

## Propagating Green Technology: A Japan Intellectual Property Association Proposal

By Naoto Kuji and Cynthia Cannady

### Introduction

This article describes a new voluntary licensing initiative for sustainable energy and environmental technologies launched by the Japan Intellectual Property Association (JIPA).<sup>1</sup> The program is called the Green Technology Package Program (GTPP). Its objective is international dissemination and implementation of sustainable energy and environmental technologies (“green technologies”).<sup>2</sup> Green technology is an umbrella term that includes, but is not limited to, solar, wind, wave, current, tidal, biofuel and biomass, waste to gas, smart grid and other IT, transport (electric vehicles, hybrid, diesel, natural gas, liquefied natural gas (LNG), hydrogen, vehicle to grid, train), geothermal, hydrogen fuel cells, new materials, thin film, construction, glass, aviation fuel and efficiency, storage (batteries), water filtration, desalination, purification, membranes, toxic remediation, carbon sequestration, and hybrid system technologies.

GTPP is in furtherance of commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and its subsequent protocols and agreements.

GTPP works as follows. Owners of IP in green technology will select and propose specific technologies that they are willing to license. The target licensees are businesses and research institutions in developing

countries, however licensees from any country will be eligible. The special value of GTPP is that licensors will offer an enabling package of both IP licenses and services, including, where appropriate, consulting and training, that will help the licensee to implement the technology in practical form.

The terms of each GTPP agreement will vary depending on the needs of the licensee and licensor. Arrangements for payment of consideration will vary: in some cases licensees will pay initial fees and/or royalties, in others, the parties will seek development assistance from governments and development banks to subsidize or guarantee project costs and licensor compensation. In some cases, projects will qualify for credits and/or assistance under the Clean Development Mechanism (CDM) of the UNFCCC.

Before providing a detailed description of GTPP and its operation (section 5), it is important to place the program in the context of climate change facts (section 1), the global response to climate change (section 2), relevant international legal commitments (section 3), and the opportunities and challenges presented by technology transfer (section 4).

### 1. Climate Change Facts

There is scientific consensus that the Earth’s ecosystem and climate are changing, that these changes are anthropogenic,<sup>3</sup> and that the effects of climate change will be dangerous for humans and other earth residents.<sup>4</sup> Respected mainstream scientists predict that these effects will include:

- Temperature increases from 1.1 to 6.4 °C (2.0-11.5 °F) during the 21st century;
- Melt down of polar and glacier ice with some projections showing that late-summer sea ice

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1. GTPP was published by JIPA as a position paper on March 15, 2010. See: <http://www.jipa.or.jp/english/index.html>.

2. In this article, we use the term “green technology” as a shorthand for sustainable energy technologies, environmental technologies, clean technologies, and environmentally sound technologies (as that term is used in the UNFCCC, see text at note below) although these terms have distinct meanings and connotations. Energy technologies are different than environmental technologies in some cases, for example: waste remediation is an environmental technology but not necessarily a sustainable energy technology. Waste to gas can be both an environmental technology (because it disposes of landfill) and a new energy technology (because it generates heat, syngas and electricity). Desalination technology is environmental technology because it offers clean water, but is not necessarily clean energy technology unless it is accomplished in an energy efficient manner. Smart grid and other information technologies are sustainable energy technologies, but are not necessarily environmental technologies, and so on.

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3. Human activity is largely responsible for climate change, with the chances that non-human activity is causing climate change estimated at less than 5 percent. “It is well established through formal attribution studies that the global warming of the past 50 years is due primarily to human-induced increases in heat-trapping gases.” Karl and Meehl, *Weather and Climate Extremes in a Changing Climate, Findings and Summary of the U.S. Climate Change Science Program Synthesis and Assessment Report 3.3*.

4. *Id.*

will disappear almost entirely by the late 21st century;

- Sea level rise resulting in flooding of coastal cities;<sup>6</sup>
- Disappearance of coral reefs and reef sea life by 2040-50 because of ocean acidification from carbon dioxide entering ocean water;<sup>7</sup>
- Intense heat waves that will make life unpleasant and unhealthy in many currently populated areas;
- Heavy rain and snow;
- Intensification of the power of cyclones and hurricanes.<sup>8</sup>

These dangers, combined with growing pollution and toxicity, increasing population, water scarcity, and economic changes paint a dismal picture of the future. Many of us are inured to predictions of doom and gloom, but are awakened by the stunning news that these changes will occur, not in the distant future, but during our lifetimes and those of our children and grandchildren. We also know that it is still possible, by our conduct, to avoid catastrophic climate change and mitigate the effects of inevitable climate change.<sup>9</sup>

## 2. The Global Response to Climate Change

At the same time that climate change threatens us,

5. "Safeguarding our Oceans in a Warming World," Natural Resources Defense Council, February 2009.

6. "Scientists predict that by the time atmospheric CO<sub>2</sub> reaches 560 parts per million, a level which could happen by mid-century; we are currently nearing 400 ppm; coral reefs growth will slow and even begin to dissolve." Natural Resources Defense Council fact sheet on Ocean Acidification, 2009. [www.nrdc.org/acidtest](http://www.nrdc.org/acidtest).

7. IPCC Fourth Assessment Report: Climate Change 2007: Working Group I: The Physical Science Basis. See: [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/spmsspmp-projections-of.html](http://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmsspmp-projections-of.html).

8. "There is still time to avoid the worst impacts of climate change, if we take strong action now." The seminal and comprehensive work on mitigation is the report by Sir Nicholas Stern to the UK government, "The Stern Review: The Economics of Climate Change" (2008). See: [http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/stern\\_review\\_report.htm](http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/stern_review_report.htm).

9. The term "emerging economy" has recently entered widespread usage to refer to Brazil, India, China as well as Abu Dhabi, Indonesia, Malaysia, Mexico, Nigeria, Qatar and other nations that are experiencing strong economic growth. Throughout this paper, for simplicity, we will usually refer to "developing countries," which refers to the countries and other parties referred to as the "the developed country Parties and other developed Parties included in Annex II" in the UNFCCC.

diverse nations, economies and cultures are being brought closer together. Globalization and technology are the twin forces that bring disparate cultures together in a world where citizens of Peru can speak to citizens of Japan by cell phone, and Singaporeans can videoconference with Abu Dhabi. Emerging economies like Brazil, India, China, Turkey, and Malaysia are on the rise and are leveling the global technology playing field. Developing country universities and research institutions are entering international IP markets and linking their technology transfer offices with international counterparts.<sup>10</sup> Abu Dhabi and Saudi Arabia are trading and developing new energy and water technologies with Germany and Australia. Today, the world is flat.<sup>11</sup> However, by the mid 21st century the world will be, in another memorable Thomas Friedman phrase, "hot, flat and crowded."<sup>12</sup> Global responses to climate change and its dangers are taking many forms and are increasingly urgent.

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10. For example, the University of the West Indies has filed multiple patent applications in the United States for inventions from endogenous research with legal support from a United States patent law firm, Wilmer, Hale. Brazil's national technology transfer organization, which recently celebrated its 4th anniversary, represents more than 20 Brazilian universities and links to European and US technology transfer organizations.

11. Friedman, Thomas, *The World is Flat*, Farrar Strauss, 2007, Friedman's thesis in this groundbreaking work is that there has been a fundamental transformation brought about by communication technology, among other causes, that results in new types of competition, faster trade and a more level playing field among economic actors.

12. Friedman, Thomas, *Hot, Flat and Crowded*, MacMillan (2008).

13. The UNFCCC is a treaty that was introduced at the Earth Summit held in Rio de Janeiro in 1992 as a non-binding statement of commitment, entered into force in 1994, and that is implemented by binding protocols, particularly the Kyoto Protocol (1997). The parties to the UNFCCC have met at successive Conferences of the Parties ("COPs") the most recent of which was held in December 2009 in Copenhagen Denmark (COP 15), which did not produce a protocol, but rather an accord of some of the parties outside of the formal processes of the COP. The next COP16 will be in Cancun, Mexico from November 29 to December 10, 2010.

The United Nations Framework Convention on Climate Change (UNFCCC)<sup>13</sup> is an international treaty that came into force in 1992 and now has 192 member states.<sup>14</sup> It contains binding provisions (“commitments”) but also serves as an umbrella (“framework”) for future protocols and agreements.<sup>15</sup> Its stated objective is “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”<sup>16</sup>

The UNFCCC attacks climate change on multiple fronts:

- Expert study, analysis, and measurement;
- National policies to restrict carbon emissions;
- International “mechanisms” to reduce carbon emissions;
- Forest conservation;
- Measures to mitigate climate change effects;
- Measures to help member states, particularly developing country member states, adapt to climate change; and
- Development and dissemination of “environmentally sound technologies” (EST’s).<sup>17</sup>

Technology development and dissemination is “central to mitigating climate change and to increase resilience to climate change impacts.”<sup>18</sup> Recycling, changing habits of consumption, and protecting and growing forests, are important, but will not be sufficient to stabilize greenhouse gases. Carbon emission reduction necessarily means reducing use of fossil fuels and relying on green energy technologies as substitutes for fossil fuel. Widespread use of green technology is also necessary for toxic remediation, water purification, landfill/waste clean up and other environmental priorities.

The UNFCCC recognizes that climate change is not a problem of the developed countries only. Developing countries, especially the emerging economies, are

the locus of contemporary economic growth,<sup>19</sup> and so must be included in any serious and effective climate change battle plan. Developing countries will be included in the solution to the climate change problem in two ways: by agreeing to limit carbon emissions, and by becoming active participants in technological problem solving. International technology collaboration—including south-south collaboration—is critical to the success of the UNFCCC’s objectives:

Technology cooperation between developed and developing countries, and increasingly *between developing countries*, will be needed on an *unprecedented scale* (emphasis supplied).<sup>20</sup>

The word “unprecedented” indicates that the level of international technology collaboration must be quantitatively and qualitatively greater than it has ever been before. Practical initiatives will be necessary in order to increase the flow of green technology trade and collaboration. As will be explained further in this article, GTPP recognizes that voluntary IP licensing is a proven and effective means to stimulate international collaboration and disseminate technology.

### 3. Relevant International Legal Commitments Regarding Climate Change

Article 4 of the UNFCCC sets forth a series of binding “commitments” including a commitment to adopt national policies and measures to limit greenhouse gas emissions. Article 4.5 sets forth a technology transfer obligation, a commitment for developed country parties to:

[T]ake all practicable steps to promote, facilitate, and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other parties, *particularly developing country Parties*, to enable them to implement the provisions of the Convention. In this process, the developed country Parties *shall* support the development and enhancement of *endogenous capacities and technologies* of developing country Parties. (emphasis supplied)

In other words, for the developed country member states of the UNFCCC, technology transfer<sup>21</sup> (or “TOT”) of green technologies to developing countries is a legal commitment. Supporting developing countries in growing endogenous capacity in green

14. Although the United States did not adopt the Kyoto Protocol to the UNFCCC, it is an active member of the Convention.

15. United Nations Framework Convention on Climate Change, Article 2, FCCC/INFORMAL/84, GE.05-6222-(E) 200705 (1992).

16. Note that we use the term environmentally sound technology as synonymous with green technology, see note 3 above.

17. UNFCCC Fact Sheet: “Why Technology is Important,” [http://UNFCCC.int/press/fact\\_sheets/items/4989.php](http://UNFCCC.int/press/fact_sheets/items/4989.php).

18. See eg. <http://industry.bnet.com/financial-services/10003669/emerging-economies-to-lead-global-economic-growth/>.

19. [http://UNFCCC.int/press/fact\\_sheets/items/4989.php](http://UNFCCC.int/press/fact_sheets/items/4989.php)

20. The UNFCCC defines transfer of technology (TOT) generally, as “a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change among different stakeholders.”

21. The United States signed the Kyoto Protocol in 2005 but has not ratified it.

technologies is also a legal commitment.

The Kyoto Protocol to the UNFCCC, which was adopted in 1997 and came into force in 2005, provides more specific rules governing regulation of greenhouse gas emissions by signatories.<sup>22</sup> Article 3 of the Kyoto Protocol imposes binding carbon emissions limits for 37 industrialized nations and the European Union (states listed in Annex I to the Protocol and therefore referred to as the “Annex I” states), and thereby instituted trading in carbon credits to offset these limits.

Article 12 of the Protocol introduced the Clean Development Mechanism (CDM), a program to incent the Annex I countries to undertake projects that have the effect of reducing emissions in “non-Annex I” states (countries not listed in Annex 1, including primarily developing countries, but also wealthy emerging economies like Brazil, China, South Korea, Malaysia, Qatar and the United Arab Emirates). Such “clean developments,” if approved by the developing country’s Designated National Authorities (DNA), and then the CDM Executive Board, give rise to “Certified Emission Reduction” (CER) credits.<sup>23</sup> The industrialized country party can use the CERs in trade (selling credits to another company or a broker) or to offset its own carbon emissions in its home industrialized country.<sup>24</sup>

The Kyoto Protocol, like its mother treaty, the UNFCCC, emphasizes the roles of technology and developing countries in responding to climate change. CDM is supposed to result in technology transfer to developing countries. “Although the CDM does not have an explicit technology transfer mandate and is not identified as a means of fulfilling the technology transfer objectives of the Protocol, it may contribute to technology transfer by financing emission reduction projects that use technologies currently not

available in the host countries.”<sup>25</sup> Operational since the beginning of 2006, the mechanism has already registered more than 1,000 projects and is anticipated to produce CERs amounting to more than 2.7 billion tons of CO<sub>2</sub> equivalent in the first commitment period of the Kyoto Protocol, 2008–2012.<sup>26</sup>

What is interesting about the Kyoto Protocol, from the perspective of IP and licensing professionals, is that TOT is not defined. It includes imports of equipment and informal knowledge transfers; in fact about 1/3 of projects that claim technology transfer involve only equipment imports.<sup>27</sup> In the examples provided on the CDM Web site, there is no explicit reference to an IP license as an element of any technology transfer to developing countries, although some equipment sales agreements may also have terms that effectively create know-how licenses.

The legal obligation of developed countries to transfer technology to developing countries did not begin with the UNFCCC or the Kyoto Protocol. The international treaty known as TRIPs (Agreement on Trade Related Aspects of Intellectual Property) was negotiated as part of the bargain between developed and developing countries; the *quid pro quo* for adherence to developed country intellectual property norms and laws was the promise that developed countries would transfer technology to developing countries and less developed countries (LDCs).<sup>28</sup> Under TRIPs, technology transfer to developing countries is supposed to occur as a result of enhanced trade relations and IP protection. Technology transfer to LDCs is explicitly provided for in Art. 66.2 of the TRIPs agreement, which requires developed countries to create incentives for private parties to transfer technology to developing countries.

Post-TRIPs discussions during the first decade of the 21st century have focused on TOT related to pharmaceutical inventions and access to medicines. The TOT debate continues and now includes a new domain, ESTs, in the context of UNFCCC and international climate change negotiations. At the Copenhagen COP15, developing countries maintained their position that TOT of green technologies has not worked well, that developed countries must transfer

22. Each CER is supposed to be equivalent to one tonne of CO<sub>2</sub>. The metrics and methodology for measuring such equivalence and also for certifying the effect of a clean development project are arguably subjective, subject to manipulation, and are therefore the topic of continuing discussion.

23. An example of a CDM project is Ormat’s Amatitlan Geothermal Project in Guatemala which was expected to offset emissions of approximately 83,000 tons of CO<sub>2</sub> per year. With Amatitlan registered under the CDM, the project will be eligible to receive certified emission reduction credits, each equivalent to one ton of carbon dioxide, which can be traded or sold. The project has a long-term contract to sell all of its emission reduction credits to a European buyer.

24. Seres, Stephen, “Analysis of Technology Transfer in CDM Projects,” November 2009. <http://www.sciencedirect.com/science/journal/03014215>.

25. See: <http://cdm.unfccc.int/about/index.html>.

26. Seres, p. 10.

27. Less developed countries or LDCs are a special United Nations category that refers to the poorest of developing countries. TRIPs adopted the LDC term.

28. In addition to the UNFCCC and the Kyoto Protocol, numerous publications and documents under the Conference of the Parties (COP) process have reiterated the role of technology collaboration and developing nations.

green technologies to developing countries, and that governments and society must provide financial support to fund such transfers. The question of how to promote green technology transfer has now become an important issue in the context of negotiations in Conferences of the Parties of the UNFCCC (COP).

As in the TRIPs negotiations, developing countries say that technology transfer is a *quid pro quo* for adherence to international standards; in TRIPs the standards were IP laws, while in UNFCCC and its protocols, the standards are carbon emissions limits. The parallels are striking: in both TRIPs and UNFCCC, developing countries see international standards and restrictions as limiting their capacity for economic growth while not providing concrete benefits. In both cases, developed countries argue that accepting limitations will lead to measurable benefits from technology transfer that outweigh the limitations.

The global response to the challenge of climate change recognizes the importance of international collaboration, technology development, and developing countries as markets for, and generators of, new technologies.<sup>29</sup> At the same time, practical accomplishment of accelerated technology transfer and diffusion requires practical mechanisms that work. Voluntary licensing of IP is a practical and effective way to disseminate green technologies and promote international collaboration against the dangers of climate change. Further, constructive initiatives by developed country parties that demonstrate practical benefits from green technology transfer—based on voluntary licensing—are essential to the success of the UNFCCC.

#### 4. Opportunities and Challenges in Green Technology Transfer

The world community has responded energetically to the need for climate change activism, proposing and implementing various creative initiatives. Currently, we can name the following initiatives, designed to help parties in selecting patented technologies owned by companies in Japan and other developed countries and that are available for licensing:

- the Eco-Patent Commons led by “World Business Council for Sustainable Development (WBCSD)”;
- Japanese State-of-the-art Alliance for Smart Energy Products & Technologies 2009-2010 by “Japanese Business Alliance for Smart Energy Worldwide (JASE-W)”;

- The United Kingdom Green Patent Database (a recent initiative consisting of publishing patents that have been processed and issued under the UK’s fast track “Green Channel.”<sup>30</sup>)

However, there seems to be no initiative that clearly shows how to transfer green technologies to developing country partners, as a practical matter. In case of the Eco-Patent Commons and the Patent Licensing Database referred above, only patents are listed to view as the subjects of licenses. But implementing patented technologies requires a certain level of technological capability and infrastructure and therefore a limited number of developing country parties can implement the licensed technology on their own. Thus, it seems difficult to use the patent lists themselves as tools for facilitating the subject technologies in developing countries. Also, for the other initiatives referred above, it may be presumed that the environmental technologies will be provided by means of supplying products and services using such technologies and it can hardly be said that these initiatives function as tools for facilitating technology transfer in the sense of licensing of intellectual properties.

Despite the logic of green technology transfer and voluntary licensing, a number of challenges prevent these effective tools from becoming as widespread as they should be, both in developed countries and in relations between developing and developed countries.

First, the negotiation process itself presents challenges. IP licensing tends to be handled based on the individual judgment of each IP owner. Consequently, in case a developing country party desires a license to IP in a green technology, a license agreement(s) must be entered into between the owner/licensor and the prospective licensee. In such licensing negotiations, there are challenges related to the difficulty of contract negotiation itself, concerns about the licensee’s capability to pay license fees, and the certainty of fulfillment of contract obligations. In some cases, licensors fear that intellectual property infringement or lack of control over trade secrets will put their technology investment at risk.

Some IP owners are hesitant to consider open licensing of technologies they have invested in. Some companies in developed countries have been slow to accept licensing out of proprietary technologies

29. <http://www.ipo.gov.uk/about/press/press-release/press-release-2010/press-release-20100604.htm>.

30. See Cannady, Cynthia (2009). Access to Climate Change Technology by Developing Countries: A Practical Strategy, ICTSD’s Programme on IPRs and Sustainable Development, Issue Paper No. 25, International Centre for Trade and Sustainable Development, Geneva, Switzerland.

as well as licensing in of technologies not invented in the company itself (“open innovation”) in general, not only in the context of proposed transactions with developing country parties. A closed innovation model has prevented many companies from licensing out technologies, despite the success that some strategic IP owners have enjoyed because of their willingness to license out IP. Licensing-out can bring many benefits to companies including expanded market access, technology collaboration and synergy, establishment of a de-facto standard or “platform,” increased profits from royalties, and many other benefits. The benefits of a licensing strategy must always be balanced against the risk of “cannibalism” (licensing to a competitor who can sell products less expensively), loss of technology control (facilitating infringement or legal imitation), and loss of technology leadership (sacrificing a valuable patent monopoly and its competitive advantages without maintaining R&D superiority). Still many companies strategically assess the pros and cons of licensing and arrive at a sophisticated approach that permits sharing of IP while retaining competitive advantages and sound profits.

There are also challenges related to the licensee’s capacity to absorb the technology. In order that licensee may implement the licensed technologies, certain technological capabilities are required. The conditions for serious technology absorption include technical education, skilled workforce, and infrastructure. Another variable is the type of technology to be transferred; not all technology requires large numbers of highly expert personnel and advanced infrastructure.

In many cases, developed country IP owners in small to medium sized enterprises (SMEs) may not know how to identify and contact potential developing country partners that have the requisite technology capacity because the developed country company’s usual business channels and networks do not include developing country parties. In other cases, the bottleneck is management attitude: an insularity that dismisses the economic potential in emerging markets.

Finally and significantly, there are challenges related to the developing countries’ acceptance of IP and licensing as business practices. Some developing countries claim that the ownership of the intellectual property rights related to green technologies obstructs dissemination of these technologies. Some further argue that the intellectual properties should be placed in the public domain in order to “free up dissemination,” not realizing that dedication of technology to the public domain destroys economic

incentives to invest in and commercialize technology.

With UNFCCC, as with TRIPs, intellectual property is sometimes treated as the villain in the story, while many of the discussants have limited practical knowledge of how technology transfer occurs in IP licenses.

For all of these reasons, there are a number of challenges facing voluntary licensing of green technologies both in the developed-developing country context and in the developed-developed country context. Emerging economies that were once considered “developing,” but have now gained economic power, are changing the economic landscape. Parties in all nations have missed and continue to miss practical opportunities to use international voluntary licensing of green technologies as a tool for “win-win” cooperation.<sup>31</sup> The emphasis of the UNFCCC on green technology transfer and outreach to developing countries is an invitation for the international community to act.

To remedy this situation, JIPA studied possibilities for establishing a new framework which enables the private sector to promote green technology transfer to developing countries, that is, a new framework which may (i) secure both the developed countries and the developing countries in each role of providing and receiving green technologies, and (ii) facilitate various technology transfer transactions. GTPP was the result of the JIPA study and is described in detail below.

## 5. Detailed Description of the GTPP

GTPP is a program to promote voluntary licensing of green technologies by IP owners and related development collaboration projects. JIPA’s objective is to encourage broad dissemination and implementation of green technologies and to make sure that IP is not a barrier but rather a facilitator of global green technology collaboration. GTPP will have several components.

**Green Technology Packages** will include, to the extent agreeable by the licensor, licenses to the necessary patents, patent applications, copyright works (*e.g.* documentation and software), and trade secrets. The package may also include non-IP that will be helpful to the licensee in commercializing the technology, including services, public domain instructions and documentation, materials, and training for licensee personnel, in accordance with the licensee’s

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31. Henry Etzkowitz in his pioneering work on innovation has argued that: “The university is the generative principle in knowledge based societies...,” *The Triple Helix: University-Industry-Government Innovation in Action*, 2008, Routledge Press.

capability. As mentioned above, a patent license alone may not be sufficient for the licensee to implement a technology in a practical form. GTPP will facilitate utilization and dissemination of green technology in developing countries by licensing not merely patents but also relevant know how as well as by providing technical assistance, consulting services, and training oriented to develop a successful business case, parts and materials not easily obtainable and supports in building the infrastructure for business operations.

GTPP is *not* an initiative to encourage patent owners to seek pure patent licenses and royalties based on portfolio strength and opportunity for royalty income.

**Licensors.** Licensors will include any companies that own IP related to green technologies and are willing to offer IP licenses. The initial licensors are expected to be JIPA member companies, but the program is not restricted to JIPA and will include licensors from many countries.

**Licensees.** Licensees will include businesses or research institutions that have the capacity to implement or further develop the licensed technology by manufacturing, reproducing, modifying, improving, selling, and/or distributing it. The target licensees for GTPP are businesses and research institutions in developing countries and emerging economies, but developed countries parties are also welcome to participate.

**Universities and Research Institutions.** GTPP parties may include a research institution such as a university with engineering or other scientific faculties, possibly in three-party development collaboration agreements including the licensor, a private business licensee and a university licensee. In many cases, universities in developing countries are necessary parties if the objective is to fully engage the participation of scientists and technologists in developing countries in evolving green technologies.

**Small to Medium Sized Enterprises.** GTPP may offer important benefits for small and medium sized business enterprises (SMEs). Even if they have technologies available for transferring to the developing countries, they may have difficulty transferring the technologies due to their limited experience in effective business negotiations with emerging economy or developing countries partners. GTPP can be of great help to SMEs in expanding to international markets.

**Less Developed Countries.** GTPP can work for licensees and collaborations with Less Developed Countries (LDCs). As each GTPP agreement will be different, it is not possible to generalize and conclude that LDCs lack sufficient infrastructure or technology

capacity. In fact, in many cases, LDCs with strong government commitment and traditional research universities may be excellent candidates for partnerships to adapt, localize, manufacture or distribute green technologies.

**Development collaborations.** The licensor may also propose a development collaboration agreement whereby the parties will work together on a project basis over a period of 1 or 2 years to implement, complete, improve, or localize the licensed technology. Such a project may qualify for CDM treatment. The parties may also agree to conduct pilot and evaluation projects in order to test a longer-term project and assess feasibility.

**License grants** will be flexible and depend on what the licensor is willing to permit and what the licensee needs in order to implement the technology in a product or project. One license may be limited to manufacturing of a component in a green technology product (*e.g.* an automotive part or an element of a solar panel). Another license may be broader and be part of a joint research and development collaboration to improve a technology (*e.g.* an initiative to improve a thin film by improving its function in humid environments).

**Principles of Voluntary Participation and Mutual Benefit.** GTPP is a voluntary program. There is no convention or accord that participants must sign. The terms and conditions of any GTPP transaction will be determined by the parties and may be confidential to the parties. Suggested term sheets and form contracts may be proposed and offered as useful tools, but none will be mandated. Licensors engaging with developing country licensees will endeavor to keep financial consideration appropriate to the licensee and its market but will not be committed to any particular financial scheme or limitations. Overly structuring transactions in the abstract and out of the context of the parties' business objectives could have the perverse effect of reducing the attractiveness of the program.

Licensors will not be required to license packages to all interested parties. Licensors will use their discretion to select licensees strategically based on a number of criteria including but not limited to geographic location, technological capacity, licensee infrastructure, licensee physical and intellectual property assets, government commitment, market opportunities, etc. Mutual benefit is the basis for collaboration under GTPP.

**Licensor benefits** include: new or expanded market for the licensor's technology, initial payments and royalties, publicity and marketing, technology enhance-

ment from licensee partner, technology synergies from R&D and technologies offered by the licensee, access to project funding, guarantees and insurance from international organizations, governments, and development banks.

**Licensee benefits** include: access to new green technologies, potential for start up company or research collaboration, potential project financing, classical technology transfer permitting development of new business, training in business, legal and technology skills.

**Financial terms and conditions** will be determined by the parties in negotiation. Initial license fees or lump sum payments may be charged by the licensor. Royalties are a means to defer payment until the project generates revenue and are therefore a good tool for licensees and licensors alike. Development banks and country development assistance, as well as CDM funding, are potential sources of funding. The developing countries' contribution to R&D would necessarily be taken into account in determining what consideration should be due to the licensor. In some cases, cross licensing may occur either in the initial GTPP agreement, or in the context of a development collaboration agreement where both parties license each other the rights to exploit foreground technology.

**GTPP Database.** In order for the licensee to understand benefits of the use of the technology, GTPP will present a searchable database concerning available green technologies including: features of each technology, granted patents and pending patent applications, the countries where patent protection exists or is sought, other intellectual property that affects the technology (*e.g.* copyright works such as software and documentation, design patents, trademarks), comparisons with other technologies, the terms and conditions of provision of the technologies and examples of model agreements. The licensor may, at its own discretion, determine the scope of its information provided on a database and may require a separate confidential agreement for the provision of certain information. JIPA is currently in collaboration with the World Intellectual Property Organization (WIPO) concerning the development and operation of the GTPP database.

**Agreements where the relevant patents are not protected in the developing country partner.** There may be cases where a potential licensor is contacted by a potential partner resident in a country where the patents in issue have not been filed and are thus in the public domain. The purpose of GTPP is not to cause such a partner to accept contractual limitations

that are greater than those imposed by law. The parties may however negotiate a license agreement for non-patent IP (*e.g.* trade secrets, works of authorship like technical documentation).

**Pro Bono or reduced fee services** will be solicited from law firms to assist developing country parties in negotiating contracts where local attorneys do not have expertise in IP contract negotiations. WIPO currently offers training in licensing negotiation, and these sessions may assist developing country parties and their legal representatives in determining their negotiating positions and seeking a mutually beneficial terms and conditions. Rather than offer a "cookie-cutter agreement," a one size fits all form, GTPP licensors may publish a proposed term sheet. Rather than rely on form agreements, the concept is that developing country parties should be empowered to evaluate proposed terms and conditions and negotiate on their behalf.

**Role of Licensing and Technology Transfer Professionals.** GTPP transactions will need skilled professionals to develop deal points, negotiate and draft agreements on behalf of both parties. It is expected that professional organizations like the Licensing Executives Society International (LESI), the Association of University Technology Managers (AUTM), the Fórum Nacional de Gestores de Inovação e Transferência de Tecnologia (FORTEC), and other national and international organizations will lend their assistance to facilitating GTPP transactions.

**Partnership Formation and Matching Needs.** It often is difficult for developing countries to investigate possibilities of introduction of the environmental technologies without expertise information concerning licenses, such as details of the technology, information on the technology owner, differences between the licensed technology and other similar technologies, availability and effectiveness of the technology in the Licensee's country, the terms and the conditions of the license and availability of related technical assistances. However, the owners of the technologies in the developed countries normally manage each owner's technology independently. Therefore, it may be said that the information needed for green technology projects is often hidden, even in our contemporary information society. In order for the developing countries to find the right information, the framework in which a neutral third party selects and presents information on available and useful environmental technologies owned by the developed countries to the developing countries may be valid and functional. WIPO has agreed to support GTPP by developing and maintaining an international

database to list GTPP offerings and providing a global forum for networking and discussion.

**GTPP Advisory Service.** The GTPP may offer a third party advisory service to act as an independent advisor between licensors and licensees by facilitating introductions, bridging negotiations, and advising with a view to progressing negotiations for licensing or other business transactions. The advisory service would assist both licensor and licensee in:

- (i) offering of CDM credits for businesses operated under the license;
- (ii) acquisition of carbon credits by the licensor and application of any available tax deductions in return therefore;
- (iii) researching and applying for grants or loans from development banks or Official Development Assistance (ODA); and
- (iv) assisting in applying for exemption of license restrictions to governments or competent authorities of each Licensee country.

The GTPP advisory service could be offered by a subsidiary of the UNFCCC or by a United Nations agency. Alternatively, advisory services could be offered by private parties who would be compensated by one or both parties.

## Conclusion

Climate change can be slowed and its dangerous effects can be mitigated. This will require prudent and courageous governmental policies, as well as private sector development and pervasive implementation of green technologies. Slight efforts and modest improvements will likely not be sufficient. In the next decade, we must wage nothing less than a war on climate change. Developing countries and emerging economies are necessarily a part of this struggle. Global deployment of green technologies is essential to our victory, and IP licensing is a proven

and practical way to drive technologies into markets. GTPP will be one means to spread green technologies and promote international collaborations in green technology. It turns out that the licensing profession has a critical role to play in the great Climate Change War of the 21st century. ■

## Glossary of Abbreviations:

**BRIC**—Brazil, Russia, India, China

**CDM**—Clean Development Mechanism of the UNFCCC

**CER**—Certified Emission Reduction Credits

**COP**—Conference of the Parties of the UNFCCC

**EST**—Environmentally Sound Technologies, a UNFCCC term used in this article as equivalent to the term green technologies

**GTPP**—Green Technology Package Program

**IP**—Intellectual Property

**JASE-W**—Japanese Business Alliance for Smart Energy Worldwide

**JIPA**—Japan Intellectual Property Association

**INPIT**—National Center for Industrial Property Information and Training

**LDC**—Less Developed Countries

**LES**—Licensing Executives Society

**NEDO**—New Energy and Industrial Technology Development Organization

**ODA**—Official Development Assistance

**SME**—Small to medium sized enterprise

**TOT**—Transfer of Technology

**TRIPs**—Agreement on Trade Related Aspects of Intellectual Property

**UNFCCC**—United Nations Framework Convention on Climate Change

**WBSCD**—World Business Council for Sustainable Development