

IP5
Honolulu
Hawaii
June 13–15
2023

IP5 Offices' Initiatives on Climate Change



16th Annual Meeting of the IP5 Heads of Office

IP5 Offices' Initiatives

EPO

- 2016 — Optimized Programme for Accelerated Prosecution of European Patent Applications (PACE), which includes accelerated examination for green technologies.
- 2020 — Released a joint study with the International Energy Agency (IEA), "Innovation in batteries and electricity storage," highlighting the key role of batteries in clean energy.
- 2021 — Released a joint study with IEA, "[Patents and the energy transition.](#)"
- 2022 — Launched the Espacenet [Clean Energy Technologies platform](#) that provides more than 60 smart ready-made search queries combining classification and keywords helping innovators, investors, and policymakers to innovate and save the planet. It covers renewable energy, solutions for carbon-intensive industries, energy storage, and other enabling technologies.
- 2022 — Released [Green Techs in Focus](#) platform to identify where green tech innovation is needed.
- 2022 — Released a joint report with International Renewable Energy Agency (IRENA) on innovation trends in electrolyzers for hydrogen production.
- 2022 — Presented the Innovation for Green Transition at the European Commission's EC Direct event.
- 2023 — Released a joint study with IEA, "[Hydrogen Patents for a Clean Energy Future.](#)"
- 2023 — Launched the Espacenet Firefighting Platform with 30 ready-made smart searches. These queries enable precise navigation through over 140 million documents in Espacenet, supporting inventors, scientists, and engineers in accessing the most relevant patent information on fighting wildfires: in fire detection and prevention, fire extinguishing, protective equipment post-fire restoration.
- 2023 — Published "[The Highlights Report: Patents paving the way to a sustainable future.](#)" This report demonstrates how patent intelligence shared in more than 20 initiatives contributes to 7 UN Sustainable Development Goals (SDGs) and can help innovators solve puzzles for sustainability, especially in green technologies and climate change.
- Will host upcoming "Inspiring Inventors" talk series programs on green hydrogen from sunlight and air.

JPO

- 2022 — Published the [Green Transformation Technologies Inventory](#) (GXTI) identifying global patent filing green transformation (GX) trends.
- Published [survey of GX-related patent application trends](#) to encourage further innovation.
- 2020 — Partnered with [WIPO GREEN](#), an online marketplace for sustainable technology.
- Provides accelerated examination and appeal processes for green tech patent applications.

KIPO

- 2009 — Established a technology acquisition strategy to nurture future green technologies.
- 2010 — Granted super-accelerated patent and design examinations filed by green tech companies.
- 2022 — Executed a business agreement with Korean financial institutions to financially support and help commercialize environmental patent technologies of small and medium-sized enterprises (SMEs).

CNIPA and USPTO initiatives are on next page



CNIPA

- 2012 — Provided accelerated examination for climate change-related inventions.
- 2014 — Published "Green Construction Material Industry Patent Analysis" (2014) and "New Energy Vehicle Industry Patent Analysis."
- 2015 — Published "Graphene Battery Industry Patent Analysis."
- 2016 — Published "Green Patent Classification System Research and Green Patent Statistical Analysis."
- 2021 — Published "Electric Vehicle Range Technology Patent Analysis Research."
- 2017 — Provided accelerated examination for climate-related inventions and launched the "Accelerated Patent Examination Regulations," identifying utility models and designs associated with climate change that are eligible for accelerated examination.
- 2020 — Issued patent certificates in electronic format.
- 2021 — Provided electronic receipts for patent fees.
- 2022 — Published the [IPC Green and Low-Carbon Technology Inventory](#) showing the relationship between Green and Low-carbon Technologies and the IPC.
- 2022 — Established a patent classification database for green and low-carbon technologies comprising over 2.4 million inventions.
- 2023 — Published [Global Green and Low-Carbon Technology Patent Statistics and Analysis Report](#) (in Chinese).
- 2023 — Issued all patent certificates in electronic format.
- Provided multiple examination modes, optimizing the examination procedure, covering centralized examination, circuit examination, deferred examination, etc., that meet the diversified needs of innovative subjects.

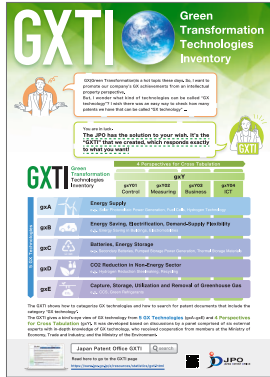
USPTO

- 2022 — Launched the [Climate Change Mitigation Pilot Program](#) to expedite the examination of green technologies.
- 2022 — [Became a technology partner](#) to the global green-technology platform of WIPO GREEN.
- 2023 — Announced a new [Patents for Humanity Green Energy](#) awards category for green energy technologies. Qualifying applications will be advanced out of turn to expedite a first Office Action.
- 2023 — Launched the new [Trademarks for Humanity](#) awards program. The 2023 awards cycle will recognize brand owners who are improving the environment through their products, services, or business practices.
- 2023 — Co-sponsored the [Green Energy Innovation Expo](#) to facilitate strategic partnerships and highlight the impact of green energy in the fight against climate change.



Clean Energy Resources

Analytical reports by the IP5 partner Offices on clean energy technologies



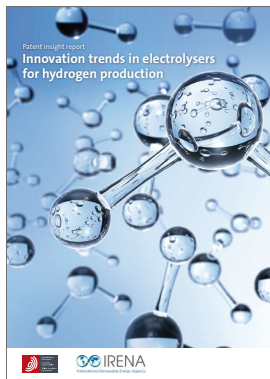
[The Green Transformation Technologies Inventory \(GXTI\)](#)

- Gives a bird's-eye view of technologies related to GX.
- Published by the JPO in June 2022.



[Innovation in batteries and electricity storage: A global analysis based on patent data](#)

- Strong patent activity shows trends in electricity storage, particularly lithium-ion. EPO.



[Patent Insight Report: Innovation trends in electrolyzers for hydrogen production](#)

- Maps the various electrolyser technologies and trends revealed by an analysis of worldwide patent filings. EPO.



[Patents and the energy transition: Global trends in clean energy technology innovation](#)

- Examines the landscape of low-carbon energy technologies and covers the past, present and future of clean energy innovation. EPO.



[Hydrogen patents for a clean energy future: A global trend analysis of innovation along hydrogen value chains](#)

- Tracks technical progress in hydrogen-related technologies and assesses their alignment with the needs of energy transitions. EPO.

Climate Innovation Incentives

Implementing accelerated examination to incentivize innovation in green technologies



EPO

Optimized Programme for Accelerated Prosecution of European Patent Applications (PACE), includes accelerated examination for green technologies.



JPO

Provides accelerated examination and appeal processes for green tech patent applications.



KIPO

Grants super-accelerated patent and design examinations filed by green tech companies.



CNIPA

Prioritized Examination of Patent Applications.



USPTO

Provides expedited the examination of green technologies through the Climate Change Mitigation Pilot Program and Patents for Humanity awards.

Global Climate Innovation Trends



EPO

Green Techs in Focus (identifies where innovation is needed)

Green energy technologies platform (Esapacenet search platform for energy technologies)



JPO

Green Transformation Technologies Inventory (GXTI) identifies global patent filing green transformation (GX) trends.



KIPO

Executed a business agreement with Korean financial institutions to financially support and help commercialize environmental patent technologies of small and medium-sized enterprises (SMEs).



CNIPA

Classification system for green and low-carbon technologies



USPTO

Patents for Humanity Green Energy, an awards competition recognizing innovators who use game-changing technology to meet global humanitarian challenges.

WIPO Activities in 2022

Facilitation of access to and commercializing of green technologies

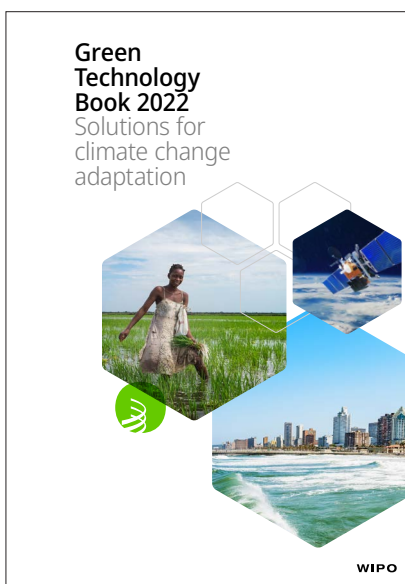
- Continued development of the [WIPO GREEN database](#) to accelerate green solutions for climate change.
- Pursuing [WIPO GREEN Acceleration Projects](#) in Latin America, China, and Indonesia.
- Developed the [IPC Green Inventory](#) to facilitate searching for patent information on environmentally sound technologies.
- Launched the [Intellectual Property Management Clinic for SMEs Program](#) (IPMC), designed to support SMEs from developing countries that are working on green technology solutions in advancing their business and IP strategies.
- Continued its interview series [Women in Green](#), where the spotlight is given to female innovators and green entrepreneurs to share their experiences in the eco-friendly technology and innovation fields.

Dissemination of information on green technology

- Published the first [Green Technology Book](#), a new annual WIPO publication that looks at the state of green technologies around the world and how they offer solutions to some of the most critical challenges of climate change.

Global norm-setting and international cooperation

- Held the [34th Session of the Standing Committee on the Law of Patent](#) (SCP), where Member States shared their experiences and information on the expedited examination mechanisms at their IP offices. Presentations on fast-track patent prosecution (including the ones relating to green technologies) from United States, Japan, Spain, Brazil, Israel, and Canada were made available. The WIPO Secretariat plans to publish a document containing information on the expedited examination programs of IP offices.
- Launched [IPO Green](#) with funding from the Japan Patent Office, designed to bring IP offices together to share their experiences and insights on enacting green policies and programs.



Patent Filing Statistics

IP5 offices at a glance

These updates and statistics reflect the totality of applications/filings in the IP5 jurisdictions.

2022 Patent Operations and Filing Statistics (IP5 Offices)

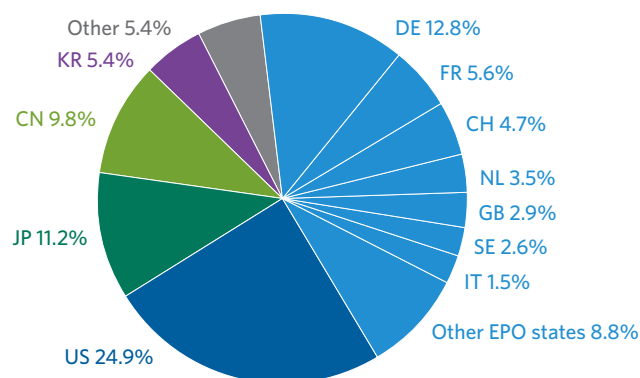
Office	Patent filings	PCT filings	Issued patents	First Action pendency (months)	Total pendency (months)
European Patent Office (EPO)	193,460				
Japan Patent Office (JPO)	289,530	48,719	201,420	10	14.7
Korea Intellectual Property Office (KIPO)	237,633	21,916	135,180	13.7	14.7
China National Intellectual Property Administration (CNIPA)	1,619,000	74,452	798,347		16.5
United State Patent and Trademark Office (USPTO)	646,855	59,056	325,455	16.4	25.2

EPO

Filing statistics

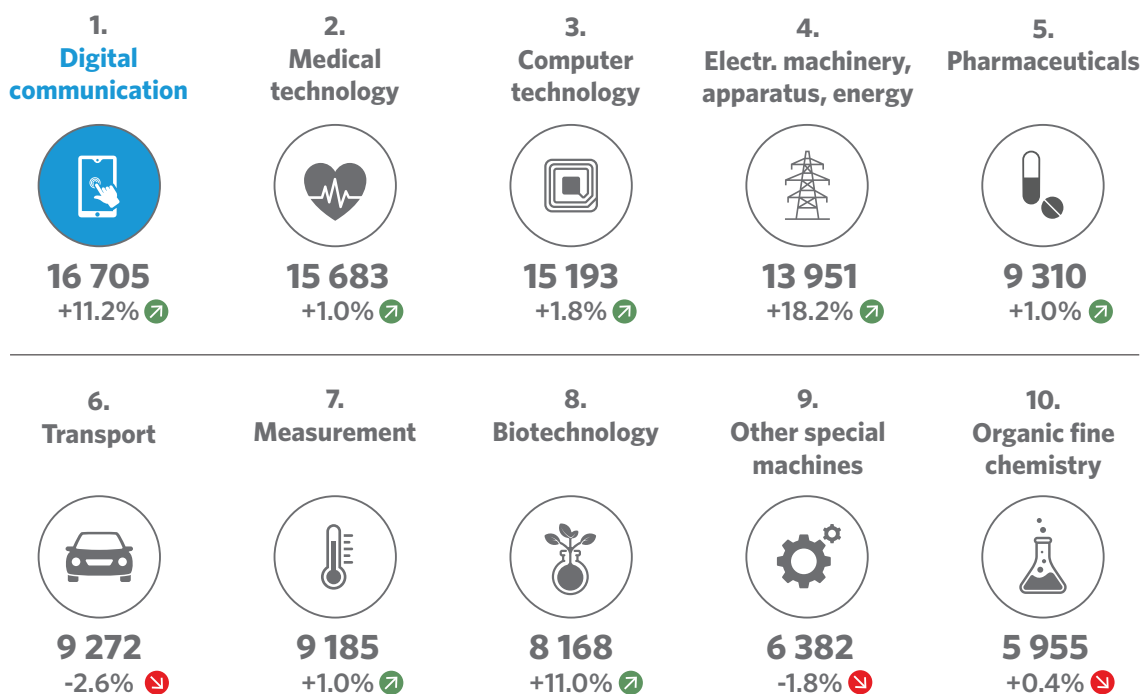
- Growth in patent applications continues: 193,460 applications filed in 2022 (an increase of 2.5% from 2021).
- Q1 2023: increase of 3.4% compared to the same period last year.
- PCT applications represent 64% of the total number of applications filed during Q1 2023. This reflects a 5.5% increase over the same period last year, and is slightly more than for the whole of 2022, where PCT applications accounted for 62% of the total.
- Timeliness in search: 91% compliance (on time), mean duration, 4.7 months.
- Timeliness in examination: 78% compliance (on time), mean time: 24.7 months.

This graph shows the geographic origin of the European patent applications determined by the country of residence of the first applicant listed on the application form (first-named application principle).



Source: EPO

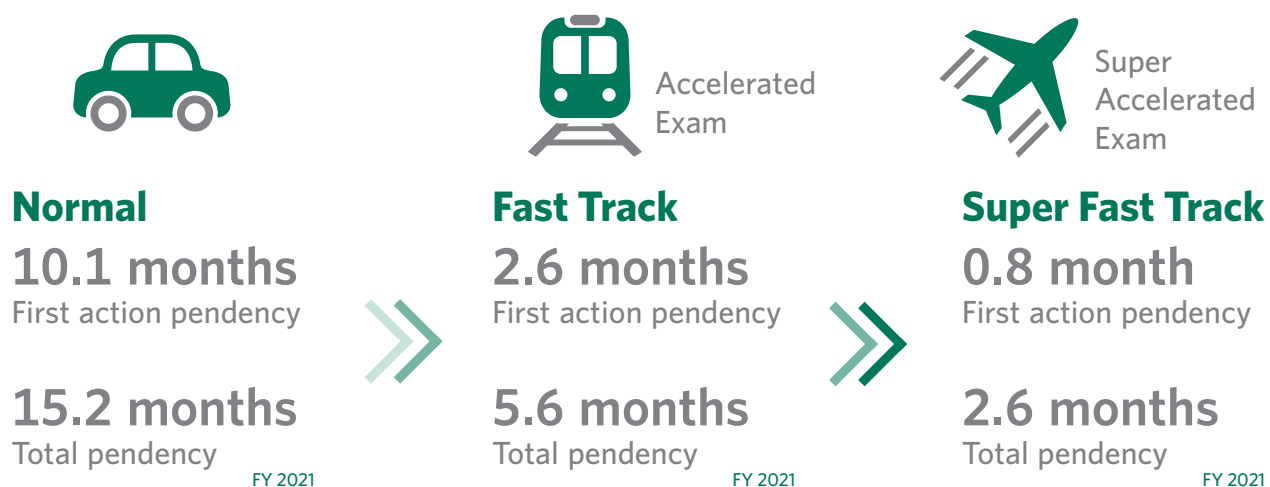
Top technical fields



Source: EPO
Status: 30.1.2023

JPO

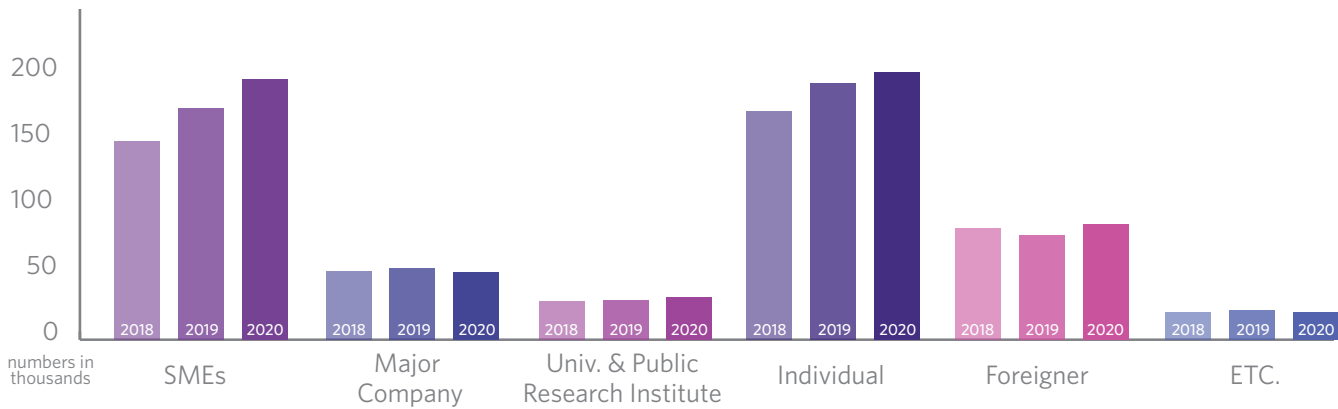
Accelerated examination statistics



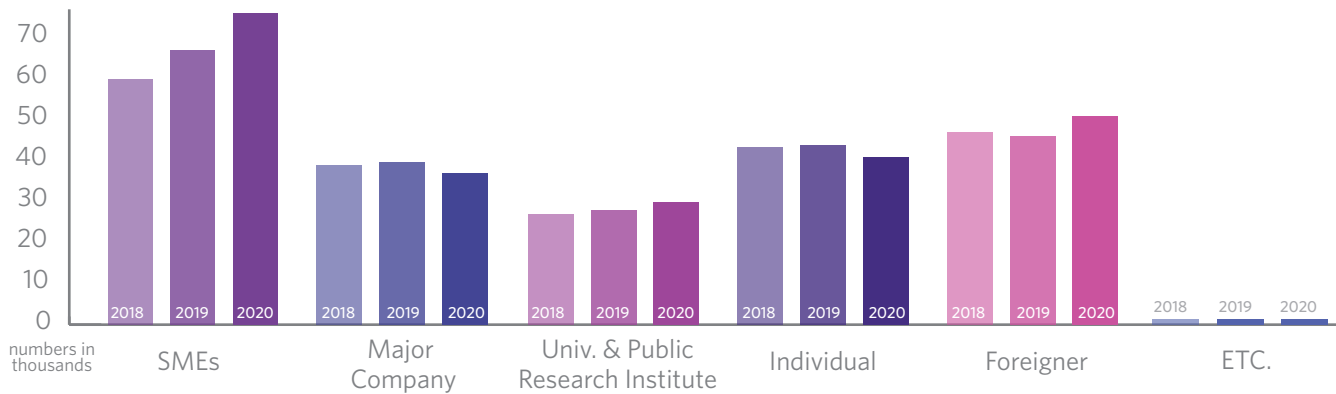
Source: JPO

FREE OF CHARGE

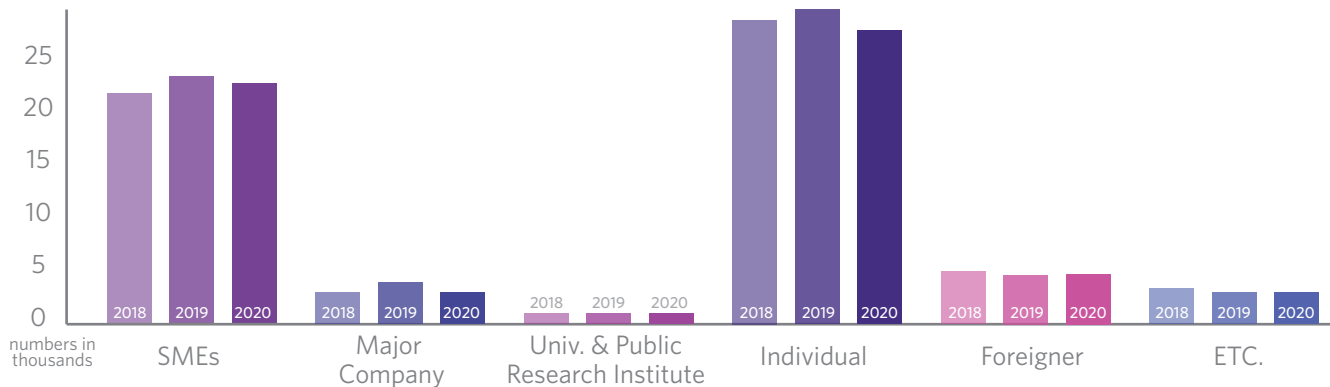
IP applications



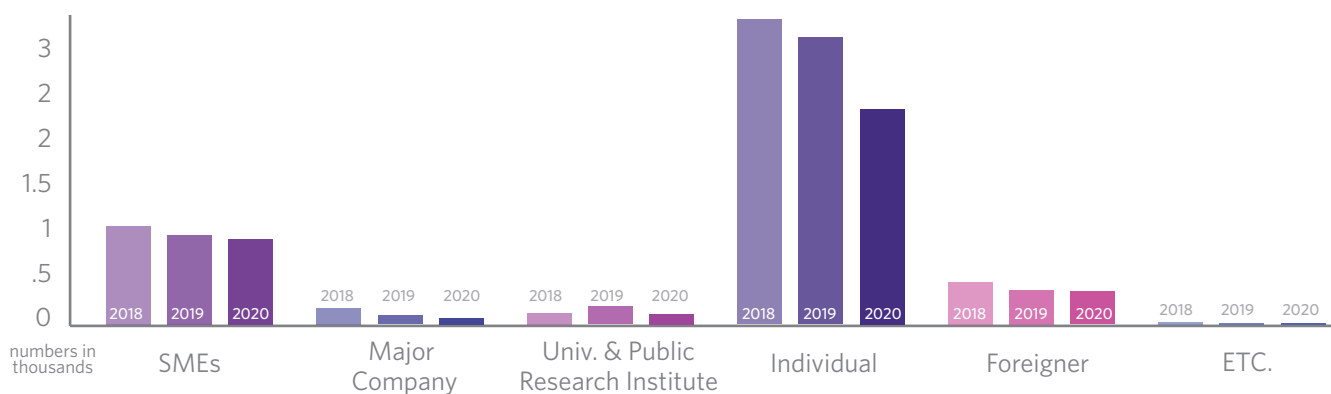
Patents applications



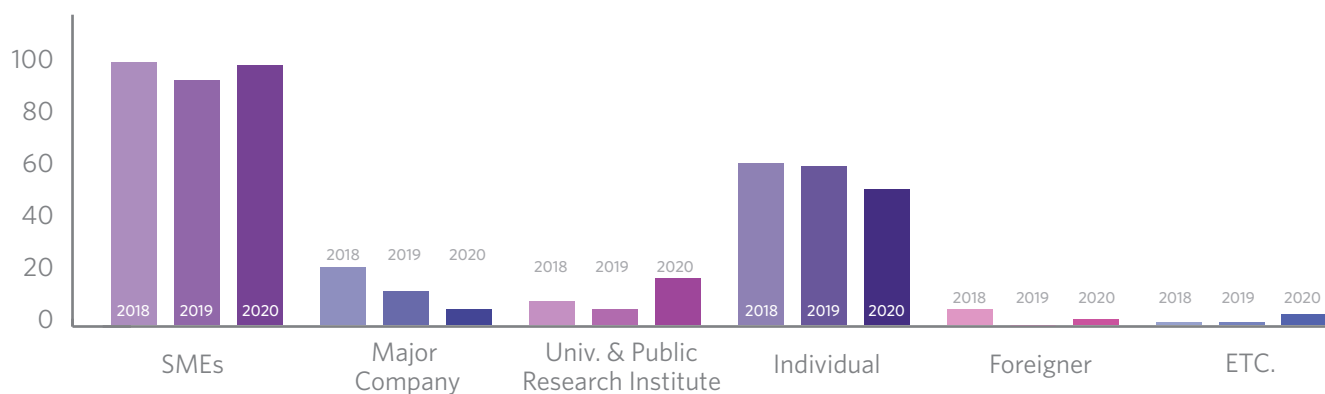
Designs applications



Utility models applications



Super-accelerated examinations for green tech

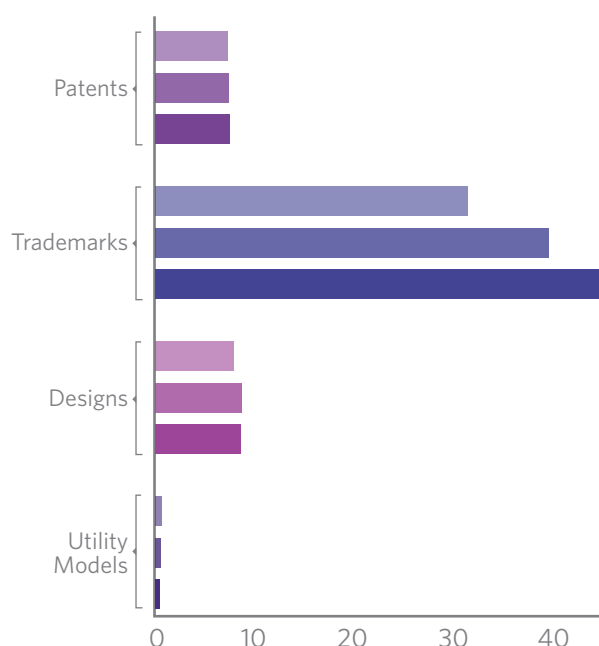


Top 5 IPC applied with super-accelerated examinations for green tech

IPC	2019	2020	2021	Total
Destroying solid waste or transforming solid waste into something useful or harmless (B09B 3/00)	13	9	2	24
Multistage treatment of water, wastewater, or sewage (C02F 9/00)	1	10	10	21
Biological treatment of water, wastewater, or sewage (C02F 3/00)	7	8	2	17
Devices for separating liquid or solid substances from sewage (E03F 5/14)	1	7	5	13
Collecting-tanks; Equalizing tanks for regulating the run-off; Laying-up basins (E03F 5/10)	6	4	2	12

- In 2021, female applications increased by 12% from the previous year to 62,402, accounting for about 10.5% of the total IP applications of 592,615.

Female applications

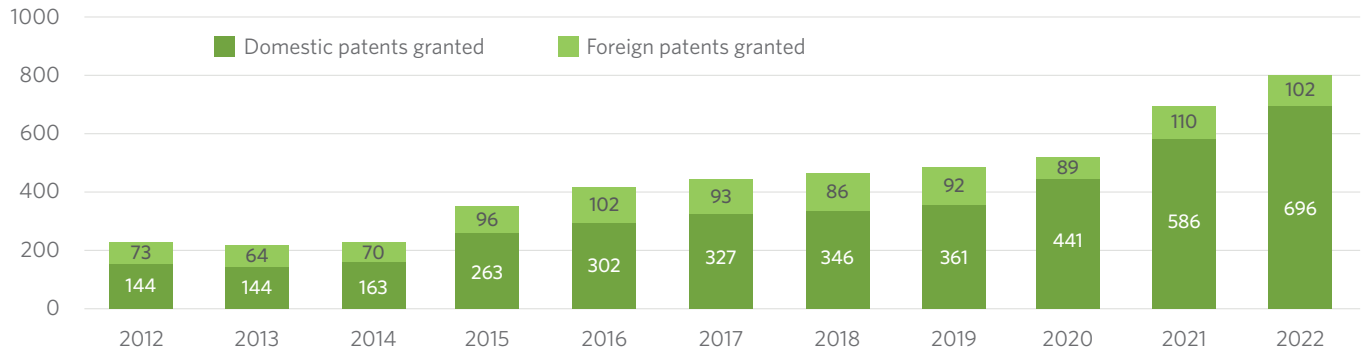


CNIPA

Filing statistics

- A total of 798,347 invention patents and 720,907 design patents were granted.

Invention patents granted from 2012 to 2022 (thousands)



- As of the end of 2022, the total number of invention patents granted and maintained valid in China reached 4.212 million, a year-on-year increase of 17.1%.
- The number of domestic invention patents was 3.28 million, accounting for 77.9% of the total, a year-on-year increase of 21.3%.
- The number of foreign invention patents in China was 860,000, accounting for 20.4% of the total, a year-on-year increase of 4.5%.

13.0 months	16.5 months
Average Pendency for High-value Patent Examination	Average Pendency for Invention Patent Examination

1,286	607
Applications for International Registration of Designs Filed by Chinese Applicants under the Hague Agreement	Applications for International Registration of Designs Entering China after the Publication of the International Registration

- The number of domestic enterprises that possess valid invention patents was 35,000, increased by 57,000 enterprises compared with the previous year.

USPTO

Filing statistics

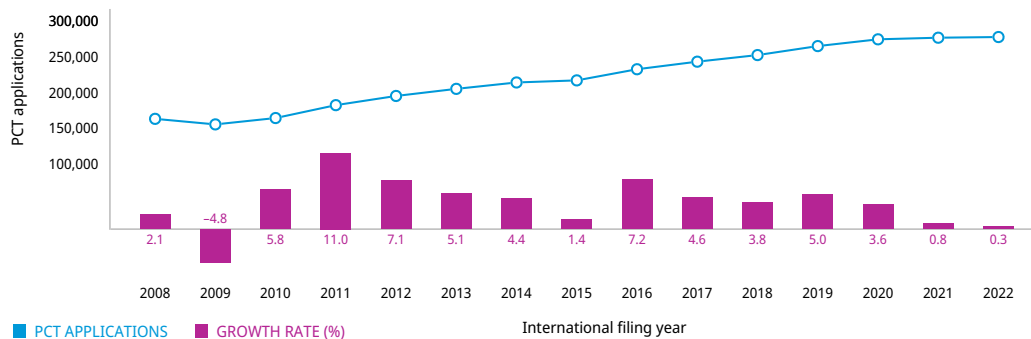
- The design patent inventory is 76,014.
- As of January 2023, the Patent Trial and Appeals Board (PTAB) total ex parte inventory was 4,515 cases.
- As of January 2023, PTAB ex parte rehearing inventory was 16.
- The number of countries and regions trained in fiscal year 2022 was 163.
- The number of U.S. stakeholders assisted by IP attachés in fiscal year 2022 was 8,818.
- Number of people, including foreign government officials and U.S. stakeholders, trained on best practices to protect and enforce intellectual property in fiscal year 2022 was 18,643.

WIPO

PCT filings

- Total PCT filings in 2022: 278,100, the highest number ever recorded in a single year.
- Greatest growth in PCT filings among the top 20 origins, 2021-2022: India (+25.4%) and the Republic of Korea (+6.2%).
- Main source of PCT applications: Asia, accounting for 54.7% in 2022, up 14.4% over 2012.

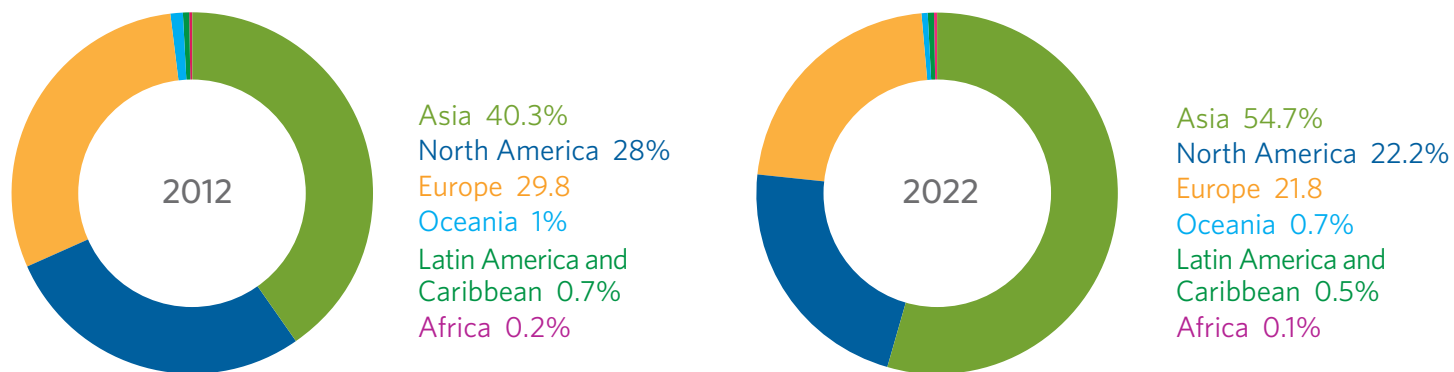
Trend in filings of PCT applications, 2008-2022



Note: Data for 2022 are WIPO estimates

- Top 5 origins of PCT applications in 2022:
 - China: 70,015
 - United States: 59,056
 - Japan: 50,345
 - Republic of Korea: 22,012
 - Germany: 17,530
- Largest shares of published PCT applications, by technology:
 - Computer technology: 10.4%
 - Digital communication: 9.4%
 - Electrical machinery: 7.1%
 - Medical technology: 7%
 - Measurement: 4.6%
- Of the top 10 fields of technology, eight saw growth in 2022, with digital communication (+8.7%) and computer technology (+8.1%) seeing the fastest rate of growth, followed by semiconductor (+6.8%), biotechnology (+6.7%) and electrical machinery (+6.1%). After the particularly strong growth in health-related technology fields in 2021, digital technology fields returned to the fastest growing fields among PCT applications in 2022.
- Top 5 filers of PCT applications:
 - Huawei Technologies of China: 7,689
 - Samsung Electronics of the Republic of Korea: 4,387
 - Qualcomm of the US: 3,855
 - Mitsubishi Electric of Japan: 2,320
 - Ericsson of Sweden: 2,158
- Samsung Electronics had the fastest growth rate among the top 10 applicants, with an increase of 44.3%, which propelled it to the top two spot. 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%.
- Asia remained the main source of PCT applications, accounting for 54.7% of the 2022 total, up 14.4% from 2012.

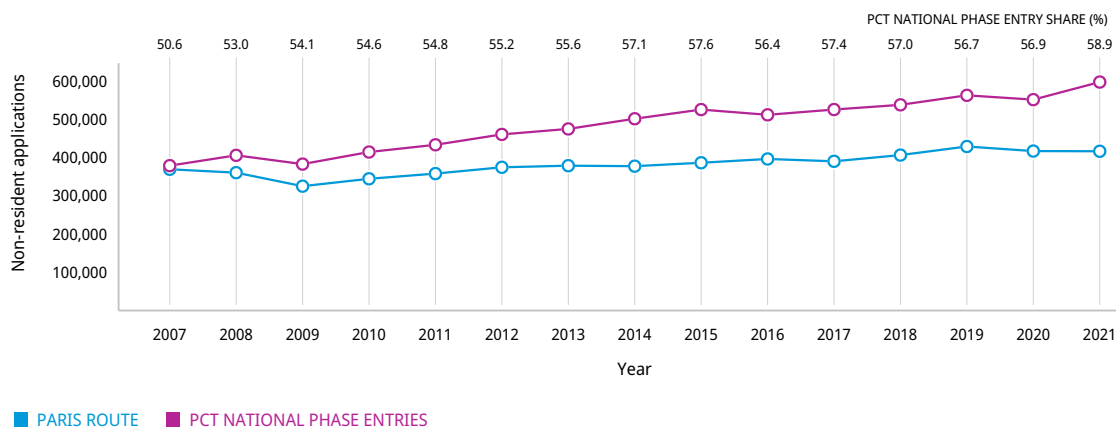
Distribution of PCT applications by region, 2012 and 2022



Source: World Intellectual Property Organization

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

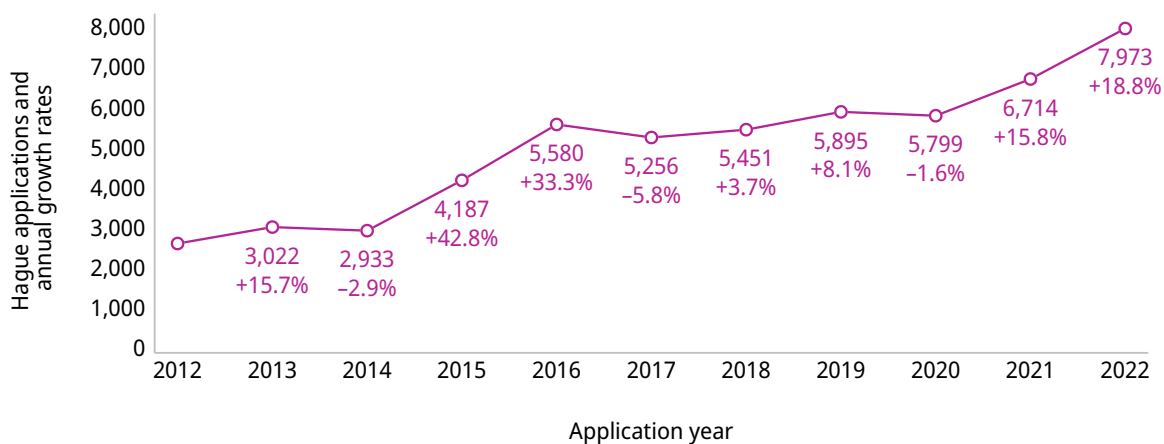
Trend in non-resident patent applications by filing route, 2007-2021



Hague filings

In 2022, Hague international applications experienced a second consecutive year of double-digit growth, increasing by 18.8%.

Hague international applications, 2012-2022



Note: Data for 2022 are WIPO estimates.

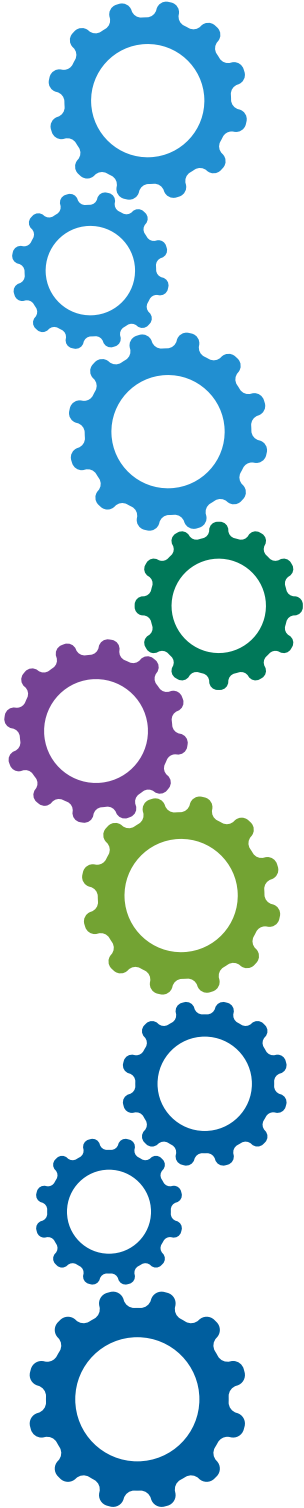
Worldwide patent filings

- Innovators around the world filed 3.4 million patent applications in 2021, up 3.6% from the previous year, with offices in Asia receiving 67.6% of all applications worldwide. Strong growth in patent filings in China (+5.9%), the Republic of Korea (+5%) and India (+8.5%) drove the global growth in patent applications in 2021, propelling the share of Asian filings to cross the two-thirds threshold. Patenting activity in the United States (-1%) and Germany (-5.7%) declined in 2021.

New members of the PCT

- Jamaica, Iraq, and Cabo Verde joined the PCT in 2022, and Mauritius did in 2023. The PCT now has 157 Contracting States.

Strategic partnerships



EPO

- EPO — International Energy Agency
www.iea.org/news/hydrogen-patents-indicate-shift-towards-clean-technologies-such-as-electrolysis-according-to-new-joint-study-by-iea-and-epo
- EPO — International Renewable Energy Agency
www.irena.org/publications/2022/May/Innovation-Trends-in-Electrolysers-for-Hydrogen-Production
- EPO shares knowledge on green techs via e-trainings, events in collaboration with other partners www.epo.org/about-us/annual-reports-statistics/statistics/2022/insight-new-energy-landscapes.html

JPO

- JPO organized the international symposium on IP - Initiatives to Solve Environmental Issues through WIPO GREEN- in collaboration with JIPA and WIPO in June 2021
www.jpo.go.jp/e/news/kokusai/seminar/wipo_green.html

KIPO

- Agreement with Korea Technology Finance Cooperation and Industrial Bank of Korea
www.state.gov/reports/2022-investment-climate-statements/south-korea

CNIPA

- Consulted the expert opinions of the National Development and Reform Commission, Experts Consultation Committee of the CNIPA, Dalian Chemistry and Physics Institute of the Chinese Academy of Sciences, Beijing Low-carbon Clean Energy Institute of the CHN Energy, etc. in drafting the IPC Green and Low-Carbon Technology Inventory.
https://english.cnipa.gov.cn/module/download/down.jsp?i_ID=182612&colID=3192

USPTO

- The USPTO and National Oceanic and Atmospheric Administration (NOAA) created a work-sharing program to advance green technology. www.uspto.gov/about-us/news-updates/noaa-us-patent-and-trademark-office-create-work-sharing-program-advance-green
- Rejoined Paris Agreement in January 2021
www.state.gov/the-united-states-officially-rejoins-the-paris-agreement
- Department of Energy and the Office of Science and Technology Policy
www.whitehouse.gov/ostp/news-updates/2022/11/22/a-white-house-call-for-real-time-standardized-and-transparent-power-outage-data
- National Oceanic and Atmospheric Administration (NOAA) and the National Institute of Standards and Technology (NIST)
www.whitehouse.gov/wp-content/uploads/2023/03/FTAC_Report_03222023_508.pdf

fiveIPoffices

European Patent Office /// Japan Patent Office ///

Korean Intellectual Property Office ///

National Intellectual Property Administration, PRC ///

United States Patent and Trademark Office