



# Evergreen IP

Smart & Biggar/Fetherstonhaugh's **Daphne C Lainson** examines the drive behind green IP

**C**lean, green, environmentally friendly, eco-friendly, sustainable... the names given to innovation relating to clean energy technologies (CETs) is lengthy.

There is no single definition of what is a clean or green invention. Most patent practitioners would probably agree, however, that many of the new technologies relating to biofuels, carbon capture and storage, geothermal energy, hydro/marine energy, solar energy, and wind energy are included.

Patenting CETs is no different from any other area of innovation, and draws on the traditional sciences relating to biology, chemistry and physics, and the breadth of engineering disciplines. But CETs have drawn special attention, largely due to government and societal interests. Aside from access to medicines, there does not appear to be any other area of technology that has attracted this kind of interest.

## International pressures and government actions

There has long been innovation relating to reducing waste and emissions, but within the last two decades, global pressure to increase innovation in CETs has been building.

The United Nations Framework Convention on Climate Change (UNFCCC) in 1992 was a significant international step forward towards the promotion of environmentally-sound technologies. However, it was the adoption of the Kyoto Protocol in 1997 that coincided with a surge in patenting activity around CETs<sup>1</sup>.

Countries have also implemented national energy initiatives that are driving innovation. Clean air and other emission control legislation and renewable fuel standards, for instance, help to direct new innovation. In the US and Canada, specific states and provinces have also moved forward with legislation and initiatives for clean energy. California, for instance, is a hub for green technology innovation<sup>2</sup>, and is also considered the country leader in clean initiatives<sup>3</sup>. Other countries, like Japan, are looking to clean energy alternatives for nuclear power, which will also drive innovation<sup>4</sup>.

## Green innovation

So, where do these pressures and incentives lead? A number of studies have tried to answer the question by analysing patent filing statistics.

One of the more significant studies involved the European Patent Office (EPO), the United Nations Environment Programme (UNEP) and the International Centre for Trade and Sustainable Development (ICTSD). 20 to 30 years of CET patent filing activity was reviewed, resulting in a 2010 report on CET patenting<sup>5</sup>.

The EPO report focuses on filing trends based on priority applications relating to solar photovoltaic (PV), solar thermal, wind, geothermal, hydro/marine, biofuels, carbon capture, carbon storage and integrated gasification combined cycle (IGCC) technologies.

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According to the report, the leading six countries patenting these CETs are the US, Japan, Germany, the Republic of Korea, the UK and France.

In terms of the top five filers, the US, Japan and Germany alternate in rank and take the top three positions for the CETs studied, with the exception of carbon storage, where France takes second place after the US and before Japan, and Germany takes fourth place.

Rounding out the top five filing countries over the last 20 years are<sup>6</sup>: the Republic of Korea and France (solar PV); France and Italy (solar thermal); Denmark and Spain (wind); Israel, Canada and Austria (geothermal); France and the UK<sup>7</sup> (hydro/marine, biofuels and carbon capture); the UK, Canada and Norway (carbon storage); and the UK, Sweden and Finland (IGCC).

Not unexpectedly, the report found an increase in CET priority patent filings in China since 1998. Also, certain countries are demonstrating specialisations in particular fields compared to the entire field of CETs. For example, the report shows that Singapore

follows the Republic of Korea in terms of percentage filings of priority applications for solar PVs within the entire field of CETs.

The data in the EPO report is consistent with other studies, such as a 2012 Batten Institute report<sup>8</sup>. The Batten report also specifically considered fuel cell related technologies, finding that patent filings in this area ranked lower than solar (largely comprised of solar PV) and biofuel technologies, but higher than wind-related patent filings.

The Cleantech Group also tracks green innovation, publishing an annual list of the top 100 private clean technology companies in North America, Europe, Israel and the Asia Pacific region<sup>9</sup>. The list does not focus on top patent filers. California-based companies led the top 100 list in 2012, with 37 of the top 100 companies (58%) based in that state. The greatest percentage of the top 100 companies focused on energy efficiency related products/services (eg, efficient electronics, home energy management, lighting), followed by solar energy, and by biofuels and biochemicals and waste and wastewater treatment.

It is difficult to predict future innovation trends. But, the rise in patent filings for clean and green technologies is sure to continue, and we are likely to see greater diversity in terms of patentees and originating countries. The degree of partnerships between large multinationals and private companies is also likely to grow as private enterprises specialising in green innovations thrive.

## Patent office initiatives: expedited procedures

National patent offices have tried to assist in the patenting of CETs by developing programmes to advance the grant of patents relating to green technology innovations.

Australia, Brazil, Canada, China, Israel, Japan, the Republic of Korea and the UK, each have procedures to prioritise or advance examination of patent applications relating to green or clean technologies.

What is considered a green invention is not clearly and consistently defined across each patent office, however. For instance, the Japan Patent Office considers inventions with an energy-saving effect or that contribute to CO<sub>2</sub> reduction to qualify. The Canadian Intellectual Property Office (CIPO), on the other hand, will advance an application on filing a declaration

that the invention relates to technology and the commercialisation of which would help to resolve or mitigate environmental impacts or to conserve the natural environment and resources.

The US Patent and Trademark Office (USPTO) had a Green Technology Pilot Programme to expedite examination for green innovation, which ran from December 2009 and closed in mid-February 2012 when the programme reached its limit of 3500 applications. The USPTO still has advanced examination procedures (as do other countries), but these are not specific to clean technologies.

### Technology transfer

As with other areas of technology, and particularly access to medicines, there is a tension between making new technologies available in developing countries versus providing incentives for innovation through strong intellectual property protection.

Technology transfer is one of the obligations of the World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) as set out in Article 7. Article 66(2) of TRIPs also encourages transfer of technology to least-developed countries.

But it is Article 4.5 of the UNFCCC that specifically promotes technology transfer for environmentally-sound technologies:

The developed country parties and other developed parties included in Annex II shall take 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. Other parties and organisations in a position to do so may also assist in facilitating the transfer of such technologies.

Technology transfer often takes the form of licensing programmes, and may include royalty-free access to patented products for research and development activities. One initiative in this regard relating to environmentally-sound technologies is the Eco-Patent Commons, which was launched by industry in partnership with the World Business Council for Sustainable Development. In the Eco-Patent Commons, innovators can make their patents available, royalty-free, for

producing environmental benefits.

There are also a number of other initiatives by international bodies to support the transfer of environmentally-sound technologies, such as World Intellectual Property Organization (WIPO) Green, and funding, such as through the Global Environment Facility.

The stated objective of WIPO Green is to “contribute to the accelerated adaptation, adoption, and deployment of environmental technologies, particularly in developing countries and emerging economies<sup>10</sup>”. WIPO acts as secretariat to the WIPO Green platform, which permits public and private sector entities to “meet, collaborate and learn about existing technology and networking opportunities, available funding for implementation, and project support services/technical assistance<sup>11</sup>”.

As noted above, technology transfer has been a significant issue in other areas, such as access to medicines. While there are parallels between access to clean innovation and access to medicines, some of the issues that developing economies encountered with pharmaceuticals may not arise with clean technologies<sup>12</sup>. For pharmaceuticals, there may not be a substitute for a patented medicine. However, a 2007 study of solar PV, biomass and wind technologies in Brazil, China and India, considered the key barriers were not likely to be associated with patents. In each of these areas, there is competition between a number of patented products as well as with other sources of clean energy and other energy alternatives. In addition, basic technologies are off-patent.

### Tracking green technologies

National patent offices, like the UK Intellectual Property Office, and CIPO have green technology databases that identify those applications that are under expedited prosecution on the green technology track.

Other than for these specific cases, it can be a difficult task to identify whether a patent application relates to a green technology.

Patents are categorised or classified by the technical area to which they relate. For CETs, a patent may fall within more than one class, making searching for relevant patent properties difficult. The EPO therefore introduced a new classification system for climate change mitigation technologies to simplify searching<sup>13</sup>. While WIPO has not reclassified patents, it has launched the IPC Green Inventory, which directs users to relevant classifications that encompass environmentally-sound technologies.

### The next chapter

How green IP will develop is anyone's guess, but we are sure to see an increase in interdisciplinary research and development,

global adoption of the technologies, and greater incentives for technology transfer, which will impact all areas of IP.

### Footnotes

1. 'Patents and clean energy: bridging the gap between evidence and policy', final report of the European Patent Office, United Nations Environment Programme and the International Centre for Trade and Sustainable Development (2010) ("EPO report").
2. See, for instance, 'GlobalCleantech'<sup>12</sup> 100: A Barometer of the Changing Face of Global Cleantech Innovation', Cleantech Group LLC (October 2012).
3. See '2012 State Clean Energy Index – Executive Summary', Cleantech Group LLC (May 2012).
4. See Pernick, R et al, "Clean Energy Trends 2012", CleanEdge (March 2012).
5. *Supra* note 1.
6. In some instances, countries were tied resulting in more than five top five countries.
7. France ranked ahead of the UK on biofuels and carbon capture, with the UK leading over France on hydro/marine.
8. Bierenbaum, D et al, 'Winning the Green Innovation Economy: An Analysis of Worldwide Patenting', University of Virginia, Darden School of Business, Batten Institute (April 2012).
9. *Supra* note 4.
10. See <https://www3.wipo.int/green/greentechnology/charter>.
11. *Ibid*.
12. John H Barton, 'Intellectual Property and Access to Clean Energy Technologies in Developing Countries: An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies', International Centre for Trade and Sustainable Development (2007).
13. The "Y02" category is directed to climate change mitigation technologies. Only two subclasses are presently searchable through esp@cenet.

### Author



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