

## **POWERING SUSTAINABILITY - THE RISE OF GREEN PATENTS**

### **WHY IS THE RACE FOR GREEN PATENTS INTENSIFYING?**

Over the past decade, climate change mitigation has evolved from a theoretical policy goal to a tangible force behind national economic planning and corporate strategy. From silicon chemistry in solar panels and cell design in EV batteries to novel approaches to biodegradable plastics and carbon capturing, inventions that reduce emissions or substitute fossil derived materials are increasingly becoming important in terms of environmental impact, commercial value, and geopolitical leverage. The International Energy Agency estimates that the world must invest roughly *US\$4 trillion* each year in clean-energy technologies by year 2030 if we are to stay within the 1.5 °C pathway<sup>1</sup>. That sheer scale of capital creates a powerful incentive for startups, multinational corporations, and sovereign governments to secure intellectual-property rights over the inventions that will enable the transition. That is why startups, companies with multibillion-dollar supply chains, and governments looking to gain industrial leadership are all making significant investments in patenting, licensing, and regulating green inventions.

Green patents are seen by startups as a tool for persuading venture capital. A strong patent portfolio can significantly increase a startup company's valuation and exit prospects because venture capital firms now devote a sizable portion of their capital to climate tech. *PitchBook* estimates that *US\$24 billion* was invested in climate tech VC funding in 2022 alone<sup>2</sup>.

Across major economies, policies like the European Union's Fit for 55<sup>3</sup>, the United States' Inflation Reduction Act of 2022 (IRA)<sup>4</sup>, and Made in China 2025 (MIC2025)<sup>5</sup> strategy promotes green patents by rewarding firms with patented or homegrown green technologies through tax credits, subsidies, or preferential procurement.

---

<sup>1</sup> International Energy Agency. *Net Zero by 2050: A Roadmap for the Global Energy Sector*. 2023.

<sup>2</sup> Six 🔥 climate tech trends to watch for in 2023 - [Six climate tech trends to watch for in 2023 | TechCrunch](#)

<sup>3</sup> Fit for 55 - <https://www.consilium.europa.eu/en/policies/fit-for-55/> .

<sup>4</sup> The US Inflation Reduction Act: Is it a Green Deal? - [The US Inflation Reduction Act: Is it a Green Deal? – European Chair for Sustainable Development and Climate Transition](#) .

<sup>5</sup> Made in China 2.0: The future of global manufacturing? - [Made in China 2025 set the tempo of China's industrial ambitions | World Economic Forum](#) .

## WHAT ARE GREEN PATENTS?

**A green patent is a patent, the primary purpose of which is environmental benefit, whether it be by cutting carbon emissions or improving resource efficiency. It is also sometimes referred to as an eco-innovation or clean-tech patent.** A green patent is not necessarily a patent, rather, it is a legal category of innovations that are environment-friendly or eco-innovative. Further, **a patent does not need to be labelled “green” by the applicant, but the invention must be demonstrably for the benefit of the environment.** There are mainly three characteristics of green patents that are increasingly considered by courts in adjudicating such related disputes which are as follows:

- The invention must have an explicit environmental objective, such as the mitigation of CO<sub>2</sub> emissions or adaptation to climate impacts.
- It must meet the usual patent requirements of novelty, non-obviousness, and full disclosure.
- The patent should include measurable impact data such as percentage reductions in emissions or energy-efficiency gains, etc, that substantiate the claimed environmental advantage.

Green patents encompass technologies in the fields of energy (*wind turbine controls, solar cells*), transportation (*battery chemistries, charging infrastructure*), industry (*low-emissions cement, carbon-capture processes*), materials (*bioplastics, biodegradable coatings*), and waste/water management.

## WIPO'S GREEN INVENTORY AND THE IPC GREEN INVENTORY

The World Intellectual Property Organisation (WIPO) launched the Green Inventory in 2012, a searchable database that aggregates patent families worldwide. WIPO GREEN is an online platform that links suppliers and buyers of sustainable technologies. It houses technology offers, requirements, datasets, and a network that aims to spread green tech around the world. It relies on keyword tagging and cross-references to the International Patent Classification (IPC) symbols system, which selects around 200 green topics and maps them to the most relevant IPC codes so examiners, researchers and companies can reliably find patent documents related to environmental technologies. The IPC Green Inventory is used worldwide as an authoritative way to identify patents that pertain to energy-saving, emissions-reducing or resource-efficient inventions. In easier terms, WIPO Green is like a marketplace or platform dedicated to sustainable technology, whereas the IPC Green is like a tool for patent classification.

## ROLE OF GREEN PATENTS IN INDIA'S CLIMATE STRATEGY

The Indian climate strategy is anchored on Green Patents which provide an incentive for Research and Development and utilize Clean Energy Technology, Waste Management Systems and Energy Saving Solutions to achieve NDC Submissions of a minimum of 500 Gigawatts of Non-Fossil Capacity by year 2030 with Net Zero Capabilities by year 2070. Between year 2016 and year 2022, India issued over 61,000 green patents with 90% of these patents in the areas of Alternative Energy and Waste Management Technologies, resulting in over 40% growth in renewables, which attract Foreign Direct Investment through Intellectual Property (IP) Protection and support technologies such as Electric Vehicle (EV) Tech through Expedited Examination and supported by the 2016 Rules, which created seven-month grant periods for start-ups like Matter Motors<sup>6</sup>. Few of the Examples of Green Patent in India are as follows:

- Eco-friendly bioplastics from dairy waste invented by Gitam University
- Electric vehicle (EV) technology, battery management, and charging infrastructure by Tata Motors & Mahindra & Mahindra
- Energy-efficient solutions and heavy machinery, contributing to industrial sustainability by BHEL (Bharat Heavy Electricals Ltd.)
- IoT-driven solutions for smart water management and conservation in buildings by DigitalPaani & WEGoT

## PATENTABILITY CHALLENGES UNDER SECTION 3 OF THE INDIAN PATENT ACT:

The Patents Act, 1970 of India lays down 19 classes of inventions which may not be patented, while requiring that all “green” inventions are proven to be novel, inventive (non-obvious), and have industrial applicability as defined in ss. 2(1)(j) – (ja) and further that such inventions provide a tangible technical advantage compared to existing processes in order to overcome the barriers to public interest.

The primary obstacle for green inventions is *Section 3(d)* because it prohibits the “*evergreening*” of substances already known unless they have demonstrated an increase in efficacy therefore, the Applicants must quantify the environmental benefits of the inventions. The PTAB has rejected virtually all mixtures of green inventions

---

<sup>6</sup> India's leading patent trends: Green technologies - [https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/indias-leading-patent-trends-green-technologies-2022-02-08\\_en](https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/indias-leading-patent-trends-green-technologies-2022-02-08_en)

as in *Section 3(e)* (i.e, biofuels), due to the lack of synergy being a major cause of *rejection (approximately 40% of newly filed green applications being rejected based on empirical data)*.

Agricultural methods fall under *Section 3(i)*, while plants/animals/microorganisms fall under *Section 3(j)*, they must be subjected to human intervention that differentiates them from nature. Green software inventions are subject to *Section 3(k)* as such inventions require hardware integration to be patentable.

## KEY LEGAL BATTLES SHAPING THE GREEN PATENT LANDSCAPE

As the race for the Green Patents intensifies, so do the legal conflicts around it among companies across jurisdictions.

- **CATL vs CALB** – Recently, China’s battery company giant CATL sued CALB<sup>7</sup> over patent infringement relating to battery modules and sought damages, to which CALB challenged the patent at the National IP office. Such a battle between these two rivals is nothing new; over the past years, there have been around six patent infringement cases between these global battery manufacturing giants. This shows how corporations contest each other in legal conflicts over the protection of the battery module IP.
- **LG Chem vs Ronbay** – In the case of LG Chem vs Ronbay<sup>8</sup>, LG Chem, a leading Korean brand that makes materials for EV batteries, sued a subsidiary of the Chinese company Ronbay on the alleged misuse and unfair trade practices regarding the cathode and high-nickel patented materials, which apparently can boost the power and capacity of high-nickel cathode materials.
- **Tesla vs. Matthews** – In another ongoing prominent case, Tesla v. Matthews<sup>9</sup>, Tesla sued its former supplier, Matthews International Corporation, for damages exceeding \$1billion, alleging misuse and disclosure of trade secrets related to Tesla’s dry-electrode battery technology, known as the 4680 battery cells. Tesla plans to launch four different variants of these battery cells by year 2026. Apparently, the 4680 battery cell is a complete game-changer in battery cell technology, as it is claimed

---

<sup>7</sup> Chinese battery giant CATL takes CALB to court over alleged patent violation - [Chinese battery giant CATL takes CALB to court over alleged patent violation | Reuters](#).

<sup>8</sup> LG Chem files patent suit against China’s Ronbay - [LG Chem files patent suit against China's Ronbay - The Korea Times](#).

<sup>9</sup> Tesla vs. Matthews: The Legal Battle Over Battery Tech - [Tesla vs. Matthews: The Legal Battle Over Battery Tech – ilovetesla.com](#)

that they can drastically reduce energy consumption, size, and cost, while increasing power. Matthews defended the case, contending they have a prior claim over it, and Tesla thus cannot sue Matthews for patent infringement. The U.S. District Court Judge Edward Davila, giving an order against Tesla, has denied restraining Matthews from manufacturing and selling these battery cells. Meanwhile, Tesla has filed for an appeal in the higher court. The conflict between Tesla and Matthews illustrates the bigger problems in the tech industry, where new ideas are always being tested against the clock of legal and competitive constraints. It highlights the importance of intellectual property in a tech-driven corporate environment.

- **Gene Campaign vs. Union of India, 2024 INSC 545** – The decision in *Gene Campaign vs. Union of India*<sup>10</sup> has reshaped India’s legal framework for green and biotech patents. The case revolved around the approval of genetically modified mustard. The apex court simultaneously reviewed how the country handles innovations that intersect with environmental concerns. The Supreme Court struck a balance by affirming the need to support scientific progress and patent protection for technologies that promote agricultural and environmental sustainability, while insisting on rigorous safety assessments and strong regulatory oversight. The directives so issued are expected to create a landscape where green patents must be backed by solid evidence and enjoy public trust. The ruling provides a template for courts to balance patent-driven innovation with ecological protection and societal welfare.
- **Dr. Joy Vadakkan Thomas vs. Assistant Controller of Patents and Designs, CMA(PT)/20/2024** – The Madras High Court, in the case of *Dr. Joy Vadakkan Thomas v. Assistant Controller of Patents and Designs*<sup>11</sup>, has overturned the Patent Office’s refusal of an application for a single-stage carbon capture method, holding that the rejection lacked proper justification. The Court noted that the prior art cited by the Patent Office involved multi-step, soluble processes that were not comparable to the applicant’s insoluble, one-step technique. It also criticised the authorities for raising a new ground, comparison with an already granted patent, for the first time during the appeal. The Court has sent the case back for a fresh evaluation by a different officer, directing the Patent Office to reassess whether

---

<sup>10</sup> *Gene Campaign vs. Union of India*, 2024 INSC 545.

<sup>11</sup> *Dr. Joy Vadakkan Thomas vs. Assistant Controller of Patents and Designs*, CMA(PT)/20/2024 - [H.C. Delhi, March 4, 2025 CMA\(PT\)/20/2024](#).

the invention provides any technical or economic improvement and to give the applicant a fair opportunity to be heard before issuing a new order.

- **West Bengal Chemical Industries Limited v. GTZ (India) Private Limited West Bengal, CS-COM 513 of 2024** – *Chemical Industries Limited v. GTZ (India) Private Limited*<sup>12</sup> is a notable case in which WBCIL claimed that GTZ (India) had violated its chemical process patent. The Calcutta High Court observed that there has been a patent infringement on the account of GTZ (India). The court granted an interim injunction in favour of WBCIL, noting not restraining GTZ (India) would cause an irreparable loss to WBCIL. The Court emphasised the value of defending intellectual property rights to promote innovation by granting an interim injunction in favour of WBCIL. This case demonstrated how crucial it is to safeguard green technology patents so that inventors can profit from their creations and keep coming up with fresh approaches to environmental issues.
- **LONGi vs JinkoSolar: A Solar Technology Crossover: (China/US) A Solar Technology Lawsuit** between (China's) LONGi vs (China's) Jinko Solar commenced in March 2025 in the United States District Court, Eastern District of Texas, where (LONGi) accused (Jinko) of infringing TOPCon (Cell/Module) Patents and was seeking injunctions from the Federal Courts, damages, and other remedies. <sup>13</sup>Shortly thereafter, (Jinko) filed its own countersuit against (LONGi) in China (Nanchang Court) alleging that (LONGi) infringed on the TOPCon rights of (Jinko) in the opposite manner. Ultimately both companies settled their global litigation by September 2025, at which time (LONGi & Jinko) entered into a cross-licensing and cooperative R&D investment agreement, all of which illustrates the significance of the continued development of TOPCon technology for both companies.
- **Livestock** - The Delhi High Court ruling on the livestock vaccine Patent Application No. 201717005699 shows that even though the patent on microorganisms listed under *section 3(j)* after the Mashelkar Committee has been rejected, there still remain hurdles with respect to inventive step (*especially as it relates to biotech-green areas*)<sup>14</sup>. The ruling has to carefully navigate the amendments

---

<sup>12</sup> *West Bengal Chemical Industries Limited v. GTZ (India) Private Limited West Bengal*, CS-COM 513 of 2024.

<sup>13</sup> *LONGi Sues Jinko Solar in US over TOPCon Patent Infringement*- <https://www.mercomindia.com/longi-sues-jinko-solar-in-us-over-topcon-patent-infringement>.

<sup>14</sup> *Delhi High Court Stirs the Pot for Biotech Patent Applicants in India*- <https://spicyip.com/2025/02/delhi-high-court-stirs-the-pot-for-biotech-patent-applicants-in-india.html>



made to the 2005 Patents Act balancing the need for innovation while at the same time providing certain exclusions (*naturally occurring biotech*) to achieve sustainability in agricultural practices.

## END NOTE:

The green patent race has fundamentally transformed intellectual property law from a purely commercial safeguard to a global climate action and economic strategy. Looking forward, as awareness of climate change increases, there will be more conflicts around green patents. Even though the current patent race is largely driven by national interests, there is a possibility of a shift toward collaborative frameworks. The success of open-source projects in the biosciences and software industries offers examples of how to strike a balance between the demands of collective action and proprietary interests. Similarly, the increasing awareness that climate change cuts across national borders may lead to new kinds of global collaboration, technology sharing, coordinated regulatory standards, and patent pools. At the end, it all comes down to humanity's collective ability to develop, use, and scale the technologies necessary for a sustainable future.

Recent examples exist in both the open-source bio-sciences, such as pledging to share COVID-19 vaccines, and in the development of open-source software: the Eco-Patent Commons, which was established in 2008 by IBM and Nokia, committed over 100 different green patents to remain available for free, by way of royalty-free licenses, to anyone wishing to utilize these innovations for their own benefit (*pollution-cutting*) thus allowing for shared efforts without the negative impact on R&D and innovation validly achieved through their original inventors.<sup>15</sup>

Through this evolution, the public interest is supported by democratising Eco-innovations (*such as carbon capture technology and solar panel efficiency technology*) for vulnerable communities and breaking down the IP barriers that currently restrict over 80% of technology transfer from the developed world to the Global South (according to empirical studies). Journals, such as GRUR International (2025), state that compulsory mechanisms and pools help to optimize dissemination without compromising the incentive to innovate in the upstream. The Journal of International Economic Law (2025) suggests a model of entitlement based on climate change that will override patents. Research Policy (2023) states that collaborative IP has been shown to increase the speed of mitigation efforts by upwards of 20-30%.

---

<sup>15</sup> Patent Rights in Eco-Innovation: Incentivizing Production and Dissemination of Green Technologies through Eco-Standards  
<https://academic.oup.com/grurint/article-abstract/74/9/817/8209515?redirectedFrom=fulltext&login=false>

Ultimately, the key to success will be the willingness of all parties to work together in order to scale green technologies through the establishment of pools, open licensing, and coordinated standards to create a sustainable future for the environment that prioritises environmental concerns over proprietary interests.