

Summer 2011

An Antitrust Framework for Climate Change

Michael A. Carrier

Professor, Rutgers University School of Law-Camden

Recommended Citation

Michael A. Carrier, *An Antitrust Framework for Climate Change*, 9 NW. J. TECH. & INTELL. PROP. 513 (2011).
<https://scholarlycommons.law.northwestern.edu/njtip/vol9/iss8/1>

This Article is brought to you for free and open access by Northwestern Pritzker School of Law Scholarly Commons. It has been accepted for inclusion in Northwestern Journal of Technology and Intellectual Property by an authorized editor of Northwestern Pritzker School of Law Scholarly Commons.

N O R T H W E S T E R N
JOURNAL OF TECHNOLOGY
AND
INTELLECTUAL PROPERTY

An Antitrust Framework for Climate Change

Michael A. Carrier



An Antitrust Framework for Climate Change

By Michael A. Carrier*

¶1 Climate change is one of the most important issues of the twenty-first century. With the Earth's fate literally hanging in the balance, observers increasingly recognize the fragility of the planet's ecosystem. Rising temperatures, hurricanes, floods, wildfires, droughts, tropical storms, and other events demonstrate the multiple forms in which climate change appears to be presenting itself.¹

¶2 As seen with President Obama's 2009 stimulus package, carbon capture technologies, the developing "Smart Grid," and patent pools addressing climate change based on the open source and Creative Commons models, the issues are pressing. But while climate change has received attention from scholars in other fields, including environmental, property, international, and human rights law, no one has yet analyzed how antitrust law should treat collaborative activity that addresses climate change. This Article addresses this gap. It focuses on four of the most likely antitrust topics to arise.

¶3 Part I addresses the issue of markets. Given the fledgling technologies at issue, determining the scope of the relevant market is an uncertain task. In many cases, it will not be clear exactly how broad the market is. For an example, this Part discusses the analysis by the Federal Trade Commission (FTC) of Panasonic's acquisition of Sanyo, which combined the two largest manufacturers of a type of portable rechargeable battery.

¶4 Part II discusses the treatment of monopoly issues, such as refusals to license intellectual property (IP) in the United States and European Union. It then applies this law to patents that assist in the removal of carbon dioxide from the atmosphere.

¶5 Standards are the focus of Part III. The context in which standards will most likely play a role involves the "Smart Grid," which uses "a two-way flow of electricity and information" to create a network that promises to reduce blackouts and to integrate renewable energy sources.² This Part explores how antitrust law should analyze these issues.

¶6 Part IV analyzes patent pools, tracing their benefits in bringing new technologies to the market and allowing the combination of various patented inputs. In particular, this Part examines the Eco-Patent Commons and Green Xchange, two voluntary arrangements by which patent holders can disseminate beneficial environmental technologies.

*Professor of Law, Rutgers University School of Law-Camden. Copyright © 2011 Michael A. Carrier. I would like to thank Josh Sarnoff for very thoughtful suggestions and Scott Simpkins for excellent research assistance. An earlier version of this Article will appear in RESEARCH HANDBOOK ON INTELLECTUAL PROPERTY AND CLIMATE CHANGE (Joshua D. Sarnoff ed., forthcoming 2011).

¹ *Climate Change: Effects*, NAT'L AERONAUTICS & SPACE ADMIN., <http://climate.nasa.gov/effects/> (last visited Aug. 25, 2011).

² U.S. DEP'T OF ENERGY, THE SMART GRID: AN INTRODUCTION, 13 (2008), *available at* [http://www.oe.energy.gov/DocumentsandMedia/DOE_SG_Book_Single_Pages\(1\).pdf](http://www.oe.energy.gov/DocumentsandMedia/DOE_SG_Book_Single_Pages(1).pdf) [hereinafter SMART GRID].

I. MARKETS

¶7 The first issue involves the relevant market. This issue is crucial in antitrust law. Knowing the products to which consumers would turn in the event of a price increase will often be dispositive in deciding whether they have suffered harm from the challenged conduct. In fact, other than the small universe of offenses so concerning they are automatically deemed illegal, the issue of market power is essential to determining the antitrust treatment of the relevant activity.

¶8 In the context of climate-change technology, market definition is particularly challenging. The products at issue are not established. It is often not clear which technologies are substitutes for each other and, thus, should be included in the same market. Although collaborative activities between rival companies may raise concern, the courts and government enforcement agencies should be cautious in finding market power in such nascent technologies.

¶9 One example of how the agencies might approach the issue is presented by the 2009 acquisition of Sanyo by Panasonic, which has endeavored to become the “No. 1 Green Innovation Company in the Electronics Industry” by 2018.³ The transaction combined the leading manufacturers and sellers of portable nickel-metal hydride (NiMH) batteries.⁴ These batteries are one of three types of rechargeable batteries, which consumers cannot easily substitute for each other.⁵ Portable NiMH batteries play an important role in powering two-way radios such as those used by police and fire departments.

¶10 Panasonic and Sanyo were “the only two portable NiMH battery suppliers that produce[d] high-quality, reliable products.”⁶ The acquisition would have allowed the combined firm to gain a market share of more than sixty-five percent.⁷ Nor, given the “very limited prospects for growth” in the market, would a potential competitor likely have had the incentive to enter.⁸

¶11 The FTC imposed a condition on the acquisition that the companies divest a portable NiMH battery manufacturing facility in Japan that produced thirty percent of such batteries worldwide.⁹ The divestiture was designed to “preserv[e] competition in

³ PANASONIC CORP., ANNUAL REPORT 2010, at 11 (2010), available at <http://panasonic.net/ir/annual/2010/>.

⁴ *FTC Order Sets Conditions for Panasonic's Acquisition of Sanyo*, FED. TRADE COMM'N (Nov. 24, 2009), <http://ftc.gov/opa/2009/11/sanyo.shtm> [hereinafter *FTC Order*].

⁵ *Id.* The other two types are nickel cadmium (NiCd) and lithium-ion (Li-ion). See Analysis of Agreement Containing Consent Orders to Aid Public Comment at 2, In re Panasonic Corp. & Sanyo Elec. Co., 2010 WL 145153 (F.T.C., Nov. 24, 2009) (No. C-4274), available at <http://ftc.gov/os/caselist/0910050/091124panasanyoanal.pdf> (noting there are a large number of products “that have a large installed base of customers that cannot switch to another type of rechargeable battery because the products were designed specifically to accommodate portable NiMH batteries” and highlighting the “strong preference for portable NiMH batteries for performance and cost reasons”).

⁶ Complaint ¶ 8, In re Panasonic Corp. & Sanyo Elec. Co., 2010 WL 145153 (F.T.C. 2009) (No. C-4274), available at <http://ftc.gov/os/caselist/0910050/091124panasanyocmpt.pdf>.

⁷ *Id.*

⁸ *Id.* ¶ 9 (explaining that “[e]xisting fringe competitors would have to significantly improve their portable NiMH production facilities, improve the quality of their portable NiMH batteries, and overcome customers’ unwillingness to rely on a portable NiMH battery supplier that lacks the track record for producing reliable, high-quality products”).

⁹ *FTC Order*, *supra* note 4.

the market for these critical batteries.”¹⁰ The FTC also required Sanyo to supply a subsidiary of Fujitsu with battery sizes not available at the Japan plant, provide access to employees needed to run the plant, and transfer IP related to the batteries.¹¹

¶12 The FTC came to a different conclusion on the competitive effect of the acquisition in the hybrid electric vehicle (HEV) battery market. Even though Panasonic and Sanyo were the “most significant suppliers” of NiMH batteries used in current-generation HEVs, the FTC recognized that advancements in substitute lithium ion (Li-ion) technology made Li-ion HEV batteries a “superior alternative” to NiMH batteries.¹² Several firms already supplied Li-ion HEV batteries to automakers for future HEVs, and the FTC concluded that NiMH batteries used in future HEVs would “compete directly against Li-ion HEV batteries.”¹³

¶13 In the future, numerous other issues might arise in determining the appropriate markets in which to evaluate climate change technologies. Such issues could include: (1) the effect of government regulations that limit substitutability between clean technology and traditional energy supply solutions, (2) China’s uniquely large investments in clean technology (which could affect analysis of market power in the United States), and (3) the high fixed costs in sectors such as wind and biofuels.¹⁴

¶14 In any event, issues of market definition presented by climate change technologies promise to call for nuanced, fact-specific analysis. The FTC’s analysis of Panasonic’s acquisition of Sanyo, with varying competitive effects in different markets, provides the type of careful evaluation that courts and the antitrust enforcement agencies will need to apply to market determinations in the context of climate change technology.

II. MONOPOLIZATION AND IP REFUSALS TO LICENSE

¶15 The consequences of market definition will vary in different jurisdictions. For example, the standards for proving monopolization are higher under U.S. than European Union (EU) law. This Part explores one particular issue that likely will arise in the area of climate change technologies: a company’s refusal to license patented technologies. In the United States, a refusal to license will typically not lead to a finding of monopolization. In contrast, the law in the EU is more amenable to punishing firms that refuse to share IP with rivals. This section explores these differences in the context of technologies to remove carbon dioxide from the Earth’s atmosphere.

A. *United States Law*¹⁵

¶16 Most U.S. courts that have explored the issue have concluded that a company’s refusal to license its IP does not constitute monopolization. This section explores the three most important opinions, which were articulated by federal appellate courts at the

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ Craig Waldman & Margaret Ward, *Antitrust Issues in Clean Technology*, ANTITRUST SOURCE, at 2–3 (Apr. 2010), <http://www.abanet.org/antitrust/at-source/10/04/Apr10-Waldman4-14f.pdf>.

¹⁵ Discussion in this section is adapted from MICHAEL A. CARRIER, *INNOVATION FOR THE 21ST CENTURY: HARNESSING THE POWER OF INTELLECTUAL PROPERTY AND ANTITRUST LAW* 89–91 (2009).

end of the twentieth century. Of the three, the most IP-friendly decision seems to have generated the longest coattails.

¶17 In the first case, *Data General Corp. v. Grumman Systems Support Corp.*, the court held that a party's "desire to exclude others from use of its [IP protected] work is a presumptively valid business justification."¹⁶ The First Circuit found that such a presumption was not rebutted when a company refused to license a program diagnosing computer problems.

¶18 In the second case, *Image Technical Services, Inc. v. Eastman Kodak Co. (Kodak II)*,¹⁷ the Ninth Circuit affirmed a monopolization verdict, finding that the *Data General* presumption could be rebutted by evidence of pretext. The court found that such evidence existed where "the proffered business justification played no part in the [defendant's] decision to act" since "Kodak photocopy and micrographics equipment require[d] thousands of parts, of which only [sixty-five] were patented," and Kodak's parts manager testified that patents "did not cross [his] mind" when the company instituted its parts policy.¹⁸

¶19 The Federal Circuit provided the final example in *In re Independent Service Organizations Antitrust Litigation (Xerox)*, carving out three limited categories in which a patentee would not be immune from antitrust liability: (1) tying patented and unpatented products, (2) obtaining a patent through knowing and willful fraud, and (3) engaging in sham litigation.¹⁹ Because the court concluded that Xerox's refusal to sell its patented parts did not exceed the scope of the patent and did not fall within any of the three exceptions, it concluded that Xerox did not violate the antitrust laws.²⁰

¶20 The *Xerox* case has been cited by lower courts in support of antitrust immunity for refusals to license. The court in *Townshend v. Rockwell International Corp.*, for example, found that "a patent owner has the legal right to refuse to license his or her patent on any terms" and, thus, "a predicate condition to a license agreement cannot state an antitrust violation."²¹

¶21 The *Xerox* case also is consistent with a line of cases that grant immunity as long as the challenged activity lies within the "scope" of the patent.²² Finally, *Xerox* is consistent with *Verizon Communications v. Trinko*, in which the Supreme Court not only held that an incumbent telephone company's refusal to share its network with rivals did not constitute monopolization but also employed aggressive language that lauded the benefits of monopoly power; lamented antitrust law's "considerable disadvantages," false positives, and negative investment effects; and bemoaned courts' supervision of decrees and "carte blanche" to force monopolists to "alter [their] way of doing business."²³

¹⁶ 36 F.3d 1147, 1187 (1st Cir. 1994).

¹⁷ 125 F.3d 1195 (9th Cir. 1997).

¹⁸ *Id.* at 1218–20.

¹⁹ 203 F.3d 1322, 1326–28 (Fed. Cir. 2000).

²⁰ *Id.*

²¹ No. C99-0400, 2000 U.S. Dist. LEXIS 5070, at *26 (N.D. Cal. Mar. 28, 2000).

²² *E.g.*, *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 136 (1969); *Ethyl Gasoline Corp. v. United States*, 309 U.S. 436, 455–56 (1940); *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 510 (1917); *United States v. Studiengesellschaft Kohle, m.b.H.*, 670 F.2d 1122, 1135 (D.C. Cir. 1981); *United States v. Westinghouse Elec. Corp.*, 648 F.2d 642, 647 (9th Cir. 1981); *SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1206 (2d Cir. 1981).

²³ *Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 412, 415 (2004).

B. European Union Law

¶22 Refusals to license IP are more likely to be successfully challenged in the European Union. In *Radio Telefis Eireann & Independent Television Publications Ltd. v. Commission (Magill)*, the European Court of Justice found that a refusal to deal (regarding copyrighted daily program listings) could constitute an abuse of dominance in “exceptional circumstances,” which were met since (1) the information was indispensable in creating a comprehensive weekly TV guide, (2) the refusal prevented the appearance of a new product, (3) there was no justification for the refusal, and (4) the stations “reserved to themselves the secondary market of weekly television guides by excluding all competition on that market.”²⁴

¶23 In another important case, *IMS Health GmbH & Co. OHG v. NDC Health GmbH & Co. KG*, IMS refused to supply information on sales of drug products in a large number of small areas called “bricks.”²⁵ Such a system allowed IMS to offer data without identifying sales by individual pharmacies. After finding that the criteria identified in *Magill* needed to be satisfied, the European Court of Justice found an abuse of dominance.²⁶

¶24 The Court of First Instance in *Microsoft v. Commission* synthesized these cases, stating that exceptional circumstances would be met when a refusal relates to a product indispensable to behavior on a neighboring market, excludes effective competition on that market, and prevents the appearance of a new product for which there is potential consumer demand.²⁷

¶25 The Court found such circumstances in the *Microsoft* case since the refusal (1) covered indispensable interoperability information, (2) threatened to eliminate competition in the market for work group server operating systems, and (3) limited technical development.²⁸ The Court’s recitation expanded liability from the *Magill* and *IMS* cases. It indicated that it could find liability even in the absence of one of the exceptional circumstances. And it extended the reach of the third factor from preventing a new product to limiting technical development.²⁹

C. Application: Patented Carbon-Capture Technologies

¶26 The law on monopolization just described could lead to very different results in the United States and EU. An example of a patented technology possessed by a firm with monopoly power could be carbon sequestration, the process of removing carbon dioxide from the atmosphere.³⁰ The presence of this chemical compound in the atmosphere threatens to play a significant role in climate change.

²⁴ Joined Cases C-241/91 P & C-242/91 P, 1995 E.C.R. I-808 ¶¶ 49–50, 53–56.

²⁵ Case C-418/01, 2004 E.C.R. I-5069 ¶¶ 10–11.

²⁶ In particular, the Court required proof of the new-product, lack-of-objective-justification, and secondary-market criteria. *Id.* ¶¶ 38, 52.

²⁷ Case T-201/04, 2007 E.C.R. II-3601 ¶ 332.

²⁸ *Id.* ¶¶ 436, 619–20, 647–49.

²⁹ *Id.* ¶¶ 336, 649–58. See generally Renata B. Hesse, *Counseling Clients on Refusal to Supply Issues in the Wake of the EC Microsoft Case*, 22 ANTITRUST 32, 33–34 (2008).

³⁰ *Glossary of Climate Change Acronyms*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, http://unfccc.int/essential_background/glossary/items/3666.php#C (last visited Aug. 25, 2011).

¶27 In 2006, global atmospheric concentrations of carbon dioxide were more than thirty-five percent higher than they were before the Industrial Revolution.³¹ In fact, they are higher today than they have been in the last 650,000 years.³² Almost all of this increase has been traced to human activities.³³ The largest source of carbon dioxide emissions across the globe is the combustion of fossil fuels, such as coal, oil, and gas, with electricity generation playing the leading role in the United States.³⁴ Because even slowing the rate of releasing carbon dioxide into the atmosphere will have only a limited effect, technologies that can capture carbon from the atmosphere could be vital in addressing climate change.³⁵

1. Technology

¶28 One means of carbon sequestration involves “sinks,” or agricultural and forestry lands that absorb carbon dioxide.³⁶ For example, trees and plants can remove carbon dioxide from the atmosphere and turn it into biomass such as wood and leaves.³⁷ Sequestration activities “can help prevent global climate change by enhancing carbon storage in trees and soils, preserving existing tree and soil carbon, and reducing emissions” of carbon dioxide, methane, and nitrous oxide.³⁸ The process of carbon sequestration has been the subject of numerous patents and patent applications. This Article will discuss four.

¶29 The first, “fine particle carbon dioxide transformation and sequestration,” applies to methods that break down carbon dioxide into small particles, separate out the particles of a desired size, and form mineral carbonates.³⁹ This conversion into carbonates promises benefits since it can be used for industrial applications, such as building materials.⁴⁰

¶30 A second patent, “sequestration of carbon dioxide,” removes carbon dioxide from a gaseous stream by converting it to a solid, stable form.⁴¹ Such a process passes carbon-dioxide-enriched air through a gas diffusion membrane to transfer it to a fluid medium; passes this fluid through a matrix that accelerates the conversion of carbon dioxide to carbonic acid; and adds a mineral ion to the reaction to form a precipitate of carbonate

³¹ *Atmosphere Changes*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/climatechange/science/recentac.html> (last updated Apr. 14, 2011).

³² *Id.*

³³ *Id.*

³⁴ *Human-Related Sources and Sinks of Carbon Dioxide*, ENVTL. PROTECTION AGENCY, http://www.epa.gov/climatechange/emissions/co2_human.html (last updated Apr. 14, 2011) [hereinafter *Human-Related Sources*].

³⁵ *Science of Atmospheric Carbon Dioxide*, ONLY ZERO CARBON, <http://www.onlyzerocarbon.org/co2.html> (last visited July 13, 2011).

³⁶ *Carbon Sequestration in Agriculture and Forestry*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/sequestration/index.html> (last updated June 22, 2010) [hereinafter *Carbon Sequestration*].

³⁷ *Human-Related Sources*, *supra* note 34.

³⁸ *Carbon Sequestration*, *supra* note 36.

³⁹ U.S. Patent Application No. 2008/0277319 (filed May 16, 2007). A carbonate mineral is “any member of a family of minerals that contain [a particular] carbonate ion.” *Carbonate Mineral*, ENCYCLOPEDIA BRITANNICA, <http://www.britannica.com/EBchecked/topic/95132/carbonate-mineral> (last visited Aug. 29, 2011).

⁴⁰ *See Patent Application—Fine Particle Carbon Dioxide Transformation and Sequestration*, PATENTDOCS, <http://www.faqs.org/patents/app/20080277319> (last visited Aug. 29, 2011).

⁴¹ U.S. Patent No. 7,132,090 (filed May 2, 2003).

salt that can be safely stored for extended periods of time (in the ground or in storage sites).⁴²

¶31 A third, which covers “carbon dioxide capture and related processes,” increases the ocean’s alkalinity.⁴³ This enables the water to more easily absorb and store carbon dioxide.⁴⁴ The carbon dioxide can be captured from the atmosphere or from the waste stream of a source like a power or chemical plant.⁴⁵ This method increases the ocean’s alkalinity “by electrochemically removing its hydrochloric acid and neutralizing the acid through reactions with silicate minerals.”⁴⁶ As a result, carbon dioxide will dissolve into the ocean and “be stored as bicarbonate ion ‘without further acidifying the ocean.’”⁴⁷

¶32 A fourth treatment, “scrubbing ‘ionized’ rainstorm tunnel,” involves a method to scrub exhaust streams “to approach Zero Emissions with utility in Coal Fired Electricity Generation.”⁴⁸ The invention compresses the Hydrologic Cycle (circulation of Earth’s water) by using sunlight, gravity, lightning, and precipitation to cleanse the air within various tunnel configurations. It also uses a pressurized spray and rain that absorbs the toxic emissions with water that is “ionized” so it can absorb and dissolve compounds at a higher rate.⁴⁹

¶33 Given the 2009 Green Technology Pilot Program of the U.S. Patent and Trademark Office (PTO) to accelerate examination of green technology patent applications, the patenting of carbon sequestration technology could very well increase in the near future. As PTO Director David Kappos explained, “[e]very day an important green tech innovation is hindered from coming to market is another day we harm our planet and another day lost in creating green businesses and green jobs.”⁵⁰ The PTO, thus, is implementing a program that accords special status and expedites examination of applications for green technologies, which promises to reduce patent pendency by, on average, one year.⁵¹

2. Antitrust Analysis

¶34 If one of these carbon-sequestration technologies proves to be so successful that it gives its owner monopoly power, a crucial issue becomes whether the patentee should be compelled to license the technology to others. The answer depends on whether a court finds the patentee guilty of monopolization.

⁴² *Id.*

⁴³ Int’l Application No. PCT/US2007/010032 (filed Apr. 26, 2007), *available at* <http://www.wipo.int/pctdb/en/ia.jsp?IA=US2007010032>.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ Eric Lane, *Unpublished, Unpatented, but Not Unimportant: C12 Energy May Use the Ocean to Capture CO₂*, GREEN PATENT BLOG (Mar. 10, 2009), <http://www.greenpatentblog.com/2009/03/10/unpublished-unpatented-but-not-unimportant-c12-energy-may-use-the-ocean-to-capture-co2/>.

⁴⁷ *Id.*

⁴⁸ U.S. Patent Application No. 2007/081924 (filed Oct. 12, 2005), *available at* <http://www.freepatentsonline.com/20070081924.pdf>.

⁴⁹ *Id.*

⁵⁰ *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*, U.S. PATENT & TRADEMARK OFFICE (Dec. 7, 2009), http://www.uspto.gov/news/pr/2009/09_33.jsp.

⁵¹ *Id.*

¶35 In the United States, a monopolization finding based on a refusal to license is not very likely. As discussed above, the only appellate court (*Kodak*) that required an IP holder to license its protected technology relied on a finding of pretext for which the bar is extremely high. If the company's refusal to license is completely unrelated to the patented component, it could conceivably constitute monopolization. But in nearly all cases, the firm, even with monopoly power, is not compelled to license its IP. This is particularly likely if the company did not initially license the technology and then withdraws from the arrangement.⁵²

¶36 In contrast, a court in the EU is more likely to require a dominant firm to provide access to an essential patented carbon-sequestration technology the firm owns. Under the first factor, the patented technology may be indispensable to competing in the market. Second, and relatedly, a company excluded from the technology may be unable to compete. Third, the refusal could "limit technical development." Before the *Microsoft* decision, this third factor required that the refusal blocked a new product, but the refusal now need only limit technical development.⁵³ In short, a dominant firm could be forced to share essential patented carbon-sequestration (or other) technologies.

¶37 If a court (or the European Commission) makes this finding, it is far more likely to impose the remedy of compulsory licensing than U.S. courts and agencies. U.S. courts and commentators have emphasized IP owners' right to exclude in explaining why compulsory licensing is not appropriate and could stifle innovation incentives. For example, in *Verizon Communications v. Law Offices of Curtis V. Trinko*, the Supreme Court explained that sharing contravenes the "purpose of antitrust law" and that the opportunity "to charge monopoly prices—at least for a short period—is what attracts 'business acumen' in the first place [by] induc[ing] risk taking that produces innovation and economic growth."⁵⁴ And as a government official explained, "[s]ome of the risks being taken by today's innovators are massive, with reward systems that may be very fragile and that could potentially be destroyed by over-aggressive antitrust remedies" like compulsory licensing.⁵⁵

¶38 In contrast, European courts have been more willing to use the remedy of compulsory licensing, focusing less on *ex ante* incentives for innovation and more on the benefits of opening access to markets covered by IP. To pick just the most prominent example, in the *Microsoft* case, the European Commission (affirmed by the Court of First Instance) held that "the possible negative impact of an order to supply on Microsoft's incentives to innovate is outweighed by its positive impact on the level of innovation of the whole industry," with the result that "the need to protect Microsoft's incentives to innovate cannot constitute an objective justification that would offset the exceptional circumstances identified."⁵⁶ Because of the heightened possibility of the compulsory

⁵² See *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985) (finding monopolization when the owner of several downhill skiing facilities withdrew from a joint ticketing arrangement with its competitor).

⁵³ See Case T-201/04, *Microsoft Corp. v. Comm'n*, 2007 E.C.R. II-3601 ¶¶ 436, 620, 647–49.

⁵⁴ 540 U.S. 398, 407–08 (2004).

⁵⁵ Makan Delrahim, Deputy Assistant Attorney Gen., U.S. Dep't of Justice, *Forcing Firms to Share the Sandbox: Compulsory Licensing of Intellectual Property Rights and Antitrust*, Presented at the British Institute of International and Comparative Law 10 (May 10, 2004), <http://www.justice.gov/atr/public/speeches/203627.pdf>.

⁵⁶ *Microsoft*, 2007 E.C.R. II-3601 ¶¶ 706–07.

licensing remedy, it is far more likely that a court in the EU would require a firm with a dominant position to share its patented climate-change technology.

III. STANDARD SETTING

¶39 A third example of an antitrust issue presented by climate change involves standard setting. Standards are common platforms that allow products to work together. They are ubiquitous in our economy and are especially important in network effects markets, in which users benefit from an increase in the number of other users in the system. Even though standards are vital, antitrust traditionally viewed the process of setting standards with suspicion because, in doing so, industry rivals could discuss sensitive information, such as price.⁵⁷

¶40 There are several types of standards. The first, set by governments, tends to address product quality, health, and safety. A second type involves de facto standard setting, which occurs when one firm (such as Microsoft, with its Windows operating system) dominates the market. A third type involves standards voluntarily set by private industry groups known as standard-setting organizations (SSOs).

A. Smart Grid

¶41 One climate-change setting, in which standard setting is likely to play an important role, involves the “Smart Grid.” The Smart Grid integrates twenty-first century technology with the twentieth-century electric power infrastructure (the “grid”).⁵⁸

¶42 Our nation’s century-old grid is “the largest interconnected machine on Earth,” consisting of more than 9,000 electric generating units offering 1,000,000 megawatts of generating capacity linked to 300,000 miles of transmission lines.⁵⁹ The electrification made possible by the grid was, according to the National Academy of Engineering, one of the most significant engineering achievements of the twentieth century.⁶⁰

¶43 Today’s U.S. grid, however, faces increasingly pressing challenges. In the past three decades, growth in peak demand for electricity, which has been driven by population expansion, bigger houses and TVs, and more air conditioners and computers, has exceeded transmission growth by nearly twenty-five percent each year.⁶¹ Because utility providers cannot anticipate exactly when or how high demand will peak, they must bring online older plants, which generate additional greenhouse gases.⁶² Although transportation has achieved widespread attention for its role in pollution, the generation of electricity actually produces twice as much (forty percent as opposed to twenty percent) pollution.⁶³ In fact, a five percent increase in the efficiency of the grid “would equate to permanently eliminating the fuel and greenhouse gas emissions from 53 million

⁵⁷ CARRIER, *supra* note 15, at 323–24.

⁵⁸ *Plug into the Smart Grid*, GEN. ELECTRIC, http://ge.ecomagination.com/smartgrid/#/landing_page (last visited Aug. 29, 2011).

⁵⁹ SMART GRID, *supra* note 2, at 5.

⁶⁰ *Greatest Engineering Achievements of the 20th Century*, NAT’L ACAD. OF ENG’G, <http://www.greatachievements.org> (last visited Aug. 29, 2011).

⁶¹ SMART GRID, *supra* note 2, at 6.

⁶² *Id.* at 14.

⁶³ *Id.* at 20.

cars.”⁶⁴ In addition, a lack of awareness of the grid’s performance has led to three “massive blackouts” since 1999.⁶⁵

¶44 The Smart Grid offers significant potential to address these problems. Characterized as “the internet brought to our electric system,” the Smart Grid uses “a two-way flow of electricity and information” to create an “automated, widely distributed energy delivery network.”⁶⁶ In particular, it allows information to flow from a customer’s meter (1) inside the house to appliances and (2) outside the house to the utility.⁶⁷

¶45 The Smart Grid can support its components’ generation of power even when a utility is not providing it.⁶⁸ Through “real-time grid response,” the Smart Grid endeavors to “reduce the high cost of meeting peak demand.”⁶⁹ The technology promises (1) to save tens of billions of dollars; (2) to “anticipate[], detect[] and respond[] to problems,” which reduces widespread blackouts; (3) to “be more resistant to attack and natural disasters” and thus facilitate energy independence; and (4) to integrate “[c]lean, renewable sources of energy like solar, wind, and geothermal” into the electrical grid.⁷⁰ The Smart Grid is a top priority for the U.S. government, which awarded more than \$4 billion and deployed eighteen million smart meters for the grid.⁷¹

B. Interoperability

¶46 Central to the success of the Smart Grid is interoperability, which is achieved through standards. In the context of the Smart Grid, interoperability can be defined as the ability of networks, applicants, or components to securely and effectively exchange and use information.⁷²

¶47 A standard set of interfaces is needed so that components can communicate with each other and be incorporated into the Smart Grid. For that reason, Congress enacted the Energy Independence and Security Act of 2007, which charged the National Institute of Standards and Technology (NIST), an agency of the U.S. Department of Commerce, “to coordinate the development of a framework that includes protocols and model standards for information management to achieve interoperability of smart grid devices and systems.”⁷³

¶48 In January 2010, NIST published Release 1.0 of the standards framework.⁷⁴ The framework stresses the urgency of quick action, as Smart Grid devices such as smart

⁶⁴ *Id.* at 7.

⁶⁵ *Id.*

⁶⁶ *Id.* at 2, 13.

⁶⁷ FRED SISSINE, CONG. RESEARCH SERV., RL 34294, ENERGY INDEPENDENCE AND SECURITY ACT OF 2007: A SUMMARY OF MAJOR PROVISIONS 20 (2007).

⁶⁸ SMART GRID, *supra* note 2, at 23.

⁶⁹ *Id.* at 14.

⁷⁰ *Id.* at 37.

⁷¹ Steven Chu, U.S. Sec’y of Energy, Remarks on the Anniversary of the Recovery Act (Feb. 19, 2010), transcript available at <http://energy.gov/articles/secretary-chus-remarks-anniversary-recovery-act>.

⁷² U.S. DEP’T OF COMMERCE, NAT’L INST. OF STANDARDS & TECH., NIST FRAMEWORK AND ROADMAP FOR SMART GRID INTEROPERABILITY STANDARDS, RELEASE 1.0, at 19 (2010) [hereinafter NIST FRAMEWORK].

⁷³ Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492, § 1305 (2007) (codified at 42 U.S.C. § 17385).

⁷⁴ See generally NIST FRAMEWORK, *supra* note 72.

meters are moving into large-scale deployment, and the use of sensors providing real-time system assessments to avert outages is accelerating.⁷⁵

¶49 The Report lists areas of priority that include *wide-area situational awareness* allowing the monitoring and display of system components and performance; *demand response and consumer energy efficiency* that lets customers reduce their energy use “during times of peak demand or when power reliability is at risk”; *energy storage* that would allow energy to be stored; and *electric transportation* that would “enabl[e] large-scale integration of plug-in electric vehicles.”⁷⁶

¶50 In contrast, if the industry does not adopt standards, it would be taking the risk that Smart Grid technologies, in which companies are increasingly investing, will become obsolete or be implemented with insufficient security.⁷⁷ The absence of standards also could hinder innovation, beneficial applications, and the enablement of economies of scale and scope allowing robust price and quality competition.⁷⁸

¶51 In bringing together the relevant stakeholders, the NIST has relied on the GridWise Architecture Council, a team composed of utility providers, technology firms, and academic leaders developing standards to promote interoperability among components interacting with the Smart Grid.⁷⁹ In addition, due to the hundreds of standards required for the Smart Grid, NIST is working with many private SSOs.⁸⁰ But even though the EISA required the creation of standards for the Smart Grid, it did not make them mandatory or give the Federal Energy Regulatory Commission the authority to enforce the standards.⁸¹

C. Antitrust Analysis

¶52 Courts and the antitrust agencies should find that standard setting in the Smart Grid context does not violate the antitrust laws. Under the “Rule of Reason,” these activities have not yet demonstrated any significant anticompetitive effects, but instead have shown substantial procompetitive justifications.⁸²

¶53 Standard setting could potentially increase prices, lead to boycotts of rivals, or foster collusion in markets for goods sold to consumers. To date, however, these concerns have not appeared in the context of the Smart Grid. One reason could be traced to the guiding principles NIST uses for evaluating standards. The principles support “collaborative, consensus-driven processes” for developing standards and require SSOs

⁷⁵ *Id.* at 13–14.

⁷⁶ *Id.* at 20–21.

⁷⁷ *Id.* at 14.

⁷⁸ *Id.*

⁷⁹ *Mission and Structure*, GRIDWISE ARCHITECTURE COUNCIL, <http://www.gridwiseac.org/about/mission.aspx>, (last updated Aug. 2011).

⁸⁰ NIST FRAMEWORK, *supra* note 72, at 15, 20, 45–46.

⁸¹ Smart Grid Policy, Policy Statement, 128 F.E.R.C. ¶ 61,060, at ¶ 23 (July 16, 2009), *available at* <http://www.ferc.gov/whats-new/comm-meet/2009/071609/E-3.pdf>.

⁸² Antitrust courts consider most conduct (with the exception of the most concerning activities, such as price fixing) under the Rule-of-Reason framework, which considers factors such as (1) anticompetitive effects, (2) procompetitive justifications, and (3) reasonable necessity or less-restrictive alternatives for the restraint. *See generally* Michael A. Carrier, *The Real Rule of Reason: Bridging the Disconnect*, 1999 BYU L. REV. 1265.

to be “open to participation by all relevant and materially affected parties.”⁸³ Such a requirement reduces the likelihood of exclusionary conduct that would injure rivals. In particular, it makes it less likely that parties with market power would enter into a concerted refusal to deal with competitors.

¶54 The NIST also addresses concerns relating to the potential exercise of market power by requiring standards to be available on “fair, reasonable, and nondiscriminatory” terms.⁸⁴ Such a requirement is consistent with licensing rules that many SSOs have adopted. In particular, it addresses the possibility of “holdup,” by which a patentee lacking market power before the selection of the standard imposes excessive licensing terms after its technology is incorporated into the standard and the industry has invested in the technology. Such licensing rules offer a procompetitive justification by circumventing a potential bottleneck and contributing to the creation of a product that might not otherwise exist.

¶55 In its Technology Transfer Guidelines, the European Commission recognizes the benefits of SSO members negotiating licensing terms, stating that parties are “free to negotiate and fix royalties for the technology package and each technology’s share of the royalties either before or after the standard is set.”⁸⁵ It explains that such agreement “is inherent in the establishment of the standard” and cannot by itself be viewed as “restrictive of competition.”⁸⁶ And it highlights the efficiencies from royalty agreements before standards are adopted, which avoid standards that result in market power.⁸⁷

¶56 In addition to a lack of anticompetitive effects, Smart Grid standard setting promises significant procompetitive justifications. Most important, it fosters the interoperability essential to the operation of the Smart Grid. Just to pick one example, if today’s cars and light trucks charged during off-peak times, seventy percent of their needs could be supplied by the idle capacity of today’s electric power grid.⁸⁸

¶57 Absent a standardized Smart Grid, alternative energy sources and new smart consumer devices would not be able to effectively attach to the grid and communicate with each other. The lack of standards would lead to Smart Grid components becoming obsolete or suffering from security breaches. The NIST report listed numerous examples of technologies for which the current standards are not adequate for future deployment⁸⁹ and other examples where there are multiple competing standards.⁹⁰

¶58 In short, standard setting in the Smart Grid context does not currently appear to result in significant anticompetitive effects. While this deserves continued attention, the potential procompetitive justifications are compelling. The Smart Grid promises to

⁸³ NIST FRAMEWORK, *supra* note 72, at 45.

⁸⁴ *Id.* at 45–48.

⁸⁵ Commission Notice, Guidelines on the Application of Article 81 of the EC Treaty to Technology Transfer Agreements, 2004 O.J. (C 101) 2, ¶ 225 (EC), *available at* <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2004:101:0002:0042:EN:PDF> [hereinafter TT Guidelines].

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ NIST FRAMEWORK, *supra* note 72, at 25.

⁸⁹ *Id.* at 95–96, 100–01, 103–04 (referencing plug-in electric vehicles, energy storage, and the Grid’s communication protocol).

⁹⁰ *Id.* at 78–79, 90–91, 97–98 (discussing smart home appliances, meter usage data, and time synchronization).

reduce debilitating blackouts, to be more resistant to disasters, and to integrate renewable energy sources. It will foster interoperability, which will enhance security and make it less likely that consumers will be stranded with obsolete technologies. It will also enable more efficient use of electric generation assets, which will lead to a reduction in greenhouse gas emissions.

¶59 Given that the Smart Grid promises to be a revolutionary technology for the twenty-first century, these justifications should carry the day. Courts and agencies should apply Rule-of-Reason analysis to the activity and uphold nearly all standard-setting activity that would foster Smart Grid interoperability.

IV. PATENT POOLS

¶60 Patent pools offer the fourth example of an antitrust issue presented by climate change. A patent pool involves a single organization—either a new entity or one of the original patent holders—that licenses the patents of two or more companies to third parties as a package.⁹¹

A. Background

¶61 As the antitrust enforcement agencies have recognized, patent pools tend to be procompetitive in “integrating complementary technologies, reducing transaction costs, clearing blocking positions, and avoiding costly infringement litigation.”⁹² For that reason, the agencies have upheld pools related to (1) MPEG-2, a video compression technology underlying the transmission, storage, and display of digitized moving images and sound tracks;⁹³ (2) DVD-ROM and DVD-video formats describing “the physical and technical parameters for DVDs for read-only-memory and video applications”;⁹⁴ and (3) third generation (3G) wireless communication systems.⁹⁵

¶62 These pools were composed of essential patents, which means that the product or standard at issue in the pool could not have been produced without infringing the patent. Essential patents do not have substitutes and typically are complementary, possessing a greater value if the licensee can use other essential patents.

¶63 On the other hand, patent pools can present anticompetitive harm when they facilitate the combination of substitute patents, which are not necessary for the use of a technology in the pool and which present alternate ways of creating products that otherwise would be used in competition with each other. For example, competing patents made up the Summit-VISX pool, which consisted of lasers used in photorefractive

⁹¹ Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in INNOVATION POLICY AND THE ECONOMY 119, 132 (Adam B. Jaffe et al. eds., 2001).

⁹² U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY § 5.5 (1995) [hereinafter IP GUIDELINES].

⁹³ Letter from Joel I. Klein, Acting Assistant Att’y Gen., Dep’t of Justice Antitrust Div., to Gerrard R. Beene (June 26, 1997), available at <http://www.justice.gov/atr/public/busreview/215742.pdf> [hereinafter MPEG-2 pool letter].

⁹⁴ Letter from Joel I. Klein, Assistant Att’y Gen., Dep’t of Justice Antitrust Div., to Gerrard R. Beene (Dec. 16, 1998), available at <http://www.usdoj.gov/atr/public/busreview/2121.pdf>.

⁹⁵ Letter from Charles A. James, Assistant Att’y Gen., Dep’t of Justice Antitrust Div., to Ky P. Ewing (Nov. 12, 2002), available at <http://www.usdoj.gov/atr/public/busreview/200455.pdf>.

keratectomy (PRK), a form of eye surgery employed to correct vision disorders. In its Complaint, the FTC explained that, if not for the pool, the two firms would have competed against each other “by using their respective patents, licensing them, or both.”⁹⁶ These substitute patents were not necessary for the use of a technology in the pool, but presented alternate ways of creating products that otherwise would have competed with each other.

¶164 Patent pools also could reduce innovation. One context in which this has arisen involves grantback clauses. Grantbacks are arrangements by which a licensee agrees to extend to the IP licensor the right to use the licensee’s improvements to the licensed technology.⁹⁷ The concern is that grantbacks could reduce innovation incentives by reducing the return from follow-on inventions.⁹⁸ This concern has been addressed through requirements that grantback clauses be limited as narrowly as possible (such as to essential, not substitute, patents).⁹⁹

¶165 The distinction between essential and substitute patents parallels that in the European Union. The European Commission, in its Guidelines on the application of Article 81 (now Article 101) of the EC Treaty to technology transfer agreements, explained that “[t]he inclusion in the pool of substitute technologies restricts inter-technology competition,” that pools “substantially composed of substitute technologies . . . amount[] to price fixing between competitors,” and that “[w]hen a pool is composed only of technologies that are essential and therefore by necessity also complements,” it does not violate Article 81.¹⁰⁰ Japan’s Fair Trade Commission, in its Guidelines on Standardization and Patent Pool Arrangements, echoed this distinction, noting that “competition among the patented technologies is not restricted when only the essential patents are pooled” but that the pooling of nonessential patents “is likely to restrict competition and represent a legal problem.”¹⁰¹

B. Eco-Commons Patent Pool

¶166 One promising example of a patent pool in the climate change setting involves the “Eco-Patent Commons,” by which companies have agreed to license (on a royalty-free basis) patents that offer environmental benefits. The arrangement, which began in January 2008, is based on the open source movement, which employs licenses that allow others to use the software but require that they maintain its open character.

¶167 The Eco-Patent Commons is open to all. At the time this Article went to press, twelve companies—Bosch, Dow, DuPont, Fuji-Xerox, HP, IBM, Nokia, Pitney Bowes,

⁹⁶ Complaint ¶ 8, Summit Tech., Inc., 127 F.T.C. 208 (1999), *available at* <http://www.ftc.gov/os/1998/03/summit.cmp.htm>.

⁹⁷ IP GUIDELINES, *supra* note 92, § 5.6.

⁹⁸ Hartmut Schneider, *Analyzing Patent Pools: Will They Pass Muster Abroad?*, LAW360 (Aug. 16, 2010), http://www.wilmerhale.com/files/Publication/aabbc202-8474-4696-a2a5-61f6aa00c7ef/Presentation/PublicationAttachment/20796e4a-1c63-4c50-b4ea-65665acf7846/Analyzing%20Patent_Pools.pdf.

⁹⁹ MPEG-2 pool letter, *supra* note 93, at 13 (restriction of grantback clauses to essential patents makes it “unlikely that there is any significant innovation left to be done that the grantback could discourage”).

¹⁰⁰ TT Guidelines, *supra* note 85, ¶¶ 219, 220.

¹⁰¹ JAPAN FAIR TRADE COMM’N, GUIDELINES ON STANDARDIZATION AND PATENT POOL ARRANGEMENTS, pt. 3, at 6–7 (2005), *available at* http://www.jftc.go.jp/en/legislation_guidelines/ama/pdf/Patent_Pool.pdf.

Ricoh, Sony, Taisei and Xerox—had licensed more than 100 patents to the public domain.¹⁰²

¶168 Businesses may pledge patents that offer an environmental benefit, which “directly or indirectly improve[s] or protect[s] the environment and ecology of our planet.”¹⁰³ Patents may cover not only innovations related to environmental solutions but also manufacturing or business process innovations that provide benefits such as pollution prevention or efficient energy use.¹⁰⁴ The patents are listed on a website hosted by the World Business Council for Sustainable Development.¹⁰⁵

¶169 Companies also can retain their rights to patents that afford a “significant business advantage.”¹⁰⁶ But for other patents, members have been willing to share the patents to “provide greater value in a public commons.”¹⁰⁷

¶170 Examples of patents that have been pledged to the Eco-Patent Commons include

- HP’s “self-contained battery recycling station that [] encourage[s] consumers to exchange their used batteries for new ones or for credit.”¹⁰⁸
- Fuji Xerox’s patents that effectively treat wastewater and “reduce quantities of the coagulant and the resultant sludge without harming the environment.”¹⁰⁹
- Xerox’s patents that “cut[] the time it takes to remove toxic waste from soil and water from years to months” and that “make[] magnetic refrigeration less harmful to the environment” by “eliminat[ing] the need for ozone depleting refrigerants and energy-consuming compressors.”¹¹⁰
- Ricoh’s patent that “reduces waste of image device cartridges” used in copy machines, printers, and fax machines.¹¹¹

¹⁰² *Eco-Patent Commons*, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV., <http://www.wbcd.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=MTQ3NQ&doOpen=1&ClickMenu=LeftMenu> (last visited Aug. 29, 2011).

¹⁰³ *Q&A*, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV., <http://www.wbcd.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=MTU2Mg&doOpen=1&ClickMenu=LeftMenu> (last visited Aug. 29, 2011).

¹⁰⁴ *Eco-Patent Commons to Receive Three Patents from HP*, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. (July 1, 2010), <http://www.wbcd.org/Plugins/DocSearch/details.asp?DocTypeId=251&ObjectId=Mzg1MDM&URLBack=/templates/TemplateWBCSD2/layout.asp%3Ftype%3Dp%26MenuId%3DMzcx%26doOpen%3D1%26ClickMenu%3DRightMenu> [hereinafter *Patents from HP*].

¹⁰⁵ *Overview*, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV., <http://www.wbcd.org/templates/TemplateWBCSD5/layout.asp?ClickMenu=special&type=p&MenuId=MTU1OQ> (last visited Aug. 29, 2011). “The WBCSD is a CEO-led, global association” of 200 companies whose mission is “to provide business leadership as a catalyst for change toward sustainable development and to support the business license to operate, innovate and grow in a world increasingly shaped by sustainable development issues.” *Q&A*, *supra* note 103.

¹⁰⁶ *Q&A*, *supra* note 103.

¹⁰⁷ *Overview*, *supra* note 105.

¹⁰⁸ *Patents from HP*, *supra* note 104.

¹⁰⁹ *Dow and Fuji Xerox Join Eco-Patents Commons, Xerox Pledges Additional Patent to Help the Planet*, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. (Oct. 20, 2009), <http://www.wbcd.org/Plugins/DocSearch/details.asp?DocTypeId=33&ObjectId=MzYxMTQ>.

¹¹⁰ *Id.*

¹¹¹ *Ricoh and Taisei Join Eco-Patent Commons, DuPont Contributes Additional Eco-Friendly Patents*, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. (Mar. 23, 2009), <http://www.wbcd.org/Plugins/DocSearch/details.asp?DocTypeId=251&ObjectId=MzM3ODM>.

- Taisei’s patent that “provides an environmentally friendly green space construction method solution to improve water quality.”¹¹²
- DuPont’s patents that “provide environmentally superior refrigerants for use in refrigeration and air conditioning” by “reduc[ing] or eliminat[ing] the potential for ozone depletion and global warming.”¹¹³

C. *Green Xchange*

¶71 A second project, the Green Xchange,¹¹⁴ launched in 2010 in cooperation with Creative Commons. Creative Commons is a nonprofit organization that has developed model licenses that allow creators to retain some—though less than all—copyright rights.¹¹⁵

¶72 Green Xchange is more restrictive than the Eco-Patent Commons. Firms that contribute patents to Green Xchange can charge users a fixed annual licensing fee and restrict licensing by rivals for competitive use.¹¹⁶ The patentees “determine the terms for use” and “can protect sensitive information.”¹¹⁷ Such restrictions allow companies to license technology that could have a positive environmental impact in unrelated industries, while protecting them from ceding a competitive advantage to their rivals.

¶73 Green Xchange’s founders have claimed that this platform will produce more inventions since it does not “depend on altruism.”¹¹⁸ Companies in different fields could benefit from research without threatening the patentee’s core business.¹¹⁹ For example, Nike’s research on “maximizing the efficiency of air pressure in sneaker design” could be used by a company that manufactures truck tires in a way that “saves materials and money, creates a more eco-friendly product, and does not harm Nike’s sales.”¹²⁰ In fact, after Nike shared its adhesive technology with footwear makers, the levels of harmful solvents used by its suppliers fell from, on average, 350 grams per pair of shoes in 1997 to less than 15 grams in 2009.¹²¹

¶74 In addition to benefiting the environment, Green Xchange could foster the development of communities that “collaborate in innovation and the exchange of ideas.”¹²² Such an arrangement would be similar to open-source software licensing in copyright, where the free sharing of knowledge often provides “a fertile ground for new collaboration and innovation.”¹²³ In particular, Salesforce.com would provide a search

¹¹² *Id.*

¹¹³ *Id.*

¹¹⁴ THE GREEN XCHANGE, <http://greenxchange.force.com/vGXhome> (last visited Aug. 29, 2011).

¹¹⁵ *About*, CREATIVE COMMONS, <http://creativecommons.org/about/> (last visited Aug. 29, 2011).

¹¹⁶ Mary Tripsas, *Everybody in the Pool of Green Innovation*, N.Y. TIMES, Nov. 1, 2009, at BU5, available at http://www.nytimes.com/2009/11/01/business/01proto.html?_r=1.

¹¹⁷ Agnes Mazur, *Green Xchange: Creating a Meta-Map of Sustainability*, WORLD CHANGING (May 5, 2009), <http://www.worldchanging.com/archives/009822.html>.

¹¹⁸ Tripsas, *supra* note 116 (quoting Green Xchange coordinator and VP for science at Creative Commons).

¹¹⁹ Mazur, *supra* note 117.

¹²⁰ *Id.*

¹²¹ Tripsas, *supra* note 116.

¹²² *Id.*

¹²³ *Overview*, *supra* note 105.

engine, and collaboration platforms would facilitate the identification of companies with common interests.¹²⁴

¶75 In short, Green Xchange “challenges companies” to view patents not “as something to be guarded and protected” but “as something transferable, and potentially profitable when shared.”¹²⁵

D. Antitrust Analysis

¶76 Courts and the antitrust agencies should find that the Eco-Patent Commons and Green Xchange patent pools do not present antitrust violations.

1. Anticompetitive Effects

¶77 First, the pools do not create significant anticompetitive effects. They appear to consist of complementary—not substitute—patents. Accordingly, they promise to increase output and make patents more widely accessible than they otherwise would be. Pools can be particularly useful in the climate change arena, which “often integrate[s] multiple technologies.”¹²⁶ To be sure, the pools are not as formally complementary as others, since they do not cover a single product that requires use of all of the patents. Instead, the patents cover multiple products. Nonetheless, the pools promise to increase, not reduce, output.

¶78 Second, the Eco-Patent Commons does not present any notable threats of exclusion. Any company is free to join the pool. And even firms that do not join are able to use the patents that have been pledged to the pool.

¶79 There is modestly more antitrust concern with Green Xchange, since firms might not be able to use a competitor’s patents. Members can restrictively license their patents and protect sensitive information. As the agencies’ IP Licensing Guidelines explain, however, exclusion “is unlikely to have anticompetitive effects unless (1) excluded firms cannot effectively compete in the relevant market for the good incorporating the licensed technologies and (2) the pool participants collectively possess market power in the relevant market.”¹²⁷ Here, these characteristics do not seem to be present since, at a minimum, it appears that excluded firms can compete in the market.

¶80 Third, no coercion is involved in selecting patents in the pool. A company is free to use only those patents that it needs. It is not forced to accept packages of patents that include some that it might not desire.

¶81 Fourth, there do not appear to be anticompetitive price or output restraints. The Guidelines explain that “the joint marketing of pooled intellectual property rights with collective price setting or coordinated output restrictions” could be “deemed unlawful if

¹²⁴ Tripsas, *supra* note 116.

¹²⁵ Mazur, *supra* note 117.

¹²⁶ Mark Sajewycz, *Patenting Clean Technologies: Trends, Issues, and Strategies*, NORTON ROSE (Jan. 21, 2010), <http://www.nortonrose.com/knowledge/publications/45553/patenting-clean-technologies-trends-issues-and-strategies>; see also Sarah Dowdey, *What Is Clean Coal Technology?*, HOWSTUFFWORKS, <http://science.howstuffworks.com/environmental/green-science/clean-coal.htm> (last visited Aug. 29, 2011) (explaining how clean coal technology “us[es] multiple technologies to clean coal and contain its emissions”).

¹²⁷ IP GUIDELINES, *supra* note 92, § 5.5.

they do not contribute to an efficiency-enhancing integration of economic activity among the participants.”¹²⁸ Here, users of the Green Xchange pool are charged a fixed annual licensing fee. Such fees could raise concern, such as where (as in the case of the DIVX pool) patentees combine substitute patents and charge sublicensees a fee each time they use a patent from the pool.¹²⁹ In the Green Xchange pool, however, the annual fee seems to be a means to recover the costs of creating patented inputs and is essential to an “integration of economic activity.”¹³⁰

2. Procompetitive Justifications

¶82 In addition to a lack of anticompetitive effects, the pools offer procompetitive justifications. First, they increase access to environmental patents. By offering the patents for free (in the Eco-Patent Commons) or for a fixed amount (Green Xchange), the pools enhance output in a vital industry. The pools also foster cross-pollination of ideas and environmentally friendly products across various industries.

¶83 Second, the pools increase innovation by opening the market to new players and allowing businesses “to identify common areas of interest and establish new collaborative development efforts.”¹³¹ The companies can collaborate on research aimed at common goals such as reducing environmental harms.¹³² More broadly, the pools promise to “chang[e] the way we think about transferring intellectual property and benefiting from shared ideas.”¹³³ The sharing of IP-protected assets serves as an example of a regime that—like open-source and Creative-Commons licensing—could be successful without employing a maximalist view of IP rights.

¶84 Third, the pools avoid litigation. Firms can use the patents without having to spend time litigating their validity in court. Confirming the lack of concern is that many of the members of the pools are not competitors.

¶85 In short, pools such as the Eco-Patent Commons and Green Xchange do not have significant anticompetitive effects. At the same time, they promise to promote collaboration and innovation. Given the vitally important endeavor in which these pools are engaged, they should not be subject to significant antitrust scrutiny.

¶86 Even the European Union, which often applies a more aggressive antitrust approach, would likely find that the pools do not present a competition problem. Under EU law, a pool with a dominant position must adhere to fair and nondiscriminatory (FRAND) royalties and issue nonexclusive licenses.¹³⁴ These requirements “are necessary to ensure that the pool is open and does not lead to foreclosure and other anti-competitive effects on down stream markets.”¹³⁵

¶87 The Eco-Patent Commons and Green Xchange pools have issued nonexclusive licenses, and there has been no concern that parties obtaining licenses from the pool have

¹²⁸ *Id.*

¹²⁹ See Complaint ¶ 12, Summit Tech., Inc., 127 F.T.C. 208 (1999), available at <http://www.ftc.gov/os/1998/03/summit.cmp.htm>.

¹³⁰ IP GUIDELINES, *supra* note 92, § 5.5.

¹³¹ *Q&A*, *supra* note 103.

¹³² Mazur, *supra* note 117.

¹³³ *Id.*

¹³⁴ TT Guidelines, *supra* note 85, ¶ 226.

¹³⁵ *Id.*

not been able to use other technologies. In addition, any royalties seem to be fair and nondiscriminatory. The Eco-Patent Commons allows its patents to be used for free. And Green Xchange imposes a fixed annual licensing fee that appears to be a reasonable means to recover costs.

3. Licensing Analysis

¶88 Finally, the deference to licensing in the pool context should apply to such activity on a smaller scale. Not all licensing issues will involve the pools discussed here. But many of the same benefits will justify licensing arrangements between fewer parties.

¶89 As the U.S. agency guidelines explain, “[i]ntellectual property typically is one component among many in a production process” which “derives value from its combination with complementary factors [such as] manufacturing and distribution facilities, workforces, and other items of intellectual property.”¹³⁶ It is usually more efficient for the patentee to enter into licensing agreements with parties that own complementary assets or capabilities.¹³⁷ In particular, licensing “can facilitate integration of the licensed property with complementary factors of production,” which can result in efficient exploitation of IP, thereby leading to lower costs, increased research and development (R&D), and new products.¹³⁸

¶90 To similar effect, the European Commission has recognized that “the vast majority of licen[s]e agreements are pro-competitive” as they disseminate technologies, increase efficiency, and foster innovation by allowing companies to receive returns covering R&D costs.¹³⁹

¶91 A patentee can utilize a broad range of licenses, which include customer, territorial, and field-of-use restrictions and various types of royalties. Field-of-use and geographic restrictions allow patentees to offer rights that complement the strengths of licensees.¹⁴⁰ The restrictions also prevent free-riding and increase incentives to license.¹⁴¹

¶92 For all these reasons, the licensing of climate-change technologies between a few parties is likely to be procompetitive. For example, a party that licenses patented carbon sequestration technologies will tend to expand output and the number of parties that benefit from the technology.

V. CONCLUSION

¶93 Technologies to combat climate change present numerous uncharted issues that call for nuanced antitrust analysis. This Article has provided an overview, recognizing the complicated issues that are likely to arise from market definition, patented carbon-

¹³⁶ IP GUIDELINES, *supra* note 92, § 2.3.

¹³⁷ Patrick Rey & Ralph A. Winter, *Exclusivity Restrictions and Intellectual Property*, in COMPETITION POLICY AND INTELLECTUAL PROPERTY RIGHTS IN THE KNOWLEDGE-BASED ECONOMY 159, 168 (Robert D. Anderson & Nancy T. Gallini eds., 1998).

¹³⁸ IP GUIDELINES, *supra* note 92, § 2.3.

¹³⁹ TT Guidelines, *supra* note 85, ¶ 17.

¹⁴⁰ Carl Shapiro, *Competition Policy and Innovation* (OECD Sci. Tech. & Indus. Working Paper 19, 2002) (on file with author).

¹⁴¹ IP GUIDELINES, *supra* note 92, § 2.3.

sequestration technologies, Smart Grid standard setting, and patent pools such as the Eco-Patent Commons and Green Xchange.

¶194 First, the issue of market definition calls for fact-specific analysis. The FTC's review of Panasonic's acquisition of Sanyo provides a roadmap for the type of nuanced evaluation required.

¶195 Second, a party's control of patented carbon-capture technologies would lead to different outcomes depending on the jurisdiction. The United States most likely would not require a monopolist to license the patents. In contrast, the EU would be more willing to require a firm with a dominant position to share its patented climate-change technology.

¶196 Third, standard-setting activity related to the Smart Grid is likely to avoid antitrust liability. The interoperability allowing energy grid network components to communicate with each other presents strong procompetitive justifications without apparent countervailing anticompetitive effects.

¶197 Fourth, patent pools are likely to survive antitrust scrutiny. The Eco-Patent Commons and Green Xchange, which do not exclude any firms and do not require package licensing of patents, present minimal anticompetitive effects. At the same time, the pools offer procompetitive justifications in increasing access to environmental patents and fostering innovation.

¶198 In short, while the field of climate change technology requires continued scrutiny, most of the collaboration that has occurred to date should be shielded from antitrust condemnation.