No Need to Reinvent the Wheel: The Positive Relationship Between Green Technology and Patent Enforcement

Addison S. Fowler

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NO NEED TO REINVENT THE WHEEL: THE POSITIVE RELATIONSHIP BETWEEN GREEN TECHNOLOGY AND PATENT ENFORCEMENT

I. Necessity, Mother of Invention: The Issue of Climate Change and the Crucial Role of Technology to Confront It

The climate change phenomenon presents an enormous challenge to human civilization.\(^1\) Within Earth’s biosphere, carbon emissions threaten the health of the natural ecosystems upon which societies rely.\(^2\) Abrupt changes to ecological systems, impacts on biodiversity, and disruptions to food production are all serious maladies that trace their roots back to the changing climate and carbon emissions.\(^3\) Climate change displaces populations and adversely impacts human health, infrastructure, and economic performance.\(^4\) In 2018, Congress identified climate change as a “direct threat” to United States national security.\(^5\) Moreover, from a sociopolitical standpoint, researchers have observed an association between the threat of climate change and increased authoritarian tendencies among populations.\(^6\)

While many factors impact climate fluctuations, human greenhouse gas production, namely through carbon dioxide emissions,

\(\begin{align*}
1. & \text{For a discussion on the hazards of climate change to humanity, see infra notes 2-6 and accompanying text.} \\
2. & \text{Yadvinder Malhi, Janet Franklin, Nathalie Seddon, Martin Solan, Monica G. Turner, Christopher B. Field & Nancy Knowlton, } \textit{Climate Change and Ecosystems: Threats, Opportunities and Solutions}, 375 PHIL. TRANSACTIONS ROYAL SOC’Y B, at 1 (2020) (explaining climate change threat). \\
3. & \text{See id. at 1-2 (reporting impact of climate change on natural environment); see also Amos P.K. Tai, Maria Val Martin & Colette L. Heald, } \textit{Threat to Future Global Food Security from Climate Change and Ozone Air Pollution}, 4 NATURE CLIMATE CHANGE 817, 819 (2014) (projecting decreased global food production associated with rising global temperatures). \\
\end{align*}\)
heavily contributes to rising temperatures.\(^7\) Greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, raise the temperature of the Earth’s atmosphere by capturing solar energy reflected from the Earth’s surface and emitting it as heat.\(^8\) The concentration of atmospheric carbon dioxide has risen by more than forty percent since the Industrial Revolution — over half of which has accumulated since 1970.\(^9\) Given humanity’s continued reliance on fossil fuel energy and other activities that produce greenhouse gases, the continued warming of the Earth can be projected with high certainty.\(^10\)

Innovation within a wide range of technological areas will be a crucial aspect of addressing climate change because of the breadth and scope of the problem.\(^11\) The Inter-Governmental Panel on Climate Change (IPCC) is looking in part to technological progress to help facilitate climate change mitigation and foster sustainable economic development.\(^12\) Innovations in both efficient energy production and consumption will be necessary to reduce emissions.\(^13\) The IPCC’s faith in innovation appears well-founded, as global studies


\(^8\) Id. at B1 (explaining atmospheric and climate dynamics of greenhouse gas effect).

\(^9\) Id. at B2 (recounting historical carbon dioxide levels).


\(^12\) See Intergovernmental Panel on Climate Change, Working Group III, Climate Change 2022: Mitigation of Climate Change 1646 (Priyadarshi R. Shukla et al. eds., 2022) [hereinafter Working Group III] (expressing need for rapid innovation and diffusion of knowledge).

reveal that changes in levels of carbon emissions are predictive of a higher propensity toward green innovation in response.\textsuperscript{14} Moreover, researchers have demonstrated that the uptake of renewable energy technological innovations creates a “significant” reduction in carbon emissions.\textsuperscript{15}

Encouragingly, on the energy production front, one report on the costs of electricity generation by source shows that renewable sources are globally becoming more cost-competitive with traditional fossil fuels.\textsuperscript{16} The United States, however, continues to extract a majority of its energy consumption from fossil fuels.\textsuperscript{17} Technological innovation has historically been and continues to be crucial in transitioning to cleaner, more efficient forms of energy.\textsuperscript{18}

A system that fosters both innovation and widespread diffusion of technology will be essential to harness the environmental benefits of green technology.\textsuperscript{19} Such a system requires a well-functioning legal regime of intellectual property (IP) that incentivizes innovation without creating undue obstacles to technological uptake.\textsuperscript{20} IP protections are indispensable to technological advancement because they attract necessary investment and facilitate both specialization

\begin{itemize}
  \item 19. See Working Group III, \textit{supra} note 12, at 1646 (expressing urgent need for innovation and diffusion of green technology).
  \item 20. For a further discussion of patent law and innovation incentives, see \textit{infra} notes 28-34 and accompanying text.
\end{itemize}
and competition.\textsuperscript{21} This specialization enables efficient use of resources, which breeds invention and ensuing innovation.\textsuperscript{22}

This Comment explores the enforcement of patent rights with a focus on bettering environmental outcomes.\textsuperscript{23} Part II provides a background of patent law and the use of injunctive relief against defendants in infringement actions.\textsuperscript{24} Part III explores recent case law grappling with the public interest considerations of granting injunctive relief, including a discussion of an especially hopeful decision, \textit{Siemens Gamesa Renewable Energy A/S v. General Electric Co.}\textsuperscript{25} Finally, Part IV scrutinizes certain proposals that seek to reshape patent law – ostensibly to better climate prospects – and proposes an alternative approach via pre-existent injunctive relief analysis.\textsuperscript{26} Part IV also considers this approach’s potential impact on the fight against climate change.\textsuperscript{27}

\section{The Drawing Board: An Introduction to Patent Law and Injunctive Enforcement}

In economic terms, technology and knowledge are considered public goods because their use is “non-rival” and “non-excludable.”\textsuperscript{28} This means individuals can use public goods simultaneously, so one person’s use does not deter another’s.\textsuperscript{29} Because each additional user can access a public good for free, pure market forces are inadequate to produce new technology and knowledge efficiently.\textsuperscript{30}

\begin{thebibliography}{99}
\footnotesize
\bibitem{22} Id. at 160 (explaining implications of specialization).
\bibitem{23} For a further discussion of the association between patent enforcement and environmental outlook, see \textit{infra} notes 219-29 and accompanying text.
\bibitem{24} For a further discussion of patents and injunctive relief, see \textit{infra} notes 28-86 and accompanying text.
\bibitem{25} 626 F. Supp. 3d 468, 475 (D. Mass. 2022) (announcing tailored injunction). For discussion of select injunction case law, see \textit{infra} notes 87-178 and accompanying text.
\bibitem{26} For an assessment of various proposals related to patent rights and environmental concerns, see \textit{infra} notes 179-229 and accompanying text.
\bibitem{27} For a discussion of patent enforcement and its relationship to future public access to green technology, see \textit{infra} notes 219-29 and accompanying text.
\bibitem{29} See \textit{id.} (highlighting public goods dynamics).

\end{thebibliography}
In essence, without patents, once an inventor creates technology, others can adopt the technology without the cost of invention.\textsuperscript{31} Thus competitors are able to undercut the inventor, disincentivizing further innovation by the original inventor.\textsuperscript{32} Patents ensure incentives to innovate remain in place by granting patent-holders the ability to monetize their inventions.\textsuperscript{33} This system provides an avenue for inventors to recoup the cost of research and development (R&D) and thus continue to innovate.\textsuperscript{34}

For environmentally beneficial technology, however, a separation exists between traditional market forces and the social benefits the inventions produce.\textsuperscript{35} This is because an improved environment is itself a public good from which entities may benefit independent of their own contribution or investment.\textsuperscript{36} In combination with the public good characteristics of knowledge, this “double market failure” diminishes the level of environmentally friendly technology markets provide below a socially optimal level, absent external intervention.\textsuperscript{37}

A. Patents and Their Legal Underpinnings

Patent law provides a legal regime for intellectual property ownership of inventions and is essential to ensuring that society maintains incentives for inventors to innovate.\textsuperscript{38} By providing incentives to invest in innovation, patents aim to counteract the public good market failure.\textsuperscript{39} They achieve this by creating an exclusionary

\textsuperscript{31}See WIPO Report, supra note 28, ¶ 28 (explaining market failure).
\textsuperscript{32}See WIPO Report, supra note 28, ¶ 30 (noting implications of knowledge as public good); see also F. Scott Kieff, Property Rights and Property Rules for Commercializing Inventions, 85 MINN. L. REV. 697, 708-10 (2001) (describing later market participants’ advantages in commercialization of nascent technologies).
\textsuperscript{33}See WIPO Report, supra note 28, ¶ 30 (demonstrating incentive problem with knowledge as public good).
\textsuperscript{34}See supra notes 28-34 and accompanying text.
\textsuperscript{35}See id. at 233 (reporting systematic market gap between market demand and social value with respect to environmentally beneficial technology).
\textsuperscript{36}See id. at 233-34 (discussing externalities of environmental treatment).
\textsuperscript{37}See id. at 235-36 (summarizing impact of market failures surrounding green technologies); see also Scott Taylor, Where Are the Green Machines?: Using the Patent System to Encourage Green Invention and Technology Transfer, 23 GEO. INT’L ENV’T L. REV. 577, 580 (2011) (noting importance of correcting double market failure to combat climate change).
\textsuperscript{38}For discussion on innovation incentives, see supra notes 28-34 and accompanying text.
\textsuperscript{39}See WIPO Report, supra note 28, ¶ 31 (describing economic rationale for patent system).
right for patentees, allowing patentees to prevent “[f]ree riders” and monetize their discoveries.\textsuperscript{40} This system is demonstrably effective, as there is strong empirical evidence that intellectual property protections spur innovation in highly developed countries with significant levels of education and economic freedom.\textsuperscript{41}

The United States grounds patent law in Article I, Section 8 of the Constitution, which grants Congress the authority “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”\textsuperscript{42} The United States must implement patent law through federal legislation, as the Constitution’s language here is not self-executing.\textsuperscript{43} Accordingly, Congress codified patent law within Title 35 of the United States Code.\textsuperscript{44} The Supreme Court has characterized the constitutional underpinnings as “both a grant of power and a limitation,” in that patent laws must comply with the stated constitutional purpose.\textsuperscript{45}

\textbf{B. Exclusivity and Injunctive Relief}

A patent grants a patentee rights in the protected material akin to a property right.\textsuperscript{46} The Supreme Court described the right to exclude others from one’s property interest as the “hallmark” of the bundle of rights granted by patent protection.\textsuperscript{47} As set forth in Title 35, the patent right is “the right to exclude others from making, using, offering for sale, or selling the invention . . . or importing the invention into the United States.”\textsuperscript{48}

\begin{small}
40. See id. ¶ 3031 (explaining exclusionary right granted by patent).
42. U.S. CONST. art. I, § 8, cl. 8. (granting congressional power to support technological innovation).
43. PAT. L. FUNDAMENTALS, supra note 33, § 1:4 (noting functionality and nature of constitutional power grant).
44. LAWRENCE M. SUNG, PATENT LAW HANDBOOK § 1.1 (2023) (referencing location of patent law in U.S. code).
46. See Patent Act, 35 U.S.C. § 261 (announcing patents to retain attributes of personal property); see also PAT. L. FUNDAMENTALS, supra note 33, § 1:4 (outlining rights conferred by patent).
\end{small}
The exclusionary right granted by a patent is a negative right, meaning patentees may only enforce it through injunctive relief. Section 283 provides that courts may grant injunctions on terms the court finds reasonable according to the principles of equity. Once infringement has been established, historically courts have generally granted patentee requests for a permanent injunction against the infringing activity. Injunction law more broadly, courts adjudicate requests for injunctive relief equitably according to several “well-established principles.” Among them are, the parties’ competing claims of irreparable injury, the consequences for each party of an injunction or lack thereof, the adequacy of legal remedies otherwise, and the public interest. In the patent context, despite these considerations, between the late 1980s and 2005, the Federal Circuit considered as a “general rule” that a court should grant injunctions against patent infringement absent “exceptional circumstances.”

The Federal Circuit based its injunction preference on the right to exclude as a foundational law of property, such that, once infringement is found, it would be unjust to deny the right. Thus, as a matter of course, in conjunction with monetary damages to account for past harm, district courts granted injunctions to prevent future harm. To illustrate, in MercExchange, L.L.C. v. eBay, Inc., the Federal Circuit acknowledged isolated instances in which courts denied

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49. See Edmund J. Sease, Court Decisions and Recent Legislation Are Creating a “Perfect Storm” Incentive for Inventors to Rely on Trade Secrets, Not Patents, 69 Drake L. Rev. 53, 59 (2021) (defining role and enforcement of negative rights). “A patent is not a grant of a right to make anything,” but rather a right to exclude others from the patented subject matter. Id. (stressing importance of injunctive relief for protecting patents).

50. 35 U.S.C. § 283 (providing injunction remedy).


53. Id. (expounding on equitable considerations).


56. See Angela Foster, Compulsory Licensing After eBay, N.J. Law., June 2009, at 42 (recounting court relief practices prior to eBay Supreme Court decision). For further discussion of the eBay opinion, see infra notes 72-86 and accompanying text.

57. 401 F.3d 1323, 1325 (Fed. Cir. 2005) (finding denial of permanent injunction was abuse of discretion).
injunctions to favor protecting the public interest. It observed that this exception to the general rule, however, was narrow, amounting to “rare instances.”

C. The Public Interest Inquiry

Historically, courts considering injunctive relief have assessed the potential impacts on the public’s interest before executing an injunction. In patent law, injunctions can be understood to reflect the public interest in maintaining a well-functioning patent system that provides incentives for innovation. This interest in incentivizing innovation has typically swayed the court in favor of granting a permanent injunction after a finding of infringement.

Given the general tendency toward enforcement, it is historically rare for courts to find that injunction prospects are not in the public interest. Sometimes, however, public health concerns have been controlling. An emblematic example of this was City of Milwaukee v. Activated Sludge, where an injunction would have led to a dangerous restriction on a local community’s raw sewage disposal abilities. Because an injunction would have forced the city

58. Id. at 1338 (quoting Rite-Hite Corp. v. Kelley, Inc., 56 F.3d 1538, 1547 (Fed. Cir. 1995)) (noting rarity of public interest exception).
64. See Wyatt, supra note 63, at 300 (noting historical public health exception, where concerns about injunction’s impact outweigh tradition of enforcing patent rights).
65. 69 F.2d 577, 593 (7th Cir. 1934) (reversing injunction).
66. Id. (considering implications of injunction).
to redirect the sewage into nearby Lake Michigan, the court found
the risk of pollution and threat to residents’ health and lives to be of
overriding concern.67

_Hybritech, Inc. v. Abbott Laboratories_68 further shows courts’ pro-
pensity to favor outcomes that protect human health over patent
exclusivity.69 In _Hybritech_, the Federal Circuit upheld the district
court’s decision to withhold injunctive relief against vital test kits for
cancer and hepatitis patients.70 Notwithstanding dramatic examples
such as these, however, courts historically did not place significant
weight on a public interest analysis when assessing injunctive relief.71

D. Injunctive Relief Changes Course in eBay

In 2006, the Supreme Court unanimously reasserted defer-
ence to the traditional four-factor equitable relief test in _eBay Inc.
v. MercExchange, L.L.C. (eBay)._72 The Court clarified an injunctive
relief ruling “is an act of equitable discretion by the district court,
reviewable on appeal for abuse of discretion.”73 The Court further
emphasized the long-followed Supreme Court practice of adhering
to equitable practices in injunction law.74

The Court concluded patent law was hardly an appropriate
area for a departure from this practice, instead observing that
Section 283 of the Patent Act specifically prescribes the use of equi-
table principles.75 While the Court confirmed that, as expressed in
Section 261, an aspect of a patent’s treatment as personal property
was a patentee’s right to exclusivity, it nonetheless observed Section
261’s qualifying language: “subject to the provisions of this title.”76
Section 283’s equitable prescriptions, which specify a court “may”
grant an injunction, were therefore controlling.77 The Court thus

67. _Id._ (refusing to risk disastrous sewage situation).
68. 849 F.2d 1446, 1458 (Fed. Cir. 1988) (upholding limited preliminary
injunction). Court analysis of preliminary injunctions also considers the public
interest. _Id._ (including public interest factor analysis).
69. _Id._ (noting district court’s public interest analysis with respect to cancer
and hepatitis test kits).
70. Riley & Allen, _supra_ note 55, at 756-57 (recounting _Hybritech_ court rationale
for concluding it was not in public interest to grant injunctive relief).
71. _Id._ at 757 (discussing widespread judicial approach to public interest analysis
leading up to _eBay_).
73. _Id._ (clarifying judicial process of considering injunctive relief).
74. _Id._ at 391-92 (reinforcing deference to equitable practices).
75. _Id._ (assessing Patent Act language and stating reasons to follow equitable
practice).
77. _eBay_, 547 U.S. at 392 (quoting 35 U.S.C. § 283) (deferring to Section 283’s
equity principles).
declared a four-factor test a plaintiff must satisfy in keeping with the principles of equity:

(1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury;
(3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and
(4) that the public interest would not be disserved by a permanent injunction.\(^78\)

Chief Justice Roberts’s concurrence identified the significant historical prevalence of granting injunctions in patent infringement cases.\(^79\) He urged an appreciation for this “long tradition” in courts’ equitable analyses.\(^80\) Justice Roberts also noted that monetary remedies do not easily satisfy a patentee who wishes to exclude another.\(^81\)

Justice Kennedy’s concurrence, while acknowledging the historical pedigree of injunctions in patent cases, drew attention to the evolving nature of patent ownership in the economy.\(^82\) He observed the emergence of a new business model in which an entity uses its patent portfolio primarily to obtain license fees, not to practice inventions and protect its own production – in which case an injunction would merely act as an aggressive bargaining chip.\(^83\) Justice Kennedy saw this shift as a difference in kind from the circumstances that led to the historical prevalence of courts granting injunctions.\(^84\) Further, he noted the public interest concerns implicated in situations involving this new business model, especially when the infringed patent at issue is a minor component of the overall technology.\(^85\) Justice Kennedy nonetheless expressed confidence that an equitable test is well-suited to account for such considerations as long as courts scrutinize case facts appropriately.\(^86\)

\(^78\). Id. at 391 (announcing equitable test).
\(^79\). Id. at 394-95 (Roberts, C.J., concurring) (noting past injunction practices).
\(^80\). Id. at 395 (quoting Weinberger v. Romero-Barcelo, 456 U.S. 305, 320 (1982)) (advocating deference to historical approach to equitable remedies).
\(^81\). Id. (explaining pattern of historical decisions regarding four-factor test).
\(^82\). eBay, 547 U.S. at 395-97 (Kennedy, J., concurring) (noting emergence of patent licensing industry).
\(^83\). Id. at 396 (describing IP licensing business model and questioning fairness of injunctive relief therein).
\(^84\). See id. (contrasting historical infringement actions’ satisfaction of four-factor test with new circumstances calling for different modern analysis).
\(^85\). Id. (posing sufficiency of legal damages in such situations).
\(^86\). Id. at 396-97 (asserting suitability of equitable test in assessing facts of modern infringement litigation).
III. NEW INDUSTRY-STANDARD: LEGAL LANDSCAPE POST-EBAY MAKES ROOM FOR ENVIRONMENTAL CONCERNS

“eBay marked the demise of courts’ nearly automatic grant of injunctive relief based on the presumption of irreparable harm.” As the Federal Circuit has since certified, “eBay jettisoned the presumption of irreparable harm as it applies to determining the appropriateness of injunctive relief.” Granted, the Federal Circuit has specified this development “does not swing the pendulum in the opposite direction,” noting the fundamental exclusivity of a patent property right must still be considered in the analysis. Nonetheless, a trend began in the post-eBay era for district courts to forgo permanent injunctions and instead award ongoing royalty damages.

Another noteworthy aspect of the eBay decision is that it requires district courts to affirmatively address public interest considerations in their injunction analyses. District courts have since deferred strongly to Justice Kennedy’s eBay concurrence in their

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89. Id. (measuring impact of eBay).


91. Riley & Allen, supra note 55, at 757 (noting eBay requirement that courts address public interest). While outside the focus of this Comment, it should be noted that the ITC also requires an assessment of the “public health and welfare” to adjudicate an exclusion order. 19 U.S.C. § 1337(d) (1) (prescribing exclusion analysis). This assessment has exhibited a fact-specific approach but has rarely resulted in the ITC rejecting an otherwise proper exclusion order based on public welfare concerns. See generally Riley & Allen, supra note 55, at 758-62 (surveying ITC public welfare assessment).
own decisions. As such, some observers argue the concurrence is even more impactful than the unanimous majority.

The Federal Circuit has since reflected on the public interest prong in several decisions. The court notably affirmed the public’s “strong” interest in maintaining patent property rights as a driver of innovation. Nonetheless, the court has expressed that the “touchstone” for adjudicating an injunction request involves “striking a workable balance between protecting the patentee’s rights and protecting the public from the injunction’s adverse effects.”

The Federal Circuit, in Amgen, Inc. v. Sanofi, described the public interest prong as its own independent requirement. There, the Federal Circuit went so far as to characterize the injunction the district court granted despite a finding it would be a disservice to


94. See, e.g., Metalcraft of Mayville, Inc. v. Toro Co., 848 F.3d 1358, 1369 (Fed. Cir. 2017) (focusing public interest inquiry on areas of “critical” public interest and declining to overturn preliminary injunction for abuse of discretion based on argument disruption to “status quo” of product market would constitute public harm); Apple Inc. v. Samsung Elecs. Co., 809 F.3d 633, 646-47 (Fed. Cir. 2015) (finding increased competition insufficient to deny tailored injunction); Douglas Dynamics, LLC v. Buyers Prods. Co., 717 F.3d 1336, 1345-46 (Fed. Cir. 2013) (denying that competitive pricing from infringing competitors outweighs public interest in patent system incentivizing innovation); i4i Ltd. P’ship v. Microsoft Corp., 598 F.3d 831, 863 (Fed. Cir. 2010) (reviewing favorably lower court’s injunction order which court narrowly tailored to protect public interest).

95. See Apple, 809 F.3d at 647 (weighing public interest in healthy competition against public benefit of honoring patentee’s property rights). The court further clarified that the public’s interest in patent protection outweighed a generalized benefit of competition in the marketplace. Id. (noting opposite approach would weigh public interest against patent enforcement in every case).


97. 872 F.3d 1567, 1382 (Fed. Cir. 2017) (vacating permanent injunction).

98. Id. at 1381 (declaring plaintiff who fails to satisfy public interest prong cannot be granted injunctive relief).
the public interest, as a “clear violation of eBay.” To that end, the Federal Circuit has favored injunctions tailored to avoid unduly disrupting markets and consumer interests.

In *Celgard, LLC v. LG Chem, Ltd.*, the Federal Circuit took the drastic step of disagreeing with the district court’s finding that a preliminary injunction was in the public interest. The Federal Circuit reasoned that, given the innovation’s technological importance and its corresponding benefit to consumers, the public interest weighed against an injunction because the plaintiff seeking it did not practice the invention, meaning the public would no longer have access to the technology. This case represents a current norm of patent injunction adjudication, brought on by Justice Kennedy’s *eBay* concurrence, wherein a plaintiff who does not practice an invention is denied injunctive relief.

A. Post-*eBay* Injunctions by the Numbers

Empirical analyses of decisions post-*eBay* have confirmed that injunctions are now more difficult to obtain. One assessment found that courts are 44.1 percent less likely to grant permanent injunctions post-*eBay*. Analyses have demonstrated injunction success rates of seventy to eighty percent, whereas, prior to *eBay*, courts granted the overwhelming majority of injunctions upon finding patent infringement. In the two years prior

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99. *Id.* (holding district court may not issue injunction absent demonstration it would not disserve public interest).

100. See, e.g., *Bio-Rad Labs*, 967 F.3d at 1379-80 (noting carve-out for service of products sold prior to injunction’s effective date); *TEK Global, S.L.R.*, 920 F.3d at 793 (commendming injunction’s “well-crafted sunset provision” to avoid end-user disruptions).

101. 624 F. App’x 748, 755 (Fed. Cir. 2015) (reversing preliminary injunction).

102. See *id.* at 754 (finding public interest weighs against injunction in contravention of district court assessment).

103. See *id.* (evaluating public interest considerations).


105. See Auer et al., supra note 21, at 166 (detailing empirical findings of *eBay*’s impact on patent litigation).


to *eBay*, courts denied between zero and six percent of motions for injunction.\(^{108}\)

Another analysis sought to break down the different circumstances coinciding with injunction rejections.\(^{109}\) The study noted the public interest weighed against an injunction in fifty-two percent of the denied injunctions analyzed.\(^{110}\) The study further described an outsized rejection rate for medical device injunctions and theorized it may be the result of instances where public interest weighed in favor of device access.\(^{111}\)

### B. The Public Interest and Select District Court Injunction Decisions

District courts since *eBay* have demonstrated a willingness to consider a multitude of factors when adjudicating the public interest.\(^{112}\) In fact, the Eastern District of Virginia, in its *eBay* opinion on remand, listed a series of potential considerations: "the type of patent involved, the impact on the market, the impact on the patent system, and any other factor that may impact the public at large . . . "\(^{113}\) The district court recognized that after *eBay*, the public’s interest in the integrity of the patent system could not create a presumption of public interest in favor of injunctions.\(^{114}\)

Courts, such as the District Court of Massachusetts in *Smith & Nephew v. Interlace Medical*,\(^ {115}\) have placed significant emphasis on maintaining an uninterrupted supply of life-saving medical instruments.\(^ {116}\) In *Smith*, the court found a "strong countervailing public interest" because the defense presented evidence that some doctors

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\(^{110}\) Id. at 1995 (recounting study results regarding public interest *eBay* factor).

\(^{111}\) Id. at 1999 (noting discrepancy in medical device technology litigation outcomes).

\(^{112}\) For a discussion of district court injunction adjudications considering the public interest, see infra notes 113-78 and accompanying text.


\(^{114}\) Id. (addressing implications of *eBay* ruling).


found the patent-infringing medical instrument more effective than what would otherwise be available if a permanent infringement were instituted.\textsuperscript{117} Similarly, in \textit{Waters Corp. v. Agilent Technologies Inc.},\textsuperscript{118} the Delaware District Court denied a preliminary injunction partly because an unavailability of the chemical reagent product at issue would have hampered the drug development and approval pipeline.\textsuperscript{119}

Courts’ assessments of these countervailing interests have also extended beyond human health.\textsuperscript{120} In \textit{Centripetal Networks, Inc. v. Cisco Systems, Inc.},\textsuperscript{121} for example, the District Court for the Eastern District of Virginia declined to issue a permanent injunction against Cisco, even though it found Cisco had infringed with an array of its products.\textsuperscript{122} The court explained an injunction would create significant disruptions to both civilian and military networks because Cisco’s products were interwoven within the global internet infrastructure.\textsuperscript{123} The court further reasoned monetary damages were justified in lieu of an injunction because Centripetal had previously demonstrated a willingness to accept such damages against other direct competitors.\textsuperscript{124}

While \textit{Centripetal Networks} provides a dramatic set of countervailing circumstances, other courts have considered what public interest circumstances warrant offsetting the interest in protecting patent rights and have required an element of unique social value.\textsuperscript{125} \textit{Carnegie Mellon University v. Marvell Technology Group, Ltd.}\textsuperscript{126}

\begin{footnotes}
\item[117.] \textit{Smith & Nephew}, 955 F. Supp. 2d at 80 (discussing prospect of negative impact of injunction on some doctors and their patients).
\item[119.] \textit{Id.} (explaining drug-validation pitfalls if injunction granted).
\item[120.] For discussion of additional injunction considerations, see infra notes 121-30 and accompanying text.
\item[122.] \textit{Id.} at 605-06 (finding injunction to be inappropriate legal remedy).
\item[123.] \textit{Id.} at 606 (explaining potential adverse effects on national defense and internet in general).
\item[124.] \textit{Id.} (considering patentee’s previous willingness to accept monetary damages from direct competitor which resulted in licensing agreement).
\end{footnotes}
presented these circumstances. In this case, the District Court for the Western District of Pennsylvania determined that the complex spill-over effects an injunction might have caused for the computer chip supply chain conditions made it appropriate to permanently enjoin Marvell. The court also pointed to the public funding used to facilitate the patent holder, Carnegie Mellon’s research that yielded the patented technology. It noted that although this funding would normally strengthen the public interest in the patent’s enforcement, an injunction here would contravene the funding’s purposes by increasing the likelihood of computer chip offshoring.

C. District Courts Address Environmental Concerns

Several post-ebay decisions have exemplified the public interest prong’s potential to impact environmental concerns. Soon after eBay, the Eastern District of Texas decided Paice LLC v. Toyota Motor Corp., in which it issued an injunction ruling with the potential to impact Toyota’s hybrid vehicle lineup. Toyota argued an injunction would disserve the public interest because its hybrid vehicles lowered harmful carbon emissions and reduced dependence on foreign oil. While the court was unmoved by this line of argument – noting a lack of evidence that other hybrids could not fill the demand – it concluded the public interest “[did] not weigh heavily in either party’s favor,” and denied the requested injunction. Given that the court also considered the “long recognized” public interest in patent enforcement, this apparent draw indicates that Toyota’s environmental argument influenced the court. Moreover, on appeal at the Federal Circuit, the court’s denial of a permanent injunction for the plaintiff ultimately passed the abuse of discretion standard.

127. Id. at *36 (describing computer chip market dynamics).
128. Id. (projecting widescale price increases throughout supply chain based on defendant’s dominant market share).
129. Id. (considering effect of public funding on public interest).
130. Id. (incorporating goal of National Science Foundation funding into analysis).
131. For further discussion of public interest incorporation of environmental concerns, see infra notes 132-49 and accompanying text.
133. See id. at *19 (issuing ongoing royalty regime for infringing vehicles).
134. Id. at *8 (recounting Toyota’s argument against injunction).
135. Id. at *17 (assessing public interest prong).
137. See Paice LLC v. Toyota Motor Corp., 504 F.3d 1293, 1304, 1315 (Fed. Cir. 2007) (reciting standard of review and recounting district court rejection of injunction).
**BASF Plant Science, LP v. Commonwealth Science & Industrial Research Organization** further exemplifies environmental considerations enjoying prominence in the public interest prong of the *eBay* injunction analysis. This case concerned patents directed at using genetically modified canola plants to produce omega-3 oils for use in farmed salmon fish food. The District Court for the Eastern District of Virginia determined that an injunction from future use “would clearly harm the public.”

In its assessment, the court weighed two primary considerations: the production technology’s benefits to the environment, and the underserved nature of the market omega-3 market. Since the court observed the market demand for omega-3 would likely remain unmet even with both litigants’ market participation, the court did not want to approve the injunction and contribute to the deficit. Turning to the environmental aspect, the court recognized using genetic plant engineering to fulfill the omega-3 demand was beneficial to the environment because it “reduce[d] dependence on fishing for oily fishes” to feed to the farmed salmon – a practice the court viewed as environmentally destructive. The Eastern District of Virginia further noted that the “seasonal scarcity” and “price volatility” of the omega-3 market had led to a decrease in omega-3 oils in farm-raised salmon, thereby limiting the health benefits their consumption provides.

Based on these considerations, the court determined that the patentee failed to establish an injunction would not disserve the public interest. The court further rejected the patentee’s argument that the public interest did not outweigh the other three *eBay* factors. The court cited *Amgen* in response, which established that under *eBay*, the public interest is not merely balanced, but must be

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139. Id. at *58-59 (considering environmental benefits of technology at issue).
140. Id. at *24-29, *32-33 (describing invention at issue and its usage).
141. Id. at *57 (stating public interest finding).
142. Id. at *57-60 (evaluating circumstances surrounding patented technology).
144. Id. at *58-59 (considering environmental impact of reliance on fishing as omega-3 oil source for farm-raised salmon fish food). To the court, the use of “renewable” omega-3 products was environmentally preferable. Id. (acknowledging environmental impact of omega-3 oil supply chain).
145. Id. (detailing struggles of omega-3 market).
146. Id. at *59 (declaring finding of public interest prong).
147. Id. at *59-60 (discounting defendant’s argument that despite *eBay*, injunction here is necessary).
I. Independent Proven. On appeal, the Federal Circuit scrutinized the Eastern District of Virginia’s reasoning and found “no reversible error.”

D. Siemens Gamesa: The Public Interest Tackles Global Emissions

In *Siemens Gamesa Renewable Energy A/S v. GE*, the District Court for the District of Massachusetts issued an injunction decision following a jury finding of patent infringement. Siemens sued General Electric (GE) for patent infringement based on several of Siemens’ patents related to wind turbine technology. GE had contracted to install wind turbines off the coast of the United States for two large offshore projects. GE was to provide its Haliade-X turbine model for the projects – a model Siemens contended infringed their patents. After a jury finding of infringement by GE of one of Siemens’ patents, Siemens sought a permanent injunction from the court. The District of Massachusetts’s decision is noteworthy because it explicitly grappled with the “rapidly developing climate crisis” in crafting the proper remedy.

The court applied the four-prong *eBay* analysis, assessing irreparable harm, the inadequacy of monetary remedies, the balance of hardships, and the public interest in turn. In its analysis, the court found Siemens had established irreparable harm, noting the company lost “significant” market share due to the infringement. Additionally, the District of Massachusetts pointed out that GE and Siemens compete head-to-head and had been the final two bidders in at least one of the projects. Further, the court concluded monetary

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151. *Id.* at 470 (recounting procedural history).
152. *Id.* (noting context of matter).
154. *Id.* (explaining GE’s project details).
156. *Id.* at 474 (assessing countervailing public concerns).
157. *Id.* at 470-74 (engaging in four-factor *eBay* analysis).
158. *Id.* at 471-72 (announcing irreparable harm and finding and recounting evidence).
159. *Id.* at 472 (assessing competition between parties). In pointing to evidence that the contested patented feature made GE’s turbines more competitive,
remedies would be inadequate, as the installation of wind turbines can create numerous downstream sales that are difficult to quantify.\textsuperscript{160}

The court first weighed the balance of the hardships by observing that offshore wind turbines were only a small portion of GE’s business, whereas the turbines made up the bulk of Siemens’s.\textsuperscript{161} It noted further that GE produces other non-infringing models that it has used in projects elsewhere.\textsuperscript{162} In sum, the District of Massachusetts determined the balance of hardships weighed in Siemens’ favor.\textsuperscript{163}

The \textit{Siemens Gamesa} court then assessed the public interest factors involved in this case.\textsuperscript{164} The court first stressed the incentives toward innovation that patent protection provides.\textsuperscript{165} It reasoned that allowing continued infringement would inhibit such innovation; specifically, it would “surely chill advancement of wind turbine and renewable energy technology.”\textsuperscript{166}

Given the nature of the technology at issue, however, the court then went on to expound on the public interest surrounding the “rapidly developing climate crisis.”\textsuperscript{167} It pointed to United Nations findings that fossil fuel usage is causing increased global temperatures, resource scarcity, and disruptions to weather patterns and international security.\textsuperscript{168} The District Court of Massachusetts, mindful of these significant additional concerns, sought to implement a “carefully tailored injunction.”\textsuperscript{169}

In the court’s view, causing delays to large-scale wind energy projects, such as the two the case involved, would run contrary to efforts to combat the environmental crises it articulated.\textsuperscript{170} The court heavily weighed GE’s account of the significant time and resources the court found that a causal nexus existed between the infringement itself and the harm Siemens experienced. \textit{Id.} (contending with GE’s objection – that Siemens failed to show infringing feature drives consumer demand – by recounting evidence of causal link between infringement and harm).

\textsuperscript{160} \textit{Siemens Gamesa}, 626 F. Supp. 3d at 471-73 (evaluating adequacy of monetary remedies).

\textsuperscript{161} \textit{Id.} at 474 (weighing balance of hardships between parties).

\textsuperscript{162} \textit{Id.} (noting GE’s capabilities to manufacture non-infringing models).

\textsuperscript{163} \textit{Id.} (making conclusion on balance of hardships).

\textsuperscript{164} See \textit{id.} (analyzing public interest prong).

\textsuperscript{165} See \textit{Siemens Gamesa}, 626 F. Supp. 3d at 474 (explaining public interest in patent system).

\textsuperscript{166} \textit{Id.} (predicting ramifications of permissiveness toward infringement).

\textsuperscript{167} \textit{Id.} (incorporating climate crisis considerations into public interest assessment).


\textsuperscript{169} \textit{Id.} at 474-75 (expressing intended approach to drafting injunction).

\textsuperscript{170} See \textit{Siemens Gamesa}, 626 F. Supp. 3d at 474 (discouraging project delays because of negative environmental consequences).
it had taken to progress as far as it had with the two projects in question.\textsuperscript{171} It further noted the benefits the projects would provide the local community and the concomitant price increase for clean power that delays would create.\textsuperscript{172} The court stated it would account for this array of factors by carefully tailoring the injunction to create prudent carve-outs.\textsuperscript{173}

Ultimately, the District of Massachusetts handed down a permanent injunction with carve-outs to permit GE to continue providing and servicing Haliade-X turbines for the two specific projects.\textsuperscript{174} These carve-outs were subject to royalty provisions for GE’s associated income.\textsuperscript{175} One commentator has noted the “unusual” nature of these carve-outs and has predicted the decision will have “far-reaching implications.”\textsuperscript{176}

Following the trial, GE expressed its readiness to maintain the Haliade-X series in United States markets through alternate, non-infringing designs.\textsuperscript{177} Nonetheless, since declaring its intention to appeal the injunction ruling, GE has reached a settlement agreement with Siemens, resolving all outstanding wind turbine patent disputes through a cross-licensing arrangement.\textsuperscript{178}

\section*{IV. \textbf{Eureka Moment?}: Proposed Alterations to Patent Law in Response to Climate Crisis and Why the Public Interest Presents the Solution}

Scholars and commentators have frequently discussed ways to optimize the patent system to facilitate the creation and uptake of

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  \item \textsuperscript{171} See \textit{id.} at 474 (expressing appreciation for GE’s arguments).
  \item \textsuperscript{172} \textit{Id.} (explaining benefits of projects and implications of delay).
  \item \textsuperscript{173} \textit{Id.} (remarking on injunction considerations).
  \item \textsuperscript{175} \textit{Id.} (instituting royalty mechanisms).
  \item \textsuperscript{176} Bobby Magill & Kelcee Griffis, \textit{GE Turbine Block a Setback, Not Death Knell, for New Wind Energy}, BL (Sept. 8, 2022, 4:54 PM), \url{https://news.bloomberglaw.com/ip-law/ge-turbine-block-a-setback-not-death-knell-for-new-wind-energy} (providing commentary acknowledging unusualness of carve-out allowing GE to continue producing infringing turbines). For further discussion of the significance of the Siemens Gamesa injunction decision, see \textit{infra} notes 222-23 and associated text.
  \item \textsuperscript{177} See \textit{id.} (reporting sentiments from GE).
\end{itemize}
\end{footnotesize}
green technology. Many have embraced patents as innovation accelerants and have sought to ease or otherwise expedite the process of obtaining patents related to green technology. Some have focused on international technology transfer, seeking to facilitate developing economies’ green technology uptake through international cooperation and devices such as patent pools and public-private partnerships. Others still have sought to supplement the patent system with additional incentives specifically aimed at environmental technology development. These additional measures seek to counteract the second prong of the double market failure associated


180. See, e.g., id. at 254-55 (encouraging focus on domestic innovation, international aid, and collaboration as opposed to international technology transfer to mitigate climate change); Taylor, supra note 37, at 606 (supporting reduction of barriers to patenting, encouragement of international technology transfer, and implementation of flexible petty patent system); Deborah Behles, The New Race: Speeding Up Climate Change Innovation, 11 N.C. L.J. & TECH. 1, 49-50 (2009) (advocating optional new patent program for green technology with less stringent qualification requirements than current patent regime and compulsory licensing informed by environmental value). One commentator has gone so far as to consider leveraging the patent system to institute a post-grant review process structured to eliminate protection for inventions deemed environmentally destructive. Samuel Habein, Encouraging Sustainable Innovation: Is There Room for a Post-Grant Environmental Challenge in American Patent Law?, 46 Wm. & MARY ENV'T L. & POL’Y REV. 899, 900 (2022) (considering possibility of post-grant challenge to environmentally harmful patents).


182. See Burleson, supra note 181, at 76 (discussing subsidies as method to support development of green technology); Daniel Van Fleet, Legal Approaches to Promote Technological Solutions to Climate Change, DUKE L. & TECH. REV., Oct. 10, 2008, at 8-9 (noting carbon cap-and-trade and carbon taxing as policies that increase green technology investment); Van Smith, Enabling Environments or Enabling Discord: Intellectual Property Rights, Public-Private Partnerships, and the Quest for Green Technology Transfer, 42 GEO. J. INT’L’L. L. 817, 850-52 (2011) (promoting public-private partnerships to facilitate technology transfer instead of alterations to intellectual property rights).
with green technology — that improved environmental outcomes are a public good and, therefore, distanced from traditional innovation incentives.¹⁸³

A. Proposals to Weaken Green Technology Patent Enforcement

Some commentators have favored measures to weaken patent protection, including curbing the exclusivity of patent protection in an attempt to bolster more widespread distribution of green technology.¹⁸⁴ Certain proposals have advocated for various formats of green technology compulsory licensing regimes, in which governments assert the power to mandate patent holders to engage in patent licensing.¹⁸⁵ These regimes are generally intended to prevent instances of “patent holdup,” where a patentee, enabled by a patent’s exclusionary power, demands excessive licensing fees from a potential practicer of the patent.¹⁸⁶ Proponents of compulsory licenses call on the public interest in broad access to the technologies subject to their proposals to justify their compelled licensure.¹⁸⁷ They seek to avoid instances of anti-competitive behavior that result in barriers to market entry and may impact the development of “nascent” technology.¹⁸⁸

¹⁸³. See Hall & Helmers, supra note 13, at 522 (concluding additional policy interventions are needed to account for environmental externalities unreachable by IP incentives); Taylor, supra note 37, at 580 (explaining necessity for additional measures to counteract environmental technology double-market failure); Tur-Sinai, supra note 34, at 227-29 (explaining how market conditions inherent to green technology require that innovation be incentivized in other ways). For further discussion of the market failures associated with green technology, see supra notes 35-37 and accompanying text.


¹⁸⁵. See e.g., id. at 628-29 (proposing compulsory licensing regime for climate engineering patents to combat possibility of repressed access); see also Gorius & Plebani, supra note 181, at 314 (noting possible need for compulsory licenses for environmentally sound technologies (ESTs)).

¹⁸⁶. See Auer et al., supra note 21, at 159 (describing policy motivation to combat patent hold-up); see generally Carl Shapiro & Mark A. Lemley, The Role of Antitrust in Preventing Patent Holdup, 168 U. Pa. L. Rev. 2019, 2032-34 (2020) (explaining patent hold-up phenomenon and circumstances leading to it).

¹⁸⁷. See Hardin, supra note 184, at 611-12 (asserting importance of broad access to technologies contemplated by proposal); Behles, supra note 180, at 30, 33 (noting potential use of compulsory licenses to assist in distributing climate change innovations).

One author has advocated for a temporary enforcement moratorium on green patents issued before 2020 to help broaden the distribution of green technologies. Under this proposal, activities that would otherwise constitute infringement of IP rights related to climate change mitigation – including green patents – would be permissible within the moratorium’s window. Additionally, any further use by actors who began otherwise infringing activities during the moratorium would remain unactionable indefinitely. In effect, this proposal is intended to create a rush of green technological adoption on a global scale to facilitate an emissions peak before 2025 so emissions may be considerably reduced by 2050.

Another author has proposed an affirmative fair use defense, akin to the fair use defense in copyright law, specifically for green technology patent infringement. The proposal would have courts apply a multi-factor analysis to adjudicate fair use, incorporating “(1) the market potential; (2) the patentee’s developments; (3) the purpose and nature of the secondary use; and (4) the interests of the patentee and industry.” This proposal also identifies the potential to compensate the patentee if justice requires, notwithstanding a finding of fair use, but not to the extent it would chill the fair use.

These various proposals seeking to weaken patent protection accord with an overall dim view of patents among those who assert

190. Id. (advocating for moratorium that suspends all exclusivity of affected patents).
191. Id. at 30-31 (explaining mechanics of proposed moratorium). The proposal additionally contemplates a remuneration regime that patent holders can also elect to take part in that would apply to all prior and new users. Id. at 31 (detailing proposed state-run liability regime).
192. See id. at 29 (noting emissions projections and asserting need for rapid technological uptake).
194. Id. at 240 (listing proposed factors for analysis to adjudicate fair use). The author envisions the first factor as looking to any untapped potential from the patent in question. Id. at 240 (expanding on first factor). The second factor assesses whether the patentee is making adequate use of the patent to justify exclusivity. See id. at 241 (clarifying second factor). The third factor considers the potential infringer’s use of the technology, with a more environmentally impactful use weighing in favor of fair use. See id. (explaining assessment of secondary use). The final factor weighs the patentee’s interests in search of a “legitimate reason” to uphold the patentee’s exclusivity. See id. (elaborating on final proposed factor).
195. Id. at 241-42 (expressing possibility for court to award royalties despite fair use finding).
that they may be a poor instrument to facilitate green innovation.\textsuperscript{196} Beyond fears about patent hold-up, much of this notion stems from the double market failure that characterizes green technology, which diminishes incentives to innovate in that technological space.\textsuperscript{197} Commentators have proposed various additional measures to help remedy the additional element of market failure for green technology, such as subsidies or tax credits.\textsuperscript{198} Still, in diplomatic contexts when coordinating IP policy, multiple countries have resisted patent protection for environmentally friendly technology, because they view such protection as a barrier to their own uptake thereof.\textsuperscript{199}

B. Innovation Incentives Caution Against Weakened Enforcement

This Comment urges restraint surrounding any policy initiative that would seek to diminish patent rights, especially those intended to expand the use of green technology.\textsuperscript{200} The Comment further asserts that current injunction law, including the public interest inquiry, provides an adequate backstop to prevent undue restriction on green technology access without further harming innovation incentives in the area.\textsuperscript{201} \textit{eBay} was itself a seismic shift in the foundational patent right to exclusivity; additional measures to reduce the strength of patent protection for green technology threaten to stifle its progress.\textsuperscript{202}

I. Concerns About Patent-Weakening Propositions

Legal certainty is an essential condition for innovation.\textsuperscript{203} It impacts the risk assessments of those who may invest in research and

\begin{itemize}
  \item \textsuperscript{196} See, e.g., Hall & Helmers, supra note 13, at 490 (questioning efficacy of IP protection to facilitate development and transfer of green technology).
  \item \textsuperscript{197} See id. at 490, 522 (raising environmental externalities and questioning ability of IP protection to counteract them).
  \item \textsuperscript{198} See id. at 490 (discussing potential policy interventions).
  \item \textsuperscript{199} See Xiang, supra note 179, at 215-16 (recounting past United Nations Framework Convention on Climate Change and World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights Council rhetoric and propositions surrounding green technology).
  \item \textsuperscript{200} For a discussion of the threats of weakened patent protection, see infra notes 201-18 and accompanying text.
  \item \textsuperscript{201} For discussion of the sufficiency of current injunction law to ensure green technology access, see infra notes 219-29 and accompanying text.
  \item \textsuperscript{202} See Michel & Dowd, supra note 92, at 41 (discussing \textit{eBay}'s negative innovative effects and continuing anti-patent sentiment); Sease, supra note 49, at 62 (observing patent value diminishment post-\textit{eBay}); see also Osenga, supra note 63, at 1090-91, 1102-03 (explaining value of predictability of injunctions pre-\textit{eBay} and ensuing shift post-\textit{eBay} toward attractiveness of "efficient infringement" due to reduced threat of injunctions).
  \item \textsuperscript{203} See Michel & Dowd, supra note 92, passim (describing importance of innovation certainty, including legal rules whose uncertainty contributes to risk); cf.
development but are willing to invest elsewhere – substantively and geographically – if risk conditions become less favorable. Accordingly, the diminished assurance of patent exclusivity reduces the value proposition of patent intellectual property. Proposals such as a green IP enforcement moratorium or an introduction of a green fair use doctrine – modeled after a historically fickle copyright doctrine – would introduce significant uncertainty to patent protection for green technology. Furthermore, any proposal that specifically targets green technology patent protection risks driving investment away and instead into other avenues.

Substantive changes to patent law, especially those that make patent enforcement more difficult, can dramatically affect the risk of patent investments and, thus, the value of innovation. Moreover, weakened enforcement mechanisms tend to coax innovators towards greater secrecy as an alternative way to achieve an innovator’s desired exclusivity – behavior that can hamper innovation. The ability to enforce one’s patent exclusivity allows innovators to remain nimble and operate in commercially effective ways by providing recourse in the event one’s disclosures lead to unsanctioned use of the technology by others.

Mossoff & Claeys, supra note 104, at S138 (recounting view of positive relationship between reliably enforced patent exclusivity and social welfare).

204. See Michel & Dowd, supra note 92, at 44-45 (citing innovation certainty’s impact on venture capital investment behavior).


206. See Pierre N. Leval, Toward a Fair Use Standard, 103 Harv. L. Rev. 1105, 1106-07 (1990) (describing widely inconsistent fair use outcomes despite codification of factors); see also Greg Reilly, Power Over the Patent Right, 95 Tul. L. Rev. 211, 222-24 (2021) (discussing patent law developments that have and continue to erode stability of patent rights). For a further discussion of the enforcement moratorium and green patent fair use proposals, see supra notes 189-95 and accompanying text.

207. Cf. Michel & Dowd, supra note 92, at 45 (detailing responsiveness of research investment to levels of patent protection).

208. Cf. Tokic, supra note 92, at 390 (explaining risks associated with patent investments).

209. Brenda M. Simon, Patents, Information, and Innovation, 85 Brook. L. Rev. 727, 781-82 (2020) (discussing impact of enforcement mechanism on incentives surrounding innovation); see also Sease, supra note 49, at 69-70 (detailing circumstances, including eBay ruling, that have significantly enhanced focus on trade secrets). Patents, on the other hand, require extensive disclosure, a measure that supports innovation by equipping the public with the knowledge of the invention’s subject matter. WIPO Report, supra note 28, ¶ 32 (describing purpose of patent disclosure requirements).

210. See Auer et al., supra note 21, at 160-61 (extolling benefit of injunctions to enable better business operation by limiting reliance on secrecy surrounding innovation).
Advocates of using compulsory licenses to combat patent hold-up must additionally consider the bargaining efficiency that patent exclusivity provides. Well-defined exclusivity tends to facilitate IP transactions because the concomitant certainty reduces transaction costs. In fact, the cross-licensing resolution to in Siemens Gamesa demonstrates patent exclusivity’s assistance in negotiating licensing agreements.

A compulsory license regime, on the other hand, would statutorily eliminate patent exclusivity for any patents subject to the policy. Instead of efficient bargaining, compulsory licensing would render “efficient infringement” of the affected patents a viable business strategy. Such efficient infringement diminishes faith in the patent system as a whole. Additionally, it is doubtful whether patent hold-up is sufficiently prevalent to justify such measures.

211. See id. at 167 (noting efficiency benefits provided by possibility of injunctions, including decreased cost of negotiating for license).

212. See Kieff, supra note 31, at 732-33 (describing technology licensing dynamics). Kieff distinguishes between protecting patents through “property rules” and “liability rules.” Id. (categorizing enforcement mechanisms). The former entitles a patent holder to enjoin infringement, creating enforcement certainty and, thus, efficient transacting, whereas the latter only monetarily compensates a patent holder for an infringer’s actions, making infringement-in-lieu-of-negotiation a potentially viable strategic decision. See id. (describing infringement recourse prospects).


214. See Cahoy, supra note 188, at 854 (explaining U.S. compulsory license operation).

215. See Auer et al., supra note 21, at 167 (discussing legal and economic strategy behind efficient infringement). Commentators thus must temper policy proposals with an awareness of the reverse phenomenon of patent hold-up: “patent holdout.” Id. at 160-61, 167 (describing formation of patent holdout). Through this, the patent holder’s decreased leverage makes infringement more attractive relative to engaging in licensing negotiations, incentivizing “efficient infringement.” Id. (describing how weakening patent enforcement may result in patent holdout and efficient infringement); Henry E. Smith, Putting the Equity Back into Intellectual Property Remedies, 96 NOTRE DAME L. REV. 1603, 1618 (2021) (noting effect of leverage on prevalence of infringer holdout behavior); see also Kieff, supra note 31, at 735 (describing infringement strategy when patent rights impose only liability rules, not property rules). For further discussion on patent infringement liability versus property rules, see supra note 215 and accompanying text.

216. See What Happened to the Public’s Interest?, supra note 61, at 1102-03 (describing social impacts of efficient infringement, including distrust in patent system).

2. Current Injunction Law Is Equipped to Maintain the Fight Against Climate Change

This Comment argues that the equitable discretion afforded to courts in injunction decisions, as bolstered by eBay, provides adequate assurance that patent infringement proceedings do not harm the public through a lack of access to green technology.\(^{218}\) Cases such as Siemens Gamesa, BASF, and the other above-discussed injunction decisions exemplify the highly practical, fact-specific analysis in which courts can engage when adjudicating an injunction request, especially within the public interest prong.\(^{219}\) Courts have extended this discretion to embrace sensitivity to public environmental concerns.\(^{220}\) The Siemens Gamesa decision is notable for its explicit invocation of climate science to inform its analysis and its subsequent tailored injunction.\(^{221}\) Because injunction cases have not often hinged on the public interest inquiry, the Siemens Gamesa decision will likely have outsized influence going forward when the public interest is threatened.\(^{222}\)

The fight against climate change depends on a robust market of sustainable innovation.\(^{223}\) Efforts to weaken patent protections for green technologies risk disrupting the motivations crucial to future progress.\(^{224}\) Courts have continued to grant injunctions to a significant majority of requests following a finding of infringement, thereby largely maintaining patent exclusivity.\(^{225}\) Even still, many commentators view eBay itself as a destructive decision for patent protection.\(^{226}\) Further steps to undermine patent rights, especially those specifically targeted at green technology, would be counterproductive to

\(^{218}\) For further discussion on the adequacy of current injunction case law to ensure public access to environmentally friendly technology, see infra notes 220-29 and accompanying text.

\(^{219}\) For an account of select case studies that demonstrate a court’s ability to weigh practical public concerns, see supra notes 112-78 and accompanying text.

\(^{220}\) For discussion of cases where a court has weighed environmental concerns associated with a prospective injunction, see supra notes 64-67, 131-78 and accompanying text.

\(^{221}\) For further discussion of the Siemens Gamesa injunction decision, see supra notes 150-78 and accompanying text.

\(^{222}\) Cf. Riley & Allen, supra note 55, at 755 (discussing outsized impact of minor changes to precedent in public interest inquiry due to sparse case law).

\(^{223}\) For discussion of the need for strong innovation conditions, see supra notes 19-22 and accompanying text.

\(^{224}\) For discussion of concerns surrounding measures to weaken green patent protections, see supra notes 200-18 and accompanying text.

\(^{225}\) For discussion of empirical assessments of injunction results post-eBay, see supra notes 105-11 and accompanying text.

\(^{226}\) For further commentary on eBay’s impact on innovative incentives, see supra note 202 and accompanying text.
the continued advancement of these key areas of innovation. This Comment asserts strong patent rights, enforced by a court’s equitable discretion post-eBay, will best serve this innovative ecosystem, and thus, the fight against climate change.

Addison S. Fowler*

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227. For an assessment of measures to weaken green patent protections, see supra notes 200-18 and accompanying text.

228. For a discussion of the need for strong, reliable patent enforcement, see supra notes 203-11 and accompanying text.

* J.D. Candidate, May 2024, Villanova University Charles Widger School of Law; M.S., Bioengineering, 2021, Stevens Institute of Technology; B.S., Chemical Engineering, 2019, The Pennsylvania State University. I would like to extend my heartfelt thanks to my parents, Meg and Anthony Fowler, my fiancée, Alyssa Kell, and the rest of my family for their love and unending support; to my friends for their vital encouragement; to the Villanova Law faculty for their generous guidance; and to my colleagues at the Villanova Environmental Law Journal for their collaboration and attention to detail.