the 20 origins that filed the most applications abroad used the PCT most in 2021.

B13. Share of PCT national phase entries in total filings abroad for the top 20 origins, 2021

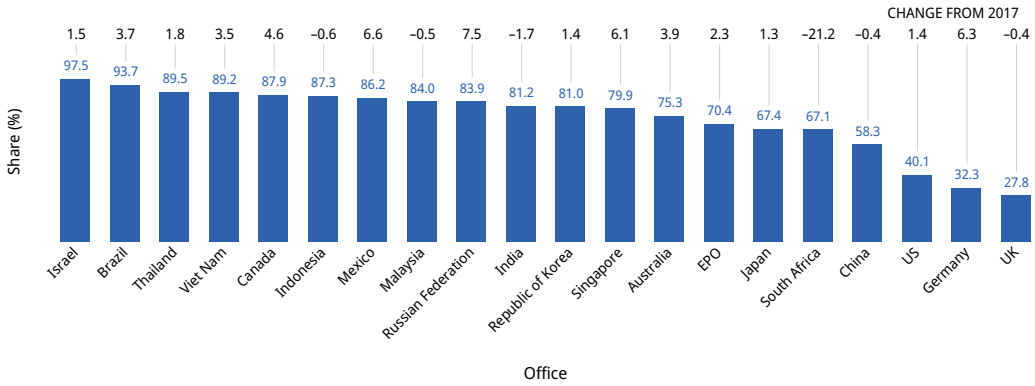


Note: Share is defined as the number of PCT national phase entries initiated abroad divided by the total number of patent applications filed abroad. It includes data from the 20 origins that filed the most applications abroad in 2021.

Source: WIPO Statistics Database, March 2023.

Israel received more than 97% of non-resident patent applications via the PCT System.

B14. Share of PCT national phase entries in total non-resident filings for the top 20 offices, 2021



Note: Share is defined as non-resident PCT national phase entries initiated divided by the total number of non-resident patent applications filed. It includes data from the 20 offices to receive the most non-resident filings in 2021; that is, data from countries that are members of the PCT System and who provided data broken down by filing route. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

Applicants from Sweden used the PCT route for all patent filings at the offices of Indonesia, Israel and Viet Nam.

B15. Share of PCT national phase entries in total non-resident filings for the top 10 origins and the top 20 offices, 2021

Office	Origin: US	Japan	China	Germany	Republic of Korea	France	UK	Switzerland	Netherlands	Sweden
US	n.a.	43.5	38.0	52.6	32.1	65.5	54.9	58.8	68.5	72.5
China	60.4	57.3	n.a.	61.0	38.3	74.3	76.1	70.1	79.0	74.5
EPO	69.5	73.6	79.0	n.a.	62.3	n.a.	n.a.	n.a.	n.a.	n.a.
Japan	64.6	n.a.	73.3	70.9	59.5	80.6	74.9	71.1	79.4	70.9
Republic of Korea	89.3	71.9	79.7	83.8	n.a.	90.1	92.5	91.4	82.7	85.6
India	79.1	81.2	91.7	75.0	66.3	85.0	91.1	81.8	90.8	92.5
Canada	84.6	93.9	87.1	90.0	92.3	87.0	94.8	93.3	93.4	96.0
Australia	70.5	82.0	85.6	81.7	72.7	83.6	81.0	83.7	77.8	87.1
China, Hong Kong SAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brazil	91.7	89.7	97.4	92.0	98.9	93.0	97.7	98.5	98.1	96.9
Germany	21.5	58.5	48.9	n.a.	15.2	11.6	27.8	10.4	37.0	18.4
Mexico	82.0	90.5	92.8	87.5	90.1	92.1	88.6	93.4	92.1	96.3
Singapore	82.8	74.9	83.0	80.0	64.3	85.8	85.9	86.6	84.4	89.1
Russian Federation	82.0	80.0	90.4	84.5	72.1	86.9	85.0	88.6	89.8	93.3
South Africa	88.4	92.9	21.5	92.1	93.6	93.5	94.5	94.2	89.3	96.8
Israel	97.9	99.3	96.9	96.7	94.9	95.3	99.6	99.4	98.2	100.0
Viet Nam	95.9	92.0	96.9	92.5	80.3	95.6	100.0	91.6	100.0	100.0
Indonesia	97.8	82.2	82.8	96.4	85.6	96.0	99.5	97.9	96.6	100.0
Thailand	96.0	83.2	91.1	96.0	87.7	97.8	99.0	97.5	98.9	96.3
UK	42.5	37.7	48.2	2.6	15.7	15.2	n.a.	1.7	24.9	4.0

Note: This figure includes data from the 20 offices to receive the most non-resident filings in 2021, regardless of whether or not they accept applications for entry into the national phase. EPO is the European Patent Office.

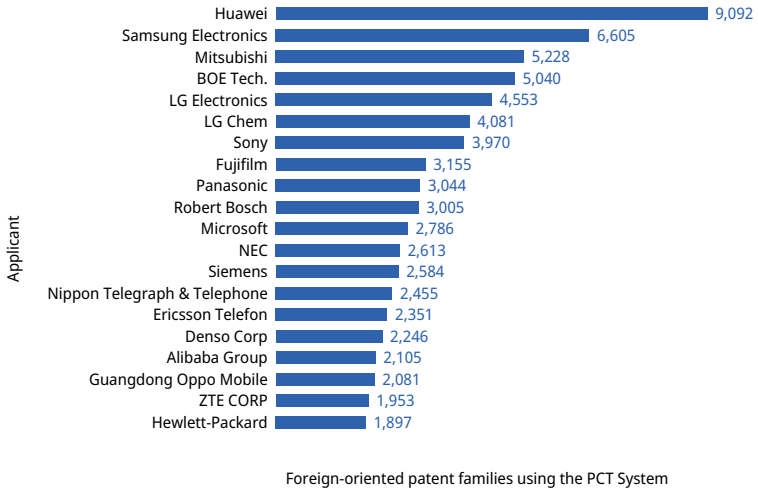
n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2023.

Top applicants in foreign-oriented patent families

Huawei had by far the highest number of foreign-oriented patent families using the PCT route in 2017–2019.

B16. Top 20 applicants in foreign-oriented patent families using the PCT System, 2017–2019



Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2022 edition of PATSTAT may be incomplete for the most recent years. A patent family is a set of interrelated patent applications filed at one or more offices to protect the same invention. Patent applications in a family are interlinked by one or more of the following: priority claim, PCT national phase entry, continuation, continuation-in-part, internal priority, and addition or division. Foreign-oriented patent families have at least one filing at an office other than the applicant's home office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2023.

Half of the top 50 applicants in foreign-oriented patent families in 2017–2019 relied primarily on the PCT System for the protection of their innovations abroad.

B17. Top 50 applicants in foreign-oriented patent families, 2014–2016 and 2017–2019

		Foreign-oriented patent families		Foreign-oriented patent families using the PCT route (%)	
Rank	Applicant	2014–2016	2017–2019	2014–2016	2017–2019
1	SAMSUNG ELECTRONICS CO LTD	15,486	13,395	29.3	49.3
2	HUAWEI TECH CO LTD	6,988	9,331	95.3	97.4
3	CANON KK	9,864	9,173	9.3	11.1
4	BOE TECHNOLOGY GROUP CO LTD	6,358	8,335	70.5	60.5
5	TOYOTA MOTOR CORP	5,353	7,496	14.7	3
6	LG ELECTRONICS INC	3,929	7,196	50.1	63.3
7	BOSCH GMBH ROBERT	6,242	6,463	44.9	46.5
8	HONDA MOTOR CO LTD	4,077	6,450	24.1	23.6
9	FORD GLOBAL TECH LLC	6,583	6,085	1.9	2
10	MITSUBISHI ELECTRIC CORP	5,896	5,967	82.4	87.6
11	UNIV NORTHEASTERN	2,305	5,045	1.7	5.6
12	SAMSUNG DISPLAY CO LTD	6,485	4,805	0.1	6.2
13	HYUNDAI MOTOR CO LTD	5,153	4,704	0.4	1.6
14	SEIKO EPSON CORP	5,020	4,340	11.7	2
15	BAYERISCHE MOTOREN WERKE AG	3,339	4,321	33	26.9
16	SONY CORP	5,075	4,287	87.6	92.6
17	LG CHEMICAL LTD	2,462	4,280	91.7	95.4
18	SIEMENS AG	4,890	4,131	53.2	62.6
19	KIA MOTORS CORP	1,179	3,855	0.6	2
20	FUJIFILM CORP	3,708	3,825	75.6	82.5
21	PANASONIC IP MAN CO LTD	3,381	3,786	65.2	80.4
22	DENSO CORP	4,142	3,715	54.2	60.5
23	FUJITSU LTD	5,003	3,091	13.8	17.2
24	INTEL CORP	3,301	2,890	84	26.5
25	SHARP KK	2,738	2,886	88.3	58.5
26	MURATA MANUFACTURING CO	2,365	2,879	71.8	65.4
27	NEC CORP	2,442	2,871	86.7	91
28	MICROSOFT TECHNOLOGY LICENSING LLC	2,246	2,856	98.6	97.5
29	RICOH CO LTD	4,010	2,650	13.3	10.6
30	IBM	1,872	2,640	25	64
31	PANASONIC IP MAN CORP	2,825	2,610	35.8	34.8
32	TOSHIBA CORP	3,816	2,533	11.1	9.5
33	GEN ELECTRIC	3,406	2,515	26.1	28.9
34	SK HYNIX INC	2,502	2,503	0.1	0.4
35	NIPPON TELEGRAPH & TELEPHONE	418	2,460	97.8	99.8
36	HKC CO LTD	108	2,419	82.4	53.7
37	ERICSSON TELEFON AB L M	2,262	2,412	94.9	97.5
38	HITACHI LTD	2,536	2,278	55.6	40.2
39	GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP LTD	370	2,273	98.6	91.6
40	ALIBABA GROUP HOLDING LTD	1,629	2,197	85.4	95.8
41	SUMITOMO ELECTRIC INDUSTRIES	1,910	2,138	77.7	77.2
42	LG DISPLAY CO LTD	2,009	2,126	2.8	2.6
43	FUJI XEROX CO LTD	2,271	2,111	2.2	2.4
44	SCHAEFFLER TECHNOLOGIES AG	1,821	2,084	54.7	47.2
45	KONINKLIJKE PHILIPS NV	2,418	2,032	97.2	87.5
46	MICRON TECHNOLOGY INC	515	1,992	45.8	55.2
47	ZTE CORP	1,687	1,968	99.8	99.2
48	HEWLETT PACKARD DEVELOPMENT CO	1,537	1,946	97.7	97.5
49	BROTHER IND LTD	1,928	1,889	8.7	12.4
50	TOKYO ELECTRON LTD	1,282	1,862	21.3	28.1

Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2022 edition of PATSTAT may be incomplete for the most recent years. A patent family is a set of interrelated patent applications filed at one or more offices to protect the same invention. Patent applications in a family are interlinked by one or more of the following: priority claim, PCT national phase entry, continuation, continuation in part, internal priority, and addition or division. Foreign-oriented patent families have at least one filing at an office other than the applicant's home office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2023.

Statistical table

B18. PCT national phase entries by office and origin, 2020–2021

Name	PCT national phase entries in 2021		PCT national phase entries in 2020	
	At designated office	By country of origin	At designated office	By country of origin
Afghanistan	n.a.	1	n.a.	0
African Intellectual Property Organization	397	n.a.	324	n.a.
African Regional Intellectual Property Organization	791	n.a.	705	n.a.
Albania	1	2	..	1
Algeria	569	8	541	1
Andorra	n.a.	16	n.a.	33
Angola	..	0	77	0
Antigua and Barbuda	..	310	..	415
Argentina	n.a.	133	n.a.	119
Armenia	1	22	5	29
Australia	23,381	8,000	21,125	7,704
Austria	458	5,605	468	5,474
Azerbaijan	15	1	16	7
Bahamas	n.a.	32	n.a.	4
Bahrain	306	2	256	3
Bangladesh	n.a.	2	n.a.	7
Barbados	73	176	29	128
Belarus	70	42	59	33
Belgium (c)	..	6,482	..	6,063
Belize	27	3	23	5
Benin (d)	..	0	..	0
Bhutan	n.a.	0	n.a.	1
Bolivia (Plurinational State of)	n.a.	1	n.a.	1
Bosnia and Herzegovina	8	2	8	7
Botswana	..	0	..	0
Brazil	18,496	1,538	17,979	1,297
Brunei Darussalam	131	2	112	1
Bulgaria	5	75	7	121
Burkina Faso (d)	..	0	..	0
Cambodia	..	1	47	1
Cameroon (d)	..	1	..	0
Canada	30,383	11,640	27,580	9,483
Central African Republic (d)	..	0	..	0
Chad (d)	..	0	..	0
Chile	2,676	475	2,402	414
China	93,608	61,997	87,954	51,638
China, Hong Kong SAR	n.a.	612	n.a.	470
China, Macao SAR	n.a.	1	n.a.	16
Colombia	1,822	203	1,706	138
Comoros (d)	..	0	..	0
Congo (d)	..	1	..	0
Costa Rica	562	46	509	16
Côte d'Ivoire (d)	..	0	..	1
Croatia	3	111	1	63
Cuba	79	75	77	100
Curaçao	n.a.	4	n.a.	1
Cyprus (c)	..	192	..	135
Czech Republic	29	550	25	417
Democratic People's Republic of Korea	..	12	6	7
Democratic Republic of the Congo	n.a.	0	n.a.	0
Denmark	58	6,752	78	6,119
Djibouti	..	0	..	1
Dominica	..	1	..	1
Dominican Republic	221	29	201	19
Ecuador	..	5	374	12
Egypt	1,313	42	1,199	48
El Salvador	130	0	123	0
Equatorial Guinea (d)	..	0	..	0
Estonia	1	116	..	79
Eswatini (a)	..	2	..	0
Ethiopia	n.a.	2	n.a.	0

Name	PCT national phase entries in 2021		PCT national phase entries in 2020	
	At designated office	By country of origin	At designated office	By country of origin
Eurasian Patent Organization	2,764	n.a.	2,486	n.a.
European Patent Office	115,103	n.a.	106,854	n.a.
Finland	37	5,751	41	5,257
France (c)	..	28,040	..	26,226
Gabon (d)	..	2	..	0
Gambia	..	0	16	0
Georgia	159	11	134	24
Germany	6,900	57,568	7,525	56,780
Ghana	..	0	8	0
Greece (c)	..	416	..	300
Grenada	..	0	2	2
Guatemala	242	1	196	3
Guinea (d)	..	1	..	0
Guinea-Bissau (d)	..	0	..	0
Guyana	n.a.	16	n.a.	0
Honduras	182	0	..	0
Hungary	6	599	5	502
Iceland	2	182	2	127
India	28,852	4,716	26,956	4,333
Indonesia	6,494	44	6,130	89
Iran (Islamic Republic of)	..	32	..	48
Iraq	n.a.	1	n.a.	0
Ireland (c)	..	2,884	..	2,546
Israel	8,549	8,228	6,908	7,850
Italy (c)	15	11,706	..	10,928
Jamaica	n.a.	1	n.a.	0
Japan	72,782	136,521	67,634	134,237
Jordan	299	10	244	19
Kazakhstan	..	19	97	10
Kenya	35	3	31	14
Kuwait	..	17	..	3
Kyrgyzstan	1	7	..	0
Lao People's Democratic Republic	..	0	..	7
Latvia (c)	..	69	..	50
Lebanon	n.a.	9	n.a.	27
Lesotho	..	1	..	0
Liberia	..	0	..	0
Libya	..	0	..	1
Liechtenstein (b)	..	581	..	611
Lithuania (c)	..	74	..	93
Luxembourg	194	1,434	105	1,394
Madagascar	22	0	18	2
Malawi	..	1	..	0
Malaysia	5,610	383	4,839	379
Mali (d)	..	1	..	2
Malta (c)	..	130	..	147
Mauritania (d)	..	1	..	0
Mauritius	n.a.	42	n.a.	39
Mexico	13,003	466	11,515	540
Monaco (c)	..	69	..	60
Mongolia	70	1	80	0
Montenegro	..	6	..	15
Morocco	2,199	70	2,029	40
Mozambique	16	0	10	0
Namibia	..	0	..	3
Nepal	n.a.	1	n.a.	1
Netherlands (c)	..	15,702	..	15,530
New Zealand	5,209	1,499	4,385	1,321
Nicaragua	..	0	..	0
Niger (d)	..	0	..	0
Nigeria	..	3	589	2
North Macedonia	1	17	3	41
Norway	559	2,937	511	2,984
Oman	96	116	..	5
Pakistan	n.a.	6	n.a.	2
Panama	310	28	290	54
Papua New Guinea	..	0	50	0

Name	PCT national phase entries in 2021		PCT national phase entries in 2020	
	At designated office	By country of origin	At designated office	By country of origin
Paraguay	n.a.	2	n.a.	0
Peru	1,101	52	1,092	84
Philippines	3,663	68	3,237	34
Poland	58	909	40	852
Portugal	16	667	15	547
Qatar	81	52	610	39
Republic of Korea	43,419	36,575	38,078	34,192
Republic of Moldova	6	1	8	2
Romania	11	107	11	60
Russian Federation	9,621	1,921	9,079	1,878
Rwanda	..	0	..	0
Saint Kitts and Nevis	..	22	..	44
Saint Lucia	..	15	..	1
Saint Vincent and the Grenadines	11	0	5	0
Samoa	..	4	..	1
San Marino	..	13	..	7
Sao Tome and Principe	..	0	..	0
Saudi Arabia	2,875	1,612	2,451	2,132
Senegal (d)	..	8	..	2
Serbia	6	62	2	40
Seychelles	16	23	..	8
Sierra Leone	..	0	..	0
Singapore	10,458	4,197	9,163	3,177
Sint Maarten (Dutch Part)	n.a.	1	n.a.	0
Slovakia	9	111	5	148
Slovenia (c)	..	192	..	224
South Africa	6,311	761	5,498	730
Spain	73	4,541	72	4,067
Sri Lanka	257	30	240	25
Sudan	..	2	3	6
Sweden	49	14,665	65	13,915
Switzerland	84	23,247	95	20,138
Syrian Arab Republic	..	3	16	6
Tajikistan	..	0	..	0
Thailand	6,647	432	5,975	390
Timor-Leste	n.a.	10	n.a.	0
Togo (d)	..	47	..	0
Trinidad and Tobago	149	10	111	1
Tunisia	..	11	..	11
Türkiye	320	1,510	265	1,146
Turkmenistan	..	3	..	0
Uganda	..	2	..	2
Ukraine	1,816	145	1,583	122
United Arab Emirates	2,240	306	1,803	345
United Kingdom	2,355	24,380	2,329	22,513
United Republic of Tanzania	..	12	..	5
United States of America	169,483	203,081	161,565	184,452
Uruguay	n.a.	59	n.a.	46
Uzbekistan	225	1	203	1
Vanuatu	n.a.	3	n.a.	0
Venezuela (Bolivarian Republic of)	n.a.	5	n.a.	0
Viet Nam	6,663	40	5,748	35
Zambia	..	0	..	5
Zimbabwe	..	1	..	1
Others	1,852	9,531	1,324	9,685
Total	**715,200**	**715,200**	**664,400**	**664,400**

Note: World totals are WIPO estimates. Offices of destination are designated and/or elected offices.

(a) The African Regional Intellectual Property Organization is the competent designated or elected office.

(b) The Office of Switzerland is the competent designated or elected office.

(c) The European Patent Office is the competent designated or elected office.

(d) The African Intellectual Property Organization is the competent designated or elected office.

.. indicates data are unknown.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2023.

C. Statistics on the performance of the PCT System

Highlights

The International Bureau

In addition to its role as a receiving office (RO), the International Bureau (IB) of WIPO is responsible for functions relating to the international phase of the PCT System, including examining formalities; translating abstracts, titles and patentability reports; and publishing PCT applications.

About 43% of PCT applications were published in English in 2022

In 2022, about 43% of all PCT applications were published in English, followed by Chinese (23.4%) and Japanese (17.7%) (figure C1). The other seven languages of publication combined accounted for 15.5% of the total. The share of applications filed in Chinese has increased sharply over the past 15 years, rising from 3.1% in 2008 to 23.4% in 2022. Conversely, the share of applications filed in English has dropped by over 20 percentage points since 2008.

PCT applications filed electronically made up over 99% of the total

Applicants filed 99.1% of PCT applications electronically and the remaining 0.9% on paper in 2022 (figure C2). Since electronic means of filing were first made available to applicants, their use has continuously increased.

ePCT-filing was the portal used to file one-third of PCT applications in 2022

In 2022, 86 ROs accepted ePCT filings and applicants filed 93,522 PCT applications using this online service. This represents an increase of 53.5% on the previous year and corresponds to one-third of all PCT applications filed in 2022 (figure C3). Applicants from the US (22,571) filed by far the most applications using ePCT, followed by those from the Republic of Korea (10,921) and Italy (2,756). Among the 10 origins filing most actively via ePCT, the US (+47.5%), Israel (+46.6%) and the Republic of Korea (+40.3%) recorded the sharpest increases compared to 2021 (figure C4).

The IB examined more than 91% of all PCT applications within two weeks of receipt

In 2022, the IB performed the PCT-required formalities examination for 78% of PCT applications within one week of receipt and 91.3% within two weeks (figure C5).

Over 77% of publications occurred during the week following the expiration of the 18-month period from the priority date, and nearly all (99.8%) publications occurred within two weeks of that period (figure C6). When an international search report (ISR) is unavailable at the time of publication, an application is republished together with its ISR, once available. Nearly every application (99.2%) was republished within three months of receipt of an ISR (figure C7).

The receiving offices

A PCT application is filed with a RO, which can be a national or regional patent office or the IB. ROs are responsible for receiving PCT applications, examining compliance with PCT formality requirements, receiving payment of fees and transmitting copies of an application for further processing to the IB and the appropriate International Searching Authority (ISA).

Eleven of the top 20 ROs received most of their applications via ePCT in 2022

Of the top 20 ROs, Australia, Singapore and Türkiye received all PCT applications electronically in 2022. The share of electronic filings exceeded 90% at every top 20 office, except for that of the Russian Federation (55.4%) (figure C12).

Sixteen of the top 20 ROs received PCT applications via ePCT in 2022, of which eleven received a majority of filings via this portal. The offices of Australia, India, Singapore and Türkiye received over 99% of PCT applications via ePCT.

ROs transmitted PCT applications to the IB within 2.9 weeks

In 2022, on average, ROs transmitted PCT applications to the IB within 2.9 weeks of the international filing date (figure C14). Finland, India and the Republic of Korea transmitted all applications to the IB within four weeks of the filing date. Among the top 20 ROs, 13 transmitted more than 95% of PCT applications within this timeframe. Conversely, the EPO, Singapore and Türkiye transmitted a majority of applications to the IB more than four weeks after the international filing date had past (figure C15).

The proportion of PCT applications transmitted by ROs to the ISAs within four weeks varied slightly from that transmitted to the IB. It was above to 99% for Japan and close to 21% for the Russian Federation (figure C16).

International Searching Authorities

Each PCT application must undergo an international search by an ISA. Once the ISA has performed a search, the applicant receives an ISR containing a list of documents relevant to assessing the invention's patentability. The ISA also establishes a written opinion, providing a detailed analysis of the potential patentability of the invention in view of the documents found in the search.

The EPO and China combined accounted for a vast majority of the ISRs issued in 2022

In 2022, 276,917 ISRs were issued by the 24 existing ISAs. The EPO issued 84,083 ISRs and the office of China 75,505. Together, these two ISAs accounted for nearly 58% of all ISRs issued (figure C17). Of the top 10 ISAs, the EPO (+6.5%) experienced the sharpest growth, whereas the Russian Federation (–48.4%) saw the steepest fall. Of the 23 ISAs functioning in 2021, nine issued more ISRs in 2022 than the year before.

Of all the ISRs requiring transmission to the IB within three months of the date of receipt of the application, 84.6% were transmitted within this timeframe in 2022 (figure C20). At 17 ISAs, more than 90% of ISRs were transmitted to the IB within the three-month deadline from the date of receipt of the search copy. As for those required to be transmitted within 9 months of the priority date, 89.6% met this deadline in 2022 (figure C21). Ten ISAs transmitted all such ISRs within the required 9 months, and 19 ISAs transmitted more than 90% within that timeframe.

PCT applications by publication language and filing medium

PCT applications filed using ePCT

Timeliness in processing PCT applications by the International Bureau

Efficiency in processing PCT applications by the International Bureau

Receiving offices

International Searching Authorities

Supplementary International Searching Authorities

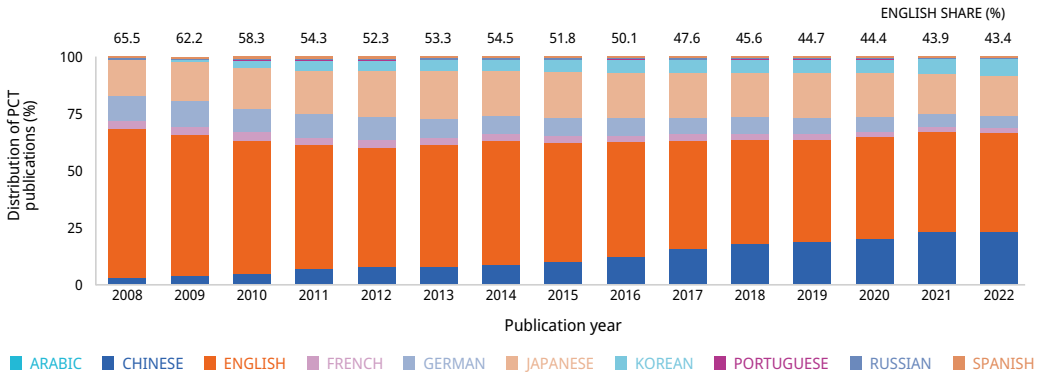
International Preliminary Examining Authorities

PCT-Patent Prosecution Highway pilots

PCT applications by publication language and filing medium

About 43% of PCT applications were published in English in 2022.

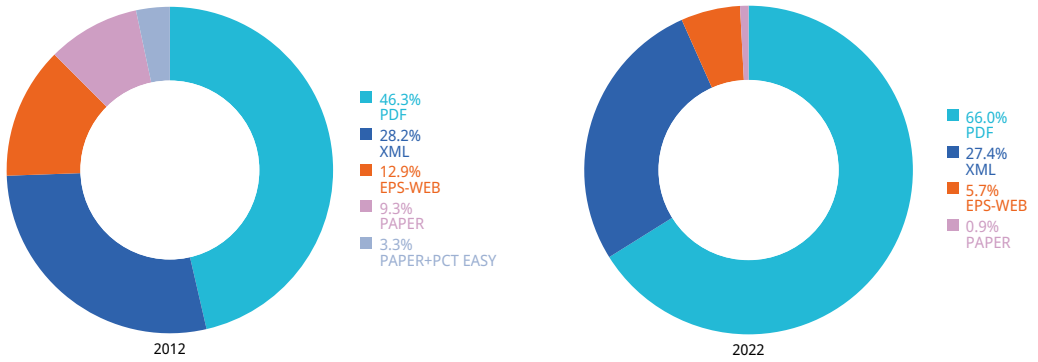
C1. Distribution of PCT applications by language of publication, 2008–2022



Source: WIPO Statistics Database, March 2023.

Nearly all PCT applications were filed electronically in 2022.

C2. Distribution of PCT applications by filing medium, 2012 and 2022



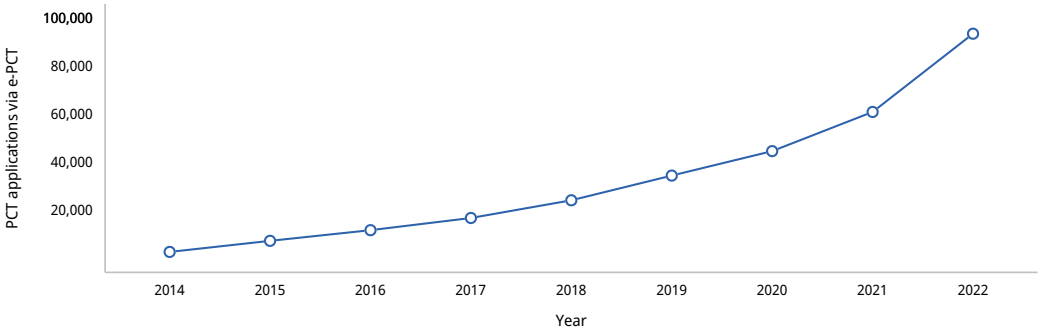
Note: PDF, EFS-WEB and XML are the three fully electronic filing mediums. Since 2015, PCT applications can no longer be filed using PCT-EASY.

Source: WIPO Statistics Database, March 2023.

PCT applications filed using ePCT

About 93,500 PCT applications were filed by applicants using ePCT in 2022, an increase of 53.5% on 2021.

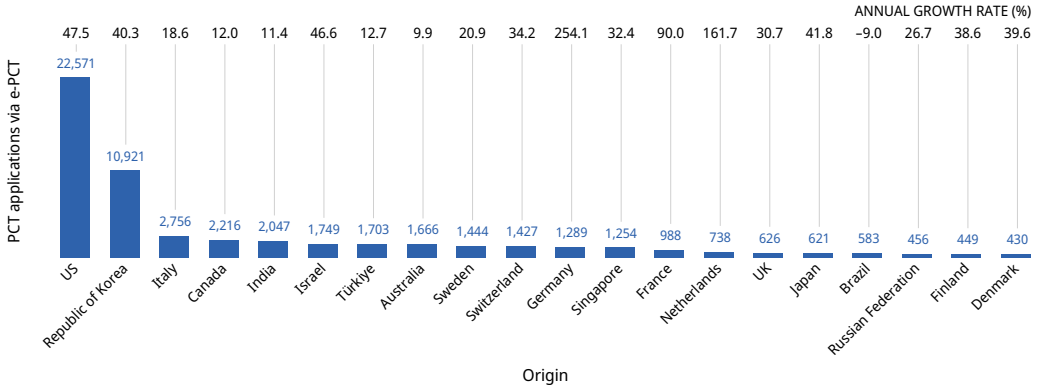
C3. Trend in PCT applications filed using ePCT, 2014–2022



Source: WIPO Statistics Database, March 2023.

Applicants resident in the US filed 22,571 applications using ePCT.

C4. PCT applications filed using ePCT for the top 20 origins, 2022

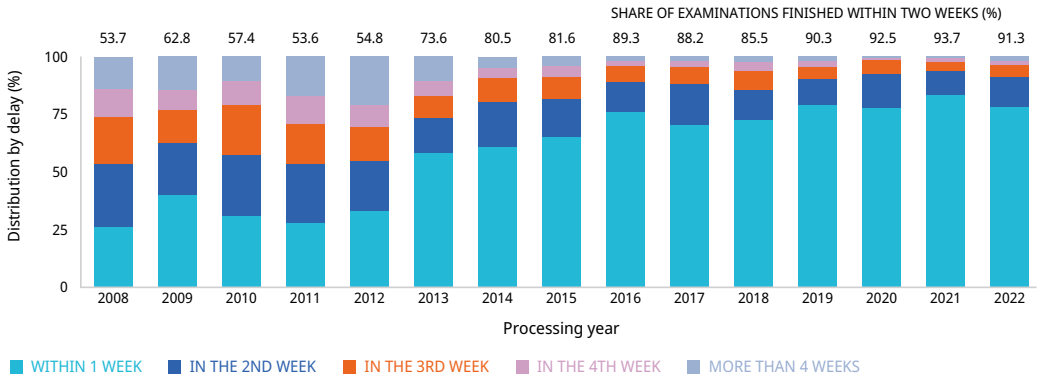


Source: WIPO Statistics Database, March 2023.

Timeliness in processing PCT applications by the International Bureau

The International Bureau formalities examination was completed within two weeks for about 91% of PCT applications processed in 2022.

C5. Timeliness of formalities examination, 2008–2022

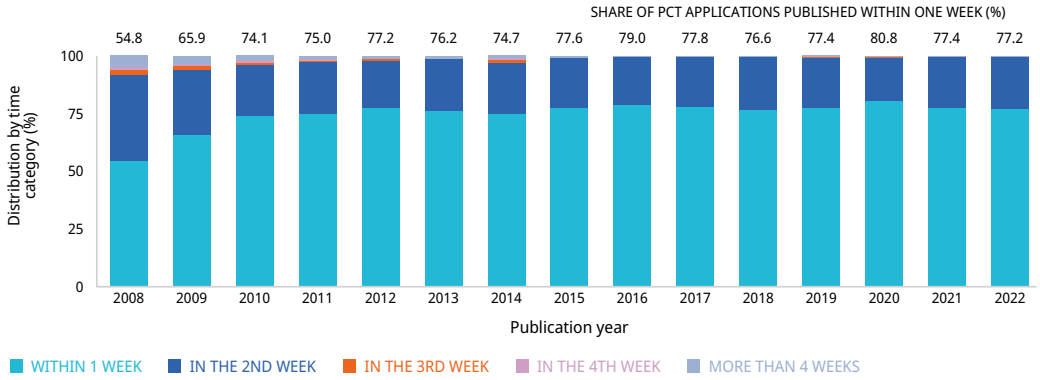


Note: The International Bureau (IB) performs a formality examination of PCT applications and related documents promptly upon receipt. Once the formality examination of a PCT application is completed, the IB sends a form to the applicant acknowledging receipt of the application. Timeliness is calculated as the time between the date of receipt of the record copy of the PCT application and the date of issuance of form PCT/IB/301.

Source: WIPO Statistics Database, March 2023.

Since 2015, over three-quarters of PCT applications have been published within one week of expiration of the 18-month limit.

C6. Timeliness in publishing PCT applications, 2008–2022

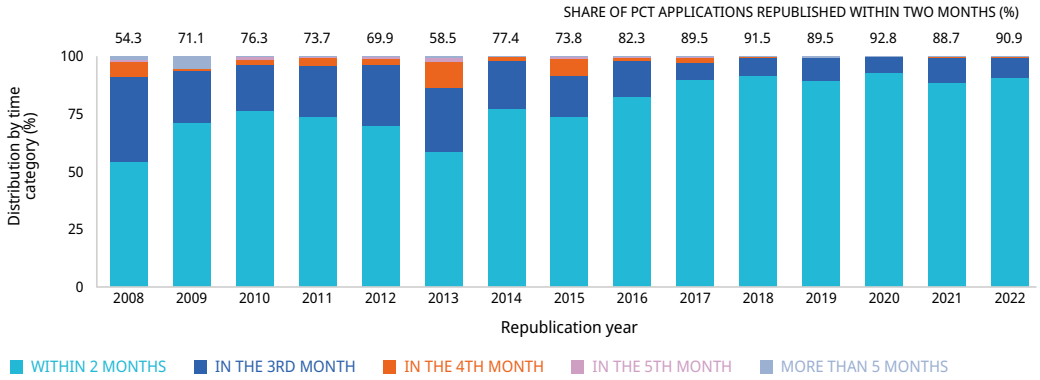


Note: PCT applications and related documents are to be published "promptly" after the expiration of 18 months from the priority date, unless the applicant requests early publication, or the application is withdrawn or considered withdrawn. Timeliness is calculated as the time between the time limit of 18 months from the priority date and the actual publication date.

Source: WIPO Statistics Database, March 2023.

In 2022, almost 91% of republications occurred within two months of receipt of an ISR.

C7. Timeliness in republishing PCT applications with international search reports, 2008–2022



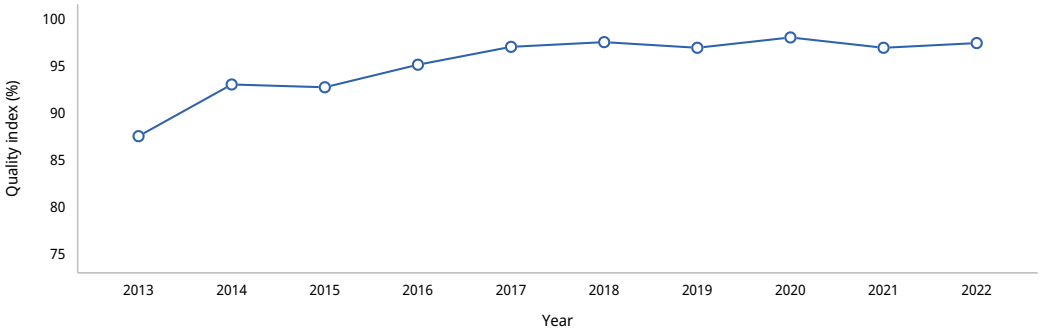
Note: The International Bureau (IB) is required to publish applications even in the absence of an international search report (ISR). In such cases, the application is republished along with an ISR after the report is received. Timeliness is calculated as the time elapsed between the date of receipt of the ISR at the IB and the date of republication by the IB.

Source: WIPO Statistics Database, March 2023.

Efficiency in processing PCT applications by the International Bureau

The overall quality of the formalities examination was scored at 97.4% in 2022.

C8. Formalities examination quality index, 2013–2022

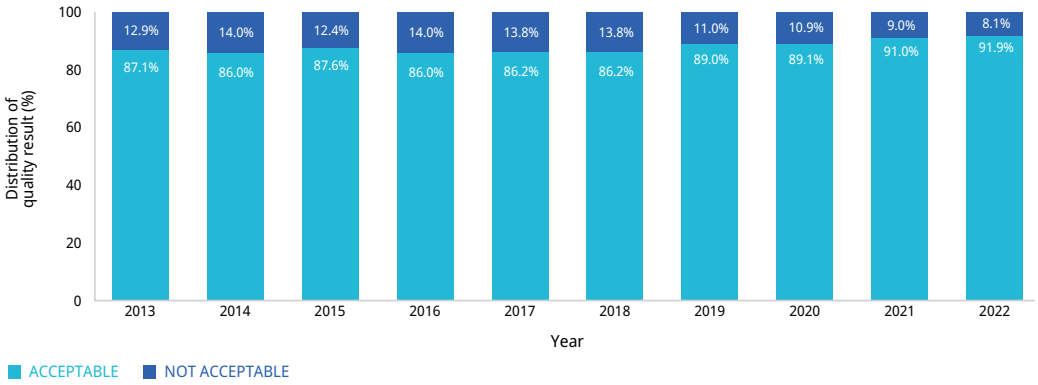


Note: In order to measure the quality of the formalities examination by the International Bureau (IB) in a simple and comprehensive manner, the IB has developed an aggregate quality index, calculated as the average of four lead quality indicators. Three of these are based on the timeliness of key transactions. The quality index is the simple average of: (i) the percentage of forms PCT/IB/301 (notification of receipt of a PCT application) sent within five weeks of the IB receiving a PCT application; (ii) the percentage of PCT applications published within six months and three weeks of the international filing date; (iii) the percentage of republications with an international search report (ISR) within two months of the IB receiving the ISR; and (iv) the PCT Operations quality control error rate.

Source: WIPO Statistics Database, March 2023.

In 2022, nearly 92% of translations were rated as being of an acceptable quality.

C9. Translation quality indicator, 2013–2022



Note: The translation quality indicator shows the average quality of abstracts and reports translated by external suppliers and in-house translators combined, based on the results of the International Bureau (IB)'s regular quality control checks. This indicator aggregates the results of quality control performed by the IB across all language combinations and document types.

Source: WIPO Statistics Database, March 2023.

Since 2019, at least 98% of report translations have been outsourced.

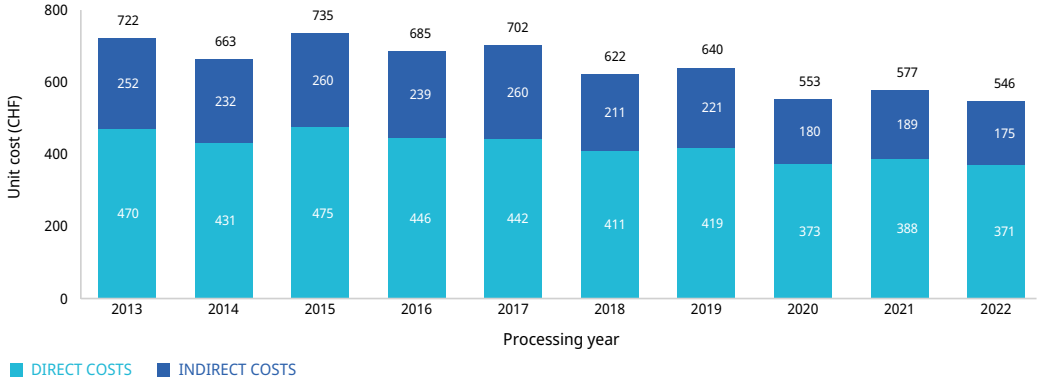
C10. Distribution of translation work, 2013–2022

Note: Translations by the International Bureau (IB) are intended to enhance the patent system's disclosure function by making the technological information in PCT applications accessible in languages other than the language in which the original documents were filed. In order to meet this objective, the IB ensures that all titles and abstracts of PCT applications are available in English and French, and that all international search and preliminary examination reports are available in English.

Source: WIPO Statistics Database, March 2023.

The average cost of processing a published PCT application was 546 Swiss francs (CHF) in 2022.

C11. Unit cost of processing a published PCT application, 2013–2022



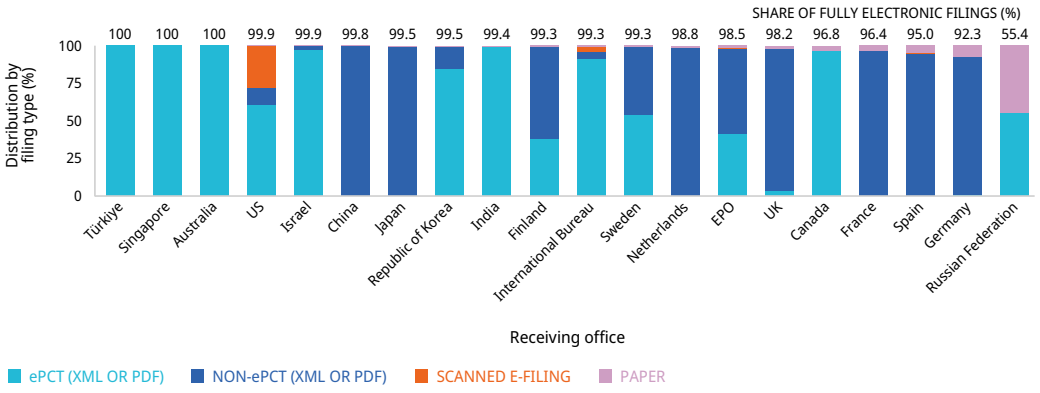
Note: The International Bureau (IB)'s efficiency in processing PCT applications can be measured by the unit cost of processing, defined as the average total cost of publishing a PCT application. Average total cost is determined by total PCT System expenditure, plus a proportion of expenditure on support and management activities. The unit cost includes the cost of all PCT activities, including translation, communication, management, and so on. Costs have direct and indirect components. Direct costs reflect expenditure incurred by the IB in administering the PCT System and related programs. Indirect costs reflect expenditure for support activities, such as buildings and information technology. Indirect costs are weighted in order to take into account only that share attributable to the PCT System. The unit cost is calculated by dividing the total cost of production by the number of PCT applications published.

Source: WIPO Statistics Database, March 2023.

Receiving offices

At eleven of the top 20 offices, a majority of PCT applications were filed via ePCT.

C12. Distribution of PCT applications by filing medium, top 20 receiving offices, 2022

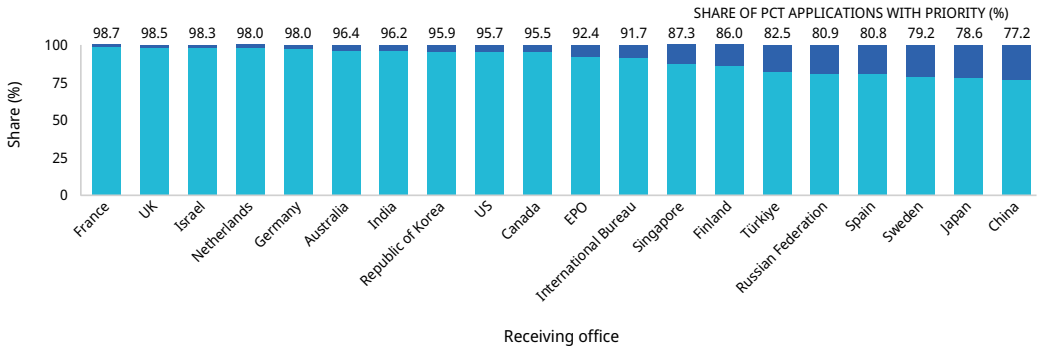


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

More than three-quarters of PCT applications filed at the top 20 offices were based on priority filings.

C13. Share of PCT applications with priority filings, top 20 receiving offices, 2022

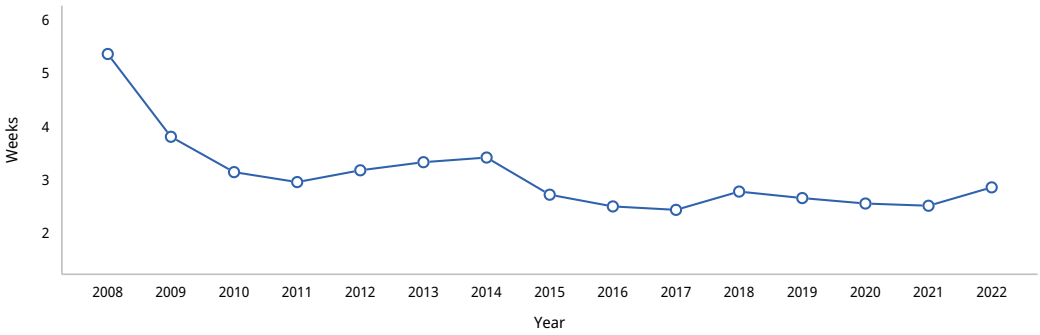


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

On average, receiving offices transmitted PCT applications to the International Bureau within 2.9 weeks in 2022.

C14. Average timeliness in transmitting PCT applications to the International Bureau, 2008–2022

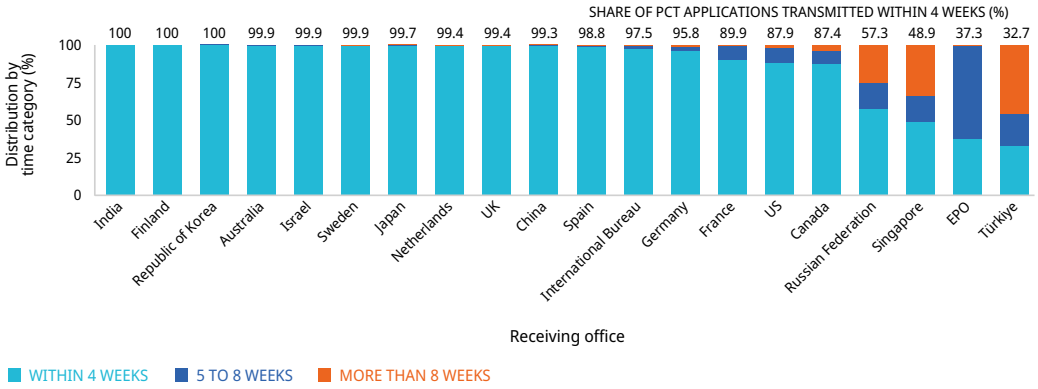


Note: The copy of the PCT application – known as the record copy – sent by the receiving office (RO) must reach the International Bureau (IB) before expiration of the 13th month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where this occurs, the IB should receive the application within one month of the international filing date. Timeliness is calculated as the time elapsed between the international filing date and the date on which the IB received the PCT application from the RO. Applications transmitted under PCT Rule 19.4 are excluded.

Source: WIPO Statistics Database, March 2023.

The offices of Finland, India and the Republic of Korea transmitted all their PCT applications to the International Bureau within four weeks.

C15. Timeliness in transmitting PCT applications to the International Bureau, top 20 receiving offices, 2022

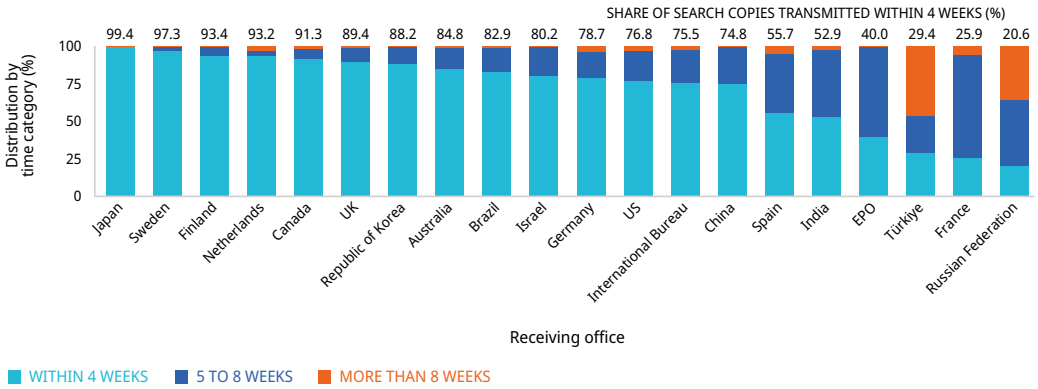


Note: The copy of the PCT application – known as the record copy – sent by the RO must reach the IB before expiration of the 13th month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where this occurs, the IB should receive the application within one month of the international filing date. Timeliness is calculated as the time elapsed between the international filing date and the date on which the IB received the PCT application from the RO. Applications transmitted under PCT Rule 19.4 are excluded. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

Half of the top 20 offices transmitted over 80% of their PCT applications to International Searching Authorities within four weeks.

C16. Timeliness in transmitting PCT applications to International Searching Authorities, top 20 receiving offices, 2022



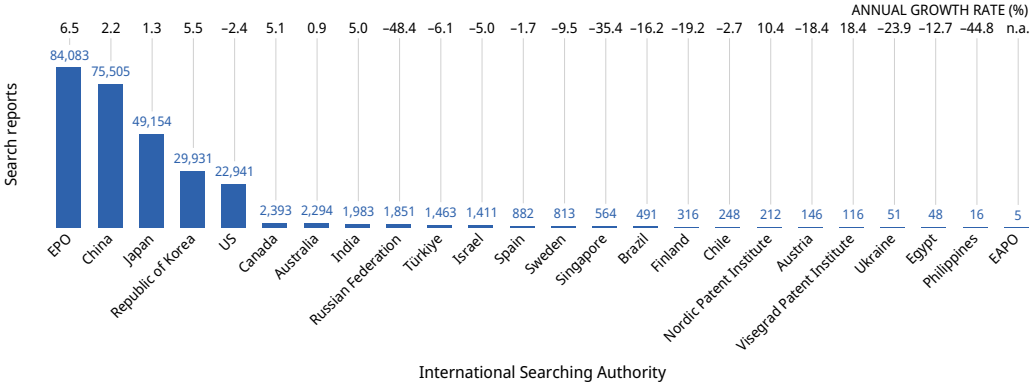
Note: Timeliness is calculated as the time elapsed between the international filing date and the date on which the International Searching Authority (ISA) received the PCT application – known as the search copy – from the receiving office. Dates of search fee payments are not used, due to the unavailability of data. Applications transmitted under the terms of PCT Rule 19.4 are excluded. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

International Searching Authorities

Nine of the 24 International Searching Authorities issued more international search reports in 2022 than in the previous year.

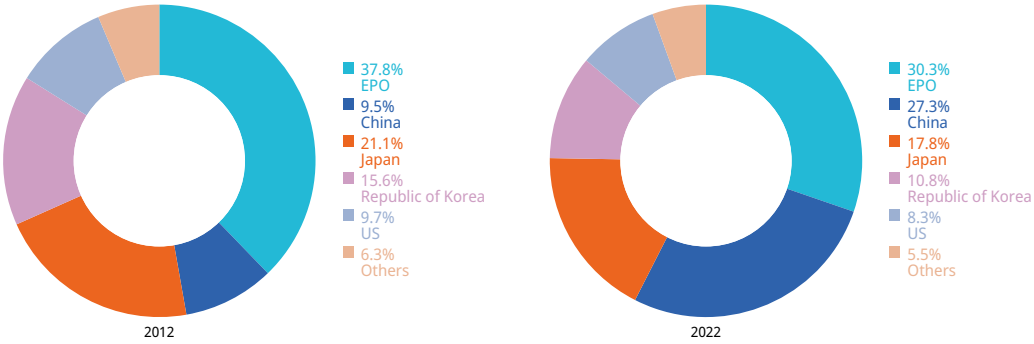
C17. International search reports issued by International Searching Authority, 2022



Note: EAPO is the Eurasian Patent Office and EPO is the European Patent Office.
n.a. indicates not applicable.
Source: WIPO Statistics Database, March 2023.

The office of China and the European Patent Office combined, established the majority of international search reports issued in 2022.

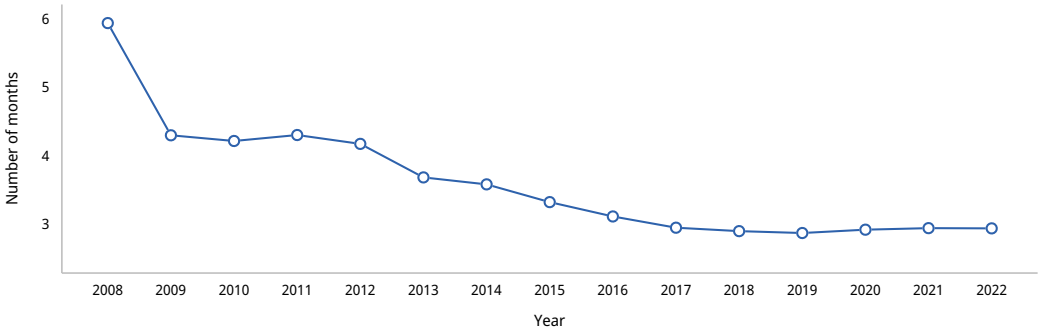
C18. Distribution of international search reports issued by International Searching Authority, 2012 and 2022



Note: EPO is the European Patent Office.
Source: WIPO Statistics Database, March 2023.

Since 2008, the average timeliness in transmitting international search reports to the International Bureau has improved sharply.

C19. Average timeliness in transmitting international search reports to the International Bureau, measured from the date of receipt of the search copy, 2008–2022

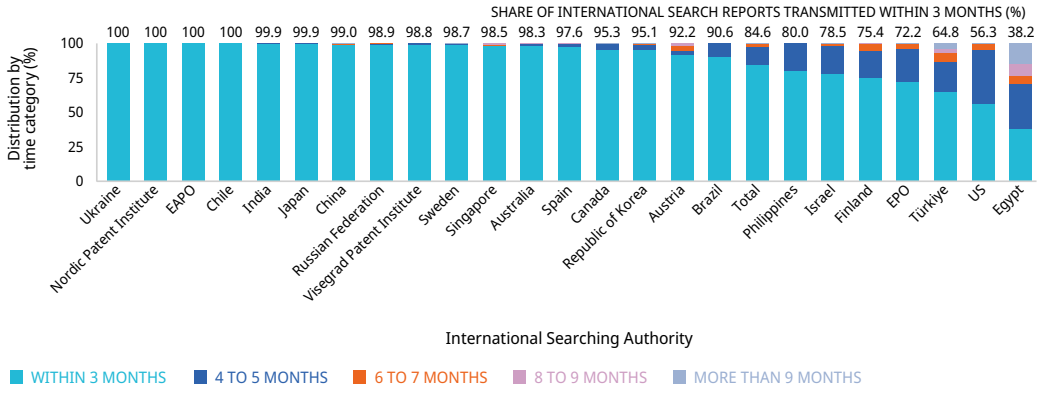


Note: The International Searching Authority (ISA) must establish an international search report (ISR) within three months of receiving a copy of an application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time between the date the ISA receives a copy of the PCT application and the date when it transmits the ISR to the International Bureau (or, if applicable, the date of receipt of the declaration under Article 17(2)(a)). This figure shows timeliness in establishing the ISR where the applicable time limit for establishing the ISR under Rule 42 is three months after the date of receipt of the search copy.

Source: WIPO Statistics Database, March 2023.

Over 98% of international search reports that ought to be transmitted to the International Bureau within three months of the date of receipt of the search copy met this deadline at half of the 24 International Searching Authorities.

C20. Timeliness in transmitting international search reports to the International Bureau, measured from date of receipt of the search copy by International Searching Authority, 2022

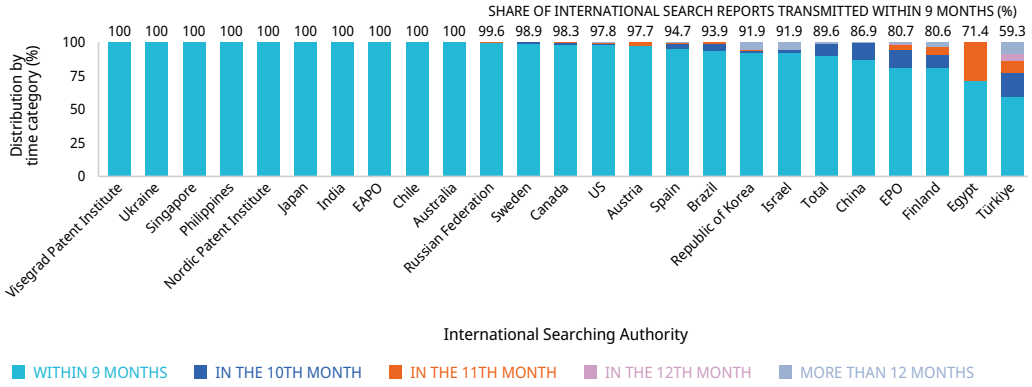


Note: The International Searching Authority (ISA) must establish the international search report (ISR) within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time between the date when the ISA receives a copy of the PCT application and the date when it transmits the ISR to the International Bureau (or, if applicable, the date of receipt of the declaration under Article 17(2)(a)). This figure shows timeliness in establishing the ISR where the applicable time limit for establishing the ISR under Rule 42 is three months from receipt of the search copy. When the date of receipt of the search copy is unknown and the ISA is the same office as the receiving office, we consider the search copy to have been received on the international filing date and calculate the timeliness accordingly. EAPO is the Eurasian Patent Office and EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

At 10 International Searching Authorities, all international search reports required to be transmitted to the International Bureau within nine months of the priority date met the deadline.

C21. Timeliness in transmitting international search reports to the International Bureau, measured from priority date by International Searching Authority, 2022



Note: The International Searching Authority (ISA) must establish the international search report (ISR) within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time elapsed between the priority date and the date on which the ISA transmits the ISR to the International Bureau (or, if applicable, the date of receipt of the declaration under Article 17(2)(a)) for ISRs where the deadline is nine months from the priority date. This figure shows timeliness in establishing the ISR where the applicable time limit for establishing the ISR under Rule 42 is nine months from the priority date (or international filing date if no priority is claimed). ISRs are excluded when the date of receipt of the search copy is unknown and the ISA is not the same office as the receiving office. EAPO is the Eurasian Patent Office and EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

The International Bureau published more than 85% of PCT applications together with an international search report for 22 of the 24 International Searching Authorities.

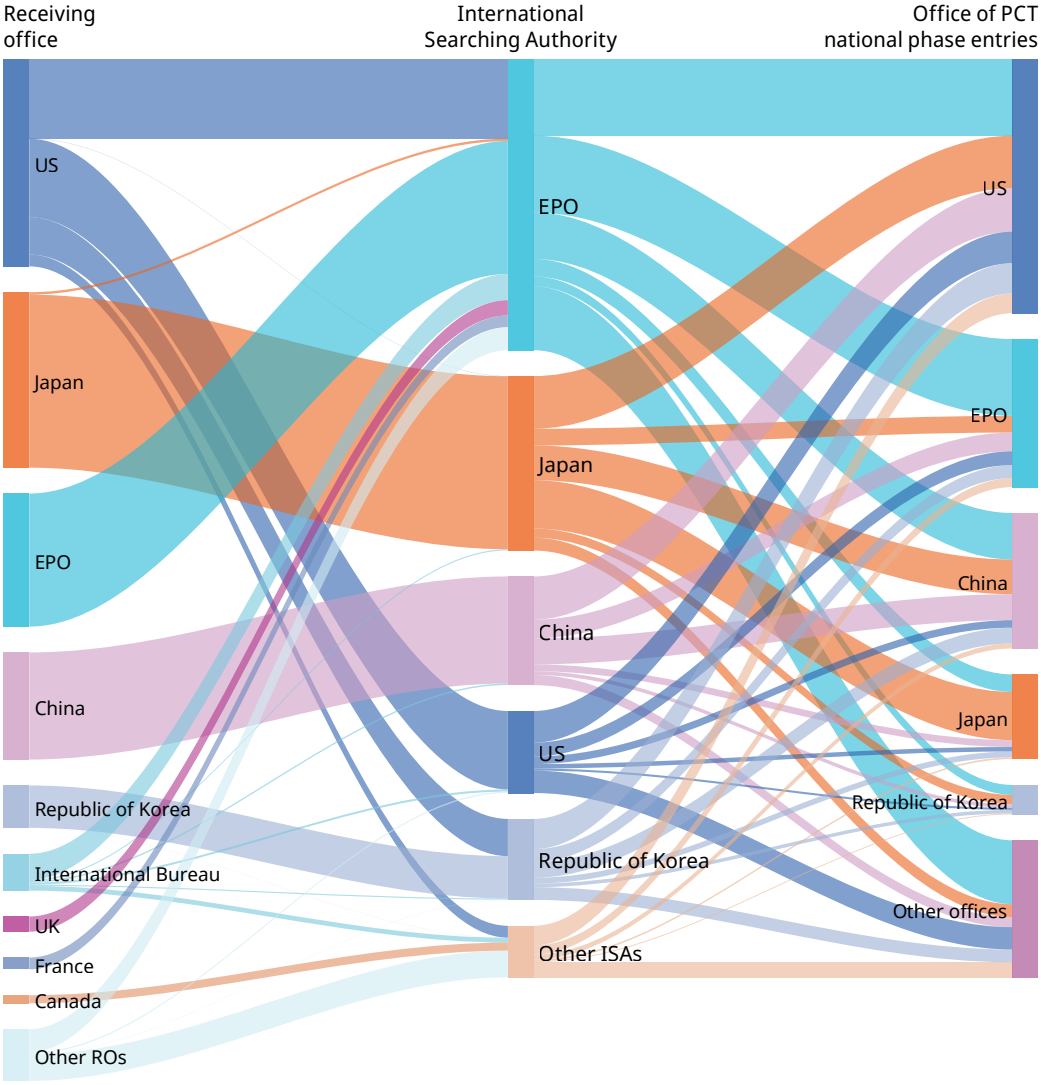
C22. Share of published PCT applications with or without an international search report by International Searching Authority, 2022

Note: A further measure of the performance of an ISA is the proportion of ISRs transmitted to the IB in time for publication with the PCT application, known as A1 publication. EAPO is the Eurasian Patent Office and EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

A large proportion of PCT applications filed at the office of the US had an international search report produced by the European Patent Office. This latter office also issued such reports for nearly half of national phase entries at offices other than the top five.

C23. Flow of PCT applications transmitted from the top nine receiving offices to the top five International Searching Authorities and the top five offices of PCT national phase entries, 2017–2019



Note: The 2017–2019 period refers to the years of PCT national phase entry and corresponds to the latest available data. National phase entry (NPE) data may be incomplete. This figure shows the flow of PCT applications between selected receiving offices (ROs), International Searching Authorities (ISAs) and offices of NPEs. Data for the offices of NPEs are based on fractional counts of PCT applications. Each RO may specify one or more ISA as competent for PCT applications filed with it. EPO is the European Patent Office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2023.

Supplementary International Searching Authorities

The European Patent Office issued the vast majority of supplementary international search reports in 2022.

C24. Distribution of supplementary international search reports by Supplementary International Searching Authority, 2020–2022

	Year		
Supplementary International Searching Authority	**2020**	**2021**	**2022**
Austria	2	1	
European Patent Office	50	48	48
Nordic Patent Institute	1	1	
Russian Federation	1	3	
Singapore	2		3
Sweden	1	1	1
Türkiye	1		
Ukraine	1		1
Visegrad Patent Institute	1		
Total	**60**	**54**	**53**

Note: Data for 2022 may be incomplete.
Source: WIPO Statistics Database, March 2023.

International Preliminary Examining Authorities

The number of international preliminary reports on patentability issued in 2022 dropped by a further 7.9%.

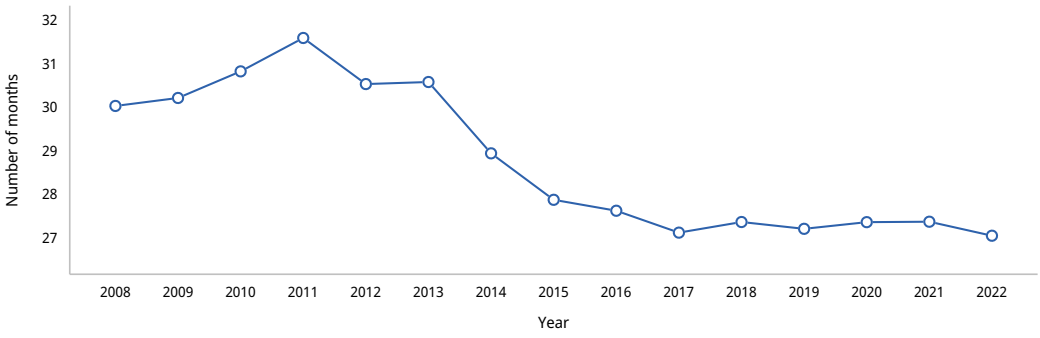
C25. Distribution of international preliminary reports on patentability by International Preliminary Examining Authority, 2020–2022

International Preliminary Examining Authority	**Year**			**2022 share (%)**	**Change from 2021 (%)**
	2020	**2021**	**2022**		
Australia	484	505	425	4.7	–15.8
Austria	8	11	4	0.0	–63.6
Brazil	72	80	87	1.0	8.7
Canada	172	173	146	1.6	–15.6
Chile	10	12	17	0.2	41.7
China	418	412	372	4.1	–9.7
Egypt	6	2	0	0.0	–100.0
Eurasian Patent Organization			1	0.0	n.a.
European Patent Office	5,399	5,303	5,201	58.0	–1.9
Finland	63	39	38	0.4	–2.6
India	67	67	58	0.6	–13.4
Israel	76	76	77	0.9	1.3
Japan	1,815	1,562	1,399	15.6	–10.4
Nordic Patent Institute	36	33	33	0.4	0.0
Philippines			1	0.0	n.a.
Republic of Korea	105	133	108	1.2	–18.8
Russian Federation	36	58	46	0.5	–20.7
Singapore	91	109	81	0.9	–25.7
Spain	63	50	53	0.6	6.0
Sweden	77	74	69	0.8	–6.8
Türkiye	46	57	53	0.6	–7.0
Ukraine	8	7	9	0.1	28.6
United States of America	1,033	965	687	7.7	–28.8
Visegrad Patent Institute	5	5	1	0.0	–80.0
Total	**10,090**	**9,733**	**8,966**	**100.0**	**–7.9**

Note: Data for 2022 may be incomplete.
n.a. indicates not applicable.
Source: WIPO Statistics Database, March 2023.

In 2022, the average timeliness in transmitting international preliminary reports on patentability to the International Bureau was 27.1 months.

C26. Average timeliness in transmitting international preliminary reports on patentability to the International Bureau, 2008–2022

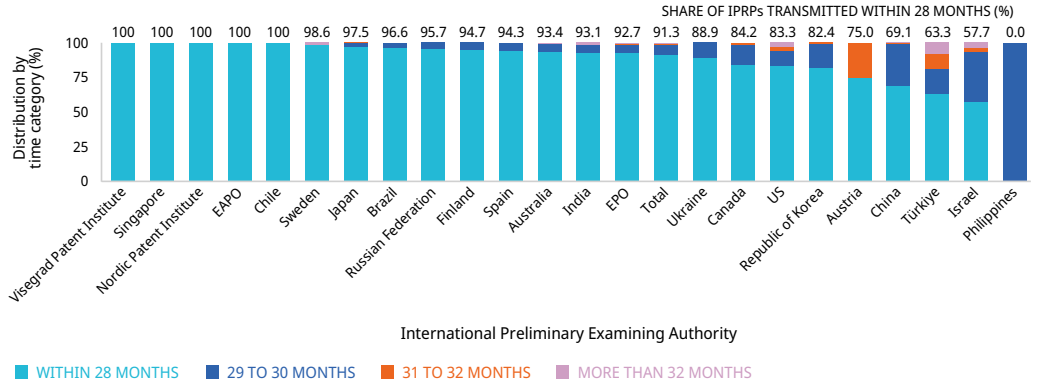


Note: Timeliness is calculated as the time elapsed between the priority date and the date on which the International Bureau received an international preliminary report on patentability (IPRP) from an International Preliminary Examining Authority (IPEA).

Source: WIPO Statistics Database, March 2023.

Eighteen offices transmitted at least 80% of international preliminary reports on patentability to the International Bureau within 28 months of the priority date.

C27. Timeliness in transmitting international preliminary reports on patentability to the International Bureau by International Preliminary Examining Authority, 2022



Note: This figure presents the same timeliness information for 2022 as that presented in figure C26, but breaks it down by International Preliminary Examining Authority (IPEA) and time category. Timeliness is calculated as the time elapsed between the priority date and the date when the International Bureau received an international preliminary report on patentability (IPRP) from an IPEA. EAPO is the Eurasian Patent Office and EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2023.

PCT-Patent Prosecution Highway pilots

China and Japan were the two main offices of later examination for PCT-Patent Prosecution Highway (PPH) requests in 2022.

C28. Distribution of PCT-PPH requests by office of earlier and later examination, 2022

	Office of earlier examination															
Office of later examination	**Japan**	**EPO**	**US**	**China**	**Republic of Korea**	**Canada**	**Israel**	**Australia**	**Singapore**	**Spain**	**Sweden**	**Russian Federation**	**Brazil**	**Finland**	**Others**	**Total**
Japan	1,177	473	83	149	45	13	5	7	16	5	3	0	0	1	3	**1,980**
China	323	592	171	0	84	14	7	0	16	0	13	8	0	5	0	**1,233**
EPO	151	0	162	123	48	28	12	14	1	0	0	5	0	0	0	**544**
Republic of Korea	100	138	92	65	59	5	7	0	18	0	0	0	0	1	10	**495**
Canada	17	158	101	22	19	76	9	9	1	1	3	0	0	1	0	**417**
Australia	25	140	171	0	25	8	3	0	1	0	0	2	0	0	7	**382**
Mexico	24	48	28	20	0	2	0	0	0	35	0	0	0	0	0	**157**
Philippines	83	0	39	0	7	0	0	0	0	0	0	0	0	0	0	**129**
Israel	4	53	24	6	2	0	20	0	1	0	0	0	0	0	1	**111**
Brazil	10	51	25	2	2	0	0	0	1	0	0	0	8	0	0	**99**
Colombia	3	24	58	0	2	3	1	1	0	2	0	0	0	0	2	**96**
Singapore	19	36	7	9	3	0	2	5	0	0	1	0	0	0	1	**83**
New Zealand	6	0	23	0	0	2	1	20	0	0	0	1	0	0	2	**55**
Russian Federation	11	12	6	17	1	0	0	2	0	1	0	1	0	0	0	**51**
UK	7	0	11	6	0	2	0	2	0	0	0	0	0	0	2	**30**
Eurasian Patent Organization	0	14	0	0	1	0	0	0	0	0	0	0	0	0	0	**15**
Others	3	0	6	1	0	0	1	3	0	0	1	0	0	0	0	**15**
Total	**1,963**	**1,739**	**1,007**	**420**	**298**	**153**	**68**	**63**	**55**	**44**	**21**	**17**	**8**	**8**	**28**	**5,892**

Note: EPO is the European Patent Office. Data for several offices of later examination, such as Germany, Indonesia and the United States Patent and Trademark Office (USPTO) are unavailable.

Source: WIPO, based on data from the Japan Patent Office, March 2023.

Annexes

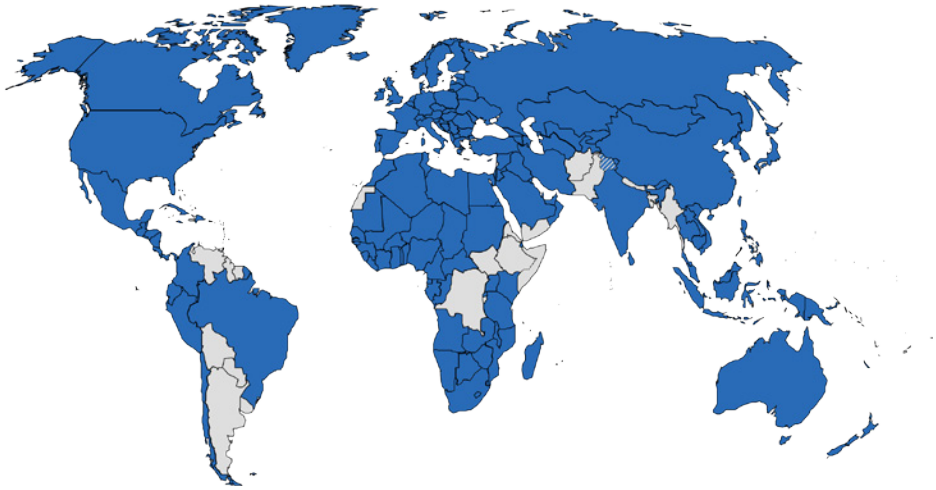
A brief presentation of the Patent Cooperation Treaty

The Patent Cooperation Treaty (PCT) is an international treaty administered by the World Intellectual Property Organization (WIPO). Since entering into force in 1978, the PCT has served as an alternative to the Paris Convention route for pursuing patent rights in different countries. The PCT System makes it possible to seek patent protection for an invention simultaneously in multiple countries by filing a single "international" patent application instead of filing several separate national or regional patent applications. When first established, the PCT System comprised 18 members. By the end of 2022, it comprised 157 Contracting States, as shown on the map below. A table listing all PCT Contracting States is provided at the end of this review.

Advantages of the Patent Cooperation Treaty

Applicants and patent offices of Contracting States benefit from uniform formality requirements, international search, supplementary international search and preliminary examination reports, and centralized international publication. Unlike the Paris Convention route, applicants can delay examination procedures at national patent offices, as well as the payment of associated legal fees and translation costs. By deferring national and regional procedures, applicants gain time to make decisions on the potential commercialization of their invention and the markets in which to seek patent protection. The reports produced by the international authorities which applicants receive during the international phase – about relevant prior art and the potential patentability of their inventions – help them make well-informed decisions.

Contracting States in 2022



Source: WIPO, March 2023.

In addition, the PCT System is intended to reduce unnecessary duplication and support work sharing between offices. Under the PCT System, an applicant must file a patent application with a receiving office (RO) and choose an International Searching Authority (ISA) to provide an international search report (ISR) and a written opinion on the potential patentability of the invention in question. The International Bureau (IB) of WIPO then publishes the application in PATENTSCOPE, its online database. Following receipt of the ISR and a written opinion, the applicant can choose to request a supplementary international search (SIS) by a Supplementary International Searching Authority (SISA), have an international preliminary examination (IPE) of the application undertaken by an International Preliminary Examining Authority (IPEA) or take no further action. The applicant generally has a minimum of 30 months from the earliest filing (priority) date during which to decide whether to enter the national phase in the countries or regions in which protection is sought.

International phase

The international phase usually continues for a period of 18 months and mainly involves the filing and formal examination of the application, international search, international publication, optional SIS and optional IPE.

Filing applications

Typically, applicants seeking protection for an invention in more than one country first file a national or regional patent application at their national or regional patent office. Within 12 months of the filing date of that first application (a time limit set by the Paris Convention), applicants must file an international application under the PCT with an RO – the respective national or regional patent office, or the IB – thereby beginning the international phase. Only a national or resident of a PCT Contracting State can file a PCT application. Where several applicants are named in a PCT application, only one need comply with this requirement.

Because the application has legal effect in all Contracting States, applicants can effectively postpone the requirement to pay certain substantial fees and costs, such as that of translating the application into national languages.

The RO transmits a copy of the application to the IB, which is responsible for:

- receiving and storing all application documents;
- performing a second formalities examination;
- translating the title and abstract of the application and certain associated documents into English and/or French, where necessary;
- publishing the application and related documents in PATENTSCOPE; and
- communicating documents to offices and third parties.

International search

Applications are subject to an international search by an ISA, which identifies the prior art relevant to the patentability of the invention, establishes an ISR and provides a written opinion on the invention's potential patentability. The opinion provided can assist the applicant in deciding whether to continue seeking protection for the invention. If the written opinion is unfavorable, the applicant can choose to amend the application in order to improve the probability of obtaining a patent, or withdraw the application before international publication and before incurring additional costs or do nothing.

Supplementary international search

Since January 1, 2009, the SIS service has afforded applicants the option of requesting additional searches from ISAs other than the one that carried out the initial search. This service aims to give applicants the option of obtaining a more complete overview of the prior art in the international phase by allowing them to have an additional search performed in an ISA's specialty language. Applicants can request an SIS report by an SISA up to 22 months from the filing (priority) date.

International preliminary examination

After receiving the ISA's written opinion, applicants can request an optional IPE – a second evaluation of the invention's patentability – to be carried out by an IPEA, usually on an amended version of the application (all ISAs are also IPEAs). The resultant international preliminary report on patentability (IPRP) further assists the applicant in determining whether to enter the national phase and contains useful information for elected offices in the national phase.

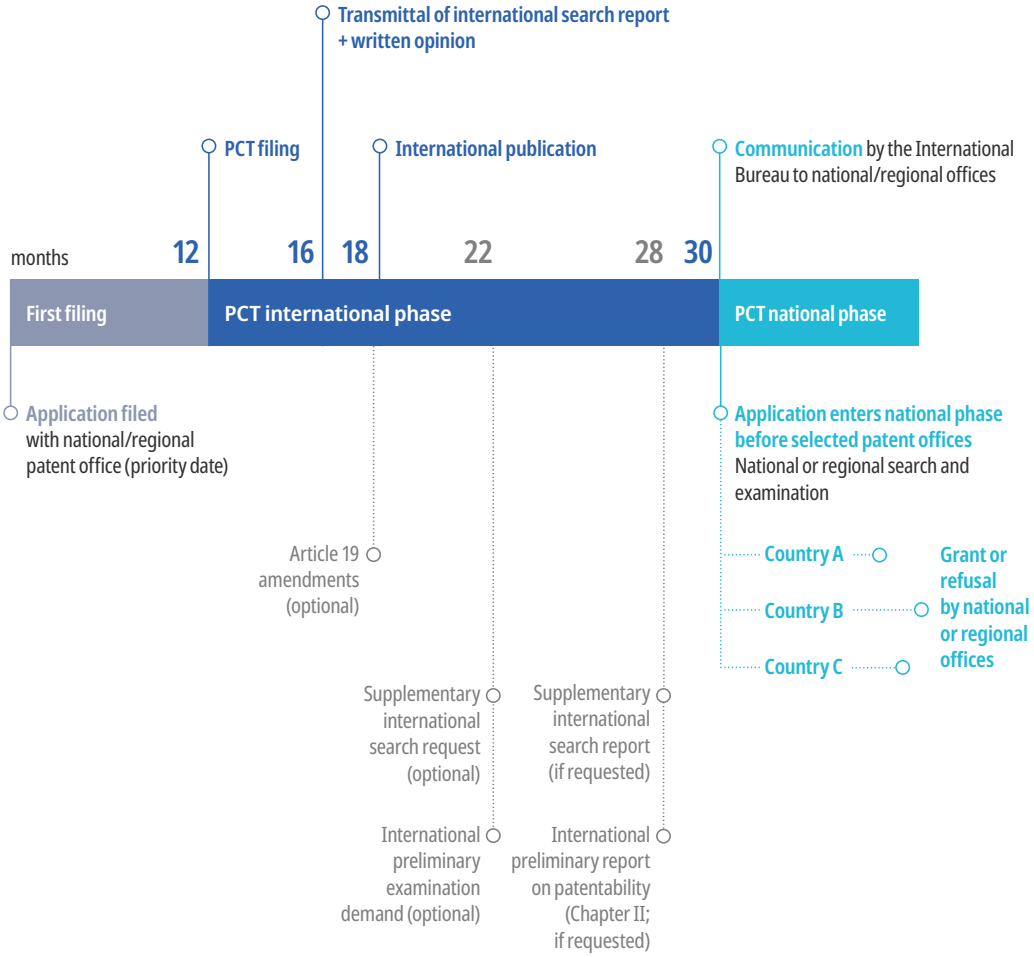
National phase

Applicants have at least 18 months from the filing date before an application needs to enter the national phase at individual patent offices. This delay affords additional time – compared to that allowed under the Paris Convention – to evaluate the chances of obtaining a patent and plan how to use the invention commercially in those countries in which protection is sought. In the national phase, certain PCT protections continue to apply. During this phase, the particular patent office processes the application in accordance with its national patent laws and decides whether to grant patent protection. The time required for processing varies between patent offices.

Patent Prosecution Highway

PCT-Patent Prosecution Highway (PCT-PPH) pilots comprise bilateral agreements between patent offices that enable applicants to request accelerated processing of national phase applications. Under these agreements, an applicant receiving a written opinion or an IPRP indicating that at least one claim in the PCT application has novelty, an inventive step or industrial applicability may request that other participating patent offices take up the processing of the application out of turn. An applicant may request the PCT-PPH procedure when entering the national phase of the PCT in a participating designated state. The advantage for PCT applicants is that patent applications are processed faster and more efficiently by designated (or elected) offices. Participating offices also benefit through having a reduced examination workload and the additional knowledge sharing.

Overview of the PCT System



Benefits

- One PCT application with legal effect in all PCT Contracting States
- Harmonized formal requirements
- Receive patentability information to support strategic decision-making
- Postpone significant costs for national processing by 18 months

The Global Patent Prosecution Highway (GPPH) pilot is a single, multilateral agreement between a group of offices. It enables applicants to request accelerated processing at any participating office, based on work products (including PCT reports) from any of the other participating offices, using a single set of qualifying requirements.

For more information on the PCT, please visit www.wipo.int/pct.

Data description

Data presented in this review were drawn from the WIPO Statistics Database. Due to a delay in transmitting PCT applications to WIPO, the figures for the international phase of the PCT for 2022 are estimates.

Publication of PCT applications usually takes place every Thursday. The years 2014 and 2020 each had 53 Thursdays instead of 52 as in other years, which slightly affects trends in statistics based on published PCT applications.

For the national phase of the PCT System, statistics are based on data supplied to WIPO by national and regional patent offices – data which WIPO often receives six months or more after the end of the year in question. Therefore, the latest year for which data are available is 2021. Data may be missing for some offices and incomplete for some origins. Data are available for most of the larger offices, if not all. With the 2021 data supplied to WIPO corresponding to 99.2% of the world total, only a very small proportion of the total is estimated. Missing data are usually estimated using linear extrapolation and averaging adjacent data points.

Due to its minor impact on data, the equivalent patent application concept for patent statistics by origin is not used in this review. National phase entry data by origin may therefore differ slightly from other sources, such as WIPO's IP Statistics Data Center.

Income groups correspond to those used by the World Bank and groupings by region are based on the United Nations (UN) definition of regions.

The figures in this review are subject to revision. Regular updates are available at WIPO's IP Statistics Data Center and Statistical Country Profiles at: www.wipo.int/ipstats.

Acronyms

ARIPO	African Regional Intellectual Property Organization
CNIPA	China National Intellectual Property Administration
EPO	European Patent Office
GPPH	Global Patent Prosecution Highway
IB	International Bureau of WIPO
IP	intellectual property
IPC	International Patent Classification
IPE	international preliminary examination
IPEA	International Preliminary Examining Authority
IPRP	international preliminary report on patentability
ISA	International Searching Authority
ISR	international search report
JPO	Japan Patent Office
KIPO	Korean Intellectual Property Office
LAC	Latin America and the Caribbean
NPE	national phase entry
OAPI	African Intellectual Property Organization
PCT	Patent Cooperation Treaty
PCT-PPH	Patent Cooperation Treaty-Patent Prosecution Highway
PDF	portable document format
PRO	public research organization
RO	receiving office
SIS	supplementary international search
SISA	Supplementary International Searching Authority (authority specified for supplementary search)
SISR	supplementary international search report
UK	United Kingdom
US	United States of America
USPTO	United States Patent and Trademark Office
WIPO	World Intellectual Property Organization
XML	extensible markup language

Glossary

Applicant: An individual or legal entity that files a patent application. There may be more than one applicant in an application. For PCT statistics, the place of residence of the first named applicant is used to determine the origin of a PCT application.

Application: The procedure for requesting IP rights at a patent office which then examines the application and decides whether to grant protection. Also refers to a set of documents submitted to an office by an applicant.

Application abroad: See "Filing abroad."

Authority specified for supplementary international search (SISA): An International Searching Authority (ISA) that provides a supplementary international search service – also known as a Supplementary International Searching Authority (SISA).

Chapter I of the PCT: The provisions in the PCT regulating the filing of PCT applications, the international searches and written opinions of ISAs, and the international publication of PCT applications – and which provide for the communication of PCT applications plus related documents to designated offices.

Chapter II of the PCT: The provisions in the PCT regulating the optional international preliminary examination (IPE) procedure.

Designated office: A national or regional office of, or acting for, a state designated in a PCT application under Chapter I of the PCT.

Designated state: A Contracting State in which protection for an invention is sought, as specified in the PCT application.

Elected office: The national or regional office of, or acting for, a state elected by an applicant under Chapter II of the PCT where the applicant intends to use the results of the international preliminary examination.

Filing abroad: For statistical purposes, an application filed by a resident of a given state or jurisdiction at an IP office of another state or jurisdiction. For example, an application filed at the Japan Patent Office (JPO) by an applicant domiciled in Lithuania is considered an application abroad from the perspective of Lithuania. This differs from a "non-resident application," which describes an application filed by a resident of a foreign state or jurisdiction from the perspective of the office receiving the application; so, the example above would be a non-resident application from the point of view of the JPO.

Foreign-oriented patent families: A patent family is a set of interrelated patent applications filed at one or more offices to protect the same invention. The patent applications within a family are interlinked by one or more of the following: priority claim, PCT national phase entry, continuation, continuation-in-part, internal priority, and addition or division. Foreign-oriented patent families have at least one filing at an office other than the applicant's home office.

Global Patent Prosecution Highway (GPPH): The GPPH pilot is a single, multilateral agreement between a group of offices. It allows applicants to make a request for accelerated processing at any participating office, based on work products from any of the other participating offices (including PCT reports), using a single set of qualifying requirements.

International application: See "PCT application."

International authority: A national or regional patent office or intergovernmental organization that fulfills specific tasks, as prescribed by the PCT.

International Bureau (IB) of WIPO: In the context of the PCT, the IB of WIPO handles certain processing tasks for all PCT applications filed at receiving offices worldwide. It also acts as a receiving office for all PCT applications from Contracting States.

International filing date: The date on which a receiving office receives a PCT application, provided certain formal requirements have been met.

International Patent Classification (IPC): An internationally recognized patent classification system, the IPC has a hierarchical structure of language-independent symbols and is divided into sections, classes, subclasses and groups. IPC symbols are assigned according to the technical features in a patent application. A patent application that relates to multiple technical features can be assigned several IPC symbols.

International phase of the PCT: The international phase consists of five main stages:

1. Filing of a PCT application by an applicant and its processing by the receiving office;
2. Establishment of an ISR and a written opinion by an ISA;
3. Publication of the PCT application and related documents, as well as their communication to designated and elected offices by the IB;
4. Optional establishment of an SISR by a SISA;
5. Optional establishment of an IPRP by an IPEA.

For further details on the international phase, see annex, A brief presentation of the Patent Cooperation Treaty.

International Preliminarily Examining Authority (IPEA): A national or regional patent office or intergovernmental organization appointed by the PCT Assembly to carry out international preliminary examinations (IPEs). Its task is to establish the IPRP (Chapter II of the PCT).

International preliminary report on patentability (Chapter II of the PCT) (IPRP): A preliminary, nonbinding opinion established by an IPEA at the request of an applicant as to whether a claimed invention appears to be novel, involve an inventive step (i.e., is not obvious) and industrially applicable. Prior to January 1, 2004, this report was known as the "International Preliminary Examination Report."

International search report (ISR): A report established by an ISA containing citations of documents (prior art) considered relevant for determining in particular the novelty and inventive step of an invention as claimed. The ISR also includes a classification of the subject matter of an invention and an indication of the fields searched, as well as any electronic databases searched.

International Searching Authority (ISA): A national patent office or intergovernmental organization appointed by the PCT Assembly to carry out international searches. ISAs establish ISRs and written opinions on PCT applications.

Invention: A new solution to a technical problem. To obtain patent rights, an invention must be novel, involve an inventive step and be industrially applicable, as judged by a person skilled in the art.

National phase entry (NPE): The national phase under the PCT follows the international phase of the PCT procedure and consists of the entry and processing of an international application in those individual countries or regions in which the applicant seeks protection for an invention. An entry must in general take place within 30 months from the priority date of the application, although longer time periods are afforded by some offices. NPE involves the payment of fees and, where necessary, the submission of a translation of the PCT application.

Non-resident application: For statistical purposes, a "non-resident" application refers to an application filed at the IP office of, or acting for, a state or jurisdiction in which the first named applicant in an application is not domiciled. For example, an application filed at the Japan Patent Office (JPO) by an applicant residing in Senegal is considered a non-resident application from the perspective of the JPO. Non-resident applications are sometimes referred to as foreign applications.

Origin: For statistical purposes, the origin of an application means the country or territory of residence (or nationality, in the absence of a valid residence) of the first named applicant in an application.

Paris Convention: The Paris Convention for the Protection of Industrial Property is an international convention signed in Paris (France) on March 20, 1883. It is one of the first and most important intellectual property treaties. The Paris Convention establishes, among other things, the "right of priority" principle, which enables a patent applicant to claim a priority of up to 12 months when filing an application in countries other than the original country of filing.

Paris route: Applications for patent protection filed directly with the national/regional office of, or acting for, the relevant state or jurisdiction (as opposed to the "national phase under the PCT"). The Paris route is also called the "direct route" or "national route."

Patent: An exclusive right granted by law to an applicant for an invention for a limited period of time (generally 20 years from the date of filing). The patent system is designed to encourage innovation by providing innovators with time-limited exclusive legal rights, enabling them to appropriate returns from their innovative activity. In return, the applicant is obliged to disclose the invention to the public in a manner that enables others skilled in the art to replicate it. The patent system is also designed to balance the interests of applicants (exclusive rights) with the interests of society (disclosure of the invention). Patents are granted by national or regional patent offices and limited to the jurisdiction of the issuing authority. Patent rights can be sought by filing an application directly with the relevant national or regional office(s), or by filing a PCT application.

Patent Cooperation Treaty (PCT): An international treaty administered by WIPO, the PCT allows applicants to seek patent protection for an invention simultaneously in a large number of countries (PCT Contracting States) by filing a single PCT international application. The granting of patents, which remains under the control of national or regional patent offices, is carried out during what is called the "national phase under the PCT."

PATENTSCOPE: Provides access, free of charge, to all published PCT applications along with related documents, and to the national or regional patent collections from numerous offices worldwide. Since April 2006, the PATENTSCOPE search system has been the authentic publication source for PCT applications.

PCT application: A patent application filed through the WIPO-administered PCT, also known as an international application.

PCT route: The procedure outlined in the PCT, as opposed to the Paris route.

PCT System: The PCT, an international treaty administered by WIPO, facilitates the acquisition of patent rights in a large number of jurisdictions. The PCT System simplifies the process of multiple national patent filings by reducing the requirement to file a separate application in each jurisdiction. However, the decision on whether to grant patent rights remains the prerogative of national and regional patent offices, and patent rights remain limited to the jurisdiction of the patent-granting authority. The PCT application process starts with the international phase, during which an international search and, possibly, a preliminary examination are performed, and concludes with the national phase, during which a national or regional patent office decides on the patentability of an invention according to national law.

PCT-Patent Prosecution Highway pilots (PCT-PPH): A number of bilateral agreements signed between patent offices that enable applicants to request an accelerated examination procedure, because of positive patentability findings made by the International Searching and/or International Preliminary Examining Authority, in the written opinion of an International Searching Authority, the written opinion of an International Preliminary Examining Authority or the international preliminary report on patentability.

Prior art: All information disclosed to the public about an invention, in any form, before a given date. Information on prior art can assist in determining whether a claimed invention is new and involves an inventive step (i.e., is not obvious) for the purposes of international searches and international preliminary examination (IPE).

Priority date: The filing date of an application on the basis of which priority is claimed.

Publication of PCT application: The IB publishes a PCT application and related documents promptly after the expiration of 18 months from the priority date. If a PCT application is withdrawn or considered withdrawn before the technical preparations for publication are completed, the application is not published. An applicant can request early publication of a PCT application.

Receiving office (RO): A patent office – or the IB – at which a PCT application is filed. The role of the RO is to check and process an application in accordance with the regulations governing the PCT.

Resident application: For statistical purposes, a resident application refers to an application filed with the IP office of, or acting for, the state or jurisdiction in which the first named applicant in the application has residence. For example, an application filed with the Japan Patent Office (JPO) by a resident of Japan is considered a resident application by the JPO. Resident applications are sometimes referred to as "domestic applications."

Supplementary international search report (SISR): A report, similar to the ISR, established during the supplementary international search, that allows an applicant to request, in addition to the main international search, one or more supplementary international searches, each to be carried out by an international authority other than the ISA undertaking the main international search. The SISR primarily focuses on the patent documentation in the language in which that SISA specializes.

Supplementary International Searching Authority (SISA): See "Authority specified for supplementary international search."

World Intellectual Property Organization (WIPO): A United Nations specialized agency dedicated to the promotion of innovation and creativity for the economic, social and cultural development of all countries through a balanced and effective international intellectual property (IP) system. Established in 1967, WIPO's mandate is to promote the protection of IP globally through cooperation among states and in collaboration with other international organizations.

Written opinion of the ISA (WOSA): For every PCT application filed on or after January 1, 2004, an ISA establishes, at the same time that it establishes the ISR, a preliminary and non-binding written opinion on whether a claimed invention appears to be novel, involve an inventive step and is industrially applicable.

PCT Contracting States

During 2022, Cabo Verde, Iraq, Jamaica and Mauritius became bound by or acceded to the PCT, bringing the number of member states to 157.

Albania	Germany	Oman
Algeria	Ghana	Panama
Angola	Greece	Papua New Guinea
Antigua and Barbuda	Grenada	Peru
Armenia	Guatemala	Philippines
Australia	Guinea	Poland
Austria	Guinea-Bissau	Portugal
Azerbaijan	Honduras	Qatar
Bahrain	Hungary	Republic of Korea
Barbados	Iceland	Republic of Moldova
Belarus	India	Romania
Belgium	Indonesia	Russian Federation
Belize	Iran (Islamic Republic of)	Rwanda
Benin	Iraq	Saint Kitts and Nevis
Bosnia and Herzegovina	Ireland	Saint Lucia
Botswana	Israel	Saint Vincent and the Grenadines
Brazil	Italy	Samoa
Brunei Darussalam	Jamaica	San Marino
Bulgaria	Japan	Sao Tome and Principe
Burkina Faso	Jordan	Saudi Arabia
Cabo Verde	Kazakhstan	Senegal
Cambodia	Kenya	Serbia
Cameroon	Kuwait	Seychelles
Canada	Kyrgyzstan	Sierra Leone
Central African Republic	Lao People's Democratic Republic	Singapore
Chad	Latvia	Slovakia
Chile	Lesotho	Slovenia
China	Liberia	South Africa
Colombia	Libya	Spain
Comoros	Liechtenstein	Sri Lanka
Congo	Lithuania	Sudan
Costa Rica	Luxembourg	Sweden
Côte d'Ivoire	Madagascar	Switzerland
Croatia	Malawi	Syrian Arab Republic
Cuba	Malaysia	Tajikistan
Cyprus	Mali	Thailand
Czech Republic	Malta	Togo
Democratic People's Republic of Korea	Mauritania	Trinidad and Tobago
Denmark	Mauritius	Tunisia
Djibouti	Mexico	Türkiye
Dominica	Monaco	Turkmenistan
Dominican Republic	Mongolia	Uganda
Ecuador	Montenegro	Ukraine
Egypt	Morocco	United Arab Emirates
El Salvador	Mozambique	United Kingdom
Equatorial Guinea	Namibia	United Republic of Tanzania
Estonia	Netherlands	United States of America
Eswatini	New Zealand	Uzbekistan
Finland	Nicaragua	Viet Nam
France	Niger	Zambia
Gabon	Nigeria	Zimbabwe
Gambia	North Macedonia	
Georgia	Norway	

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