

PRIORITIZING INNOVATION*

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ABSTRACT

Private incentives to innovate and commercialize many technologies are often inadequate in terms of their social benefits. With America's economic leadership position at risk of slipping, it becomes increasingly important to consider what measures public entities can take to promote the innovation and commercialization of those technologies that are essential to American welfare. The U.S. Patent and Trademark Office ("PTO" or "Patent Office") has the potential to reduce the divergence between social needs and private incentives for technological progress. By expediting the review of more socially valuable patent applications, the PTO could respond to critical public needs and better satisfy the constitutional justification for the existence of the patent system. The PTO's recent implementation of a program that purports to fast-track the review of applications pertaining to environmentally beneficial technologies provides a useful, albeit imperfect, model for such beneficial reform.

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This article brings key insights to a variety of weighty issues, including: the proper role of the Patent Office and other regulatory bodies in promoting the innovation and commercialization of high-priority technologies; the appropriate measurement of the “value” of technological progress; the interrelationship between the Constitution and the patent-review process; and the relevance of fairness and economic objections to the grant of preferential treatment in a monopoly system.

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INTRODUCTION

Over one hundred years ago, technological innovation helped the United States rise to dominate the global economy, a position it has maintained since that time.¹ Technological advances by other nations now threaten to oust the United States from its privileged position.² Market forces have produced a suboptimal level of innovation and commercialization of key technologies in the United States. Additional incentives are necessary to narrow the gap between the private incentives to research and develop these technologies and their social benefits.³ With this nation's economic leadership position at risk of slipping,⁴ promoting the innovation and commercialization of those technologies essential to American competitiveness becomes an urgent matter.

Urgent times justify urgent measures.⁵ In an emergency room, a patient with a heart attack will receive medical attention long before a patient with a hangnail. Such preferential treatment is justified even

¹ See Ajay K. Mehrotra, *American Economic Development, Managerial Corporate Capitalism, and the Institutional Foundations of the Modern Income Tax*, 73 LAW & CONTEMP. PROBS. 25, 33 (2010) ("Economic growth and development, driven by an abundance of natural resources, technological innovation, and increasing factor inputs and productivity, helped transform [the United States'] agriculturally based, seaboard economy into the world's leading industrial, capitalist economy by the second decade of the twentieth century."); Hon. Dana Rohrabacher, *Pennies for Thoughts: How GATT Fast Track Harms American Patent Applicants*, 11 ST. JOHN'S J. LEGAL COMMENT. 491, 492 (1996) ("The United States is successful because it has maintained a technological lead on the world. It is technology and knowledge that have given us the competitive edge throughout our Nation's history.").

² See President Barack Obama, State of the Union Address (Jan. 25, 2011), in 157 CONG. REC. H457, H458 (daily ed. Jan. 25, 2011) (discussing how nations like China and India are posing competitive threats to the United States due to their efforts to invest in research and new technologies, particularly green technologies). Newspapers are filled with stories of the United States' inability to keep pace with other countries in clean energy development. See, e.g., Bryan Walsh, *Clean Energy: U.S. Lags in Research and Development*, TIME, Aug. 1, 2009, available at <http://www.time.com/time/health/article/0,8599,1913781,00.html> (showing popular medias' publication of stories of the United States' inability to keep pace with other countries in clean energy development); Steve Monfort, *U.S. Lags in Clean Tech Investment*, T. BOONE PICKENS (Mar. 26, 2010), http://www.boonepickens.com/media_summary/032610.pdf; see also Rob Atkinson, *America Risks Missing Out in Clean Technology*, BLOOMBERG BUSINESSWEEK (Feb. 3, 2010), http://www.businessweek.com/innovate/content/jan2010/id20100122_369263.htm ("[B]etween 2009 and 2013, the governments of [China, Japan, and South Korea] will out-invest the U.S. three-to-one in these sectors, or \$ 509 billion to \$ 172 billion.").

³ See *infra* Part II.A.

⁴ See Obama, *supra* note 2, at H458 (discussing how the United States is at risk of losing its lead).

⁵ This is not to suggest that all deviations from procedure are justified. Consideration must always be given to the legal and practical implications that a deviation from procedure will produce.

though the treatment of all other patients may be delayed by the urgent nature of a heart attack. In recognition of the urgency for technological progress in certain areas, this emergency-room model permeates countless areas of the law where regulators have institutionalized deviations from their procedures to prioritize the development of technologies of national importance.⁶ The U.S. Food and Drug Administration, for instance, has expedited its review process for drugs that treat serious diseases for almost two decades.⁷

The U.S. Patent and Trademark Office (“PTO” or “Patent Office”), an agency charged with examining patent applications and issuing patents for new inventions,⁸ is well poised to create additional incentives for the innovation and commercialization of socially valuable technologies by prioritizing these key technologies in its review process.⁹ Yet, surprisingly, it has not subscribed to the emergency room model.¹⁰ Rather, patent examiners at the PTO generally review new patent applications in the order of their U.S. filing date.¹¹ The PTO adheres to this system despite the fact that it has a backlog of patent applications that requires inventors to wait almost three years on average to receive a patent.¹² These delays in the patent-review process make it difficult for inventors to obtain early financing for their inventions and render patent rights uncertain while the applications are pending.¹³ For technologies that are critically needed to further national interests, such as those relating to biomedical research, information technology, and clean

⁶ See, e.g., Press Release, Fed. Energy Regulatory Comm’n, FERC Issues First License for Hydrokinetic Energy Project (Dec. 20, 2007), available at <http://www.ferc.gov/media/news-releases/2007/2007-4/12-20-07-H-1.asp> (creating a short-term, conditioned licensing process for wave, tidal, and ocean current projects to give the hydrokinetic industry, a nascent renewable energy industry, a boost).

⁷ *Fast Track, Accelerated Approval and Priority Review*, U.S. FOOD & DRUG ADMIN., <http://www.fda.gov/forconsumers/byaudience/forpatientadvocates/speedingaccessstoimportantnewtherapies/ucm128291.htm> (last updated Aug. 2, 2010).

⁸ 35 U.S.C. § 2(a) (2006).

⁹ The Patent Office possesses the specific powers to establish regulations that “facilitate and expedite the processing of patent applications.” *Id.* § 2(b)(2)(C) (2006) (emphasis added).

¹⁰ This has not always been the case. See *infra* Part II.A.

¹¹ See MPEP § 708 (8th ed. Rev. 6, Sept. 2007) (“Nonprovisional applications shall be taken up for examination . . . in the order in which they have been filed except . . . pursuant to 37 CFR 1.102.”).

¹² See U.S. PATENT AND TRADEMARK OFFICE, 2010-2015 STRATEGIC PLAN 10 (2010), available at http://www.uspto.gov/about/stratplan/USPTO_2010-2015_Strategic_Plan.pdf (indicating that under the Patent Office’s current system of reviewing applications on a first-come, first-served basis, the average time from the filing of an application to patent issuance or abandonment was 34.6 months in fiscal year 2009 and was projected to be 34.8 months in fiscal year 2010.).

¹³ See *infra* notes 91–96 and accompanying discussion.

energy, the backlog can cause substantial harm to public interests.¹⁴ For instance, in the clean energy context, the backlog has delayed the review process for patent applications pertaining to the ten-watt Philips Electronic LED light bulb, a light bulb that emits the equivalent of a sixty-watt light bulb and lasts twenty-five times as long; the smart thermostat, which reduces residential consumption of energy by telling homeowners how much energy their homes are using and at what cost; Dow Chemical's Solar Shingle, a roof shingle that also functions as a solar panel; Enertia Building System's method of building homes and offices without using fuel or electricity; thin-film batteries that more efficiently power electronic devices; and the Environmental Protection Agency's hydraulic hybrid power-train system, which has reduced the pollution and increased the efficiency of mail-delivery trucks.¹⁵ By lessening the value of the rewards of innovation for these key technologies to both individual inventors and the public, the backlog also disrupts the constitutional patent bargain supporting the very existence of the patent system: the grant of a patent to an inventor in exchange for the benefit to society of the promotion of "the Progress of Science and useful Arts."¹⁶ Commentators have suggested a range of proposals to combat the backlog problem.¹⁷ Yet insignificant analytical attention has been

¹⁴ The delayed review of patent applications pertaining to renewable energy technologies that could potentially reduce the United States' reliance on foreign energy sources, curb greenhouse gas emissions, and help the United States compete in the international race to dominate the renewable energy industry means that irreversible damage to the environment, as well as to the United States' national security interests and international competitiveness, is occurring as a direct result of the lag time at the PTO. *See infra* Part II.A.

¹⁵ *See generally* David Kappos, Dir., Remarks at Press Conference Announcing Pilot to Accelerate Green Technology Applications (Dec. 7, 2009) [hereinafter Remarks], available at <http://www.uspto.gov/news/speeches/2009/2009nov07.jsp> (describing various environmentally beneficial inventions).

¹⁶ U.S. CONST. art. I, § 8, cl. 8.

¹⁷ *See* Robert D. Atkinson & Daniel D. Castro, *A National Technology Agenda for the New Administration*, 11 YALE J.L. & TECH. 190, 192–94 (2009) (arguing that Congress should "grant the PTO regulatory authority to increase its fees to meet its budgetary needs"); David P. Irimies, *Why the USPTO Should Adopt a Deferred Patent Examination System*, 20 DEPAUL J. ART TECH. & INTELL. PROP. L. 355, 357–61 (2010) (arguing that the PTO should use a deferred patent examination system for all non-provisional U.S. patent applications); Arti K. Rai, *Growing Pains in the Administrative State: The Patent Office's Troubled Quest for Managerial Control*, 157 U. PA. L. REV. 2051, 2077–80 (2009) (advocating changes to the PTO's fee-setting authority, more liberal judicial interpretation of the PTO's authority to manage its caseload, and changes to the inequitable-conduct doctrine); *see generally* Alisa S. Kao, *Peer Review of Patents: Can the Public Make the Patent System Better?*, 2007 U. ILL. J.L. TECH. & POL'Y 395, 402 (2007) (discussing the potential of peer review to improve the patent system). Even the PTO itself has thrown its efforts behind sweeping reform proposals. *See* ARTI RAI, STUART GRAHAM, & MARK DOMS, U.S. DEP'T OF COMMERCE, PATENT REFORM: UNLEASHING INNOVATION,

directed at the PTO's systemic failure to expedite the processing of socially valuable applications which are most likely to help satisfy national priorities if patented more quickly.¹⁸

The PTO itself has acknowledged that extenuating circumstances justify the accelerated review of certain categories of patents with greater social potential, but has done little to expedite the review of such applications. For example, in 2009 the PTO initiated the Green Technology Pilot Program, a program that purports to accelerate the processing of applications on environmentally beneficial inventions, and has suggested that it may expand this program to expedite the review of other inventions of great social value.¹⁹ However, unlike the PTO's sister patent offices abroad that are also prioritizing green technologies,²⁰ the

PROMOTING ECONOMIC GROWTH & PRODUCING HIGH-PAYING JOBS 1 (2010), available at http://www.commerce.gov/sites/default/files/documents/migrated/Patent_Reform-paper.pdf (arguing that patent reform legislation will accelerate "the pace of growth and of job creation" and "will be a powerful and deficit-neutral mechanism for expanding America's ability to innovate").

¹⁸ Several commentators have recognized that the most "valuable" patents deserve the greatest amount of attention. See, e.g., Chris J. Katopis, *Perfect Happiness?: Game Theory as a Tool for Enhancing Patent Quality*, 10 YALE J.L. & TECH., 360, 360–61, 363–64 (2008) (suggesting that the PTO only review valuable applications that are selected using game theory); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1531 (2001) (arguing that the "PTO is rationally ignorant of the objective validity of the patents it examines" because such "decisions can be made much more efficiently in litigation"). However, these commentators have viewed "value" from the economic perspective of patent owners, rather than from the social perspective of the nation as a whole. Inventions that enhance a person's libido could be extraordinarily lucrative and thus "valuable" to patent owners but have little relevance to the United States' top priorities as a nation.

¹⁹ See Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64, 666–67 (Dec. 8, 2009); David Kappos, Dir., U.S. Patent & Trademark Office, Public Meeting on Enhanced Examination Timing Control Initiative 9 (July 20, 2010), available at http://www.uspto.gov/patents/announce/3-track_meeting_transcript.pdf ("[W]e're already experimenting with various ways of enabling applicants to receive accelerated review of technologies in areas that are priorities to the Obama administration like green technology . . . and we'll be considering accelerated review in other categories of innovation that are also vital to our national interests.").

²⁰ See generally Press Release, Korean Intellectual Prop. Office, Thanks to Superspeed Examination, Green Technology Acquires Patent in a Month (Oct. 20, 2009), available at http://www.kipo.go.kr/kpo/user.tdf?seq=1305&c=1003&a=user.english.board.BoardApp&board_id=kiponews&catmenu=ek20200; Press Release, Richard Marles, Austl. Parliamentary Sec'y for Innovation & Indus., Fast Tracking Patents for Green Technology Solutions (Sept. 15, 2009), available at archive.innovation.gov.au/ministerarchive2010/Marles/Pages/FAST-TRACKINGPATENTSFORGREENTECHNOLOGYSOLUTIONS.html; Press Release, U.K. Intellectual Prop. Office, Green Patent Database Launched (June 4, 2010), available at <http://www.ipo.gov.uk/about/press/press-release/press-release-2010/press-release-20100604.htm>; *Green Channel Patent Applications Data*, U.K. INTELL. PROP. OFF., <http://www.ipo.gov.uk/types/patent/p-os/p-gcp/p-gcp-help.htm> (last updated Mar. 9, 2012); *The JPO Implemented a Pilot Program for Green Accelerated Examination Effective November 1,*

PTO (counter-intuitively) limited eligibility in the Green Technology Pilot Program to technologies that had already been invented, while providing only nominal benefits to inventors who availed themselves of the program.²¹ As a result, the Green Technology Pilot Program was notably undersubscribed and ineffective as a catalyst for the innovation of much-needed green technology.²² In essence, the PTO's program looked greener than it actually was.

Recent legislative reforms have elevated the importance of addressing the shortcomings in the PTO's prioritization programs. On September 8, 2011, Congress passed the Leahy-Smith America Invents Act ("America Invents Act"), which stipulates that the PTO may prioritize the examination of applications of importance to the national economy or national competitiveness.²³ By reviewing more types of patent applications at a rate proportional to their social values and by reducing the obstacles that prevent applications involving beneficial technologies from being expedited, the PTO could fulfill this congressional directive while responding to critical public needs.²⁴

2009, ONDA TECHNO INT'L PAT. ATT'YS (Nov. 30, 2009), <http://www.ondatechno.com/English/ip/patent/report/20091130.html>; see also Press Release, Can. Intellectual Prop. Office, Expedited Examination of Patent Applications Related to Green Technology (Oct. 5, 2010), available at <http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr02930.html>; *Green Technologies Given Special Treatment in the United States, United Kingdom, and South Korea*, NUTTER MCCLENNEN & FISH LLP (May 17, 2010), <http://www.nutter.com/Green-Technologies-Given-Special-Treatment-in-the-United-States-United-Kingdom-and-South-Korea-05-17-2010/>.

²¹ See *infra* Part III.

²² See *infra* Part II.B.

²³ Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 25, 125 Stat. 284, 337–38 (2011) [hereinafter America Invents Act] (to be codified at 35 U.S.C. § 2) (providing that the PTO, "subject to any conditions prescribed by the Director [of the PTO] and at the request of the patent applicant," may "provide for prioritization of examination of applications for products, processes, or technologies that are important to the national economy or national competitiveness without recovering the aggregate extra cost of providing such prioritization, notwithstanding section 41 or any other provision of law").

²⁴ The PTO's ability to initiate socially valuable programs is not unrestricted, however. Unlike most administrative agencies, which have broad flexibility to craft measures that further their missions, the PTO has lacked the authority to promulgate substantive rules under judicial precedent. See Sarah Tran, *Administrative Laws, Patents, and Distorted Rules*, 80 GEO. WASH. L. REV. 831, 834–837, 854, 869 (2012) (arguing that the substantive restriction on the PTO's rulemaking authority has hampered the agency's ability to remedy the patent system's deficiencies and has conflicted with the Patent Act, the Constitution, and Supreme Court precedent). The America Invents Act ("AIA") provides the PTO with new powers and responsibilities that may require the courts to acknowledge that the agency possesses substantive and policymaking authority. See Sarah Tran, *Patent Powers*, 25 Harv. J.L. & Tech. 609, 647–50 (2012) (arguing that the USPTO's new powers are incompatible with the Federal Circuit's longstanding view that the USPTO may only promulgate procedural rules); Sarah Tran, *Policy*

At first glance, my proposal might seem to conflict with popular conceptions of fairness which presume that individual inventors or investors should pay a fee or do a portion of the Patent Office's work as a *quid pro quo* for receiving fast-tracked review.²⁵ Requiring such a *quid pro quo* makes sense when all applications receive the same opportunities for expedited review. But when select categories of inventions are expedited on the basis of their ability to satisfy national priorities, the *quid pro quo* upsets the balance of the constitutional patent bargain by overburdening the parties most likely to promote "the Progress of Science and useful Arts"²⁶ and by ignoring the availability of mechanisms to accommodate applicants who experience delayed processing periods. Thus, concerns about unfairness effectively dematerialize when the focus is on socially valuable technologies.

The remainder of this article elaborates upon these arguments. Part I shows, through a focused study of renewable energy technologies, how prioritizing socially valuable applications is normatively justifiable as a measure to close the gap between the immense social benefits that these technologies bring and the private incentives to innovate and commercialize them. Part II describes how the mounting backlog of unprocessed applications at the Patent Office obstructs the innovation and commercialization of technologies that are urgently needed to serve national interests. It further explains how the Patent Office fails to provide meaningful opportunities for expedited review to inventors of socially valuable technologies. Part III identifies deficiencies in the Green Technology Pilot Program that have hindered its constructive value as a model for other programs. Part III further considers theoretical objections to any efforts to treat socially valuable patent applications preferentially and poses suggestions for overcoming these objections. Part IV presents essential lessons learned from the Green Technology Pilot Program that can aid the PTO in reforming its socially irresponsible

Tailors and the Patent Office, 46 U.C. Davis L. Rev. 101 (2012) (forthcoming 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2031653 (asserting that, due in large part to recent patent reforms, the USPTO can and should tailor patent policy to the needs of different types of inventors and industries; Melissa Wasserman, *The Changing Guard of Patent Law: Chevron Deference for the PTO*, 54 Wm. & Mary L. Rev. (forthcoming 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2166560 (contending "that the AIA rejects over two hundred years of court dominance in patent policy by anointing the PTO the primary interpreter of the core patentability standards through its new formal adjudicatory authority).

²⁵ See *infra* Part III.B.2.

²⁶ U.S. CONST. art. I, § 8, cl. 8 (granting Congress the power "[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").

system of reviewing patent applications. Finally, Part V argues that the PTO can and should further national priorities by expanding the opportunities for high-priority invention applications to be processed through the patent system.

I. JUSTIFICATION: AID FOR A SPECIAL NEEDS INDUSTRY

Although all industries to one degree or another can benefit from government stimuli, only a few industries require urgent regulatory action to maximize social welfare. These are the industries where there is a gap between the private incentives to innovate and develop certain technologies and the social needs for the new technologies to help satisfy national priorities within a set timeframe. The green industry falls within this category, as three interrelated factors are creating a pressing need for government stimuli to aid this industry: (1) America's overdependence on foreign energy sources; (2) global climate change concerns; and (3) an international race to dominate the renewable energy industry.²⁷

A. OVERDEPENDENCE ON FOREIGN ENERGY SOURCES

The United States has serious energy troubles. The nation's addiction to foreign energy sources threatens its national security and renders its energy consumption practices unsustainable.²⁸ These problems push the nation to find alternatives.

²⁷ In addition to these three time-critical factors, two market failures impede environmental innovation generally. First, environmental technologies, as well as most other technologies, are vulnerable to copying. Under a free market system, "competitors could free ride on others' inventive efforts and expenses, reducing the incentive to invent below its socially optimal level." Gregory N. Mandel, *Promoting Environmental Innovation with Intellectual Property Innovation: A New Basis for Patent Rewards*, 24 TEMP. J. SCI. TECH. & ENVTL. L. 51, 56-57 (2005). Patent and other intellectual property rights exist to help individuals and firms internalize the social benefits of their research and development efforts. Second, harmful environmental externalities, such as toxic pollution, lower atmosphere pollution, and climate change, are suffered generally rather than by the producers of the externalities. See Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CALIF. L. REV. 1256, 1263 (1981). This lowers the incentives for environmental innovation. See *id.*

²⁸ While other national issues such as health care reform trigger inter-party disputes, concerns about energy independence motivate bipartisan partnership. See Bill Murray, *Obama, Republicans Seek Common Ground on Energy*, OIL DAILY, Nov. 8, 2010 ("Democratic and Republican leaders have said they will make an effort to find common ground over energy issues in the wake of the Nov. 2 [2010] election in which the Republicans gained a majority in the US House of Representatives.").

The United States is heavily dependent on foreign energy sources.²⁹ The energy crises of the 1970s highlighted the fact that America's overreliance on foreign fuel supplies made it vulnerable to the whims of the supplying countries but did little to lessen its dependence on them.³⁰ After the crises, America became more acutely dependent on energy imports—particularly oil imports.³¹ In 2008, the United States consumed approximately thirty quadrillion more British thermal units per year of energy than it produced.³² On a per capita basis, the United States' consumption far exceeds consumption by other countries:

With only five percent of the world's population, the United States is responsible for about twenty-five percent of the world's annual energy consumption. Americans use twice as much energy as their European counterparts, almost seven times as much as the Chinese, and more than twenty-one times that of Africans. No one seriously argues that the rest of the world can safely consume energy at the same per capita level currently consumed by Americans.³³

Although America has benefited from dramatic growth in its production of shale gas in recent years, oil currently constitutes the largest source of energy used in the United States.³⁴ The unsustainable nature of oil has prompted energy experts to try to predict when global oil supplies would peak because, after the peak occurs, the price of oil can be expected to rise. Though estimates have varied as to when global

²⁹ FRED BOSSELMAN ET AL., *ENERGY, ECONOMICS AND THE ENVIRONMENT* 8 (3d ed. 2010).

³⁰ *Id.* at 7–9.

³¹ *Id.* at 8. Though the United States' recent boom in shale gas production has led to a surge in domestic drilling for natural gas, economic and environmental concerns have inhibited its ability to replace oil. *See id.* at 1–23; *see also* Kevin Begos, *Fracking Developed with Decades of Government Investment*, HUFFINGTON POST, http://www.huffingtonpost.com/2012/09/23/fracking-developed-government_n_1907178.html (last updated Sept. 26, 2012, 7:34 PM). Overcoming these issues through further technological advances would create a positive solution for America's energy needs.

³² BOSSELMAN ET AL., *supra* note 29, at 8.

³³ John C. Dernbach, *Harnessing Individual Behavior to Address Climate Change: Options for Congress*, 26 VA. ENVTL. L.J. 107, 119–20 (2008).

³⁴ *See* BOSSELMAN ET AL., *supra* note 29, at 7; *see also* U.S. ENERGY INFORMATION ADMIN., *ANNUAL ENERGY REVIEW 2011* 9 (2012), *available at* <http://www.eia.gov/totalenergy/data/annual/pdf/aer.pdf>.

oil supplies would peak,³⁵ the authoritative International Energy Agency stunned the world in November of 2010 with its announcement that the peak had already occurred in 2006.³⁶ If this announcement is correct, memories of cheap oil will fade into history.

When oil supplies diminish, demands for energy likely will not. Fast-paced economic gains by developing countries are driving a surge in the global demand for energy.³⁷ The U.S. Energy Information Administration has estimated that economic activity in countries outside the Organization for Economic Cooperation and Development (“OECD”)³⁸ will increase almost twice as much as in all OECD countries from 2008 to 2035.³⁹ With energy fueling this economic progress, demand for energy is anticipated to increase eighty-five percent in non-OECD regions, while energy demand in OECD regions is expected to increase eighteen percent.⁴⁰ Overall, world-marketed energy consumption

³⁵ See, e.g., Jacqueline L. Weaver, *The Traditional Petroleum-Based Economy: An “Eventful” Future*, 36 CUMB. L. REV. 505, 511–12 (2005–06); Jeffrey Ball, *As Prices Soar, Doomsayers Provoke Debate on Oil’s Future*, WALL ST. J., Sept. 21, 2004, at A1; Lynn J. Cook, *No Consensus on Future of Oil Supply, Prices*, HOUS. CHRON., June 23, 2005, <http://www.chron.com/business/energy/article/May-29-2005-Experts-ponder-oil-s-peak-1937733.php>; Matt Crenson, *Experts Ponder Oil’s Peak*, HOUS. CHRON., May 29, 2005, <http://www.chron.com/business/energy/article/May-29-2005-Experts-ponder-oil-s-peak-1937733.php>. In 2004, the U.S. Geological Service provided the most optimistic estimate of 2040 for the peak, but stated that the timing would depend on conservation efforts. See BOSSELMAN ET AL., *supra* note 29, at 370 (citing JOHN H. WOOD ET AL., U.S. ENERGY INFO. ADMIN., LONG-TERM WORLD OIL SUPPLY SCENARIOS: THE FUTURE IS NEITHER AS BLEAK OR ROSY AS SOME ASSERT 5–6 (2010), *available at* http://www.eia.doe.gov/pub/oil_gas/petroleum/feature_articles/2004/worldoilsupply/pdf/itwos04.pdf).

³⁶ See INT’L ENERGY AGENCY, WORLD ENERGY OUTLOOK 2010 EXECUTIVE SUMMARY 6 (2010), *available at* http://www.worldenergyoutlook.org/docs/weo2010/WEO2010_ES_English.pdf (indicating that conventional crude oil production peaked in 2006).

³⁷ Alex Kirby, *Energy: Meeting Soaring Demand*, BBC NEWS (Nov. 9, 2004), <http://news.bbc.co.uk/2/hi/science/nature/3995135.stm> (describing how developing countries are quickly surpassing developed countries in terms of energy demand for their industrial, residential, and commercial sectors).

³⁸ See U.S. ENERGY INFO. ADMIN., INTERNATIONAL ENERGY OUTLOOK 2011, at 1 (2011), *available at* [http://www.eia.gov/forecasts/ieo/pdf/0484\(2011\).pdf](http://www.eia.gov/forecasts/ieo/pdf/0484(2011).pdf). These statistics were based on the membership of the OECD on March 10, 2010. The OECD countries at that time consisted of the United States, Canada, Mexico, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, Japan, South Korea, Australia, and New Zealand. Chile subsequently became a member on May 7, 2010, so its membership was not reflected in Outlook. See *id.* at 1 n.2 (identifying OECD member countries as of September 1, 2010).

³⁹ See *id.* at 17, 19. The administration predicts an average of 4.6% annual growth in non-OECD countries, compared with an average of 2.1% annual growth for OECD countries. *Id.* at 17.

⁴⁰ *Id.* at 1.

is estimated to increase fifty-three percent.⁴¹ What these statistics signify is that competition for energy resources may intensify America's need for energy independence in coming years.

If energy independence and national security had concrete market values, they could signal energy developers in the United States to produce the optimum level of domestic energy. Unfortunately, while fossil fuels, like oil and natural gas, carry clear market signals to consumers in terms of price, energy independence and national security do not. Energy independence and national security are positive externalities that result when America has the resources to supply its own energy needs. To capture these positive externalities, governmental stimuli are needed to encourage the innovation and development of potential alternatives to foreign energy sources.

B. CLIMATE CHANGE

In addition to America's insecure position as a net energy importer, climate change is becoming an increasingly pressing global problem. Climate change is creating an urgent need for the development of innovative renewable energy technologies.

An influential report by the Intergovernmental Panel on Climate Change has concluded that unless the international community soon commits to decreasing greenhouse gas emissions substantially, global warming will very likely cause catastrophic damage during this century.⁴² To avoid the most destructive weather and prevent costly sea-level rise, the International Energy Agency stated that efforts must be taken to limit the temperature increase to about 2°C by stabilizing the greenhouse gas concentration at around 450 parts per million carbon dioxide equivalent.⁴³ To do so, global energy-related emissions of carbon dioxide

⁴¹ *Id.* at 9. Though the recent economic downturn decreased the short-term demands for energy, with economic recovery, the demands for energy are anticipated to return to their former trajectories. *Id.*

⁴² See generally INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. A number of Republicans, however, remain skeptical of climate change. See Steve Hargreaves, *GOP Ready to Fight over Global Warming*, CNNMONEY (Nov. 22, 2010), http://money.cnn.com/2010/11/22/news/economy/epa_global_warming_republicans/index.htm. Nonetheless, they support all forms of energy development, including renewable energy development. See *id.*

⁴³ INT'L. ENERGY AGENCY, WORLD ENERGY OUTLOOK 2009 FACT SHEET 4 (2009), available at http://www.worldenergyoutlook.org/media/weowebiste/factsheets/fact_sheets_WEO_2009.pdf.

would need to peak just before 2020 at 30.9 gigatonnes (Gt) and decline thereafter to 26.4 Gt by 2030.⁴⁴ A delay in reaching these milestones would exacerbate global climate change and increase the costs of resolving it.⁴⁵ Specifically, the Adviser to the UK Government on the Economics of Climate Change and Development has estimated that

if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.

In contrast, the costs of action—reducing greenhouse gas emissions to avoid the worst impacts of climate change—can be limited to 1% of global GDP each year.⁴⁶

Technology is expected to be a vital tool for reducing the world's carbon footprint.⁴⁷ The Pew Center on Climate Change claims that “seriously addressing global climate change will require a decades-long commitment to develop and deploy new, low-carbon technologies around the world.”⁴⁸

Theoretically, and under perfect market conditions, the supply of renewable energy technologies would rise to meet the demand for them. In other words, the amount of innovation performed should satisfy the need for innovation. But there are several impediments to relying on the free market alone. Renewable forms of energy still generally cost more

⁴⁴ *Id.* at 4. To put these values into context, 28.8 Gt of carbon dioxide was emitted in 2007. *Id.* at 5.

⁴⁵ NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW xiii (2007).

⁴⁶ *Id.* at xv.

⁴⁷ The Pew Center on Climate Change's 2006 “Agenda for Global Action” has listed “science and technology” at the top of its list of six key areas on which to concentrate. AGENDA FOR CLIMATE ACTION, PEW CENTER FOR GLOBAL CLIMATE CHANGE i, available at http://www.c2es.org/docUploads/PCC_Agenda_2.08.pdf. The report further gave fifteen recommendations requiring immediate implementation. *Id.* at ii–iii. At least five of these recommendations targeted stimulating research and development of technology that could combat climate change. *See id.* Six other recommendations called for increased funding and incentives for the innovation and development of a more efficient energy system. *Id.*

⁴⁸ CTR. FOR CLIMATE AND ENERGY SOLUTIONS, CLIMATE CHANGE 101: TECHNOLOGICAL SOLUTIONS 1 (2009), available at <http://www.c2es.org/docUploads/climate101-technology.pdf>.

than traditional fossil fuels.⁴⁹ Additionally, using renewable energy technologies results in benefits to society, such as less climate change, that are not readily quantifiable.⁵⁰ Like national security, a sustainable environment lacks a fixed monetary value, but it is a valuable public good. From an economic perspective, global climate change is a negative externality with global causes and consequences.⁵¹ Conversely, technological solutions that limit the harmful effects of climate change create positive social benefits realized not only by the inventors, but also by the entire country and even the whole world.⁵² Because climate change represents an imminent problem, delaying the development of solutions to this problem means society will experience greater negative externalities until the problem is addressed.

C. HEATED RACE

As demands for energy grow alongside an escalated appreciation of the potential hazards of global climate change, a heated race to develop renewable energy technologies that offer the promise of cleaner, sustainable energy has become front-page news.⁵³ Thus far, the United

⁴⁹ See STERN, *supra* note 45, at 249 (“Options for low-emission energy technologies are developing rapidly, though many remain more expensive than conventional technologies.”).

⁵⁰ “The climate is a public good: those who fail to pay for it cannot be excluded from enjoying its benefits and one person’s enjoyment of the climate does not diminish the capacity of others to enjoy it too. Markets do not automatically provide the right type and quantity of public goods, because in the absence of public policy there are limited or no returns to private investors for doing so . . . Thus, climate change is an example of market failure involving externalities and public goods.” *Id.* at 27 (citations omitted). Energy innovation does produce some public benefits that are readily quantifiable. For example, America’s energy intensity reportedly declined forty-two percent from 1973 to 2000 due to technological improvements, resulting in savings of more than \$430 billion. Paul Maidment, *How to Fuel the Coming Century*, FORBES (Nov. 16, 2005), http://www.forbes.com/2005/11/15/energy-conservation-oil_cx_pm_1116energy_maidment.html.

⁵¹ See STERN, *supra* note 45, at 33.

⁵² It is a basic assumption that the United States is a rational, self-interested actor and thus is primarily interested in furthering its own welfare. Climate change, however, requires a global response and has prompted the international community to recognize the need for joint action. When the United States takes action to address climate change, such as by providing incentives for the innovation and development of new green technologies, it improves its relationships with other countries that are also concerned about climate change. In other words, the United States experiences positive political externalities when it takes proactive action to address climate change.

⁵³ See, e.g., Keith Bradsher, *China Leading Global Race to Make Clean Energy*, N.Y. TIMES (Jan. 30, 2010), at A1, <http://www.nytimes.com/2010/01/31/business/energy-environment/31renew.html?ref=science>; Meena Janardhan, *The Race for Renewable Energy Sources*, THE ARAB AM. NEWS.COM (Aug. 22, 2008), <http://www.arabamericannews.com/news/index.php?mod=article&cat=World&article=1400> (discussing efforts by oil-rich Gulf countries

States has been lagging behind other countries in the renewable energy race.⁵⁴

While a number of countries have asserted that they intend to lead the field,⁵⁵ China has taken the largest measures to dominate the renewable-energy industry.⁵⁶ China's Renewable Energy Law of 2006, its Medium and Long-Term Renewable Energy Plan, and other regulations implemented by government ministries have all sought to increase the generation of renewable energy to fifteen percent by 2020.⁵⁷ China's efforts to control the world's supply of rare-earth metals necessary for renewable energy technologies, such as wind turbines or electric car batteries, have given it control over the production of ninety-seven percent of these metals.⁵⁸ China's dominance has led some to speculate that the United States' dependency on Middle Eastern

not to be left behind in the development of renewable energy sources); *Green China & the Clean-Tech Race*, 90.9WBUR (Sept. 30, 2009), <http://www.onpointradio.org/2009/09/30/green-china-and-the-clean-tech-race> [hereinafter WBUR.ORG]; *U.S. Seen Losing Renewable Energy Race to Asia*, REUTERS (Sept. 23, 2010), available at <http://www.reuters.com/article/idUSTRE68L54J20100923>; see also Sarah McQuillen Tran, *Why Have Developers Been Powerless to Develop Ocean Power?*, 4 TEX. J. OIL GAS & ENERGY L. 195, 195–96 (2009) (noting that renewable energy has become so desirable that the Federal Energy Regulatory Commission and the Minerals Management Service engaged in a prolonged battle to establish which agency had lead regulatory authority over new forms of renewable energy technology on the Outer Continental Shelf).

⁵⁴ Monfort, *supra* note 2; Walsh, *supra* note 2; see also Atkinson, *supra* note 2. Under Council Directive (EC) No. Directive 2001/77 the European Union member nations aimed to produce twenty-one percent of their electricity from renewable energy sources by 2010. In line with this measure, several European countries aggressively invested in the development of renewable energy technologies. The United Kingdom, for example, has been a leader in the development of hydrokinetic technologies that depend on ocean wave power. See Tran, *supra* note 53, at 210; *World's Largest Subsea Tidal Turbine Installed in Scotland*, RENEWABLEENERGYWORLD.COM (Sept. 16, 2010), <http://www.renewableenergyworld.com/rea/news/article/2010/09/worlds-largest-subsea-tidal-turbine-installed-in-scotland> (discussing how the world's largest rotor diameter subsea tidal turbine was installed in Scottish waters in 2010). Outside of Europe, China is also aggressively engaged in the renewable energy race. See Bradsher, *supra* note 53.

⁵⁵ For example, Russia has announced its intention to become a global leader in the field of green innovation. See Jürgen Janssens, *Russia Leading the Green World*, MKT. MELANGE (Mar. 26, 2010), <http://www.market-melange.com/2010/03/26/russia-leading-the-green-world/>.

⁵⁶ See Bradsher, *supra* note 53; see also Tony Cheng, *China Looks to Renewable Power*, BBC NEWS (Mar. 1, 2005, 7:18 AM), <http://news.bbc.co.uk/1/hi/world/asia-pacific/4306997.stm>.

⁵⁷ See BOSSELMAN ET AL., *supra* note 29, at 920–23; see also Cheng, *supra* note 56. China's renewable energy targets are particularly aggressive given that they do not include the nation's nuclear power generation. See BOSSELMAN ET AL., *supra* note 29, at 925. In 2009, China already had “9 GW of installed nuclear power, and planned to build as many as 14 new plants to account for 5 percent of its electricity by 2020.” See *id.*

⁵⁸ See Kent Garber, *America's New Energy Dependency: China's Metals*, U.S. NEWS AND WORLD REPORT (July 1, 2009), <http://politics.usnews.com/news/national/articles/2009/07/01/americas-new-energy-dependency-chinas-metals.html>.

countries for fossil fuels will soon convert to a dependency on China for renewable energy.⁵⁹ China has a strong domestic motivation to develop sustainable and renewable energy sources; its heavy reliance on coal has helped it earn the title of the “world’s biggest polluter.”⁶⁰ The Chinese government contends that, rather than risk drowning in its own pollution, it intends to become a green superpower.⁶¹

The United States has had a slow start in the renewable-energy race; however, the race is not yet lost. The renewable-energy industry is still in the fledgling state.⁶² Renewable-energy technologies in the United States and abroad are generally not yet cost-competitive with traditional sources of energy like oil.⁶³ While the discrepancy in price will likely decrease gradually over time due to rising oil prices and incremental changes to existing innovations,⁶⁴ nascent industries like the renewable-energy industry often lack the funding necessary for the optimal level of innovative research and development without a regulatory boost.⁶⁵ If the United States provides regulatory incentives to expedite the growth of the renewable-energy industry, it could still emerge as a leader in this field while also taking affirmative action to tackle its climate change and national security problems.

⁵⁹ *Id.* China is well worth watching. Not only does China have one of the fastest growing economies in the developing world, but it has also demonstrated its resilience in times of economic distress. Its recovery from the global economic recession that began in 2008 and continued into 2009 outpaced that of the United States and other developed countries, like Japan and members of the European Union. See U.S. ENERGY INFO. ADMIN., *supra* note 38, at 9.

⁶⁰ See Cheng, *supra* note 56 (discussing how China mined roughly 1.8 billion tons of coal in 2004 alone but has been prompted by oil prices and environmental concerns to shift to renewable energy); Roger Harrabin, *China ‘Now Top Carbon Polluter,’* BBC NEWS (Apr. 14, 2008, 11:11 PM), <http://news.bbc.co.uk/2/hi/asia-pacific/7347638.stm> (stating that China has overtaken the U.S. as the world’s “biggest polluter”).

⁶¹ WBUR.org, *supra* note 53.

⁶² See STERN, *supra* note 45, at 249.

⁶³ *Id.* (“Options for low-emission energy technologies are developing rapidly, though many remain more expensive than conventional technologies.”).

⁶⁴ One example of how an incremental innovation can have a large effect on an energy industry is China’s recent breakthrough in extracting uranium and plutonium from spent fuel. See *China Makes Breakthrough in Extracting Uranium and Plutonium from Spent Fuel*, CCTV.COM (Jan. 3, 2011, 10:04 AM), <http://english.cntv.cn/program/newsupdate/20110103/101317.shtml>. The new nuclear power technology is expected to make China’s nuclear materials sixty times as efficient. See *id.* China anticipates it will be able to use the uranium detected within its borders to fuel its nuclear power plants for up to three thousand years, rather than just fifty to seventy years under current technology. *Id.*

⁶⁵ See STERN, *supra* note 45, at 27 (describing how the market fails to provide private investors with incentives to engage in socially-optimal level of innovation of renewable energy technologies).

Despite the well-substantiated need for regulatory measures that will encourage more innovation and commercialization of renewable energy technologies, no one solution can be expected to save the day.⁶⁶ The patent-review process is well poised to be part of the solution. In addition to the benefits the general public and industries receive from prioritization,⁶⁷ there is almost no limit on the types of technologies for which the PTO can grant patents.⁶⁸ Section 101 of the Patent Act provides that “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” is patentable.⁶⁹ The Supreme Court has construed this section broadly as including “anything under the sun that is made by man.”⁷⁰ This breadth of jurisdictional reach enables the PTO to help fill gaps that other regulators leave.⁷¹

Some commentators have expressed concerns, however, that intellectual property (“IP”) rights may hurt, rather than help, the efforts to address climate change. During climate treaty negotiations in 2009, China and other developing countries asserted that patents impede their access to green technologies.⁷² As a result, the May 2009 United Nations climate treaty negotiating text included proposals to “remove barriers to development and transfer of technologies from developed to developing

⁶⁶ For example, in the climate change context, the Pew Center has explained that “[g]iven the many sources of emissions, a comprehensive response to climate change requires a portfolio of solutions.” *CTR. FOR CLIMATE AND ENERGY SOLUTIONS, CLIMATE CHANGE 101: UNDERSTANDING AND RESPONDING TO GLOBAL CLIMATE CHANGE 4* (2011), available at <http://www.c2es.org/docUploads/climate101-fullbook.pdf>.

⁶⁷ See *infra* Part II.A.

⁶⁸ Each U.S. agency has its own agenda. If the agendas could be woven together, they would not form a cohesive, integrated policy but rather a patchwork of regulatory goals. See Jody Freeman & Jim Rossi, *Agency Coordination in Shared Regulatory Space*, 125 *HARV. L. REV.* 1131, 1133 (2012) (arguing that inter-agency coordination is one of the great challenges of modern governance).

⁶⁹ 35 U.S.C. § 101 (2006).

⁷⁰ See *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (citations omitted). The Court has pronounced just three exceptions: “laws of nature, natural phenomena and abstract ideas.” See *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (citations omitted).

⁷¹ See William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 *IOWA L. REV.* 1, 4–6 (2003) (discussing how environmental regulation, in particular, is problematic in the sense that regulatory gaps arise from inadequate, overlapping, or inconsistent regulations of a common resource).

⁷² See, e.g., U.N. Framework Convention on Climate Change, Ad Hoc Working Group on Long-Term Coop. Action Under the Convention, Bonn, Ger., Mar. 29–Apr. 8, 2009, *China’s Views on the Fulfillment of the Bali Action Plan and the Components of the Agreed Outcome To Be Adopted by the Conference of the Parties at its 15th Session*, at 23, U.N. Doc. FCCC/AWGLCA/2009/MISC.1 (Mar. 13, 2009), available at <http://unfccc.int/resource/docs/2009/awglca5/eng/misc01.pdf>.

country” by weakening IP rights.⁷³ The following month, the revised negotiating text proposed excluding certain environmental technologies from patenting, providing for compulsory licensing of green technologies, allowing developing countries to access trade secrets on royalty-free terms, and revoking all existing patents on climate change related patents in developing countries.⁷⁴ Excluding green technologies from patentability and revoking existing patents on green technologies would have substantially altered international law particularly given that the World Trade Organization (“WTO”) Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPS”) requires China, India, and other developing countries who are members of the WTO to enforce IP rights.⁷⁵

The U.S. Congress responded swiftly in opposition to the proposals to weaken green IP rights. It passed an amendment to the Foreign Relations Authorization Act, Fiscal Years 2010 and 2011, in which it stated “with respect to the United Nations Framework Convention on Climate Change, the [United States] should prevent any weakening of, and ensure robust compliance with and enforcement of, existing international legal requirements . . . for the protection of intellectual property rights related to [green technologies].⁷⁶ Congress also passed the American Clean Energy and Security Act of 2009, which provided that “[a]ny U.S. funding directed toward assisting developing countries with regard to exporting clean technology should promote the robust compliance with and enforcement of existing international legal requirements for the protection of intellectual property rights” in accordance with TRIPS and other bilateral trade agreements.⁷⁷ As a result, the December 2009 Copenhagen Accord contained no language

⁷³ See U.N. Framework Convention on Climate Change, Ad Hoc Working Group on Long-Term Coop. Action Under the Convention, Bonn, Ger., June 1–12, 2009, *Negotiating Text*, ¶¶ 187–89, U.N. Doc. FCCC/AWGLCA/2009/8 (May 19, 2009), available at <http://unfccc.int/resource/docs/2009/awglca6/eng/08.pdf>.

⁷⁴ See U.N. Framework Convention on Climate Change, Ad Hoc Working Group on Long-Term Coop. Action, Bonn, Ger., June 1–12, 2009, *Revised Negotiating Text*, ¶¶ 186–189, U.N. Doc. FCCC/AWGLCA/2009/INF.1, (June 22, 2009), available at <http://unfccc.int/resource/docs/2009/awglca6/eng/inf01.pdf>.

⁷⁵ See Agreement on Trade-Related Aspects of Intellectual Property Rights art. 41–50, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, available at http://www.wto.org/english/docs_e/legal_e/27-trips.pdf.

⁷⁶ Foreign Relations Authorization Act, Fiscal Years 2010 and 2011, H.R. 2410, 111th Cong. § 1120A (2009). The amendment adding the quoted language passed 432-0. *On Agreeing to the Amendment: Amendment 7 to H R 2410*, GOVTRACK.US, <http://www.govtrack.us/congress/vote.xpd?vote=h2009-323> (last visited Oct. 3, 2012).

⁷⁷ American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 441(a)(11) (2009).

calling for the weakening of IP rights.⁷⁸ Debates about green IP rights have been noticeably missing from subsequent climate treaty negotiations as well.

The debates about IP rights were largely based on theoretical concerns rather than on actual studies. Since the debates died down, research has emerged suggesting that the concerns that patent rights would impede the transfer of green technologies were likely ill founded.⁷⁹ The concerns derived in large part from experiences in the pharmaceutical industry.⁸⁰ In 2007, however, John Barton analyzed the technology and industrial structures of solar photovoltaic, fuel biomass, and wind technologies in China, India, and Brazil. He concluded that IP “protection generally plays a quite different role in the renewable energy industries than it does in the pharmaceutical sector” because there tends to be more competition between patented products in the green industry.⁸¹ His study further suggested that stronger, not weaker, IP rights would likely aid China, India, Brazil, and other scientifically-advanced developing nations.⁸² Additional studies have further concluded that patent rights likely do not impede the transfer of green technologies to most developing countries.⁸³ In any event, while concerns about diffusion

⁷⁸ See U.N. Framework Convention on Climate Change, Conference of the Parties, Copenhagen, Den., Dec. 7–18, 2009, *Draft Decision -/CP.15, Proposal by the President, Copenhagen Accord*, ¶ 11, U.N. Doc. FCCC/CP/2009/L.7, (Dec.18, 2009), available at <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>.

⁷⁹ See Douglas H. Pearson, *Potential Threats to Patent Rights in Climate-Friendly Technologies*, 2 Eur. J. Risk Reg. 247, 248 (2011) (acknowledging the literature suggesting that intellectual property rights pose a barrier to the transfer of green technologies but asserting that “actual studies in the literature provide evidence that patent rights are not a barrier to technology transfer in developing countries and, to the contrary, are more likely facilitating the adoption of clean technologies in developing countries”).

⁸⁰ *Id.* at 250.

⁸¹ JOHN H. BARTON, INT’L CTR. FOR TRADE AND SUSTAINABLE DEV., *INTELLECTUAL PROPERTY AND ACCESS TO CLEAN ENERGY TECHNOLOGIES IN DEVELOPING COUNTRIES: AN ANALYSIS OF SOLAR PHOTOVOLTAIC, BIOFUEL AND WIND TECHNOLOGIES* x (2007), available at http://ictsd.org/downloads/2008/11/intellectual-property-and-access-to-clean-energy-technologies-in-developing-countries_barton_ictsd-2007.pdf.

⁸² *Id.* at vii, xi.

⁸³ See, e.g., COPENHAGEN ECON. A/S AND THE IPR CO. APS, *ARE IPR A BARRIER TO THE TRANSFER OF CLIMATE CHANGE TECHNOLOGY?* 1, 4–5 (2009), available at http://trade.ec.europa.eu/doclib/docs/2009/february/tradoc_142371.pdf (examining 215,000 patents registered worldwide, including 22,000 in developing countries, between 1998 and 2008 and concluding that patent rights do not impede the transfer of green technologies in the vast majority of developing countries because “there are hardly any patents on these [green] technologies registered in these countries”); Eric Lane, *Clean Tech Reality Check: Nine International Green Technology Transfer Deals Unhindered by Intellectual Property Rights*, 26 SANTA CLARA COMPUTER & HIGH TECH. L.J. 533, 541–42 (2010) (providing anecdotal evidence that IP protections do not impede the transfer of green technologies to developing countries); See

may justify caution with regard to the standards of patentability, they have little relevance to the speed of the review process, which is the focus of this article.

In summary, America's overreliance on energy imports from countries rife with internal conflicts, the recognition that climate change requires proactive action by the United States, and a heated race to establish dominance in the renewable-energy sector are driving the United States to prioritize efforts to encourage more innovation and development of renewable-energy technologies. The renewable-energy industry is representative of other special-needs industries that cannot produce the socially optimal level of technological progress without government intervention.

II. A SOCIALLY IRRESPONSIBLE SYSTEM

Given the compelling need for government stimuli to promote the development and commercialization of certain key technologies, the question arises whether the PTO should prioritize these technologies in the patent system. Because substantial harm to the relevant industries and public interests will occur otherwise, I argue that the answer is a resounding "yes."

To obtain a patent, an inventor must file an application with the PTO in a timely fashion.⁸⁴ Unfortunately, in recent years, applicants have not received a timely response from the Patent Office regarding the patentability of their applications. In 1876, Alexander Graham Bell received a patent for the telephone less than one month after submitting an application to the Patent Office.⁸⁵ As of July 24, 2012, however, the average time from the filing of an application to patent issuance or

generally Lee G. Branstetter, Raymond Fisman & C. Fritz Foley, *Do Stronger Intellectual Property Rights Increase International Technology Transfer? Empirical Evidence from U.S. Firm-Level Panel Data*, 121 Q. J. ECON. 321, 321-49 (2006) (examining technology transfer within U.S. multinational companies in response to IPR reforms occurring in Argentina, Brazil, Chile, China, Columbia, Indonesia, Japan, Mexico, Philippines, Portugal, South Korea, Spain, Taiwan, Thailand, Turkey and Venezuela, and concluding IP reforms increased technology transfer to reforming countries).

⁸⁴ 1 DONALD S. CHISUM, CHISUM ON PATENTS at OV-1 (2012).

⁸⁵ DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 22 (2009).

abandonment was 33.5 months⁸⁶ and this represented an improvement for the PTO from prior years.⁸⁷

The backlog of unprocessed applications at the Patent Office carries serious repercussions for inventors and the public—the backlog diffuses the incentives for the innovation and commercialization of key technologies that could improve America’s competitiveness. The PTO traditionally recognized the heightened value of technologies that further national interests and provided socially valuable patent applications with limited opportunities for expedited review.⁸⁸ However, to cut back on the popularity of these opportunities, the PTO instituted the revised Accelerated Examination program,⁸⁹ a program notorious for placing an excessive burden on applicants who are desperate enough to use it. Rather than promoting social goals, it has essentially eliminated the opportunities for fast-tracked review that high-priority applications once received.⁹⁰ The PTO’s Green Technology Pilot Program represents a positive, albeit imperfect, step towards reforming the PTO’s socially irresponsible system.

A. ACCELERATED EXAMINATION

The rising delays in the PTO review process impose substantial costs on patentees and society at large. An owner of a patent has the right to exclude others from most practical applications of a claimed invention for a limited time.⁹¹ This monopoly power can provide startups and other

⁸⁶ *Data Visualization Center*, U.S. PATENT & TRADEMARK OFFICE, <http://www.uspto.gov/patents/stats/index.jsp> (last visited Jul. 24, 2012) (click on “USPTO Data Visualization Center—Patents Dashboard”).

⁸⁷ The average time from the filing of an application to patent issuance or abandonment was 34.6 months in fiscal year 2009. *See* U.S. PATENT & TRADEMARK OFFICE, 2010-2015 STRATEGIC PLAN 10 (2010), available at http://www.uspto.gov/about/stratplan/USPTO_2010-2015_Strategic_Plan.pdf.

⁸⁸ *See infra* Part II.A.

⁸⁹ *See generally* Changes to Practice for Petitions in Patent Applications To Make Special and for Accelerated Examination, 71 Fed. Reg. 36,323 (June 26, 2006) (describing the revised Accelerated Examination program requirements).

⁹⁰ *See, e.g.*, Rai, *supra* note 17, at 2076–77 (commenting that the disclosure requirements of the revised Accelerated Examination program are sufficiently burdensome that relatively few applicants utilize the program); Jason D. Grier, Comment, *Chasing Its Own Tail? An Analysis of the USPTO’s Efforts to Reduce the Patent Backlog*, 31 HOUS. J. INT’L L. 617, 634–35 (2009) (arguing that the revised Accelerated Examination program fails to provide needed flexibility and imposes extra burdens on the applicant).

⁹¹ The Patent Act entitles patent owners to exclude others from making, using, selling, or offering to sell the claimed invention in this country and entitles the patent owners to exclude others from

businesses with distinct competitive advantages; they can use patents to attract venture capital investment, develop additional products and services, and create new jobs.⁹² Because a patent secures an invention for only a limited time and the clock typically starts ticking from the day the application is filed,⁹³ long pendency times generally reduce the value of patents to applicants.⁹⁴ As the value of a patent diminishes, the ability of a patent to provide an incentive for innovation—a fundamental justification for the patent system—is correspondingly reduced.⁹⁵ At the same time, commercialization of technologies may be delayed until a patent is granted, as competing parties cannot predict *ex ante* the precise scope of any patent rights that will be granted.⁹⁶ For industries where there is an urgent need for the innovation and development of new technologies, like the renewable energy industry, delay hurts both inventors and the public.

Although patent examiners at the PTO normally review new patent applications in the order of their U.S. filing date,⁹⁷ the PTO has initiated opportunities for accelerated processing of an assortment of high-priority applications. Between at least 1982 and 2004, the PTO initiated accelerated processing for applications such as those relating to environmental quality, energy resource development, counterterrorism, recombinant DNA, HIV/AIDS, and cancer, among others.⁹⁸ Applicants could receive accelerated review simply by filing a petition to make their applications “special,” proving in their petitions that their applications fell within a category designated by the PTO as deserving of preferential

importing the invention from another country without the authority of the patent owner. *See* 35 U.S.C. § 271(a), (e)(4)(B) (2006).

⁹² *See* RAI ET AL., *supra* note 17, at 2–4; *see also* Henry R. Nothhaft & David Kline, *The Biggest Job Creator You Never Heard Of: The Patent Office*, HARV. BUS. REV. (May 6, 2010, 12:37 PM), http://blogs.hbr.org/cs/2010/05/the_biggest_job_creator_you_ne.html.

⁹³ *See* 35 U.S.C. § 154(a)(2) (2006) (stating that the term of a patent usually ends “20 years from the date on which the application for the patent was filed in the United States or, if the application contains a specific reference to an earlier filed application or applications under . . . this title, from the date on which the earliest such application was filed”). *But see* 37 C.F.R. § 1.701 (2011) (providing several bases for patent term extensions).

⁹⁴ *See* LONDON ECON., ECONOMIC STUDY ON PATENT BACKLOGS AND A SYSTEM OF MUTUAL RECOGNITION viii (2010), *available at* <http://www.ipo.gov.uk/p-backlog-report.pdf>. This phenomenon is not universal, as some applicants may prefer to have the process delayed so that they can focus resources or time on other endeavors.

⁹⁵ *Id.* at viii–xi.

⁹⁶ *Id.* at xi.

⁹⁷ *See* MPEP, *supra* note 11, § 708.

⁹⁸ *See id.* § 708.02.

treatment, and by paying any required fees.⁹⁹ To illustrate, applicants who sought special status on the basis of environmental quality needed to state in their petition under 37 C.F.R. section 1.102 that special status was being sought “because the invention materially enhance[d] the quality of the environment of mankind by contributing to the restoration or maintenance of the basic life-sustaining natural elements.”¹⁰⁰ Similarly, applicants who sought special status on the basis of energy development or conservation had to state in their petitions that special status was sought because the invention materially contributed to either “(A) the discovery or development of energy resources, or (B) the more efficient utilization and conservation of energy resources.”¹⁰¹ The materiality standard could be satisfied either from the face of the application disclosure or through the submission of an explanatory statement by the applicant, assignee, or an attorney or agent registered to practice before the Patent Office.¹⁰²

Filing a petition for special status on one of these socially valuable grounds was exceedingly popular.¹⁰³ Indeed, it was too popular for the PTO’s liking.¹⁰⁴ In August of 2006, the PTO implemented new rules for accelerated examination that threatens the expedited review of socially valuable inventions.¹⁰⁵ Rather than designate particular categories of inventions as deserving of expedited review due to their social worth, the PTO created a one-size-fits-all program—the revised Accelerated Examination program—that allows any applicant to file a petition for special status.¹⁰⁶

It made sense to stop prioritizing some of the categories of technologies that had been receiving preferential status, like semiconductors, as they were no longer national priorities. But the PTO

⁹⁹ See *id.* Applicants filing a petition for special status needed to comply with the guidelines and requirements set forth in MPEP section 708.02 subsections I-II and V-XII.

¹⁰⁰ *Id.* § 708.02(V).

¹⁰¹ *Id.* § 708.02(VI).

¹⁰² See *id.* § 708.02(V)–(VI).

¹⁰³ Telephone Interview with Pinchus M. Laufer, Senior Legal Advisor, U.S. Patent & Trademark Office (Feb. 25, 2011). The PTO has not released any official statistics to indicate precisely how often these petitions were filed, however. *Id.*

¹⁰⁴ See *id.* (describing how cutting back the flood of petitions for special status and providing a true “fast track” review process motivated the PTO to institute the revised Accelerated Examination program).

¹⁰⁵ See Changes to Practice for Petitions in Patent Applications To Make Special and for Accelerated Examination, 71 Fed. Reg. 36,323 (June 26, 2006) (revising procedures for requesting accelerated review).

¹⁰⁶ See *id.*; see also MPEP, *supra* note 11, § 708.02(VIII).

provided no justification for eliminating all preferential treatment for socially valuable inventions. Additionally, even though the PTO attempted to provide inventors with a final decision on their accelerated applications within twelve months, which is a shorter pendency period than previously provided to any recipient of special status,¹⁰⁷ the program attracted little interest from inventors due to the liabilities and burdens it placed on applicants.

Petitions for accelerated review have had to comply with the fee requirements of the Manual of Patent Examining Procedure (“MPEP”) section 708.02(a).¹⁰⁸ Most troubling to inventors are provisions requiring applicants who file petitions for the revised Accelerated Examination program to do a fair amount of the PTO’s work for the agency, and provisions imposing severe penalties if they make any errors.¹⁰⁹ This burden is most apparent in the requirements of submitting a pre-examination search report and preparing an examination support document.

First of all, the pre-examination search requirements substantially alter an applicant’s responsibilities. Normally, applicants have a duty to disclose to the PTO relevant prior art of which they are aware, but they are not required to search for prior art.¹¹⁰ Under the

¹⁰⁷ See Press Release, U.S. Patent & Trademark Office, USPTO to Give Patent Filers Accelerated Review Option (June 26, 2006), available at <http://www.uspto.gov/news/pr/2006/06-37.jsp>.

¹⁰⁸ See Changes to Practice for Petitions in Patent Applications To Make Special and for Accelerated Examination, 71 Fed. Reg. at 36,326–27; see also MPEP, *supra* note 11, § 708.02(a). Only three types of petitions for special status do not need to comply with the revised Accelerated Examination program: petitions based on the applicant’s poor health, advanced age, or involvement in the Patent Prosecution Highway (“PPH”) pilot program. See Changes to Practice for Petitions in Patent Applications To Make Special and for Accelerated Examination, 71 Fed. Reg. at 36,324. The PPH is an international network of agreements between patent offices to expedite the review of patent applications based on the findings of another patent office. See, e.g., Press Release, U.S. Patent & Trademark Office, U.S. and Japan to Pilot Patent Prosecution Highway (May 24, 2006), available at <http://www.uspto.gov/news/pr/2006/06-35.jsp>; The PTO has PPH agreements with Australia, Austria, Canada, China, Denmark, the European Patent Office, Finland, Germany, Hungary, Iceland, Israel, Japan, Mexico, Norway, Russia, Singapore, South Korea, Spain, and the United Kingdom. See *Patent Prosecution Highway (PPH) - Fast Track Examination of Applications*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/patents/init_events/pph/index.jsp (last updated Sept. 4, 2012, 11:16 AM).

¹⁰⁹ See *infra* notes 119–124 and accompanying discussion.

¹¹⁰ Compare MPEP, *supra* note 11, § 609 (stating that applicants have a duty of disclosure, but that there “is no requirement that an applicant make a patentability search”), with *id.* § 708.02(a)(I)(H) (requiring applicants, at the time of the filing, to “provide a statement that a preexamination search was conducted”). The preexamination search statement must also include a statement of the “class and subclass and the date of the search . . . and for database searches, the search logic or chemical structure or sequence used as a query, the name of the file or files searched and the database service, and the date of the search.” *Id.* § 708.02(a)(I)(H).

PTO's revised Accelerated Examination procedures, applicants must perform a pre-examination search of all potential prior art, including U.S. patents and patent application publications, foreign patent documents, and nonpatent literature.¹¹¹ This search could easily cost the applicants thousands of dollars in additional legal fees.¹¹² Plus, if a claim is amended or added later that includes a feature that was not included in the pre-examination search, the applicant may not be permitted to make the amendment or add the new claim.¹¹³ This structure forces applicants filing petitions for special status to try to anticipate any and all potential amendments or revisions to the claims.

The required filing of an examination support document ("ESD"), which has been coined the "express suicide document,"¹¹⁴ represents a second major impediment to use of the revised Accelerated Examination program. As part of the ESD, applicants must submit to the PTO an Information Disclosure Statement ("IDS") that discloses all prior art that is deemed most closely related to the subject matter encompassed by the claims.¹¹⁵ Applicants must further explain what the prior art teaches and how their invention differs from it.¹¹⁶ Specifically, for every prior art reference mentioned in the IDS, applicants must identify all the limitations in their claims that are disclosed by the reference and specify where the limitations are disclosed in the cited reference.¹¹⁷ Applicants must further state how their invention is useful and show how the application's written description¹¹⁸ supports the claimed invention.¹¹⁹

¹¹¹ U.S. PATENT & TRADEMARK OFFICE, GUIDELINES FOR APPLICANTS UNDER THE NEW ACCELERATED EXAMINATION PROCEDURE 1 (2006) [hereinafter PTO, GUIDELINES], available at http://www.uspto.gov/patents/process/file/accelerated/ae_guidelines_011111.pdf.

¹¹² See generally *Budget Estimator for Patents*, BROWN & MICHAELS, PC, <http://www.bpmllegal.com/patfees.html#other> (last visited Oct. 1, 2012) (indicating that the cost of a clearance search to determine if any currently existing or valid patents might be infringed by a product is often at least \$25,000).

¹¹³ PTO, GUIDELINES, *supra* note 111, at 4.

¹¹⁴ Gene Quinn, *Accelerated Exam in Inequitable Conduct Friendly Era*, IPWATCHDOG (Aug. 11, 2009, 5:30 AM), <http://ipwatchdog.com/2009/08/11/accelerated-exam-in-inequitable-conduct-friendly-era/id=4833/>.

¹¹⁵ PTO, GUIDELINES, *supra* note 111, at 4.

¹¹⁶ *Id.* at 4–5.

¹¹⁷ *Id.*

¹¹⁸ The "written description" refers to that portion of the patent application in which the inventor must demonstrate that he has possession of the invention. It must enable one skilled in the art to make and use the invention. In particular, the specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention. 35 U.S.C. § 112 (2006).

The pre-examination search and ESD requirements create three practical problems for inventors: (1) they increase the legal fees for prosecuting an application, (2) they push the applicants to narrow the scope of their claims at an early stage, and (3) they render any patents that issue out of this program potentially subject to a greater risk of unenforceability. The third problem has been most troubling to applicants because “[e]ach individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the [Patent] Office, which includes a duty to disclose to the [Patent] Office all information known to that individual to be material to patentability.”¹²⁰ The U.S. Court of Appeals for the Federal Circuit (“Federal Circuit”), which has exclusive nationwide jurisdiction over appeals from all district court cases arising under the patent laws,¹²¹ has made clear that a breach of this duty during the prosecution of a patent application constitutes “inequitable conduct” and renders all the claims of the patent unenforceable for the life of the patent.¹²² Litigating parties seeking to render a patent unenforceable may argue that, among other things, the pre-examination search was insufficient, the applicant did not submit all relevant prior art to the PTO, or the applicant mischaracterized the prior art.¹²³ Thus, patent practitioners have been concerned that the expediency of the revised Accelerated Examination program may open them up to a higher legal risk of having the patent rendered invalid in subsequent litigation. It is too early to know whether recent judicial and legislative actions taken to limit the availability of inequitable conduct claims will affect the popularity of the revised Accelerated Examination program.¹²⁴

¹¹⁹ PTO, GUIDELINES, *supra* note 111, at 5–6.

¹²⁰ 37 C.F.R. § 1.56(a) (2011).

¹²¹ 28 U.S.C. § 1295 (2006).

¹²² See *Kingsdown Med. Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 877 (Fed. Cir. 1988) (en banc).

¹²³ See *Accelerated Examination*, INVENTIVE STEP (Sept. 10, 2009, 4:13 PM), <http://inventivestep.net/2009/09/10/accelerated-examination/> (discussing some of the perceived problems with the revised Accelerated Examination program). Of course, not every inequitable conduct claim will be won. A winning claim would likely require egregious facts, rather than evidence of mere negligence.

¹²⁴ The Federal Circuit has called the inequitable conduct doctrine a “plague” on the patent system and has raised the standards for prevailing on an inequitable conduct claim. *Therasense, Inc. v. Becton, Dickinson and Co.*, 649 F.3d 1276, 1290 (Fed. Cir. 2011). In the America Invents Act, Congress further attempted to reduce concerns about inequitable conduct by creating a new procedure that enables patent holders to submit supplemental information to correct errors or omissions in proceedings before the PTO. Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 257 (2011).

In summary, though the PTO traditionally recognized the social importance of certain categories of applications, its revised Accelerated Examination procedures do not. The burdens imposed on patent applicants by the revised Accelerated Examination program have discouraged applicants with socially valuable applications from seeking expedited review and getting their inventions to market earlier. Instead of serving public needs, the PTO has instituted a socially irresponsible system for expediting patent applications.

B. GREEN TECHNOLOGY PILOT PROGRAM

The PTO's revised Accelerated Examination program does not represent the only means by which a patent application can be fast-tracked. In recent years, the PTO has initiated a handful of experimental programs that expedite certain categories of applications.¹²⁵ None of these programs aided a category of socially valuable applications until actions by foreign patent offices forced the PTO to take notice. On May 12, 2009, the United Kingdom Intellectual Property Office ("UK IPO") commenced its "Green Channel" initiative to expedite the review of applications on green technologies.¹²⁶ Soon after, the Japanese Patent Office ("JPO"),¹²⁷ the Australian Patent Office ("IP Australia"),¹²⁸ and the

¹²⁵ For example, on November 27, 2008, the PTO established the Patent Application Backlog Reduction Stimulus Plan. Under this program, a small entity that expressly abandoned a co-pending, unexamined application could have another application advanced out of turn. *See* Patent Application Backlog Reduction Stimulus Plan, 74 Fed. Reg. 62,285, 62,285–87 (Nov. 27, 2009). The duration of this pilot program was extended on February 1, 2010, until June 30, 2010. Extension of the Patent Application Backlog Reduction Stimulus Plan, 75 Fed. Reg. 5041, 5041 (Feb. 1, 2010). Then, on June 3, 2010, the PTO announced a proposal to establish three distinct patent processing tracks (the "Three-Track Examination Program"). Press Release, U.S. Patent & Trademark Office, USPTO Proposes To Establish Three Patent Processing Tracks (June 3, 2010), available at http://www.uspto.gov/news/pr/2010/10_24.jsp. The proposed tracks consisted of an accelerated examination (Track I), traditional examination (Track II), and an applicant-controlled examination that could be delayed for up to thirty months prior to examination (Track III). *Id.* Since the enactment of the America Invents Act, the PTO has issued a final rule implementing Track I, which requires a fee of \$4,000 in addition to the normal filing fees. *See* Changes to Implement the Prioritized Examination for Requests for Continued Examination, 76 Fed. Reg. 78,566, 78,566–69 (Dec. 19, 2011).

¹²⁶ *See* Press Release, U.K. Intellectual Prop. Office, *supra* note 20; U.K. INTELL. PROP. OFF., *Green Channel Patent Applications Data*, *supra* note 20; *see also* Press Release, U.K. Intellectual Prop. Office, UK 'Green' Inventions To Get Fast-Tracked Through Patent System (May 12, 2009), available at <http://www.ipo.gov.uk/about/press/press-release/press-release-2009/press-release-20090512.htm>.

¹²⁷ *See* ONDA TECHNO INT'L PAT. ATT'YS, *supra* note 20.

¹²⁸ *See* Press Release, Richard Marles, *supra* note 20.

Korean Intellectual Property Patent Office (“KIPO”)¹²⁹ followed suit by creating similar programs.¹³⁰ In response to pressures from the Obama Administration, in December of 2009 the U.S. PTO created its own program, the Green Technology Pilot Program,¹³¹ to expedite the review of certain “green technologies.”¹³² Although this program represents a step in the right direction, it looks far greener than it actually is.¹³³

Several elements of the Green Technology Pilot Program have hindered its effectiveness. Applications accepted under the Green Technology Pilot Program receive special status in any appeal to the Board of Patent Appeals and Interferences, as well as in the patent publication process.¹³⁴ But unlike applications advanced under the revised Accelerated Examination program, which are accorded special status throughout the entire course of prosecution before an examiner, applications proceeding via the Green Technology Pilot Program have

¹²⁹ The KIPO program, which KIPO claims provides the fastest examination in the world, made headlines in October of 2009 when the agency reported that one examination was completed in less than a month. See Press Release, Korean Intellectual Prop. Office, *supra* note 20; see also NUTTER MCCLENNEN & FISH LLP, *supra* note 20.

¹³⁰ The Canadian Intellectual Property Office, which is implementing permanent rules to provide for the expedited review of green applications, is among a handful of other global patent offices that have expressed an interest in introducing opportunities for the accelerated review of green applications into their own systems. See Press Release, Can. Intellectual Prop. Office, Expedited Examination of Patent Applications Related to Green Technology (Oct. 5, 2010), available at <http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr02930.html>; see also Estelle Derclaye, *Not Only Innovation but Also Collaboration, Funding, Goodwill and Commitment: Which Role for Patent Laws in Post-Copenhagen Climate Change Action*, 9 J. MARSHALL REV. INTELL. PROP. L. 657, 662 (2010) (stating that the “UK IPO reports that China, Japan and Brazil have expressed interest in introducing similar fast track systems”).

¹³¹ See generally Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666 (Dec. 8, 2009); see also Kappos, *supra* note 15; Press Release, U.S. Patent & Trademark Office, The U.S. Commerce Department’s Patent and Trademark Office (USPTO) Will Pilot a Program To Accelerate the Examination of Certain Green Technology Patent Applications (Dec. 7, 2009), available at http://www.uspto.gov/news/pr/2009/09_33.jsp.

¹³² The PTO specified that a green technology is one that “materially enhances the quality of the environment, or that materially contributes to: (1) The discovery or development of renewable energy resources; (2) the more efficient utilization and conservation of energy resources; or (3) greenhouse gas emission reduction.” Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,667.

¹³³ In a calculated effort to attract public attention, the officials timed their announcement to coincide with the commencement of the fifteenth session of the Conference of the Parties (“COP-15”) international climate treaty talks in Copenhagen, Denmark. Martin LaMonica, *Patent Office Puts Green Tech on Fast Track*, CNET (Dec. 8, 2009), http://news.cnet.com/8301-11128_3-10411175-54.html.

¹³⁴ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,666.

only been accorded special status prior to the first Office action.¹³⁵ This first Office action typically consists of only the first of multiple letters from an examiner to an applicant describing the legal status of the application.¹³⁶ Moreover, while a final decision is generally made on applications reviewed under the revised Accelerated Examination program within twelve months,¹³⁷ the PTO indicated the pilot program would only lower the average wait for a final decision by twelve months.¹³⁸ This means that the PTO anticipated that applications processed under this program would still require two years to fully process.

The PTO further placed three major restrictions on the Green Technology Pilot Program that did not exist under the revised Accelerated Examination procedures.¹³⁹ First, to qualify for the Green Technology Pilot Program, applications originally had to be filed prior to December 8, 2009, and petitions for special status had to be filed prior to December 8, 2010.¹⁴⁰ In other words, accelerated review was only available for one year to applications already in the system—the program had no relevance to technologies that had not yet been invented. The second restriction was a cap on the number of eligible applications. Secretary of Commerce Gary Locke had stated that 25,000 pending applications were eligible for the Green Technology Pilot Program,¹⁴¹ but the PTO limited the scope of the program to the first 3,000 grantable petitions for special status.¹⁴² Finally, the PTO limited the program to 79

¹³⁵ An Office action is a written opinion of patentability from the PTO. *See* MPEP, *supra* note 11, § 1.104(a).

¹³⁶ *See Possible USPTO Communications from Examining Attorneys*, U.S. PAT. & TRADEMARK OFF., <http://www.uspto.gov/trademarks/process/update/oa.jsp> (last modified Apr. 5, 2012, 8:23 AM) (“An Office action issues to notify the applicant regarding problems with the application. This will include the reason why registration is being refused or what requirements must be satisfied. In most cases, the applicant must respond to an Office action within 6 months from the date the Office action is issued or the application will be abandoned.”).

¹³⁷ *See* Press Release, U.S. Patent & Trademark Office, USPTO To Give Patent Filers Accelerated Review Option (June 26, 2006), *available at* <http://www.uspto.gov/news/pr/2006/06-37.jsp>.

¹³⁸ *See* U.S. Patent & Trademark Office, *supra* note 131.

¹³⁹ *See* Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,666, 64,668.

¹⁴⁰ *See id.* at 64,666–67.

¹⁴¹ Gary Locke, U.S. Sec’y of Commerce, Remarks at Announcement of USPTO Green Tech Pilot Program (Dec. 7, 2009) [hereinafter Locke, Remarks at Announcement], *available at* <http://www.commerce.gov/news/secretary-speeches/2009/12/07/remarks-announcement-uspto-green-tech-pilot-program>.

¹⁴² *See* Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,666.

eligible classifications out of over 450 classifications recognized by the PTO “to balance the workload and gauge resources needed to achieve the goals of the Green Technology Pilot Program.”¹⁴³ The only relative benefit of the Green Technology Pilot Program over the revised Accelerated Examination program was the removal of the requirements that applicants conduct pre-examination searches and provide ESDs to the PTO.¹⁴⁴

It soon became abundantly clear that the Green Technology Pilot Program had generated suboptimal participation levels. Five months after going into effect, the PTO had received fewer than one thousand requests from applicants who wanted their applications to be made special under the Green Technology Pilot Program.¹⁴⁵ Of these requests, the PTO awarded special status to only 342 patent applications.¹⁴⁶ Following internal review, the PTO determined that the classification requirement was too restrictive and not necessary to maintain a balanced workload.¹⁴⁷ Indeed many environmentally beneficial inventions were ineligible for the program due to the classification requirement.¹⁴⁸ The PTO eliminated the classification restriction on May 21, 2010.¹⁴⁹ This revision opened up the program to all viable “green technologies.”¹⁵⁰ Applicants who had previously been denied eligibility for the program on the basis of the

¹⁴³ *Id.* at 64,668–69. For a list of the classifications that were originally eligible for the program, see Appendix.

¹⁴⁴ Compare Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,666–68, with MPEP, *supra* note 11, § 708.02(a)(I)(G)–(I).

¹⁴⁵ Press Release, U.S. Patent & Trademark Office, USPTO Expands Green Technology Pilot Program to More Inventions (May 21, 2010), available at http://www.uspto.gov/news/pr/2010/10_21.jsp.

¹⁴⁶ *Id.*

¹⁴⁷ See Elimination of Classification Requirement in the Green Technology Pilot Program, 75 Fed. Reg. 28,554, 28,554 (May 21, 2010).

¹⁴⁸ For example, a bottle/container coupling system that served to reduce landfill wastes by altering disposable water bottles in such a way that they could be fitted end-to-end with one another was excluded by the classification requirement. U.S. Patent No. 7,644,828 (filed Apr. 11, 2007); see also *Innovative Eco-Friendly Re-Use for Plastic Water Bottles Granted Patent*, MMDNEWswire.COM (Feb. 9, 2010), <http://www.mmdnewswire.com/water-bottles-6938.html> (explaining the utility of Patent No. ‘828). In addition, the classification requirement originally excluded all applications regarding systems and methods using temperature and humidity controls to promote energy conservation (“USPC 236”). See, e.g., Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,668–69 (showing that USPC 236 was originally ineligible for the GTPP).

¹⁴⁹ See Elimination of Classification Requirement in the Green Technology Pilot Program, 75 Fed. Reg. at 28,554.

¹⁵⁰ See *id.*; see also Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,666–67 (defining “green technologies”).

classification restriction were allowed to submit renewed petitions.¹⁵¹ Despite the PTO's admission that the Green Technology Pilot Program had garnered lower participation levels than anticipated, the PTO stated that it had "received positive feedback and suggestions from stakeholders" on the program.¹⁵²

On November 10, 2010, the PTO again revised the Green Technology Pilot Program.¹⁵³ First of all, the PTO extended the program until December 31, 2011—slightly more than one year past the original deadline.¹⁵⁴ In addition, the PTO opened up the program to applications filed on or after December 8, 2009.¹⁵⁵ The PTO thereby eliminated the requirement that an application had to have been pending when the program began. At the same time, the PTO confirmed that the original size constraint on the program, which limited the program to the first 3,000 grantable petitions, remained in effect.¹⁵⁶ This constraint had come to carry little meaning, however. By early November 2010, the PTO had granted only 790 petitions, a far stretch from the limit of 3,000 grantable petitions.¹⁵⁷ Given these statistics, it is unsurprising that this expansion of the program was made with little fanfare. Unlike the original implementation of the pilot program and the removal of its classification restriction, these changes were not accompanied by a press release. The sole explanation for the changes was that they would "permit more applications to qualify for the program."¹⁵⁸

¹⁵¹ See Elimination of Classification Requirement in the Green Technology Pilot Program, 75 Fed. Reg. at 28,555.

¹⁵² *Id.* No comments on the Green Technology Pilot Program were made available to the public, however. See *Changes to Practice for Petitions to Make Special in Patent Applications Pertaining to Green Technologies*, REGULATIONS.GOV (Dec. 8, 2009), <http://www.regulations.gov#!docketDetail;D=PTO-P-2009-0038> (showing no public submissions available); *Elimination of Classification Requirement in the Green Technology Pilot Program*, REGULATIONS.GOV (May 21, 2010), <http://www.regulations.gov#!docketDetail;D=PTO-P-2010-0042>; see also *Green Technology Pilot Program*, REGULATIONS.GOV (May 17, 2010), <http://www.regulations.gov#!docketDetail;D=PTO-P-2010-0050>.

¹⁵³ See Expansion and Extension of the Green Technology Pilot Program, 75 Fed. Reg. 69,049, 69,049–50 (Nov. 10, 2010).

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ See Press Release, U.S. Patent & Trademark Office, USPTO Extends Deadline to Participate in Green Technology Pilot Program by One Year (Nov. 10, 2010), available at http://www.uspto.gov/news/pr/2010/10_55.jsp.

¹⁵⁸ Expansion and Extension of the Green Technology Pilot Program, 75 Fed. Reg. at 69,050.

Though lacking in sure-footedness at its start, the Green Technology Pilot Program should not be written off as a bold, yet entirely unsuccessful, adventure. By the time the program closed on March 30, 2012, applicants had filed 5,550 petitions for expedited review under the program.¹⁵⁹ As of April 26, 2012, the PTO had granted 3,533 of those petitions and published 1,062 patents under the program.¹⁶⁰ In other words, 698 green technologies have had the opportunity to surge forward onto the marketplace rather than await examination for the next couple of years in the PTO's backlog. The statistics for the Green Technology Pilot Program are also significant when contrasted with those for the PTO's revised Accelerated Examination program. Between the inception of the revised Accelerated Examination program in August of 2006 and December 31, 2010, only 4,464 applicants filed petitions under the program.¹⁶¹ Averaging the number of petitions filed over the period of time these programs have been in force, the Green Technology Pilot Program has had about 200 applications filed per month, whereas the revised Accelerated Examination program has had merely 86.5 petitions per month. Given the Green Technology Pilot Program's restriction to a narrow group of patent applications (green technologies) and the absence of restrictions for technologies eligible for the revised Accelerated Program, the substantial discrepancy between the average values for these programs demonstrates that the Green Technology Pilot Program has been a relative hit. What is more, since the PTO implemented its latest revisions, the rate of petitions for special status filed per month under the pilot program has nearly doubled. But while the Green Technology Pilot Program has been substantially more popular than the revised Accelerated Examination program, the level of participation in the Green Technology Pilot Program has still been remarkably limited. Applicants filed fewer than 6,000 petitions for special status under the pilot program during its first twenty-four months of implementation, a far cry from the 25,000 applications the Secretary

¹⁵⁹ U.S. PATENT & TRADEMARK OFFICE, GREEN PETITION REPORT SUMMARY (Apr. 26, 2012) [hereinafter Green Petition], available at http://www.uspto.gov/patents/init_events/green_report_summary20120426.pdf; *Green Technology Pilot Program – CLOSED*, U.S. PATENT & TRADEMARK OFFICE, http://www.uspto.gov/patents/init_events/green_tech.jsp#heading-5 (last modified May 7, 2012).

¹⁶⁰ *Id.* It is not clear how many of the applications that received expedited status under the Green Technology Pilot Program are still awaiting a final decision as to patentability.

¹⁶¹ See U.S. PATENT & TRADEMARK OFFICE, ACCELERATED EXAMINATION STATISTICS 1 fig.1 (2011), available at http://www.uspto.gov/patents/process/file/accelerated/ae_stats_v8_05jan2011.pdf.

of Commerce claimed were eligible.¹⁶² These preliminary statistics suggest that, while the Green Technology Pilot Program has been a relative success compared to the revised Accelerated Examination program, the program should not serve as a model for prioritizing other socially valuable patent applications until the PTO recognizes and addresses its deficiencies.

III. OPTIMIZING THE PATENT BARGAIN

Although the PTO currently fails to meaningfully prioritize socially valuable patents, the constitutional purposes underlying the existence of the patent system support reform of this deficiency. The heart of the patent system is an exchange of a benefit to the public—the promotion of “the Progress of Science and useful Arts”—in return for an inventor’s ability to hold the exclusive rights to an invention for a limited time.¹⁶³ Not every grant of a patent benefits society, however. The PTO does not discriminate against inventions that could be seen as detrimental to society (e.g., those enhancing tobacco production or weapons products) or of little worth (e.g., those with little to no likelihood of commercial success).¹⁶⁴ At the other end of the spectrum are inventions that are urgently needed to enhance the quality of life for millions of U.S. citizens, improve America’s competitiveness before it falls too far behind other nations, and save lives. Unfortunately, the private incentives to develop these technologies are often inadequate, considering the benefits that society would receive from their use. Given the discrepancy in the importance of different inventions to society, providing preferential treatment to those inventions most likely to “promote the Progress of Science and the useful Arts” should be the PTO’s highest priority. By using the Green Technology Pilot Program as a model for broader

¹⁶² Compare Green Petition, *supra* note 159, at 1, with Locke, *supra* note 141.

¹⁶³ U.S. CONST. art. I, § 8, cl. 8. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480–81 (1974) (“The stated objective of the Constitution . . . is to ‘promote the Progress of Science and useful Arts.’ The patent laws . . . have a positive effect on society . . . by way of increased employment and better lives for our citizens.”).

¹⁶⁴ See *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1366–68 (Fed. Cir. 1999). The court stated: “To be sure, since Justice Story’s opinion in *Lowell v. Lewis*, 15 F. Cas. 1018 (C.C.D. Mass. 1817), it has been stated that inventions that are ‘injurious to the well-being, good policy, or sound morals of society’ are unpatentable . . . [But this principle] has not been applied broadly in recent years As the Supreme Court put the point more generally, ‘Congress never intended that the patent laws should displace the police powers of the States, meaning by that term those powers by which the health, good order, peace and general warfare of the community are promoted.’” *Id.* (citation omitted).

permanent programs that target high-priority technologies, while also recognizing the shortcomings of this program, the PTO can help the United States surge forward and better optimize the fundamental patent bargain.¹⁶⁵

The gap between private incentives to develop green technologies and the social benefits that arise from such technologies justified action by the PTO to expedite the processing of green patent applications. But the PTO's approach in the Green Technology Pilot Program has been far from ideal. By providing only nominal benefits to applicants who spend considerable resources to petition for special status under the program, the PTO has effectively paid lip service to environmental goals while doing little to aid the needy green industry. Even more worrisome, by restricting program eligibility to already-invented technologies,¹⁶⁶ the PTO has neglected one of its most basic regulatory purposes: fueling the innovation of new socially valuable technologies. These fundamental problems with the pilot program must be rectified before it can serve as a constructive model for broader programs that expedite the review of applications for other high-priority technologies. Concerns about the impropriety of allowing the PTO to define what constitutes a socially valuable technology and about fairness, however, can largely be overcome in light of the purposes of the patent system and the existence of mechanisms that ameliorate these concerns.

A. DEFICIENCIES IN THE GREEN MODEL

One of the most apparent weaknesses in the PTO's Green Technology Pilot Program is its lack of benefits for participating inventors; this has yielded the unsurprising result of minimal participation in the program. But the Green Technology Pilot Program's failure to provide incentives for the innovation of new green technologies is even more disconcerting.

1. Barriers to Participation

For parties interested in expedited review, the most obvious problems with the Green Technology Pilot Program are the lack of

¹⁶⁵ Of course, the PTO is not the only entity capable of furthering the patent bargain. Congress and the courts have major roles to play as well.

¹⁶⁶ See *infra* Part III.A.1.

tangible benefits for inventors who partake of the program, and the difficulty in meeting its eligibility requirements.¹⁶⁷ These practical problems have prevented technologies of great environmental value from taking advantage of the Green Technology Pilot Program.

Few inventors took advantage of the Green Technology Pilot Program because few benefits flowed from the program. The PTO claimed that the fast-tracking opportunities available under the Green Technology Pilot Program would enable applicants to get a final decision on their applications about one year faster than the average wait for a decision for applications in green technology areas.¹⁶⁸ However, the PTO compared the overall average wait time for green technologies with the average anticipated wait time under the pilot program. The overall average wait time is calculated based on applications spanning all different levels of complexity, not merely the most straightforward ones. The Green Technology Pilot Program has never been open to all applications. Rather, the Green Technology Pilot Program was limited to the simplest applications.¹⁶⁹ Like the revised Accelerated Examination program, the pilot program requires that qualifying applications (1) have three or fewer independent claims, (2) have twenty or fewer total claims, (3) have no multiple dependent claims, (4) have claims drawn to a single invention (with the applicant agreeing in advance to make an election telephonically without traverse if the examiner finds that this condition is not met), and (5) be non-reissue utility applications under 35 U.S.C. § 111(a) or international applications that have entered the national stage under 35 U.S.C. § 371.¹⁷⁰

In addition to these joint restrictions, the Green Technology Pilot Program went a step further than the Accelerated Examination program by (1) excluding provisional applications, (2) excluding reexaminations, (3) excluding design applications,¹⁷¹ (4) originally limiting the program to pending applications, (5) capping the program to the first 3,000

¹⁶⁷ Other problems may have also played a role in inhibiting effective participation. For example, it is unclear if many inventors were even aware of the pilot program.

¹⁶⁸ See U.S. Patent & Trademark Office, *supra* note 131.

¹⁶⁹ See Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,667 (Dec. 8, 2009).

¹⁷⁰ Compare *id.*, with MPEP, *supra* note 11, § 708.02(a)(I)(E)–(F).

¹⁷¹ Compare Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,667, with MPEP, *supra* note 11, § 708.02(a)(I)(B).

grantable petitions, and (6) originally limiting the program to seventy-nine eligible patent classifications.¹⁷²

Many of these restrictions were fairly benign and had only minimal impact on the eligibility of applicants when considered individually. However, applications that satisfied all of the restrictions for eligibility in the pilot program were bound to take less time to review than the average application on a green technology due to their inherent simplicity, rather than due to any efforts by the PTO to expedite them. This laundry list of restrictions on eligibility can be directly contrasted with the UK IPO's influential Green Channel Initiative, which places no restrictions on the types of eligible applications other than the requirement that they "relate[] to a 'green' or environmentally-friendly technology."¹⁷³

In all likelihood, many applicants did not investigate the accuracy of the PTO's claim that the patent-review process would decrease by one year for green technologies. However, each inventor with a pending application has the opportunity to request an approximate estimate from the PTO of when his patent application may be reviewed under standard procedures.¹⁷⁴ This mechanism has given inventors the opportunity to learn for themselves that the anticipated "fast-tracking" service available under the Green Technology Pilot Program was not that different from the wait they might otherwise anticipate.¹⁷⁵ Even if the PTO's statement that it would reduce the patent application process by one year was accurate, from the viewpoint of many inventors, such a difference is insufficient to justify the costs associated with hiring a lawyer to file a petition for expedited review and the risk that the petition would be dismissed or denied. This risk is quite appreciable. Close to one

¹⁷² See Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,666–67.

¹⁷³ *Green Channel for Patent Applications*, U.K. INTELL. PROP. OFF., <http://www.ipo.gov.uk/protypes/pro-patent/p-law/p-pn/p-pn-green.htm> (last visited Oct. 1, 2012).

¹⁷⁴ See Telephone Interview with Victor Cardona, Intellectual Prop. Attorney, Heslin Rothenberg Farley & Mesiti P.C. (Nov. 24, 2010).

¹⁷⁵ E-mail from Victor Cardona, Intellectual Prop. Attorney, Heslin Rothenberg Farley & Mesiti P.C., to author (Feb. 27, 2011, 11:27 AM CST) (on file with author) (discussing how, after his client's initial rejection from the Green Technology Pilot Program, the client declined to challenge the decision even though the program had been opened to all technology classifications and the invention would probably have been accepted because the "timeline for receiving an office action under the regular procedures at that time . . . was not that different than if [they] applied for and were accepted into the greentech accelerated program").

third of the inventors who filed a petition for the Green Technology Pilot Program have had their petitions denied.¹⁷⁶

Additionally, the PTO can review patent applications considerably faster than it proposed for the Green Technology Pilot Program. The revised Accelerated Examination program provides a suitable basis for comparison—as it also contains a number of restrictions designed to weed out complicated applications. There, the PTO strives to give applicants a final decision within twelve months¹⁷⁷ which is about a year less than it offered applicants for the Green Technology Pilot Program. While it could be argued that the reason the PTO can achieve this quick decision rate for the revised Accelerated Examination program is due to its prior-art search requirement, a more significant factor appears to drive this discrepancy. Applications proceeding via the Green Technology Pilot Program have only been accorded special status prior to the first Office Action.¹⁷⁸ In contrast, under the revised Accelerated Examination program, each accepted application has been placed on the examiner's special docket throughout its prosecution before the examiner.¹⁷⁹ Moreover, under its proposed three-track program, the PTO has indicated that applications filed under "Track I" of the program could be processed within one year without the completion of a prior art search.¹⁸⁰

Significantly, other patent offices provide applicants with even shorter pendency periods than the PTO has provided for the revised Accelerated Examination program and do so without imposing onerous requirements on applicants. The UK IPO strives to grant patents on green technologies within nine months,¹⁸¹ and KIPO, which lays claims to the fastest examinations in the world, made headlines in October 2009 when

¹⁷⁶ By the time the program closed, only 63.7% of the petitions filed had been granted. *See* Green Petition, *supra* note 159.

¹⁷⁷ *See* U.S. Patent & Trademark Office, *supra* note 107.

¹⁷⁸ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,666 (Dec. 8, 2009).

¹⁷⁹ *See id.*; *see also* Changes to Practice for Petitions in Patent Applications To Make Special and for Accelerated Examination, 71 Fed. Reg. 36,323, 36,324–25 (June 26, 2006) (describing the revised Accelerated Examination program requirements).

¹⁸⁰ *See* Enhanced Examination Timing Control Initiative; Notice of Public Meeting, 75 Fed. Reg. 31,763, 31,765–66 (June 4, 2010). The PTO requested comments on thirty-three questions regarding the Three-Track Examination Program. *Id.* at 31,767–68.

¹⁸¹ *See* Press Release, U.K. Intellectual Prop. Office, *supra* note 126 ("The green patents initiative will make it easier and faster for new products to reach the market. It could take only nine months to get a patent granted under this scheme, compared with the current average time of two-to-three years.").

the agency reported that it had completed an examination in less than a month.¹⁸² The speed of fast-tracking efforts abroad highlights the inadequacies of a “fast-tracking” review program that strives to review applications within about two years.

Thus, the successful implementation of the Green Technology Pilot Program has been hindered by the PTO’s failure to offer tangible benefits to inventors who petition for eligibility. The ability of the PTO to expedite other applications within twelve months and the demonstrated desire and ability of other patent offices to provide more condensed review periods highlights the inadequacies of an “expedited” program that was designed to make inventors wait about two years for a final decision. By offering applications involving socially valuable technologies opportunities for expedited review throughout their prosecution, as the PTO does for applications under its revised Accelerated Examination program, the PTO can better entice inventors to participate in future acceleration programs and bring valuable technologies to market in a timelier manner.¹⁸³

2. Barriers to Innovation

Beyond the Green Technology Pilot Program’s problematic barriers to participation, an even more troubling aspect of the program is that the PTO designed it in a manner that prevented it from providing incentives for the innovation of new green technologies. As a result, it only provides applicants with the ability to commercialize their inventions earlier. The benefits of earlier commercialization, such as enabling inventors to “secure funding, create businesses, and bring vital

¹⁸² See Korean Intellectual Prop. Office, *supra* note 20; see also NUTTER MCCLENNEN & FISH LLP, *supra* note 20. One commentator has discovered that the KIPO program is limited primarily to inventions that have “received financial support or certification from the [Korean] government.” Eric Lane, *KIPO Green Tech Fast Track Inaccessible for Most Applicants*, Green Patent Blog (Nov. 7, 2011), <http://www.greenpatentblog.com/2011/11/07/kipo-green-tech-fast-track-inaccessible-to-most-applicants/>. These restrictions limit the ability of American inventors and other non-Korean inventors to benefit from KIPO’s expedited review program but may not impose a substantial burden on Korean inventors. *Id.*

¹⁸³ Several other mechanisms that could be used to reward green technologies in the patent system have been suggested, including: the reduction, cancellation, or waiver of patent fees; the removal of green inventions from deferred examination; earlier publication and/or priority at the opposition and infringement stages; greater patent protection; and disclosure of information about the invention’s environmental impact. See Derclaye, *supra* note 130, at 659 (describing the different mechanisms that have been proposed to green the patent system). It is beyond the scope of this Article to address these alternatives.

green technologies into use much sooner,”¹⁸⁴ are important to inventors and the economy. But the program’s failure to promote innovation runs contrary to both greater social needs and public expectations.

An incentive to invent a new technology exists only if an inventor is aware of an opportunity that will benefit her as a result of the invention. The Green Technology Pilot Program did not create any such opportunities. The PTO may have feared that providing a new incentive for the innovation of green technologies would lead inventors to develop more technologies on which they would subsequently seek patents, resulting in the exacerbation of the PTO’s backlog of pending applications.¹⁸⁵ The agency eliminated the program’s potential to provide incentives for new innovation by restricting eligibility in the program to pending applications.¹⁸⁶ Even though the PTO later expanded the program to include applications filed after the initial period ended,¹⁸⁷ the program still failed to provide an incentive for innovation, as it was set to expire little more than a year after the expansion took effect.¹⁸⁸ As the PTO is likely well aware, one year is generally insufficient time for an inventor to conceive of an idea, reduce it to practice, and prepare an application for the invention.

It is understandable that the PTO wants to reduce its backlog. The backlog represents a serious drain on the effectiveness of the agency as a whole.¹⁸⁹ But if the PTO’s efforts to reduce its backlog have motivated it to design a program that does not contribute to innovation, the PTO is neglecting its higher regulatory priorities. The purpose of the patent system is to give inventors incentives to develop new technologies, to disclose their inventions to the public in such a manner that other inventors can take the next step forward, and to risk capital in their inventions.¹⁹⁰ If green technologies are truly “of fundamental importance to sustainable development as well as to the growth of our

¹⁸⁴ See U.S. Patent & Trademark Office, *supra* note 131.

¹⁸⁵ See Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,668 (Dec. 8, 2009) (expressing concerns about PTO’s workload and available resources).

¹⁸⁶ See *id.* at 64,667.

¹⁸⁷ Expansion and Extension of the Green Technology Pilot Program, 75 Fed. Reg. 69,049, 69,050 (Nov. 10, 2010).

¹⁸⁸ *Id.*

¹⁸⁹ See *supra* Part II.

¹⁹⁰ See John B. Campbell, Note, *What’s the Deal Now? A Business Perspective Analysis of the U.S. Patent System and Recent Changes to the Patent Laws*, 10 TEX. INTELL. PROP. L.J. 293, 297–301 (2002) (discussing at length the basic rationales of the patent system).

economy” as the PTO has indicated, encouraging their innovation should have been a goal to pursue, not one to avoid.¹⁹¹ This is especially true given the compelling social reasons for the institution of the Green Technology Pilot Program. By preventing the Green Technology Pilot Program from promoting the innovation of much-needed green technologies, the PTO’s actions were antithetical to the rationale underlying the existence of the patent system (the promotion of science in exchange for a limited monopoly) and to the public need for the innovation of green technologies.

What is alarming is that few recognized and understood at the initiation of the Green Technology Pilot Program that it would not provide an incentive for innovation. Most astonishingly, even Secretary of Commerce Gary Locke, when announcing the program’s initiation, misrepresented the nature of the program:

American competitiveness depends on innovation and innovation depends on creative Americans *developing new technology* . . . By ensuring that many new products will receive patent protection more quickly, *we can encourage our brightest inventors to invest needed resources in developing new technologies* and help bring those technologies to market more quickly.¹⁹²

These statements suggest that this senior official did not understand that the Green Technology Pilot Program would not provide incentives for innovation or the development of new technologies.¹⁹³ The PTO’s press release for the initiation of the program also quoted Carl Horton, Chief Intellectual Property Counsel of General Electric, as failing to recognize this limitation on the program. He stated, “we hail this initiative as an excellent incentive to *fuel further innovation of clean technology* and a terrific mechanism to speed the dissemination of these patented technologies throughout the world.”¹⁹⁴ But unless the program is institutionalized into some long-term or permanent form that would

¹⁹¹ Additionally, restricting the program to pending applications likely impeded the appeal of the program as the only inventors who were eligible were the ones who already had settled plans and expectations and were least likely to be motivated to apply for the program.

¹⁹² See U.S. Patent & Trademark Office, *supra* note 131.

¹⁹³ It is worth noting that the Secretary’s prepared statements did not include these remarks. See Locke, *supra* note 141.

¹⁹⁴ See U.S. Patent & Trademark Office, *supra* note 131.

enable inventors to gain a reward for their investment of time and resources in inventing green technologies, the program cannot be expected to “fuel further innovation.”

The PTO’s failure to promote the innovation of green technologies suggests an inability to fulfill and prioritize its regulatory responsibilities. When the PTO takes steps to address its backlog problem in the future, it needs to do so without overlooking its constitutional responsibility to promote the innovation of technologies that further public goals.

B. OBJECTIONS

Implementing preferential treatment in the patent-review process provokes two normative objections: (1) the PTO is incapable of defining “green technologies” in such a way as to limit unpredictable and inconsistent determinations of eligibility as well as excessive free-riding by inventions with little environmental benefit, and (2) it is unfair for the PTO to treat one category of inventors more favorably at the expense of all other inventors who must wait longer for their applications to be reviewed. In light of the theoretical goals of the patent system and existing mechanisms the PTO has in place to ameliorate these concerns, both of these objections can be largely overcome. Nonetheless, greater collaboration between the PTO and other agencies or heightened PTO expertise in key areas could further extinguish these concerns.

1. Definitional

Before granting a class of socially valuable technologies preferential treatment, it is necessary to define which technologies are eligible for such treatment. If the definition is too restrictive, it will exclude beneficial technologies from eligibility.¹⁹⁵ On the other hand, if the definition is too broad it will allow for excessive free-riding by inventions of little social worth.¹⁹⁶ Those critical of the PTO’s efforts to define socially valuable patent applications could point out that

¹⁹⁵ This was one of the early problems with the Green Technology Pilot Program. *See supra* Part II.B.

¹⁹⁶ For instance, a new coffee cup designed for cockpits could theoretically keep pilots awake and therefore less likely to crash their planes into the ocean and could ultimately prevent the release of toxic chemicals into sensitive waters. But the environmental benefits of such an invention are highly attenuated and thus render such an application unsuitable for expedited treatment.

individual patent examiners may make inconsistent and unpredictable determinations, and may otherwise disagree on which inventions deserve special attention. The possibility that patent examiners would come to different conclusions as to whether a given patent application relates to a “green technology” highlights the fact that it is not immediately apparent what makes a technology “green.” The adjective “green” is commonly appended to many terms ranging from marketing, technology, and buildings, to household products and even lifestyles. The word is ubiquitous and implies broadly that something is “environmentally friendly,” “recyclable,” “biodegradable,” or “energy efficient.”¹⁹⁷ Notably, some commercial industries have already embraced extensive rules and regulations in an attempt to quantify various degrees of “green.”¹⁹⁸ A number of federal entities have also begun to propose definitions for “green” terms.¹⁹⁹ For example, the phrase “green technology products” has recently been defined by the Office of the United States Trade Representative as:

products used to produce renewable energy or reduce the emissions associated with the production and use of energy. These are the products necessary to produce energy from wind, solar, biomass, geothermal, hydro, and nuclear resources, products to enable the production of energy from coal with fewer greenhouse gas emissions, and products that consume less energy or alternative sources of energy, such as energy-efficient vehicles and energy-efficient lighting.²⁰⁰

¹⁹⁷ See Roger D. Wynne, *Defining “Green”: Toward Regulation of Environmental Marketing Claims*, 24 U. MICH. J.L. REFORM 785, 786 (1991).

¹⁹⁸ See, e.g., Les Lo Baugh, *LEED® Green Building Incentives*, in GREEN REAL ESTATE SUMMIT 2008: WHAT ATTORNEYS, DEVELOPERS, BANKERS AND REGULATORS NEED TO KNOW 23, 25 (2008), available at 556 PLI/Real 23 (Westlaw); see also Mary Jane Augustine, *Project Owner Strategies for “Greening” Design and Construction Contracts*, in THE GREEN REAL ESTATE SUMMIT 2009: WHAT ATTORNEYS, DEVELOPERS, BANKERS AND LENDERS NEED TO KNOW 121, 125–27 (2009), available at 565 PLI/Real 21 (Westlaw).

¹⁹⁹ See, e.g., Bureau of Labor Statistics Comment Request, 75 Fed. Reg. 12,571, 12,571–73 (Mar. 16, 2010) (acknowledging that government, academia, and the business community define “green jobs” differently and also listing widely used definitions of the term).

²⁰⁰ See Initiation of Section 302 Investigation and Request for Public Comment: China — Acts, Policies and Practices Affecting Trade and Investment in Green Technology, 75 Fed. Reg. 64,776, 64,776 (Oct. 20, 2010). The Office of the United States Trade Representative used this definition to set the parameters for an investigation of Chinese trade practices. The definition has the potential to be recognized by the global community as a definition of “green technology” for future treaties and negotiations.

Rather than rely on an existing definition of “green,” the PTO chose to define the term itself. For purposes of the Green Technology Pilot Program, the PTO defined green technologies broadly as those inventions that “materially enhance[] the quality of the environment, or that materially contribute[] to: (1) The discovery or development of renewable energy resources; (2) the more efficient utilization and conservation of energy resources; or (3) greenhouse gas emission reduction.”²⁰¹ Although this definition of “green technology” is somewhat vague, several factors reduce, but do not completely eliminate, the risk of improper eligibility determinations.

Most significantly, and contrary to what might be expected, the decision as to whether or not an application is drawn to a “green technology” has not been made by individual patent examiners. Rather, these decisions have been made on a case-by-case basis by expert Special Program Examiners in each individual Technology Center at the PTO.²⁰² These individuals received the same training on the standards for determining the eligibility of petitions for special status “[t]o ensure uniformity to the maximum extent possible.”²⁰³ Given the small number of these specialized and highly trained Supervisory Program Examiners, the likelihood that patent applicants would receive inconsistent determinations as to eligibility is likely negligible.

In addition, the use of a materiality standard ameliorates the concern that the Supervisory Program Examiners could make unpredictable decisions due to their inability to anticipate *ex ante* what environmental benefits a particular invention will produce. The requirement that an invention “materially” benefit the environment appears to achieve the appropriate balance between maximizing the social benefits that derive from a broad definition for eligibility and preventing excessive free-riding by inventions of little social worth. As the PTO has explained:

²⁰¹ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,667 (Dec. 8, 2009).

²⁰² Memorandum from Randall Beane to author 5–6 (Sept. 6, 2010) (on file with author) (citing Telephone Interview with Manjunath Rao, Supervisory Patent Examiner, Art Unit 1656, U.S. Patent & Trademark Office (Aug. 12, 2010)) (explaining that the guidelines for the revised Accelerated Examination program have been followed in the implementation of the Green Technology Pilot Program with respect to who is responsible for deciding whether a petition is eligible for fast-tracked review); *see also* PTO, GUIDELINES, *supra* note 111, at 6.

²⁰³ PTO, GUIDELINES, *supra* note 111, at 6.

The materiality standard does not permit an applicant to speculate as to how a hypothetical end-user might specially apply the invention . . . Nor does such standard permit an applicant to enjoy the benefit of advanced examination merely because some minor aspect of the claimed invention may [be directed to one of the grounds for special status].²⁰⁴

As a result, the materiality standard serves as a policing mechanism to ensure that inventions that have only tangential or speculative effects on the environment cannot avail themselves of special status. At the same time, it is sufficiently broad to cover a wide spectrum of technologies.²⁰⁵

Finally, the PTO has reduced the ambiguity inherent in its definition of “green technologies” by providing guidance on three terms from its definition. The agency explained that the term “renewable energy resources” includes “hydroelectric, solar, wind, renewable biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, and municipal solid waste, as well as the transmission, distribution, or other services directly used in providing electrical energy from these sources.”²⁰⁶ With regard to technologies that would produce “more efficient utilization and conservation of energy resources,” the PTO specified that “inventions relating to the reduction of energy consumption in combustion systems, industrial equipment, and household appliances” would be eligible.²⁰⁷ Finally, it clarified that “the

²⁰⁴ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,667; see also MPEP, *supra* note 11, § 708.02(V).

²⁰⁵ This limitation on the scope of the program represents an improvement over some terms used by overseas patent offices, such as the UK IPO, that have allowed patent applications with any environmental benefit, whether significant or not, to receive expedited treatment. See, e.g., Press Release, U.K. Intellectual Prop. Office, UK ‘Green’ Inventions To Get Fast-Tracked Through Patent System (May 12, 2009), available at <http://www.ipo.gov.uk/about/press/press-release/press-release-2009/press-release-20090512.htm> (requiring only that eligible patent applications have “some” environmental benefit); *Green Channel: Frequently Asked Questions*, U.K. INTELL. PROP. OFF., <http://www.ipo.gov.uk/types/patent/p-applying/p-after/p-green/p-green-faq.htm> (last visited Oct. 1, 2012) (“There is no specific environmental standard to meet in order to benefit from the Green Channel.”). It is virtually certain that applicants with inventions of questionable environmental value will take advantage of the low threshold for eligibility that these programs offer, creating a problem of excessive free-riding by inventions that the programs were not intended to benefit.

²⁰⁶ See Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,667.

²⁰⁷ *Id.*

reduction of greenhouse gases . . . would include, but is not limited to, inventions that contribute to (1) advances in nuclear power generation technology, or (2) fossil fuel power generation or industrial processes with greenhouse gas-abatement technology (e.g., inventions that significantly improve safety and reliability of such technologies).²⁰⁸ These examples help the PTO decision makers, as well as applicants, understand the boundaries of eligibility for the Green Technology Pilot Program.

Although these mechanisms reduce the likelihood that the PTO has made inappropriate determinations of eligibility, the PTO's ability to restrain undesirable free-riding completely is hindered by the limitations on its regulatory capabilities. Unlike patent offices overseas, the PTO does not consider policy concerns, such as the safety or efficacy of technologies, when it evaluates whether to grant a patent for an invention.²⁰⁹ Moreover, unlike the authority of the EPA, the Federal Communications Commission, and other U.S. agencies that regulate in complex and technical areas, the courts have construed the Patent Office's powers as limited to procedural, rather than substantive, rulemaking.²¹⁰ The PTO thus has not developed the expertise to know whether the benefits of a particular technology are offset by its detrimental impact on society. To illustrate, the PTO considers energy generated by hydroelectric facilities to be renewable energy²¹¹ because

²⁰⁸ *Id.*

²⁰⁹ Compare 35 U.S.C. § 101 (2006) (defining patentable subject matter in the United States as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof"), with European Patent Convention art. 53(a), Oct. 5, 1973, 1065 U.N.T.S. 199 (revised at the Convention on the Grant of European Patents Nov. 29, 2000), available at <http://www.epo.org/law-practice/legal-texts/html/epc/2010/e/ma1.html> (requiring that an invention not be "contrary to ordre public or morality" (internal quotations marks omitted)) and Andean Community Decision 486: Common Intellectual Property Regime art. 20(b), Dec. 1, 2000, available at <http://www.sice.oas.org/Trade/Junac/Decisiones/DEC486ae.asp#tit2> (allowing no patents that exploit "human or animal life or health" to "avoid serious prejudice to plant life and the environment"). See also Timothy R. Howe, Comment, *Patentability of Pioneering Pharmaceuticals, What's the Use?*, 32 SAN DIEGO L. REV. 819, 826 (1995) ("The Federal Circuit has also explained that safety and effectiveness, per se, are not concerns of the PTO.").

²¹⁰ See *Tafas v. Doll*, 559 F.3d 1345, 1353–1354 (Fed. Cir. 2009); *Merck & Co., Inc. v. Kessler*, 80 F.3d 1543, 1549–50 (Fed. Cir. 1996) ("[T]he broadest of the [Patent Office's] rulemaking powers . . . [do] NOT grant the Commissioner the authority to issue substantive rules." (quoting *Animal Legal Def. Fund v. Quigg*, 932 F.2d 920, 930 (Fed. Cir. 1991))); Stuart Minor Benjamin & Arti K. Rai, *Who's Afraid of the APA? What the Patent System Can Learn from Administrative Law*, 95 Geo. L.J. 269, 271 (2007).

²¹¹ See Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. at 64,667 (specifying that hydroelectric projects fall within the meaning of "renewable energy resources").

dams do not contribute to global warming. However, hydroelectric facilities have been the frequent subject of attacks by environmentalists due to their negative effects on stream flow and wildlife.²¹² The Federal Energy Regulatory Commission (“FERC”), which has authority over most hydroelectric facilities pursuant to section 23(b)(1) of the Federal Power Act,²¹³ would be better equipped to weigh these competing environmental impacts than the PTO. Perhaps, after reviewing the potential benefits and adverse implications of using hydroelectric facilities, FERC would indicate that our energy needs demand further innovation of all types of energy resources, including hydroelectric facilities. But unless the PTO seeks out the other agency’s advice or develops better in-house expertise, it is unlikely that it will make an informed decision. If the PTO chooses to develop its institutional expertise, the time and effort the PTO invests in increasing its expertise could exacerbate its backlog. However, as the PTO’s institutional competence grows, it would improve its efficiency and better target key technologies, resulting in net benefits for the backlog and patent system.

Given the small number of specialized examiners who are charged with making eligibility determinations, the materiality standard that reduces excessive free-riding by inventions of little-anticipated environmental worth, and the PTO’s explicit guidance on eligible technologies, it seems unlikely that inconsistent or unpredictable determinations of eligibility would be made by the PTO. This unevenness is true despite the PTO’s use of a broad definition for “green technologies.” Nonetheless, the PTO’s inability to consider the safety and efficacy of technologies could allow for the expedited review of applications that will have a net detrimental impact on the environment or on other social interests. To avoid this problem in the future, the PTO should either focus on developing greater expertise in key areas or collaborate with other agencies to better target the technologies that optimize the social benefits of an expedited review process.

²¹² See, e.g., *Edward’s Mfg. Co., Order Denying New License & Requiring Dam Removal*, 81 F.E.R.C. ¶ 61,255 (1997) (ordering a dam removed after adopting the EIS analysis which concluded “that the project’s significant negative impacts on fishery resources could not be mitigated except by removal of the dam”); *Merimil Ltd. P’ship, Project No. 2574-032, Order Issuing New License*, 110 F.E.R.C. ¶ 61,240 (2005) (rejecting arguments that a dam should be removed to allow for restoration of fish runs).

²¹³ Federal Power Act § 23(b)(1), 16 U.S.C. § 817 (2006).

2. Fairness

Beyond definitional concerns, the PTO's Green Technology Pilot Program could potentially be seen as raising fairness concerns. Anytime the Patent Office grants preferential treatment to one class of inventors, as it did with this pilot program, someone must shoulder the burden such privileged status creates. The burden could have been allocated to the general public if the PTO had hired new patent examiners or made other expenditures to accommodate its increased workload. Alternatively, the burden could have been allocated to the parties seeking expedited review by requiring that the applicants seeking preferential treatment do a portion of the PTO's job for it or pay fees to cover the PTO's expenses, as the PTO has done with its revised Accelerated Examination program and proposed three-track program.²¹⁴ Instead the PTO chose to spread the burden among all of the other applicants in the system by making them wait longer for their chance at review. As shall be seen, this final option represents the only practicable option for promoting the innovation and development of socially valuable technologies.

In an ideal world, the general public would bear the burden of a program that benefits society as a whole. But allocating the burden to the general public is easier said than done. Relying exclusively on capital-intensive actions, such as increased financial expenditures by the PTO, is neither a politically acceptable nor economically sound course of action at this time. The PTO lacks adequate resources to perform its most basic task of processing patent applications efficiently.²¹⁵ And although Congress recently gave the PTO fee-setting authority,²¹⁶ the United States' current economic situation limits the PTO's ability to raise fees to subsidize a limited group of patent applications. A financial crisis, followed by a recession, crippled many nations and left the United States with an unemployment rate of about nine percent in November 2011.²¹⁷ As a result, federal regulatory agencies in the United States face an undesirable predicament: they are increasingly being tasked with finding

²¹⁴ See, e.g., MPEP, *supra* note 11, § 708.02(a)(I).

²¹⁵ Robert D. Atkinson & Daniel D. Castro, *A National Technology Agenda for the New Administration*, 11 *YALE J.L. & TECH.* 190, 192 (2009).

²¹⁶ See America Invents Act, Pub. L. No. 112-29, § 10, 125 Stat. 284, 316-320 (2011).

²¹⁷ Press Release, Bureau of Labor Statistics, U.S. Dep't of Labor, *The Employment Situation – August 2012*, at 1 (Sept. 7, 2011), available at http://www.bls.gov/news.release/archives/empsit_09072012.pdf (indicating that the unemployment rate was 8.6% in November of 2011).

new ways to further national priorities but are being heavily criticized when doing so increases the strain on the economy.²¹⁸ The PTO would be wise to steer clear of any such controversies.

Given the PTO's limited funds, placing the burden on the parties seeking or benefiting from expedited treatment seems like a logical alternative. Imposing a burden on applicants for the revised Accelerated Examination program helps justify a program that does not discriminate on the basis of social worth. Specifically, because the revised Accelerated Examination program is open to all applicants, not merely those with socially valuable applications, there was no compelling reason to grant applicants opportunities for accelerated review when doing so meant that other applicants might have to wait longer for their turn for review. To resolve this problem, the PTO instituted a *quid pro quo* as a fairness measure to justify the existence of mechanisms that enable applicants to jump to the front of the examination line.²¹⁹ With the revised Accelerated Examination program, this *quid pro quo* takes the form of the pre-examination search and ESD requirements.²²⁰

When the PTO expedites applications of particular social value, the concept of requiring a *quid pro quo* becomes socially indefensible in light of the constitutional goals of the patent system. The authors of the U.S. Constitution designed the patent system to promote "the Progress of Science and useful Arts" for the benefit of the general public in exchange for an inventor's ability to hold the exclusive rights to an invention for a

²¹⁸ For instance, the Supreme Court in *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007), concluded that the EPA has the jurisdiction to regulate carbon dioxide as a greenhouse gas pollutant and chastised the agency for failing to do so. Representatives, as well as several seats in the Democratic-controlled Senate, in the fall of 2010 in part by campaigning to block the implementation of the EPA's new regulations on the ground that they stifled the economy. Gabriel Nelson, *Republican Victories Boost Effort To Block EPA's Climate Rules*, N.Y. TIMES (Nov. 3, 2010), <http://www.nytimes.com/gwire/2010/11/03/03greenwire-republican-victories-boost-effort-to-block-epa-72986.html>; see also *Reducing the US Carbon Footprint, Toe by Toe*, CHRISTIAN SCI. MONITOR (June 30, 2010), <http://www.csmonitor.com/Commentary/the-monitors-view/2010/0630/Reducing-the-US-carbon-footprint-toe-by-toe> (stating that bold moves on climate change, such as carbon taxes, caps on greenhouse gas emissions, or targets to cut atmospheric carbon levels have been postponed due to a high unemployment rate and upcoming elections); Murray, *supra* note 28.

²¹⁹ See Telephone Interview with Pinchus M. Laufer, Senior Legal Advisor, U.S. Patent & Trademark Office (Nov. 15, 2010) (discussing how applicants using the PTO's revised Accelerated Examination must fulfill its requirements as a *quid pro quo* for receiving the benefit of earlier processing of their applications).

²²⁰ Similarly, with the proposed three-track program, the *quid pro quo* takes the form of increased fees for applicants who seek expedited processing of their applications. See Enhanced Examination Timing Control Initiative; Notice of Public Meeting, 75 Fed. Reg. 31,763, 31,765 (June 4, 2010).

limited time.²²¹ Inventions of high social value are inherently predestined to create the greatest benefits for society and thereby fulfill this constitutional bargain better than inventions of little social worth. Because of the rewards that socially valuable inventions create, they deserve the highest priority in being processed through the patent system. Imposing burdens on these applicants serves as a barrier to the innovation and development of these valuable technologies and therefore cannot be justified. Indeed, the onerous and risk-laden requirements of the revised Accelerated Examination program have reduced the incentives for those with socially valuable applications to seek expedited review.²²² As a result, instead of providing more opportunities for inventions of critical social value to be expedited, the revised Accelerated Examination program provides fewer.²²³

Any potential fairness concerns associated with placing the burden on applicants who do not have socially valuable technologies are further mitigated by the existence of procedural mechanisms that aid these applicants. First of all, if a party urgently needed an application reviewed in a timely manner but was ineligible for preferential treatment on the basis of the anticipated social value of his or her application, the applicant could use the revised Accelerated Examination program to receive a final decision in less than one year. Additionally, Congress has enacted legislation that lengthens the term of a patent for those patent owners who experience long delays in the processing of their applications.²²⁴ It is unlikely that many applicants would experience such delays as a direct result of a program to expedite socially valuable technologies, though, as the number of applications that could potentially be expedited is small relative to the overall number of applications in the system. The PTO anticipated that over 500,000 new applications would be filed in 2010.²²⁵ Yet, the PTO capped its Green Technology Pilot

²²¹ U.S. CONST. art. I, § 8, cl. 8 (granting Congress the power “[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”).

²²² See *supra* Part II.A.

²²³ Under this program, applicants receive their patents sooner but a patent granted under this program, which is susceptible to being declared invalid due to inequitable conduct, has less worth than one otherwise reviewed. See *supra* Part II.A (describing the problems with the revised Accelerated Examination program). Thus, the program weakens the property interest patent applicants receive and further dilutes any incentives applicants could have for innovation and development of inventions.

²²⁴ See 35 U.S.C. §§ 154–156 (2006).

²²⁵ U.S. PATENT AND TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT FISCAL YEAR 2010, at 53 (2010), available at

Program at a mere 3,000 applications for a two-year period.²²⁶ This number is equivalent to less than 0.3% of the PTO's applications for the same period. Even if the PTO greatly expanded the Green Technology Pilot Program and created new opportunities for other socially valuable applications to receive expedited review, the number of these applications would remain far less than the total pool of applications. If the PTO used a materiality standard in these future programs and improved its ability to target the highest priority applications, the PTO could further reduce the burden on other parties. Spreading the delay among the other applicants would thus likely result in a negligible increase in delay. If the program did start to overwhelm the PTO, the PTO could always rein it in by imposing an annual limit on the number of applications prosecuted under the program.

In summary, the most fair and effective way for the PTO to allocate the burden for programs that expedite the processing of game-changing technologies is to distribute it among the other applicants in the system. Recent economic challenges have made allocating the burden to the public politically suicidal for the PTO, and placing a *quid pro quo* on the parties that could potentially bring valuable technologies to market would only serve to obstruct the full beneficial participation by applicants with these technologies.

V. SUMMARY OF LESSONS LEARNED

Beyond demonstrating that it makes sense for the PTO to accelerate the review of socially valuable applications, this article's analysis of the practical and theoretical implications of the PTO's Green Technology Pilot Program also highlighted important lessons for reform. By using the Green Technology Pilot Program as a model for widespread adoption of permanent programs that target high-priority areas, while also recognizing the shortcomings of this pilot program, the PTO can help the United States surge forward and better optimize the fundamental patent bargain.

<http://www.uspto.gov/about/stratplan/ar/2010/USPTOFY2010PAR.pdf> (showing that 445,613 applications were filed in fiscal year 2006, 468,330 applications were filed in fiscal year 2007, 496,886 applications were filed in fiscal year 2008, 486,499 applications were filed in fiscal year 2009, and estimating that 509,367 applications would be filed in fiscal year 2010).

²²⁶ See Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,666 (Dec. 8, 2009).

LESSON 1: IMPROVING EFFECTIVENESS

Any claims by the PTO that it is expanding the opportunities for socially valuable technologies to receive accelerated review should be treated skeptically.²²⁷ Unless the PTO provides meaningful benefits to inventors who avail themselves of a new program for accelerated patent application processing, it may merely be creating such programs to pay lip service to social goals. Indeed, the PTO has hindered full participation in the Green Technology Pilot Program by failing to offer meaningful benefits to inventors who petition for eligibility and by imposing excessive restrictions on eligibility and applying them arbitrarily, suggesting that the PTO might have been primarily concerned with green-washing itself rather than aiding the green industry. By offering opportunities for expedited review throughout the prosecution of applications involving socially valuable technologies, as the PTO does for applications under its revised Accelerated Examination program, the PTO can create a more tangible enticement to inventors to seek accelerated review and bring these key technologies to market in a timely manner. The goal should be to reduce patent pendency to a matter of months, not a matter of years.

LESSON 2: INNOVATING THE FUTURE

In implementing the Green Technology Pilot Program, the PTO's failure to promote innovation, a fundamental goal of the patent system,²²⁸ holds potentially ominous implications. The risk arises that the PTO has become so focused on its backlog, rather than on the purposes of the patent system, that it will use the Green Technology Pilot Program as a model for implementing other programs that lower its backlog but do nothing to further society's interest in the innovation of priority technologies. But innovation, not just quicker commercialization of existing inventions, is needed to help the United States overcome its most pressing problems.

²²⁷ History has shown that the PTO has lessened the opportunities for such beneficial applications to receive accelerated review when it claimed to be providing more. *See supra* Part II.A (describing how the implementation of the revised Accelerated Examination program replaced many of the opportunities for socially beneficial applications, like those benefiting cancer and HIV/AIDS research, to receive fast tracked processing with a substantially more onerous and risky procedure).

²²⁸ *See* Campbell, *supra* note 190.

To rectify this deficiency in the future, the PTO should not limit accelerated examination programs to pending applications. Just as significantly, the PTO should make the opportunities for accelerated review last sufficiently long enough for an inventor to conceive of an idea, reduce it to practice, and prepare an application for it. While permanent regulations would create greater incentives for innovation than would temporary programs, even a time-limited program could give inventors an incentive to invent new beneficial technologies if the PTO provides the inventors with adequate notice of the opportunity for expedited review from the outset of the program.²²⁹

LESSON 3: DEFINING SOCIAL VALUE

In order to implement a program that treats specific classes of technologies preferentially, the PTO must specify which technologies are socially valuable. The PTO's approach of using a broad definition of eligible technologies represents a generally sound approach. This approach allows a wide spectrum of potentially advantageous inventions to get to market more quickly, policed by a materiality standard, clarified with examples, and implemented by a limited number of special program examiners. This approach minimizes the possibility of unpredictable or inconsistent eligibility determinations. However, the PTO lacks experience when weighing policy considerations, such as the safety and effectiveness of different technologies or the relative benefits to society of the technologies.²³⁰ This could create a loophole through which applications with greater detrimental impacts on society than beneficial impacts could avail themselves of expedited review. But by actively collaborating with other agencies or developing heightened expertise in a few key areas and by relying on presidential declarations of what constitutes a socially valuable technology, the PTO could better select and more narrowly define the categories of inventions that are eligible for expedited review.²³¹ This would lessen the potential for free-riding by less socially valuable applications, quell fairness concerns, and improve the coordination and technological understanding of all participating agencies.

²²⁹ The appropriate length of time would depend on the industry being advanced and national needs.

²³⁰ See *supra* notes 196–200 and accompanying discussion.

²³¹ Further examination of mechanisms that could improve the PTO's policymaking capabilities is beyond the scope of this Article, but I intend to explore this issue in greater depth at a future time.

The PTO possesses procedures that allow for greater collaboration between agencies. Pursuant to 37 C.F.R. § 1.102(b), applications may be expedited if “the inventions are deemed of peculiar importance to some branch of the public service and the head of some department of the Government requests immediate action for that reason.”²³² Although this provision has been seldom used and has not been exempted from the onerous burdens of the PTO’s revised Accelerated Examination program,²³³ this could change. Congress could require other agencies to periodically advise the PTO as to high-priority technologies that deserve expedited review. Alternatively, in the absence of congressional action, the PTO could take the initiative to ask other agencies for their recommendations, or work to develop its expertise in areas of high priority.

CONCLUSION

No one knows the precise value that can be realized if the Patent Office prioritizes the review of socially valuable patent applications. But the possibility remains that certain applications are sitting in the PTO’s backlog that could ameliorate our immediate economic troubles and help position the United States as a leader in key industries, such as biomedical research, information technology, and clean energy, before this nation falls too far behind its overseas competitors. Foreign patent offices are already providing meaningful opportunities for the expedited processing of clean energy patent applications.²³⁴ Their programs are faster and have been implemented in forms that provide opportunities for the innovation of new green technologies, not just the commercialization of existing inventions.

²³² 37 C.F.R. § 1.102(b) (2010). In 1987, President Ronald Reagan deemed patent applications relating to superconductivity to carry such peculiar importance to the nation, and he emphasized the need of the PTO to “speed up the patent process so that it can keep pace with the fast-paced world of high technology.” President Ronald Reagan, Remarks at the Federal Conference on Commercial Applications of Superconductivity (July 28, 1987) (transcript *available at* <http://www.reagan.utexas.edu/archives/speeches/1987/072887a.htm>). In accordance with this mandate, the PTO granted special status to patent applications involving superconductivity technologies when requested by applicants. *See* MPEP, *supra* note 11, § 708.02(IX). Such requests must now comply with the revised Accelerated Examination program. *See id.* § 708.02(a).

²³³ *See* MPEP, *supra* note 11, § 708.02(a).

²³⁴ *See supra* Part II.B.

At a time when economic recovery in the United States has been “painfully slow,”²³⁵ the ability of the PTO to help ameliorate the nation’s high unemployment rate by expediting the review of technologies that satisfy urgent public needs cannot be underscored enough. The potential benefits to society of accelerating such applications are considerable. The PTO can encourage more investment in the innovation and development of socially valuable technologies while creating economic benefits and filling a regulatory gap. These public rewards further the constitutional patent bargain that justifies the very existence of the patent system: the grant of a patent to an inventor in exchange for the benefit to society of the promotion of “the Progress of Science and useful Arts.”²³⁶ Indeed, as Senator Robert Menendez, the author of the amendment to the America Invents Act that codified the PTO’s authority to expedite technologies of national importance, recently declared, prioritizing technologies of national importance in the patent system is a “good commonsense policy that can help America propel forward in the 21st century.”²³⁷

²³⁵ See Susan Decker, *Patent Chief Kappos ‘On the Hunt’ To Reduce U.S. Backlog, Spur Innovation*, BLOOMBERG (Sept. 9, 2010), <http://www.bloomberg.com/news/2010-09-09/patent-chief-kappos-on-the-hunt-to-reduce-u-s-backlog-spur-innovation.html> (discussing how President Obama called for incentives to promote American ingenuity as part of his measures to create jobs and expand productivity).

²³⁶ U.S. CONST. art. I, § 8, cl. 8.

²³⁷ See 157 CONG. REC. S1052–53 (daily ed. Mar. 1, 2011) (Amendment No. 124 and statement of Sen. Robert Menendez) (applauding the PTO for prioritizing green technologies in the review process); America Invents Act, Pub. L. No. 112-29, § 25, 125 Stat. 284, 337–338 (2011) (granting the PTO a new power to prioritize important technologies).

APPENDIX

ORIGINAL LIST OF ELIGIBLE CLASSIFICATIONS FOR GREEN
TECHNOLOGY PILOT PROGRAM²³⁸

	USPC	Brief Description
Alternative Energy Production		
	44/589	Agricultural waste
	44/605; 44/589	Biofuel
	110/235-259, 346	Chemical waste
	126/634-680	For domestic hot water systems
	52/173.3	For passive space heating
	126/561-568	For swimming pools
	429/12-46	Fuel cell
	44/605	Fuel from animal waste and crop residues
	48/197R, 197A	Gasification
	435/252.3-252.35, 254.11-254.9, 257.2, 325-408, 410-431	Genetically engineered organism
	60/641.2-641.5; 436/25-33	Geothermal
	75/958; 431/5	Harnessing energy from man-made waste
	110/235-259, 346	Hospital waste

²³⁸ Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64,666, 64,668-69 (Dec. 8, 2009) (specifying the 79 USPCs eligible for the Green Technology Pilot Program).

	USPC	Brief Description
	405/76-78; 60/495-507; 415/25	Hydroelectric
	110/235-259, 346	Industrial waste
	210/605	Industrial waste anaerobic digestion
	44/589; 44/606	Industrial wood waste
	290/51, 54; 60/495-507	Inertial (e.g., turbine)
	431/5	Landfill gas
	44/552	Municipal waste
	376/all	Nuclear power—induced nuclear reactions: processes, systems, and elements
	60/203.1	Nuclear power—reaction motor with electric, nuclear, or radiated energy fluid heating means
	60/644.1; 136/243-265	Nuclear power—heating motive fluid by nuclear energy; photovoltaic
	44/552	Refuse-derived fuel
	438/57, 82, 84, 85, 86, 90, 93, 94, 96, 97	Solar cells
	126/561-714; 320/101	Solar energy
	126/561-713; 60/641.8- 641.15	Solar thermal energy
	405/76-78; 60/495-507	Water level (e.g., wave or tide)
	290/44, 55; 307/64-66, 82- 87; 415/2.1	Wind
Energy Conservation		
	180/2.1-2.2, 54.1	Alternative-power vehicle (e.g., hydrogen)

	USPC	Brief Description
	315/150, 151, 199	Cathode ray tube circuits
	705/13	Commuting (e.g., HOV, teleworking)
	105/1.1-1.3; 296/180.1-180.5; 296/181.5	Drag reduction
	313/498-512, 567-643	Electric lamp and discharge devices
	180/65.1; 180/65.21; 320/109; 701/22; 310/1-310	Electric vehicle
	705/35-45	Emission trading (e.g., pollution credits)
	307/38-41; 700/295-298; 713/300-340	Energy storage or distribution
	180/65.21; 180/65.31	Fuel cell-powered vehicles
	180/205; 280/200-304.5	Human-powered vehicle
	180/65.21-65.29; 73/35.01-35.13, 112-115, 116-119A, 121-132	Hybrid-powered vehicle
	257/79, 82, 88-90, 93, 99-103	Incoherent light emitter structure
	105/49-61; 180/65.1-65.8	Land vehicle (e.g., electric trains, electric cars)
	359/591-598	Optical systems and elements
	404/32-46	Roadway (e.g., recycled surface, all-weather bikeways)
	52/309.1-309.17, 404.1-404.5, 424-442, 783.1-795.1	Static structures
	702/130-136	Thermal
	361/19, 20, 141, 152, 218	Transportation

	USPC	Brief Description
	440/6-7	Watercraft drive (electric powered)
	440/21-32	Watercraft drive (human powered)
	440/9	Wave-powered boat motors
	440/8	Wind-powered boat motors
	114/102.1-115	Wind-powered ships
Environmentally Friendly Farming		
	405/36-51	Alternative irrigation technique
	210/610-611; 71/11-30	Animal waste disposal or recycling
	71/8-30	Fertilizer alternative (e.g., composting)
	405/15	Pollution abatement, soil conservation
	137/78.2-78.3; 137/115.01-115.28	Water conservation
	504	Yield enhancement
Environmental Purification, Protection, or Remediation		
	383/1; 523/124-128; 525/938; 526/914	Biodegradable
	588/249-249.5	Bio-hazard, disease (permanent containment of malicious virus, bacteria, prion)
	588/299	Bio-hazard, disease (destruction of malicious virus, bacteria, prion)
	95/139-140; 405/129.1-129.95; 423/220-234	Carbon capture or sequestration
	405/129.1-129.95	Disaster (e.g., spill, explosion, containment, or cleanup)
	252/71-79	Environmentally friendly coolants, refrigerants, etc.
	422/1-43	Genetic contamination

	USPC	Brief Description
	588/1-261	Hazardous or toxic waste destruction or containment
	95/57-81, 149-240	In atmosphere
	210/600-808; 405/60	In water
	405/129.95	Landfill
	588/1-20, 400	Nuclear waste containment or disposal
	800/260-323.3	Plants and plant breeding
	264/36.1-36.22, 911-921; 521/40-49.8	Post-consumer material
	162/29, 189-191; 164/5; 521/40-49.8; 562/513	Recovery of excess process materials or regeneration from waste stream
	29/403.1-403.4; 75/401-403; 156/94; 264/37.1-37.33	Recycling
	110/345; 422/900	Smokestack
	405/128.1-128.9, 129.1-129.95	Soil
	435/626-282	Toxic material cleanup
	588/all	Toxic material permanent containment or destruction
	435/262.5	Using microbes or enzymes