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The Role of Patent Law in Incentivizing Green Technology

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By Patrick Gattari*

¶1 Energy is one of the greatest challenges to our country's economic freedom. Perhaps no other industry has the potential for such a profound effect on society. Clean, renewable, energy as an alternative to fossil fuels has become important not only for protecting the environment, but it also has enormous political and national security implications. Along with the emergence of its importance to society, "greentech," also known as "cleantech," has recently become one of the fastest growing industries. The global markets for solar photovoltaic, wind power, and biofuels grew at a 30% rate in 2011, to a combined total market size of \$246B.¹ U.S.-based venture capital investments in clean technologies increased from \$5.1 billion in 2010 to \$6.6 billion in 2012.² No one outside the oil industry seems to dispute that the move toward cleaner sources of energy is a laudable national endeavor to avoid the supply and environment issues associated with fossil fuels. The debate, however, centers on the government's role in creating a market and demand for green energy. Currently, all energy produced by green technologies—wind, solar, hydroelectric—is significantly more expensive than fossil fuels.³ Left to market forces alone, consumers will not embrace cleaner technologies unless the costs are approximately equal to the price of traditional fossil fuels. For example, recent increases in demand for battery-operated vehicles can be attributed to rising gas prices and falling costs of producing battery operated cars.

¶2 Government has played a substantial role in attempting to create favorable economic conditions for green technologies over fossil fuels, which has helped, in part, the rapid advance in recent greentech investment. For instance, a number of government agencies invest in greentech research and development⁴ or conduct research at their own laboratories. The U.S. Government spent about \$68 million on energy research and development in 2010 at Argonne National Laboratory in Argonne, Illinois.⁵ Alternatively, government subsidizes research and development at private companies by

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¹ Clean Energy Trends 2012, Clean Edge (March 2012), <http://www.cleantech.com/reports/clean-energy-trends-2012>.

² *Id.*

³ See Poul Erik Morthorst, *Wind Energy the Facts, Vol. 2, Costs & Prices*, available at http://www.ewea.org/fileadmin/ewea_documents/documents/publications/WETF/Facts_Volume_2.pdf (providing a cost comparison and analysis).

⁴ See U.S. Dep't of Energy, FY 2012 Congressional Budget Request, available at <http://www.cfo.doe.gov/budget/12budget/Content/FY2012Highlights.pdf> (The FY 2012 budget request continues to work to transform the Nation's energy infrastructure by investing over \$1,164.9 million in a variety of renewable programs including solar (\$457.0 million), wind (\$126.9 million), water (\$38.5 million), hydrogen (\$100.5 million), biomass (\$340.5 million), and geothermal (\$101.5 million)).

⁵ *Id.* at 18.

offering grants or loan guarantees.⁶ While government grants are usually less lucrative, the recent revelations about the U.S. guarantee of \$535 million in loans to Solyndra, Inc. show how much the government is willing to invest in a single player in the industry.⁷ Government can offer tax incentives to investors in and producers of green energy.⁸ Government has created markets for green products by passing regulations encouraging or requiring the use of green technology products (e.g., automobile mileage standards⁹) or by itself purchasing green products (e.g., U.S. Navy's recent commitment to invest \$510 million to produce advanced biofuels for military and commercial transportation¹⁰).

I. PATENTS PROVIDE AN INCENTIVE TO INVENT

Another way that government promotes all types of technologies, including green technologies, is through a robust patent system. While patents are private rights, government plays a substantial role, originating in Article I of the U.S. Constitution,¹¹ in the patent laws that provide for the creation and enforcement of the private rights. Unlike all of the other government-sponsored efforts of incentivizing green energy, which are focused solely on the greentech industry, patent rights are equally applicable and available to all technologies. But even within the patent system, government can create rules that allow access to a patent right more quickly or less expensively for some technologies.

A patent gives the patent holder the right to exclude others from making, using, selling, offering for sale, or importing a patented invention for the term of the patent¹² (which, as a general rule, is 20 years from the filing of the patent application). The patent is awarded as a *quid pro quo* for an inventor's disclosure of the invention in the patent. Therefore, rewarding an inventor with a temporary right to exclude others encourages the inventor to (a) invent and (b) tell the world about how to make and use the invention. By making the invention public, the inventor inspires and provides ideas to other inventors. Likewise, by giving the inventor a right to exclude, others are motivated to create improvements or new inventions that avoid the inventor's patent rights. The patent system thereby perpetuates more inventions in an ongoing cycle of innovation. In addition to incentivizing innovation for the sake of innovation, just as importantly, a patent right provides an incentive for investment.

⁶ U.S. Small Business Administration, Loan Opportunities for Green Energy, available at <http://www.sba.gov/content/green-product-development>.

⁷ See Office of Inspector General, Audit Report OIG-12-048 (Apr. 3 2012) (finding that "Consultation on Solyndra Loan Guarantee Was Rushed.").

⁸ See U.S. Dep't of the Treasury, Internal Revenue Service, *Energy Incentives for Businesses in the American Recovery and Reinvestment Act*, available at <http://www.irs.gov/newsroom/article/0,,id=209564,00.html>.

⁹ See U.S. Dep't of Energy, Alternative Fuels and Advanced Vehicles Data Center, *Key Legislation*, available at http://www.afdc.energy.gov/afdc/laws/key_legislation.

¹⁰ Press Release, U.S. Dep't of Energy, Federal Energy Management Program, *Fueling the Navy's Great Green Fleet with Advanced Biofuels* (Dec. 14, 2011), available at http://www1.eere.energy.gov/femp/news/news_detail.html?news_id=17950.

¹¹ U.S. Const. art. I, § 8, gives Congress the power "To 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."

¹² 35 U.S.C. § 271(a) (2006).

II. PATENTS PROVIDE AN INCENTIVE TO INVEST IN GREEN TECHNOLOGY

¶5 The flow of non-government capital into green technology is absolutely critical to advancing green energy, and similar to its role in other technology-heavy industries, patent protection is high on the list of incentives that drive investment in cleantech. Patentable technology in cleantech loosely fits into one of three categories, which are generally segmented by market maturity:

- Venture stage technologies (e.g., nanomaterials and wireless power);
- Emerging market stage technologies (e.g., ethanol, biofuels, and smart grid); and
- Mature market stage technologies (e.g., solar and wind power, hybrid vehicles, and light-emitting diode (LED) lighting).

¶6 The patenting behavior of the companies owning venture stage technologies can best be described as a "land grab." Companies with technology at this stage are typically focused on their patent filing strategy, building a strong patent portfolio, and using their patent position to reserve access to technology aimed at serving a particular market. Since many aspects of the technology are still new and relatively unproven, there is a substantially higher degree of risk, including financial, political, and regulatory risks, involved than with investments in mature technologies.¹³ Indeed, substantial innovation in green technologies takes place in young, start-up companies, which are often characterized by large intangible assets, negative cash flow, technological uncertainty, and low liquidation value. These entrepreneurs depend primarily on private investors for outside financing and endorsement. Investors generally look for patents to gauge the security of their investment because, hopefully, the entrepreneur will be able to protect the market share of its product through the exclusive right to make, use, sell, and import that a patent provides.

¶7 The patenting behavior of the companies owning emerging market stage technologies is often focused on value creation. Companies with technologies at this stage are typically focused on developing market share and using their patent portfolio to create a network of users of their technology. Because a patent right is an exclusive right that can be bartered, sold, exchanged, or licensed, patents provide investors with a defined asset that can have tremendous value to another investor or a larger company. Its ability to be freely exchanged enables a single entity to obtain market dominance in a particular technology area. When a network of users adopts a technology, patent rights surrounding the technology allow the owner of the right to charge consumers more for the products or services covered by the patent, which can significantly enhance the value of the technology.

¶8 The patenting behavior of companies with mature market stage technologies involves growing market share and protecting market segments. At this stage, the patent right can be asserted in litigation, or threatened litigation, to prevent competitors from selling competing products when those products are covered by the patent right. Patent owners can also force competitors to pay royalties for use of the patent right.

¹³ See Christopher Watts, THE ECONOMIST INTELLIGENCE UNIT, MANAGING THE RISK IN RENEWABLE ENERGY (Aviva Freudmann, ed., 2011).

¶9 Regardless of the stage of technology, private investors, unlike the government, will not invest in green technology companies unless they can reap a reward that is commensurate with the high level of risk involved. While there are other non-governmental incentives that justify investment in green technology, without patent protection, private money will be less likely to flow into new or even mature green technology companies. Without private investment, the growth of green technology and the public's access to these technologies will stagnate.

III. THE USPTO'S ROLE IN INCENTIVIZING GREEN TECHNOLOGY

¶10 The United States government recognized the importance of patents in securing investors in green technology. In December 2009, the United States Patent and Trademark Office created the Green Technology Pilot Program to accelerate the examination of certain green technology patent applications.¹⁴ "American competitiveness depends on innovation and innovation depends on creative Americans developing new technology," U.S. Commerce Secretary Gary Locke said in a press release following the announcement of the Green Technology Pilot Program.¹⁵ "By ensuring that many new products will receive patent protection more quickly, we can encourage our brightest innovators to invest needed resources in developing new technologies and help bring those technologies to market more quickly."¹⁶

¶11 To be eligible for the fast track program, the application must be for an invention directed towards improving environmental quality, conserving energy, developing renewable energy resources, or reducing greenhouse gas emissions.¹⁷ According to a USPTO press release, 1062 patents have been issued through the program as of April 26, 2012.¹⁸ The average time between acceptance of a patent application into the program and a first official office action from the patent office was just 68 days,¹⁹ compared to 30 months on average outside the program.²⁰ Illustratively, an application (now U.S. Patent No. 8,029,241) that was accepted into the program on January 5, 2011 received a first office action on March 24, 2011. The initial application was filed on September 15, 2010 and the patent was issued on October 4, 2011, taking less than 13 months from filing to issuance. By contrast, the average examination time for a patent application outside of the pilot program stands at approximately 40 months.²¹ This significant decrease in the

¹⁴ Press Release, U.S. Patent and 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.

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ See Expansion and Extension of the Green Technology Pilot Program, 75 Fed. Reg. 69049, 69050 (Nov. 10, 2010).

¹⁸ See U.S. Patent and Trademark Office, Green Petition Report Summary, *available at* http://www.uspto.gov/patents/init_events/green_report_summary20120426.pdf.

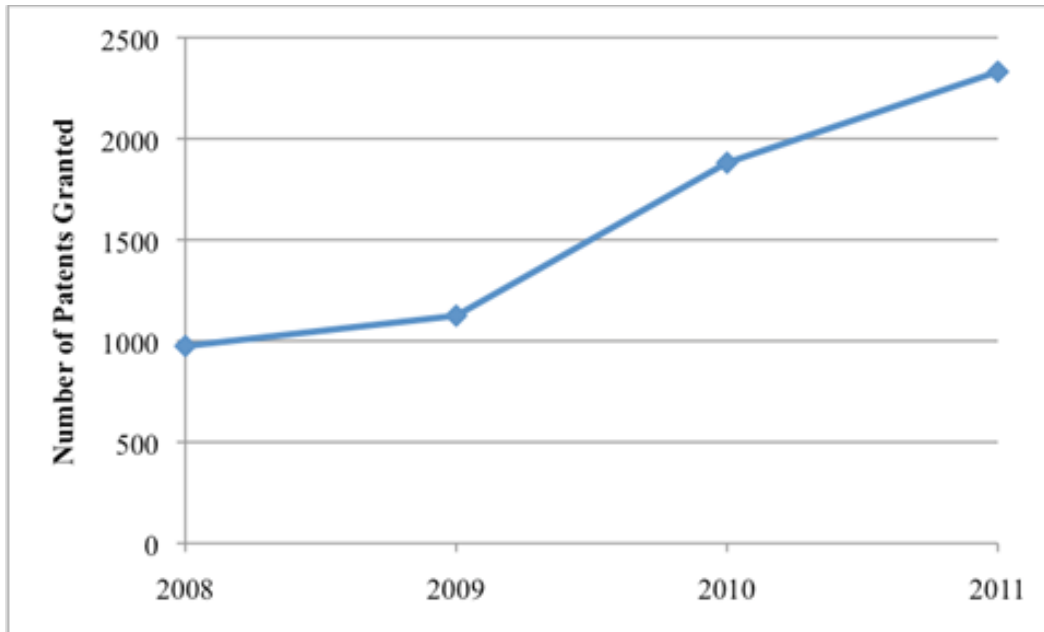
¹⁹ Press Release, U.S. Patent and Trademark Office, USPTO Issues 500th Patent Through Successful Green Technology Pilot Program (Oct. 5, 2011), *available at* <http://www.uspto.gov/news/pr/2011/11-53.jsp>.

²⁰ Press Release, U.S. Patent and 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.

²¹ *Id.*

examination time since the Green Technology Pilot Program started in 2009 has led to an increase in green patents granted, as seen in Figure 1 below.

FIGURE 1. GREEN PATENTS GRANTED BY YEAR



¶12 The USPTO is no longer accepting applications in the the Pilot Program. All new green applications are placed into the regular queue. A dip in patent issuances can be expected as all the accelerated applications issue and those in the regular queue take a few additional years to issue. But the overall upward trend can be expected to continue because of the recent substantial increase in investment in the technology.

IV. CONCLUSION

¶13 While the government can play an important role in encouraging green technology growth, the flow of non-government capital into green technology is critical to the success of the industry. In addition to providing subsidies, tax credits, and legislation that encourage investment in greentech, the government can encourage the growth of and public access to green technology through the patent system. Robust patent protection for greentech will lead to increased private investment, the creation of green jobs, and the ongoing progress of green technology. Only when the industry can be profitable in the absence of government subsidies will green technology will reduce U.S. energy consumption and improve national security through energy independence. Patent protection helps to ensure profitability and is a substantial aspect of a national strategy for this important industry.

