skilled in the art can use a claimed invention to provide some immediate benefit to the public.[169]

In short, the issue of safety or efficacy of drugs is beyond the scope of patent law and a matter for the FDA to verify. Likewise, it may be argued that 'greenness', such as the extent of reduction of greenhouse gas emissions or energy efficiency, rather than being mixed into legal patenting criteria should as a matter of policy be reviewed by specialized environmental agencies. Here, it may be noted that for example, Canada, the EU, Japan, Korea, the Philippines and the US run environmental technology verification programs to provide data for commercially viable environmental technologies for the benefit of related parties and the public.[170]

B. Role of Patent Policy

What is and should be the role of patent policy for stimulating green innovation and technology transfer? One discernible principle of the patent system is "transparency,"[171] resulting from disclosure as the *quid pro quo* of patent exclusivity. Patent information enables policymakers to track developments in important areas of technology and to use such data as an information base for stimulating innovation and diffusion of technology.[172] Another important component of patent policy is the active provision of procedures within the granting system tailored to certain perceived public goals. National offices increasingly provide supplementary services or preferential treatment accommodating green technology. Patent offices including those of Japan, Korea, the UK, the US and others have adopted so-called 'fast-tracking' of green technology, in which green inventions can be processed with priority in patent examination, so as to stimulate innovators' interest. As another source of stimulus, it has been suggested that "patenting behaviour is responsive to fee variations."[173]

To help explore the scope for patent policy, this part outlines and examines related activities by WIPO and selected national IP offices, in particular forms of preferential treatment for green technology. This part furthermore explores, in a green context, opportunities offered by the information function of patents.

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169 *In re* Fisher, 421 F.3d 1365 (Fed. Cir. 2005) (*cf.* Judge Rader's dissenting opinion argues that research tools such as expressed sequence tags are 'useful' because they help researchers identify and understand a previously unknown and invisible structure and advance science).

170 EPA, Fact Sheet: EPA's Environmental Technology Verification Program (Oct. 2008), *at* http://www.epa.gov/nrmrl/std/etv/pubs/600f08012.pdf.

171 *Supra* note 5 at 5.

172 *Id.*

173 *Supra* note 4. *See also generally* WIPO Standing Committee on the Law of Patents 2nd Session, Information Concerning Fee Reductions by the Offices, Apr. 12-23, 1999, WIPO Doc. SCP/2/6 (Mar. 17, 1999).

1. Activities by WIPO and Patent Offices

a) World Intellectual Property Organization

As a specialized UN agency responsible for international cooperation in the field of IP and for assuring efficiency and balance in the global IP system, WIPO provides an intergovernmental forum for addressing the interface between IP, innovation and global public policy issues.[174] Some of its activities concerning green technology are set forth below.

(1) Patent Cooperation Treaty

In early 2010, the International Authorities for searching and preliminary examining under the Patent Cooperation Treaty[175] discussed measures to be taken within the PCT system to give preferential treatment to international applications regarding green technology.[176] The following options had been prepared: (i) limited accelerated processing by receiving Offices, International Searching Authorities and International Preliminary Examining Authorities as well as the International Bureau (WIPO); (ii) fee-related incentives; and (iii) specifically indicating and/or drawing attention to published 'green' international applications to facilitate licensing and commercialization.[177]

However, participants raised concerns about the "difficulty to determine which applications indeed related to green technologies, noting the absence of an agreed definition" and the reliance on simple self-certification by applicants for the claimed environmental effects.[178] One Authority observed that "only 10% of applications in respect of which accelerated processing had been requested under its scheme had been indeed found to be related to such technologies."[179] In relation to the proposed fee reduction, it was pointed out that "no such fee reduction was offered by any Office for applications relating to, for example, public health or food security."[180] Authorities endorsed "making licensing information available in respect of any application, irrespective of the field of technology, for which applicant

174 WIPO, Medium Term Strategic Plan 2010-15: Revised Draft (July 29, 2010), *at* http://www.wipo.int/export/sites/www/about-wipo/en/pdf/mtsp_rev_en.pdf.
175 Patent Cooperation Treaty, June 19, 1970, 28 U.S.T. 7645, 1160 U.N.T.S. 231 [hereinafter PCT].
176 WIPO, Meeting of International Authorities under the PCT 17th Session, Agenda Item: Preferential Treatment for International Applications Relating to "Green" Technologies, WIPO Doc. PCT/MIA/17/5 (Jan. 21, 2010).
177 *Id.*
178 WIPO, Report of the 17th Session, WIPO Doc. PCT/MIA/17/12 (Feb. 11, 2010).
179 *Id.*
180 *Id.*

had made a request to that effect,"[181] which may be worth exploring further for green innovation.

(2) Patent Classification: Catchword Index for Environmentally Sound Technology

In 2009, WIPO's International Patent Classification (IPC) Revision Working Group launched a project on ESTs (Project C456). It was initiated from the UK's proposal to create a new stand-alone indexing scheme for ESTs in the IPC.[182] This proposal was opposed because the IPC was not meant to assess alleged effects or benefits (*i.e.*, no judgement on "good" and "bad" technologies).[183] As an alternative, the US proposed to create a list of entries in the Catchword Index[184] under the term EST.[185] To this end, a "concordance" list is being compiled under the following seven major headings: alternative energy production; nuclear power generation; transportation; energy conservation; waste management; agriculture/forestry; and administrative, regulatory or design aspects of ESTs.[186] In the process, the Working Group generally defined, without formal adoption, ESTs as "technologies conducive to sustainable development or to the mitigation of climate change."[187] In addition, the possibility is under discussion to align the IPC's proposed list of ESTs with the UNFCCC's ongoing climate change technology classification scheme.

(3) WIPO Development Agenda and Climate Change

The Development Agenda for WIPO, adopted in 2007, is another basis for WIPO's role in stimulating innovation and technology transfer for climate change. WIPO has been tasked to provide, within its mandate, technical assistance and capacity building support for developing countries and LDCs to protect creation, innovation and inventions and to develop domestic infrastructure for science and technology.

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181 *Id.*

182 WIPO, IPC E-Forum Project C456, *available at* http://www.wipo.int/ipc-ief, at Annex 1 (Apr. 17, 2009).

183 *E.g.*, Lutz Mailänder, WIPO, *IPC – a "Sound" Tool for Environmentally Sound Technologies?*, Presentation at the WIPO IPC Workshop, WIPO Doc. IPC/WK/GE/10 (Feb. 9, 2010).

184 The Official Catchword Index provides some 20,000 entries containing brief technical terms or keywords which can assist users to identify a starting point in the classification scheme by going through a list of catchwords. This list is available at http:www.wipo.int/classifications/ipc/ipc8/?lang=en.

185 *Supra* note 182 at Annex 4 (June 4, 2009).

186 *Supra* note 182 at Annex 2 (June 14, 2010).

187 *Id.* (*cf.* on the other hand, Japan argued that "the determination of what technologies should belong to EST is beyond the mandate given to the IPC community and WIPO").

Particular attention is thereby to be given to small and medium-sized enterprises (SMEs), scientific research institutions, and cultural industries.[188] For related norm-setting on public policy issues, WIPO should address such matters as links between IP and competition, IP-related technology transfer, and exceptions and limitations to exclusive rights.[189] Further, WIPO may explore measures for transfer and dissemination of technology to developing countries.[190] More directly, WIPO offers support services, upon request from Member States, *e.g.*, in relation to "capacity building, legislative assistance, practical technology licensing models, and arbitration and mediation services."[191]

b) Fast-tracking Services

(1) UK Intellectual Property Office: Green Channel

In May 2009, the UK Intellectual Property Office (UKIPO) launched its so-called Green Channel, allowing patent applicants "to request accelerated processing of their applications if the invention relates to a 'green' or environmentally-friendly technology."[192] Under this scheme, patents can be granted, in theory, in less than twelve months.[193] There are three shortened routes to a patent: (i) combined search and examination (which makes it possible to receive the search and examination results within four months from the request); (ii) early publication; or (iii) accelerated search and/or examination subject to the applicant's showing that the invention relates to 'green' technology or other reasons justifying fast-tracking.[194] In this third option, UKIPO can accept the fast-tracking request if the applicant demonstrates the need for accelerated processing because of potential infringers or likely investors.[195]

In June 2010, UKIPO launched a Green Channel Patent Applications database,[196] which regularly compiles published patent applications being processed under the Green Channel initiative. With a view to facilitating technology

188 WIPO, The 45 Adopted Recommendations under the WIPO Development Agenda, *available at* http://www.wipo.int/ip-development/en/agenda/recommendations.html (last visited Aug. 10, 2010).
189 *Id.*
190 *Id*.
191 *Supra* note 174.
192 UKIPO, *Green Channel for Patent Applications*, *at* http://www.ipo.gov.uk/p-pn-green.html (last visited Aug. 10, 2010).
193 UKIPO, *Patents Fast Grant Guidance*, *at* http://www.ipo.gov.uk/p-fastgrantguide.pdf (last visited Aug. 10, 2010).
194 *Id.*
195 *Id*. (*cf*. for options (i) and (ii), it is not necessary to state reasons for the request).
196 Press Release, UKIPO, Green Patent Database Launched (June 4, 2010), *at* http://ipo.gov.uk/about/press/press-release/press-release-2010/press-release-20100604.html.

transfer, it contains the patent applicant's name, filing date, patent application title and IPC classification. As of early August 2010, some 120 publications have been posted.[197]

(2) USPTO: Green Technology Pilot Program

In December 2009, the USPTO launched a pilot program to accept 3,000 petitions for accelerated examination of green technologies, *i.e.*, applications related to "environmental quality, energy conservation, development of renewable energy resources or greenhouse gas emission reduction."[198] To be eligible, claims must be designed for an invention that significantly improves the quality of the environment or that materially contributes to: "(1) the discovery or development of renewable energy sources; (2) the more efficient utilization and conservation of energy resources; or (3) greenhouse gas emission reduction", with an explanation satisfying the special status.[199] Mere speculation on possible use of the invention to achieve the above effects does not suffice.

Initially, there was a requirement that applications must belong in one of the U.S. patent classifications: alternative energy production, energy conservation, environmentally-friendly farming, or environmental purification, protection or remediation.[200] However, in May 2010, the USPTO announced removal of this restriction because "this requirement was causing the denial of petitions for applications that are drawn to green technologies" and the workload of examiners has been adjusted by other means.[201] According to a USPTO report of July 26, 2010, some 650 petitions have been granted out of 1,400 requests submitted.[202]

(3) Preferential Treatment for Patenting Green Inventions

(a) Benefits of Early Patenting

First, early patenting is a useful enforcement tool when there is an urgent and compelling need to assert rights against potential infringers or competitors. Even before

197 UKIPO, *Green Channel Patent Applications*, *at* http://www.ipo.gov.uk/types/patent/p-os/p-gcp.htm (last visited Aug. 11, 2010).
198 Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64666, 64666 (Dec. 8, 2009).
199 *Id.* at 64667.
200 *Id.* at 64668-64669.
201 Elimination of Classification Requirement in the Green Technology Pilot Program, 75 Fed. Reg. 28554, 28555 (May 21, 2010).
202 USPTO, *Green Petition Report Summary* (updated Aug. 2, 2010 and reported July 26, 2010), *at* http://www.uspto.gov/patents/init_events/green_tech.jsp.

patent grant, published patent applications are entitled to some degree of reasonable compensation against infringement.[203] On the other hand, a fast grant (especially if accompanied by early publication) is not always good for patentees. For nascent technologies, a slower pace in the granting procedure can be advantageous because it gives time to gauge commercial viability and to develop marketing plans while the patent application is still pending.

Second, a strong IP position helps start-ups to secure investment and one way to strengthen the firm's IP position is to secure patents in advance so that investors are convinced about the company's core assets for growth. This is about more than the timing of patenting; a strong IP position also relates to, for example, the strength of individual patents or the value of the overall patent portfolio.

Third, as a policy matter, early patenting helps speed up the development and deployment of technology, generate more jobs and stimulate competitiveness in business. The USPTO describes the higher-level purpose of prioritizing a specific technical field like green technology as re-organizing the patenting process in order to improve patent quality and timeliness. Importantly, reduced pendency in a chosen area helps bring new technologies into the market early.

Fourth, from an economic viewpoint, the first mover's advantage in the rapidly growing green technology market appears to stimulate early patenting in this field. For example, an economic analysis suggests that Europe's leadership in the wind turbine industry is partially driven by this type of advantage.[204] When the economy turns low-carbon through mandatory implementation of renewable energy generation, European turbine makers with advanced technologies are well-positioned to benefit from such regulatory change. On the other hand, increasing competition (including with actors in developing countries) and political uncertainty in the climate change negotiations may diminish such advantages.

Incentivizing early patenting can be beneficial to society. As Duffy argues, the race for a patent implies not only rivalry to claim exclusive rights, but also competition to end monopolies sooner.[205] In addition, embryonic technology can be commercially exploited at a much later stage of the patent term.[206] Therefore, the social benefit of early patenting is that it has the effect of reducing the actual monopoly period, *i.e.*, the time between commercial exploitation and patent expiration.

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203 EPC, *supra* note 120 at art. 67.

204 *See generally* Urs Steiner Brandt and Gert Tinggaard Svendsen, *Switch Point and First Mover Advantage: The Case of the Wind Turbine Industry* (Aarhus School of Business, Working Paper 04-2 ISSN1397-4831).

205 John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. Chi. L. Rev. 439, 494 (2004).

206 *Id.*

(b) Non-discrimination under TRIPS Article 27(1)

Opponents to preferential treatment of green technology might ask why green technology should be treated differently. There is a concern whether such treatment complies with TRIPS Article 27(1), which provides that, subject to certain TRIPS provisions, "patents shall be available for any inventions in all fields of technology …. and patent rights [shall be] enjoyable …. without discrimination as to the field of technology."[207] WTO Members are neither to exclude a particular technical field from patent grant nor to restrict patent rights, for example by shortening patent terms or conferring unjustified exceptions and limitations.[208]

However, WTO Members may employ different treatments for some technologies in order to level uneven playing fields, and TRIPS Article 27 does not prohibit such *bona fide* exceptions to deal with specific problems that exist only in certain areas.[209] For biological inventions, a deposit of biological material such as microorganisms is permissible as an alternative to fulfil written descriptions (which otherwise could not be met).[210] Such treatment is not *per se* discrimination. Rather, it is a different treatment to achieve the common goal of patenting.

Would the preferential treatment of green technology amount to discrimination under Article 27(1)? WTO Members "claiming *de facto* discrimination should be required to demonstrate some element over and above those required to establish *de jure* discrimination, and …. [WTO Members] defending an exclusion should be permitted to rebut a showing of disparate treatment by demonstrating a legitimate purpose."[211] One may defend that preferential treatment should be distinguished from discriminatory treatment, the latter typically involving exclusion of a particular technical field from granting a patent. The green technology preferential treatment sofar does not involve such exclusionary conduct, but merely prioritizes the handling of green patent applications in the patenting process.

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207 *Cf.* TRIPS Article 27(1) also prohibits discrimination against the place of invention and against the location of products. TRIPS Agreement, *supra* note 8. at art. 27(1).

208 Carvalho, *supra* note 115 at 279.

209 Panel Report, Canada—Patent Protection of Pharmaceutical Products, Para. 7.94, WT/DS114/R.

210 EPC, *supra* note 120 at Rule 31. Also such deposit of microorganisms can be mutually recognized among Members of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, Apr. 28, 1977, 17 I.L.M. 285 (1978) [hereinafter Budapest Treaty].

211 Graeme B. Dinwoodie and Rochelle C. Dreyfuss, *Diversifying Without Discriminating: Complying with the Mandates of the TRIPS Agreement*, 13 Mich. Telecomm. Tech. L. Rev. 445, 445-456 (2007); *see also supra* note 85 at 2.249 (suggesting that "governments are permitted to adopt different rules relating to technological development, transfer and dissemination for particular product areas or locations of production, provided that the differences are adopted for *bona fide* purposes and that such measures are not inconsistent with the other provisions of TRIPS").

However, the concern is that such preferential treatment could strengthen the perception that those inventions on preferential treatment are more important than other technical fields, which is what Article 27(1) would appear intended to prevent.

In any event, if a special treatment that "acknowledges different situations and aims to equalize them"[212] has to be justified, it would be necessary to verify whether green technology patent applications are being adversely affected by the overall delays in patent processing. In the absence of consensus on what belongs to green technology, it is difficult to trace pendency issues specifically detrimental to green technology.

The more serious issue is major backlogs that some patent offices experience generally and, for them, tackling backlogs is a matter of urgency.[213] Meanwhile, green technology is increasingly seen as one of the technical priorities of society. Without backlogs, there would likely be less need to prioritize certain technologies over others. However, within the limited resources of patent offices, prioritizing one field inevitably results in delays in other areas. If necessary, it might be permissible to prioritize the review of some patent applications on request, regardless of technical fields, as this would not discriminate against a specific technology but universally apply to all technical fields.[214] To alleviate the pendency problem, some patent offices collaborate with one another by information and work sharing (*e.g.*, Patent Prosecution Highway, PPH) or harmonization of certain aspects of patent processing practices.

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212 Carvalho, *supra* note 115.

213 *See generally* UKIPO, Patent Backlogs and Mutual Recognition: An Economic Study by London Economics (2010) (analyzing the pendency and handling capacity of selected patent offices in terms of the number of pending patent applications, the number of patent examiners and other factors).

214 *E.g.*, Japan Patent Office (JPO), JPO Annual Report 2009, 40 (2009) (explaining that the JPO conducts accelerated examination in response to the submission of an explanation of circumstances with respect to (a) applications relating to inventions that have already been put into practice or planned to be put into practice within two years (working related applications); (b) applications which have foreign patent families (internationally filed applications); (c) applications filed by SMEs and venture businesses which are low in funds; or (d) applications filed by universities and public research institutes which are expected to return their fruits to society). Recently, the JPO also allowed accelerated examination for green technology applications. *See also* Fa Ming Zhuan Li Shen Qing Ti Qian Shen Cha De Zan Xing Guan Li Ban Fa [Interim Administrative Measures for Early Examination of Invention Patent Applications], Section II: Reasons for Applying Expedited Examination; *also* Interview with Chen Xi, Examiner, State Intellectual Property Office of the People's Republic of China (SIPO) (Sept. 11, 2010) (on file with author) (explaining that in China, fast-tracking of patenting is generally possible if the applicant provides credible reasons that (i) the invention is of great interest to society or the nation; or (ii) after publication of the patent application, the legitimate interest of the applicant is likely to be impaired if competitors reduce the invention to practice earlier than the applicant; or (iii) the application concerns the fundamental intangible asset of a large-scale investment project. Green technology inventions may satisfy the above condition (i) and obtain the fast-tracking advantage for expedited examination).

(c) Alternative: Verifying 'Greenness' Independent from Patent Grant

Another problem with the verification of environmental soundness in patenting is, as noted earlier, that patent examiners are hardly equipped to review *ordre public* issues.[215] Moreover, green patent applications tend to rely on patent applicants' self-certified assertions on environmental effects without independent verification mechanisms. Would an inaccurate statement on environmental impact disqualify the fast-tracking request or even the entire patent application? If the alleged environmental effect is not proven, does it amount to fraud or inequitable conduct? To what extent the patenting process should integrate environmental judgement is a sensitive issue.

In terms of verifying environmental soundness, the reasonable approach for patent offices would probably be not to mix it into patenting criteria. If patent applicants wish to obtain some kind of certification on green effects of their inventions, patent offices, subject to availability of resources, might consider adopting an independent procedure for this purpose (*i.e.*, without decisive impact on patentability itself). Under such a procedure, patent applicants or patent holders could perhaps request an appraisal or expert opinion (*inter-partes* or *ex-parte*) on the likely environmental impact of their invention. It could be considered to adapt WIPO's expert determination mechanism model[216] to such a need, with experts possessing relevant specialization available for a consensual, flexible and efficient procedure.

c) Information Services

In addition to optimizing filing options and granting patents, patent offices focus on improving the public information function of the patent system, "bridging the gap between evidence and policy."[217] This is based on the assumption that, when processed in context, the collection of patent data can serve as a valuable tool for policymakers.[218]

215 *Supra* note 122.

216 WIPO, WIPO Expert Determination, *at* http://www.wipo.int/amc/en/expert-determination/ (last visited Aug. 11, 2010).

217 EPO, Patents and Clean Energy, *at* http://www.epo.org/topics/issue/clean-energy.html (last visited Sept. 6, 2010).

218 Benoît Battistelli, Director General, EPO, The Patent System and the Climate Change Challenge, Geistiges Eigentum im Gespräch: Klimawandel und "grüne Technologien" - Herausforderung für das Patentsystem [*the Conference on Intellectual Property in Discussion: Climate Change and "Green Technology" – Challenge for the Patent System*], DPMA (July 22, 2010) (Ger.).

(1) European Patent Office

(a) Patents and Clean Energy Project

To help provide empirical data for climate change policy-making, the EPO with the OECD, UNEP, and ICTSD have jointly carried out a research project on the role of patents in clean technology development. The research consisted of technology mapping, patent landscaping and analysis, and a licensing practices survey. At the outset, ICTSD commissioned technology-mapping studies to spot commercially available technologies, goods and R&D in the renewable energy supply, building, transportation and industry and agriculture sectors.[219] Based on the information gathered from the technology-mapping studies, the EPO retrieved relevant patents, *inter alia*, in renewable energy covering wind, hydro/marine, solar, geothermal, biofuels, clean coal and their respective subcategories. The OECD then conducted statistical analysis on these patent data. The initial findings show that patenting in renewable energy, carbon capture and storage technologies has significantly increased, in particular in France, Germany, Japan, Korea, the UK and the US.[220]

In addition, a survey has been conducted on renewable energy related licensing practices of some 150 companies, organizations and government agencies in France, Germany, Japan, the Netherlands, the UK and the US. Approximately 50% of participants declared to have a "significant or substantial" number of clean energy patents in their patent portfolio.[221] Among different forms of IP cooperation, R&D collaboration was the most invoked business strategy, followed by patent/technology licensing, consulting services, joint ventures, spinouts and others.

In relation to cooperation with developing countries, 58% of respondents answered that they have "never" entered into licensing agreements with licensees from developing countries over the past three years, 25% "rarely," 12% "occasionally," and 5% "frequently."[222] When making a decision on licensing or collaboration with a party in a developing country, 25% of participants consider IP protection as a "compelling reason", 29% as a "significantly attractive condition", 28% as a "basic precondition" and 18% as "not a factor."[223] In addition, half of the respondents answered that licensing terms and conditions with licensees from developing countries could be "more flexible" and 20% "more or substantially more accommodat-

219 ICTSD, Accelerating Trade in Climate-friendly Goods and Services, *at* http://www.ictsd.org/climate-change/accelerating-trade-and-diffusion-of-climate-friendly-goods -and-services (last visited Aug. 12, 2010).
220 *Supra* note 217.
221 Ahmed Abdel Latif, ICTSD, Patents and Clean Energy Project Overview and Licensing Survey Results, Presentation at the Patents and Clean Energy Side Event in Bonn, UNFCCC (June 9, 2010) (on file with author).
222 *Id.*
223 *Id.*

ing."[224] The survey results further suggest that the key beneficiary countries of green technology licensing are, in alphabetical order, Brazil, China, India and Russia.[225]

(b) Classification Scheme for Clean Energy Technologies

The EPO has established a new classification scheme for "technical attributes of technologies that can be loosely referred to as clean energy technologies"[226] to serve "as an interface between the vast amount of technical knowledge contained in the patent documentation and the information needs of society."[227] Unlike the usual classification sorted by technical field, the new scheme is similar to a tagging system. Working with the existing classifications, the new scheme marks climate change mitigation technologies by a code Y02, which is sub-divided into coding for "greenhouse gases – capture or storage/sequestration or disposal" and "greenhouse gases – emission reduction technologies related to energy generation, transmission or distribution."[228]

(2) Opportunities Provided by Patent Information

Patents have derived functions such as supporting R&D performance measurement, technology databases and strategic planning.[229] Also, to an extent, patent information has become an indicator for innovation and technology transfer,[230] and the transparency of the patent system provides an empirical information basis for policy-making.[231]

224 *Id.*
225 *Supra* note 217.
226 EPO, *Classification Scheme for Clean Energy Technologies, at* http://www.epo.org/topics/issues/clean-energy/classification.html (last visited Sept. 7, 2010).
227 *Supra* note 218.
228 *Supra* note 226; *see also* Press Release, EPO, Tagging Clean Energy Patents (June 11, 2010), *at* http://www.epo.org/topics/news/2010/20100611.html.
229 *E.g.*, Karin Hoisl, Lecture at the Munich Intellectual Property Law Center: Intangible Asset Valuation (May 2010) (unpublished manuscript) (on file with author).
230 *Cf.* Nick Johnstone, Ivan Haščič, David Popp, Renewable Energy Policies and Technological Innovation: Evidence Based on Patent Counts 138 (Springer 2009) (pointing out that, although patents reflect the technological innovative performance, they are an imperfect measure because *inter alia* "the use of unweighted patent counts would attribute the same importance to patents for which there were no successful commercial applications [as to] those which are highly profitable").
231 *Supra* note 5 at 5.

For the patent information system to be able to serve as a "global technology library,"[232] numerous challenges must be overcome.[233] Among these, the language barrier is perceived as an increasing hindrance to accessing knowledge produced in the 'local' languages. While more systematic data on the geographical scope of patent protection for green technology would still be necessary,[234] a substantial degree of general patenting activities occurs in China, Japan and Korea. Gurry points out that the Western world may be underestimating this ongoing shift of innovation activity towards Asia and the increasing amount of patent and technology information available only in the corresponding local languages.[235]

Citing the need for technology databases supporting the resolution of public policy issues such as climate change, WIPO envisages as one long-term option "a comprehensive platform of patent and other proprietary information … through an open innovation model … that would accelerate product development in … climate change" via partnership with interested parties.[236] Another type may be a Wikipedia-like open knowledge-sharing database for off-patent technologies or traditional knowledge in the public domain relevant to climate change adaptation and mitigation.

(3) Licensing Best Practices

As a further contribution to patent information policy, many ponder the concept of a collection of data on green technology licensing best practices. Publicly available information on IP cooperation such as licensing, patent pools and cross-licensing tends to be in short supply. This is in part because no uniform reporting requirements are imposed by environmental or IP authorities, and such transactions are typically confidential.[237] One proposed solution is "an escrow service, provided by a trusted third party, through which private sector data are pooled and shared on an anonymous basis on the open market to set bench marks."[238]

An experimental example, though not necessarily focused on green technology, of a licensing collection is the Patent Licensing Database managed by the National Center for Industrial Property Information and Training (INPIT) in Japan.[239] Ac-

232 *Supra* note 4.
233 *See generally* WIPO Standing Committee on the Law of Patents 14th Session, Technical Solutions to Improve Access to, and Dissemination of, Patent Information, Jan. 25-29, 2010, WIPO Doc. SCP/14/3 (Dec. 18, 2009).
234 WTO, Trade and Climate Change: WTO-UNEP Report 44 (2009).
235 *Supra* note 4.
236 *Supra* note 174.
237 *Supra* note 24.
238 *Id.*
239 INPIT, *Patent Licensing Database*, *at* http://www.ryutu.inpit.go.jp/en/db/index.html (last visited Aug. 13, 2010).

cording to its explanation, this is an open system where interested potential licensors can register their technology, provided they hold Japanese patents or patent applications for such technology.[240] For each registration, information regarding technical content, technical experience of the patentee and supply conditions is available, with an option to communicate directly with the potential licensor by email.[241] The supply conditions contain detailed licensing terms such as preferred payment options or the availability of technical assistance and consulting.[242]

240 *Id.*
241 *Id.*
242 *Id.*

Figure 1: Green Technology Policies of Selected Major Patent Offices (Hee-Eun Kim, September 2010)

	Fast-tracking generally (including PPH and IP5)	**Fast-tracking for green technology inventions**	**Green patent mapping or landscaping**	**Green patent database**	**Other notable services for green technology**	**Backlog:** number of pending applications* (in 2007)	**Reported average pendency**** (in 2007 except indicated otherwise)
EPO	Y (the PACE program)	N	Y (jointly with OECD on clean energy)	New tagging scheme (Y02)	N/A	550,079	23 – 45 months
DPMA	Y (accelerated processing available on request)	N	Y (included in annual reports in 2008 and 2009 on selected fields *e.g.*, renewable energy)	N	Conference on green technology and the role of the patent system (July 2010)	257,913	For 63.5% of applications with examination request, first office action is issued within 10 months (in 2009)
IP Australia	Y (expedited examination)	Y (expedited examination)	N	N	N	72,664	Approx. 50 months estimated as period between priority and publication dates (in 2008)
JPO	Y	Y	Y (included in annual technology trend research)	N (but JIPA proposal)	N (but JIPA proposal)	888,198	25 – 32 months
KIPO	Y	Y	Y (on product designs)	N/A	IP management consulting services for SMEs	445,944	10 – 15 months

	Fast-tracking generally (including PPH and IP5)	Fast-tracking for green technology inventions	Green patent mapping or landscaping	Green patent database	Other notable services for green technology	Backlog: number of pending applications* (in 2007)	Reported average pendency** (in 2007 except indicated otherwise)
SIPO	Y	Y (eligible under the general fast-tracking procedure)	N	N	Financial support available from local or provincial offices	60,000 (estimate)	Total pendency 26 months
UKIPO	Y	Y (the Green Channel initiative)	Y (on energy from waste, recycling and separation technologies)	Y	N/A	46,138	Approx. 36 months estimated as period between priority and publication dates (in 2008)
USPTO	Y (examination support documents required)	Y (Green Technology Pilot Program)	Planned	Planned	Funding research on green technology innovation and diffusion	1,178,090	26 – 32 months (in 2008)
WIPO	Y (*e.g.*, the Trilateral PCT-PPH)	N (concerning PCT)	Y (on alternative energy technology)	PATENTSCOPE® Technology Focus: Alternative Energy	Capacity-building, conference on climate change and IP (2011), dispute resolution services, etc.	N/A	N/A

Compilation from various sources including publicly available reports from patent offices, WIPO Statistics Database and London Economics (2010), and author correspondence with some patent offices

*A pending application is defined as an application for which the patent office has not made a decision on whether or not to grant patent rights.

** Pendency varies significantly across patent offices due to the differences in systems, procedures or capacity. Where a range is given, it indicates the average pendency to first office action (first action pendency) and the pendency to patent grant (total pendency).