News from the Cleantech and Climate Change Committee
ABA Section of Science & Technology Law

SPRING 2010

Co-Chairs Message

By Susan Mac Cormac & Kenneth Markowitz

It is our pleasure to bring you the ABA Clean Technology and Climate Change Committee (CTC3) Bulletin. In this edition, we focus on the international issues involved in the development and proliferation of clean technology solutions globally. Read more

A Review of the European Union’s Criteria For the Use of Biofuels to Reduce Greenhouse Gas Emissions

By Neil R. Mitchell

There are many reasons to consider the use of biofuels. Among the most important is the net reduction of the emission of greenhouse gases. This article describes the European Union’s (“EU”) standards and methodology establishing the relative merit of various biofuels from various sources to reduce greenhouse gas (“GHG”) emissions. Read more

The Role of Intellectual Property Rights in Addressing International Climate Change

By Sherin M. Rashedi

Negotiating a framework to facilitate the transfer of renewable energy technologies from developed to developing countries is one of the most challenging tasks ever undertaken by the international community. As the world prepares for the 2012 expiration of the Kyoto Protocol, the United Nations Framework on Climate Change (UNFCCC) and international negotiations require technology transfer agreements to assist developing countries in reducing emissions of greenhouse gases and to provide them with the tools necessary for an accelerated transition to a low carbon economy. Read more

Intellectual Property Rights and Clean Technology Transfer to China

By Emily Jones

The international community looks to clean technology as a vital source for addressing and mitigating climate change. However, compromising on a policy scheme to facilitate the transfer of cleantech from developed countries to developing countries has been one of the most challenging aspects of the negotiations being conducted under the United Nations Framework Convention on climate change. Read more
CO-CHAIRS MESSAGE

It is our pleasure to bring you the ABA Clean Technology and Climate Change Committee (CTC3) Bulletin. In this edition, we focus on the international issues involved in the development and proliferation of clean technology solutions globally.

Technology transfer continues to be a central issue in international climate change negotiations, which, after mixed results in Copenhagen last December, are regaining momentum. Global deployment of clean energy and mitigation technologies is an essential component of any greenhouse gas emission reduction and adaptation strategies. We hope that you find the relevant scholarship included in this edition to be both informative and useful to your practice.

Thank you for your interest in and support of CTC3. We encourage you to become more active in the committee and take full advantage of our educational webinars and other programs. If you have any suggestions for upcoming webinar topics or would like to be a presenter, please contact us. We also encourage you to submit your Clean Tech articles for possible publication in future editions of the CTC3 Bulletin.

Sincerely,
Susan Mac Cormac & Kenneth Markowitz
A Review of the European Union’s Criteria For the Use of Biofuels to Reduce Greenhouse Gas Emissions

By Neil R. Mitchell

There are many reasons to consider the use of biofuels. Among the most important is the net reduction of the emission of greenhouse gases. This article describes the European Union’s (“EU”) standards and methodology establishing the relative merit of various biofuels from various sources to reduce greenhouse gas (“GHG”) emissions.

The EU Directive 3 of 23 April 2009 (Directive 2009/28/EC) directs member states on the promotion of the use of energy from renewable sources. It sets mandatory national targets for the overall share of energy from renewable sources in the gross final consumption of energy and for the share of energy from renewable sources in transport.

The EU has set targets requiring that by 2020 at least 20% of the gross final consumption of energy in the EU will come from renewable sources and that at least 10% of energy for transport will be from renewable sources. These percentages are based on a 2005 base date. Each member state is to have a national renewable energy master plan by June 30th, 2010. Biofuels and bioliquids 5 are an important part of renewable energy sources under the directive. The EU recognizes at the outset that biofuels from certain sources may not reduce GHG emissions or could cause other environmental problems. In particular, biofuels obtained from the following lands will not be counted towards the renewable energy goals:

- Land that has a high biodiversity value such as primary forest, areas protected by law and highly biodiverse grassland
- Land that has a high carbon stock
- Peat land

Basically, the EU is saying that the starting material for biofuels should be taken from land already devoted to agriculture or restored degraded land. Otherwise, the biofuel will not count towards the targeted goals. These limitations on the source of biofuels represent part of the sustainability criteria of the EU. (Article 17 of the Directive).

In addition, although not subject to a precise standard, the EU is concerned with the need to assess the possible impacts of biofuel production on the cost of agricultural food production and to take action, if necessary, to address shortcomings. (Preamble of the Directive, Paragraph 9).

For those biofuels that come from sources acceptable to the EU, the EU has developed formulas which at first glance appear to be complicated. However, they can be simply described in qualitative terms as follows:
Percent GHG emission saving = \( \frac{(X-Y-Z)}{X} \) x 100

Where:
X = the amount of emissions from a fossil fuel equivalent, based on energy output, to the biofuel replacement.
Y = the amount of emissions for the production of the biofuel feedstock.
Z = the emissions from the processing of the feedstock to produce the biofuel.

The EU has established two percentages for each biofuel, a “typical” savings and a “default” savings. The typical savings must be demonstrated by the member country and finally by the supplier of the fuel, otherwise the default savings is used. In each case the default savings is at or below the typical savings.

The EU has made this determination for 34 different combinations of renewable fuels and feedstocks for these fuels. It is a significant effort involving the input of economists, chemical engineers, industrial engineers and agronomists. While the accuracy of various aspects of the determinations may be subject to debate, they are as of now the official position of the EU. The following are notable examples of these determinations:

<table>
<thead>
<tr>
<th>Biofuel &amp; Production Pathway</th>
<th>Typical GHG emission saving</th>
<th>Default GHG emission saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar beet ethanol</td>
<td>61%</td>
<td>52%</td>
</tr>
<tr>
<td>Wheat ethanol (process fuel not specified)</td>
<td>32%</td>
<td>16%</td>
</tr>
<tr>
<td>Wheat ethanol (straw as process fuel)</td>
<td>69%</td>
<td>69%</td>
</tr>
<tr>
<td>Corn ethanol (natural gas as process fuel)</td>
<td>56%</td>
<td>49%</td>
</tr>
<tr>
<td>Sugar cane ethanol</td>
<td>71%</td>
<td>71%</td>
</tr>
<tr>
<td>Sunflower biodiesel</td>
<td>58%</td>
<td>51%</td>
</tr>
<tr>
<td>Soybean biodiesel</td>
<td>40%</td>
<td>31%</td>
</tr>
<tr>
<td>Waste vegetable or animal oil biodiesel</td>
<td>88%</td>
<td>83%</td>
</tr>
<tr>
<td>Biogas from municipal</td>
<td>80%</td>
<td>73%</td>
</tr>
</tbody>
</table>
waste as compressed natural gas

Waste wood ethanol 80% 74%

With these numbers in mind the EU put additional requirements on biofuels to be counted for GHG reductions. For the moment only those biofuels that show at least a 35% reduction will be counted. In 2017 that figure raises to 50% and starting in 2018 it increases to 60%.

There are some general and specific points to be gleaned from the above.

First, biofuel made from waste products such as municipal waste, used cooking oil or waste wood have a natural advantage. The emissions connected with the production of the raw material are not counted as the material was used for another purpose. Y in the above equation drops to zero.

Second, raw materials that start with sugar such as sugar beets or sugar cane have a natural advantage over those which start with starch or cellulose, as it is easier to make alcohol out of sugar than starch or cellulose, and thus Z in the above equation is likely to be much lower for sugar-based raw materials.

Third, each country must make its own evaluation as to which, if any, of the biofuels it can make to contribute to GHG emissions reduction.

Fourth, if Brazil can demonstrate that it can produce sufficient ethanol from sugar cane for its own needs and still export some without destroying additional rain forest, ethanol from sugar cane would be a logical long-term market opportunity for Brazil (absent protective tariffs).

Fifth, and perhaps most important for U.S. lawyers, under the EU standards two of the main biofuels produced in the U.S., ethanol from corn and biodiesel from soybeans, are not efficient ways to lower GHG emissions. Soybean biodiesel would fail under current default standards and corn ethanol using natural gas as a process fuel would fail under the 2018 standards. In any case there are many more efficient biofuels according to the EU. One can argue that the two main purposes for current U.S. biofuel production are to move toward energy self sufficiency and, because biofuels are oxygenates, to reduce ground level pollution from vehicles. Perhaps noone considered the reduction of GHG emissions as a purpose. Still one wonders what role politics, rather than science, has played in our choices.

---

Neil Mitchell holds a chemical engineering degree from the University of Utah and a law degree from the University of Michigan. He was Dow Corning Corporation's first European house counsel in Brussels, Belgium; vice-president law for Velsicol Chemical Corporation during the 1970's; in private practice in Houston for 20 years and, most recently, was a visiting professor at Belgrade
University in Serbia teaching comparative environmental law. He is semi-retired and lives in Salt Lake City, Utah and Montreal, Quebec. He can be reached at neil.mitchell@live.com.”

2 It is relatively easy to do legal research on the actions of the EU. The website www.eur-lex.europa.eu is maintained by the EU and has all the actions taken by the EU in an easy to research format.

3 The EU acts in the legislative area through two vehicles, regulations and directives. Regulations are directly applicable to the member states much like federal regulations in the United States. They are used in the EU when absolute uniformity amongst the member states is necessary. Directives are not law in a member state but require each state to pass laws in conformity to the directives. Directives give member states a little latitude in implementation taking into account the different situations of the various member states.

4 Separately, the EU has set a target to improve its energy efficiency by 20% with the same target date and base date, 2020 and 2005, respectively.

5 Under the definitions of the directive “biofuels” means fuels used for transport whereas “bioliquids” means fuels for energy purposes other than transport. Both will be referred to as “biofuels” herein.
The Role of Intellectual Property Rights in Addressing International Climate Change

By Sherin M. Rashedi

Negotiating a framework to facilitate the transfer of renewable energy technologies from developed to developing countries is one of the most challenging tasks ever undertaken by the international community. As the world prepares for the 2012 expiration of the Kyoto Protocol, the United Nations Framework on Climate Change (UNFCCC) and international negotiations require technology transfer agreements to assist developing countries in reducing emissions of greenhouse gases and to provide them with the tools necessary for an accelerated transition to a low carbon economy.

To date, the global effort to mitigate climate change has been stunted by the political and technical challenges posed. The Kyoto Protocol has been widely criticized despite its ratification by 174 countries in February 2005. These criticisms include diluted emission targets that stemmed from political motives involved in negotiations and the failure to attain a commitment by developed countries like the United States to reach reduced emission targets. Many criticisms also point to the cost-benefit structure of the Kyoto Protocol as undermining its usefulness and encouraging non-participation.

The ineffectiveness of the Kyoto Protocol was largely a result of the standoff between the developed and developing countries as to who should bear the cost of change. Developing countries demanded that the cost of their efforts to address climate change be borne by the developed countries. This sentiment largely comes from a viewpoint that developed countries caused the current need for climate change through decades of unsustainable development.

Because of the stances taken by both sides to the Kyoto Protocol, negotiations proved unsuccessful. Developed countries were seen as positioned with the key to unlock the technological resources needed to advance while developing countries were seen as struggling to achieve autonomy and establish their energy infrastructures. In order to move forward and avoid the pitfalls inherent in the Kyoto Protocol, all parties must collaborate to find a viable solution for environmentally-friendly development.

The parties to the Kyoto Protocol met in 2007 and adopted the Bali Action Plan, which scheduled a conference in Copenhagen, Denmark last December 2009. The Bali Action Plan addressed the growing need for parties to cooperate and foster development by calling for enhanced action, including an increase in transfer of technology to developing countries to promote access to clean technology.

To pave discussions in Copenhagen, countries agreed to lower emissions with the understanding that developed countries would offer assistance to them with financing and technology. Because success of post-Kyoto negotiation talks on climate change depends on whether the UNFCCC can agree on a framework for the transfer of clean...
technologies, the Bali Action Plan was a critical step towards addressing the need for a solution to climate change.

Of the transfer proposals addressed in Copenhagen last December, those which outlined a compulsory licensing structure and those which advocated strong intellectual property rights protection to inventors presented the greatest amount of contention among parties. Many developing countries like India and China want a compulsory licensing structure to facilitate the transfer of clean technology. On the other end, developed countries like the United States want strong intellectual property rights protection for inventors, arguing that such protection is required to fuel innovation and therefore create a market for environmentally sound technology.

In a compulsory licensing scheme, a government uses, produces, or sells a patented product or process without consent of the patent owner, or permits a third party to do the same. The holder usually receives a set fee already predetermined for the use of her exclusive right. Under Article 31 of the World Trade Organization’s Trade-Related Aspects of Intellectual Property Rights (TRIPS), compulsory licensing schemes are permitted in cases of “national emergencies” or “other circumstances of extreme urgency.” Thus, advocates for compulsory licensing contend that the need for climate change is an international emergency and that such a system will speed up the transfer process and reduce the cost for patented technologies to bring about climate change more rapidly.

International compulsory licensing up until now has primarily been tied to pharmaceutical patents. Arguments for compulsory licensing of clean technology mirror the Doha medicine debate, which made it easier for developing countries to obtain generic versions of patent pharmaceuticals through more liberal use of compulsory licensing. In the 2001 Doha Declaration on TRIPS and Public Health, the spread of HIV/AIDS, tuberculosis, malaria and other epidemics in Africa prompted an international agreement for a compulsory licensing scheme where countries unable to produce pharmaceuticals themselves could import pharmaceuticals made under a compulsory license.

Even though compulsory licensing has been used in the field of pharmaceutical patents, it can hypothetically apply to patents in any field. However, compulsory licensing for pharmaceutical patents is an inapt analogy to draw to the clean technology field for a few key reasons.

First, an inventor of a pharmaceutical patent enjoys a monopoly over a whole market for a particular disease, and so receives value from the use of her product or process through a compulsory license. The sheer amount of competition among the various clean technology sectors and the lack of one dominant technology makes compulsory licensing potentially less valuable. Not only is there competition within each energy sector that can drive licensing fees down, but clean technology still competes with fossil fuels as well. Because wind, solar, biofuel, nuclear, and advanced geothermal energy are all being developed simultaneously, it is unclear if and what technology will dominate the market to make a compulsory licensing scheme beneficial when applied to this field. Since it is not readily foreseeable that inventors would recoup the costs associated with development, compulsory licensing schemes lack an incentive for
developed countries to continue creating technologies in the absence of strong intellectual property protection.

It is also uncertain whether compulsory licensing is a good solution because intellectual property rights may not be a principal barrier to the transfer of technology like it was in the pharmaceuticals context. The 2001 Doha Declaration on TRIPS and Public Health was necessary to curtail the spread of worldwide epidemics because developing countries lacked the local capacity to manufacture and develop vital drugs. Without a compulsory licensing structure in place, these countries were unable to gain access to drugs that combat deadly diseases. Compared to the need for climate change, intellectual property rights do not by themselves act as a barrier to access because economic and trade barriers factor into the transfer of technology, thus making the case for a compulsory licensing structure weaker when applied to this situation.

Also, the need for financial backing plays a much larger role in climate change negotiations. As discussed in Copenhagen last year, implementation of programs to reduce carbon emissions require securing sufficient funding to institute clean technologies in developing countries. Proponents of strong intellectual property rights point to economic policies designed to provide incentives to accelerate the development of clean technologies, like through the use of tax benefits that companies may take advantage of. Such plans aim to provide corporations with incentives to deploy and adapt technology to the local needs of developing countries.

An effective proposal for climate change must be comprised of a multi-layered process that includes the actual transfer of technology know-how and trade secrets to developing countries. Moreover, training programs designed to provide countries with the ability to develop sustainably and independently must be put into place in order for the transfer of clean technology to be successful. To achieve climate change globally, developed and developing countries must work collaboratively to speed the worldwide mobilization of these technologies. In order to work, an agreement must align technology goals with market opportunities to promote innovation and accelerate dissemination of environmentally sound technology.

Governments around the world are increasingly cognizant of the need to develop policies to reduce emissions of greenhouse gases. All parties must benefit for an effective solution to the climate change problem to come to fruition. This can only be done by addressing common advantages to all parties in climate change proposal talks and to create a proposal that balances fair treatment for innovators with energy policies that stimulate global diffusion of environmentally sound technology. The outcome of such talks will go a long way toward pointing to the future of international regulation and reduction of carbon emissions. However, specifics on what mitigation commitments will be made by developing countries and what funding and technological assistance developed countries will provide towards that end remains an issue to be decided in 2010.
1 Sherin M. Rashedi is a recent graduate of Santa Clara University School of Law and an incoming first-year associate at Townsend and Townsend and Crew LLP in the fall of 2010.


3 Id.


6 Id.
**Intellectual Property Rights and Clean Technology Transfer to China**

*By Emily Jones*

The international community looks to clean technology as a vital source for addressing and mitigating climate change. However, compromising on a policy scheme to facilitate the transfer of cleantech from developed countries to developing countries has been one of the most challenging aspects of the negotiations being conducted under the United Nations Framework Convention on Climate Change.\(^1\) A large part of the ongoing debate centers on how to effectively transfer technology to developing countries while protecting intellectual property rights.\(^2\) Developing nations have argued that cleantech transfer is crucial to reducing greenhouse gas emissions without compromising their development needs.\(^3\) However, developed nations are hesitant because of concerns over infringement and piracy.

A key part of the debate centers on China, given its role as both a large, emerging market for and a major manufacturer of clean technology, as well as its checkered history with respect to intellectual property protection. This article focuses on what is arguably likely to be the type of IP protection most relevant to cleantech industries generally, and specifically within China – patent law. Achieving the proper balance of protection will have a significant effect on both incentives and disincentives for cleantech firms to trade with China.

(1) **Patent Standards**

While China applies similar basic standards for patentability as most other countries (i.e., novelty, usefulness and inventiveness), until recently it used only a very limited novelty requirement, under which patent protection could be barred only if, prior to the filing date, a public use or knowledge of an invention had occurred inside China. Public use or knowledge of the product outside China did not bar patent protection.\(^4\) This has led to the risk of “patent squatting” in China, where a person obtains a patent in China for an invention previously the subject of the original inventor’s patents or patent applications in other countries. As a result, when the original U.S. or EU patent holder wishes to obtain a patent in China, they would be barred from doing so.

However, recent changes have made Chinese patent law more favorable to foreign patent holders. More in line with the other major patent systems of the world, an absolute novelty requirement became effective in October, 2009. Now, an invention will not be patentable in China if the application is not filed prior to public disclosure inside or outside China or within the priority period (usually one year) from filing in another country under international treaty.\(^5\)

(2) **Patentable Subject Matter**
In the U.S., patentable subject matter, and some examples of relevant clean technologies, can include the following:

- **Machines, Devices, Systems**: Solar cells, windmills, fuel cells, power farms
- **Methods of Use**: Generating power, storing power, producing hydrogen, servicing equipment
- **Methods of Manufacture**: Solar cell manufacture, turbine blade manufacture
- **Compositions**: Fuel cell additives, biofuels/synfuels, biological agents
- **Software**: Smart grid algorithms, power management
- **Business Methods**: Collecting revenue, upstream/downstream marketing

China has similar patentable subject matter as the U.S. Moreover, as with the U.S., software-based inventions require careful drafting. While software per se is not patentable, protection is possible if it is part of an overall invention that solves a technical problem and produces a technical effect.

(3) **Enforcement**

The ability to effectively enforce Chinese patents has continued to be problematic. Partly due to outside pressure, in recent years, China has been working to improve enforceability. The amendments to China’s Patent Law passed in late December, 2008, which took effect on October 1, 2009, increased transparency in the judicial system, established local complaint and service centers for reporting infringement, increased statutory damages, and provided for pre-action injunctions. However, a number of issues persist, including the relatively low penalties and terms of recovery for infringement suits, overbroad defenses, and lack of a centralized patent appeals court.

(4) **Compulsory Licensing**

One of the main concerns of potential patent holders under the Chinese patent system is compulsory licensing. China, like many other developing countries, justifies the need for using compulsory licensing to get access to clean technologies on the basis that the country cannot otherwise afford them. However, the risk of compulsory licensing can undermine incentives to innovate and reduce availability of financing for key phases of development or commercialization of technologies. Current law, though, provides the Chinese government significant latitude to invoke compulsory licensing. Under the 2009 Patent Law, the government may grant a compulsory license to exploit a patent if the patent holder has not done so within three years from grant. Critics of this law say that it is impractical because many inventors may not have the means to exploit a patent in China within such a short time frame.

(5) **Planned Improvements**

There are signs that China is seeking to now more vigorously enforce patent rights. For example, new regulations and guidelines are underway to improve research and resolution of problems through relevant Beijing IP tribunals of patent affirmation cases, to properly adjust the trial jurisdiction system for IP cases, and to set up
independent IP tribunals at the Supreme People’s Courts, intermediate people’s courts with heavy IP caseloads.\textsuperscript{15}

Those who are optimistic about changes and improvements in the Chinese patent system believe they will benefit both domestic and foreign patent holders in China and cure deficiencies in several areas, including the judicial system, domestic innovation, inventors’ rights, local protection, respect for IPR, and technology transfers.\textsuperscript{16} However, others note that the idea of community property is a deeply-ingrained part of Chinese culture, and changing this mindset may take considerable time.\textsuperscript{17} Nevertheless, in 2008, 828,328 patent applications were filed, up 19.4\% from the previous year, and in 2009, 976,686 were filed, up another 17.9\%.\textsuperscript{18} Out of those applications in 2009, though, 877,611, or 89.9\%, were from applicants within China, so the applications from abroad represent a small, albeit significant, share of filings.\textsuperscript{19} In 2009, SIPO granted 581,992 patents, up 41.2\% from the previous year.\textsuperscript{20} These numbers provide evidence that confidence in the Chinese patent system is growing quickly domestically, although it remains to be seen how foreign companies will react to the changes. In any event, the large increase in number of patents granted shows that the universe of Chinese patents is growing rapidly.

\textit{(6) Future Opportunities}

International agreements can help to close the gap between U.S. and Chinese IPR standards. A successful, well-designed agreement could provide security and transparency to scientists, entrepreneurs and corporations and thus encourage the creation, financing and deployment of innovative clean technology.\textsuperscript{21} Also, establishing a framework for licensing can reduce the concerns presented by the current compulsory licensing scheme.

Furthermore, benefits may come from supporting commercial activities and joint research and development. Experience has shown that expansion of a wide variety of bilateral and multilateral programs, including joint ventures, cross-training programs, cross-licensing arrangements, multilateral R&D cooperation agreements, publicly backed patent pools and knowledge sharing platforms, and a global sharing of licensing data and best practices can improve relations among countries and lessen the risk of piracy.\textsuperscript{22}

\begin{flushleft}
\textit{Emily Jones is a third year graduating law student from Santa Clara University School of Law. She spent her second year summer interning at the U.S. Department of Commerce researching international patent law relevant to clean technology companies. She can be reached at \texttt{ehjones@scu.edu}”.}
\end{flushleft}


5 Revised Patent Law, supra note 4 at art. 22.

6 John Wechkin and Susan Betcher, ABA Cleantech & Climate Change Committee, Cleantech IP Protection in the U.S. and Canada, September 15, 2009.

7 See Revised Patent Law, supra note 4. art 5.


9 Raymond M. Gabriel, The Patent Revolution: Proposed Reforms in Chinese Intellectual Property Law, Policy, and Practice Are The Latest Step to Bolster Patent Protection in China, 9 ASIAN-PACIFIC L. & POL’Y J. 323 at 354 (2008); see also Foley and Lardner LLP, Third Amendment to PRC Patent Law, February 26, 2009, available at http://www.foley.com/publications/pub_detail.aspx?pubid=5766 (maximum fine equal to four times (previously three times) the profits made as a result of the infringement may be imposed against the infringer. Where the infringer did not profit from the infringement, the maximum fine has increased from RMB 50,000 to RMB 200,000. The maximum statutory damages that may be granted by a court is RMB 1,000,000)

10 Gabriel, supra note 9 at 354.


14 Id.


16 Gabriel, supra note 9 at 342.