

Spring 2006

# Energy

NEWS...INTERPRETATION...ANALYSIS

## An African Gusher

*Nigeria is torn by political unrest but its oil industry is booming. Can it make a significant contribution to U.S. energy security?*

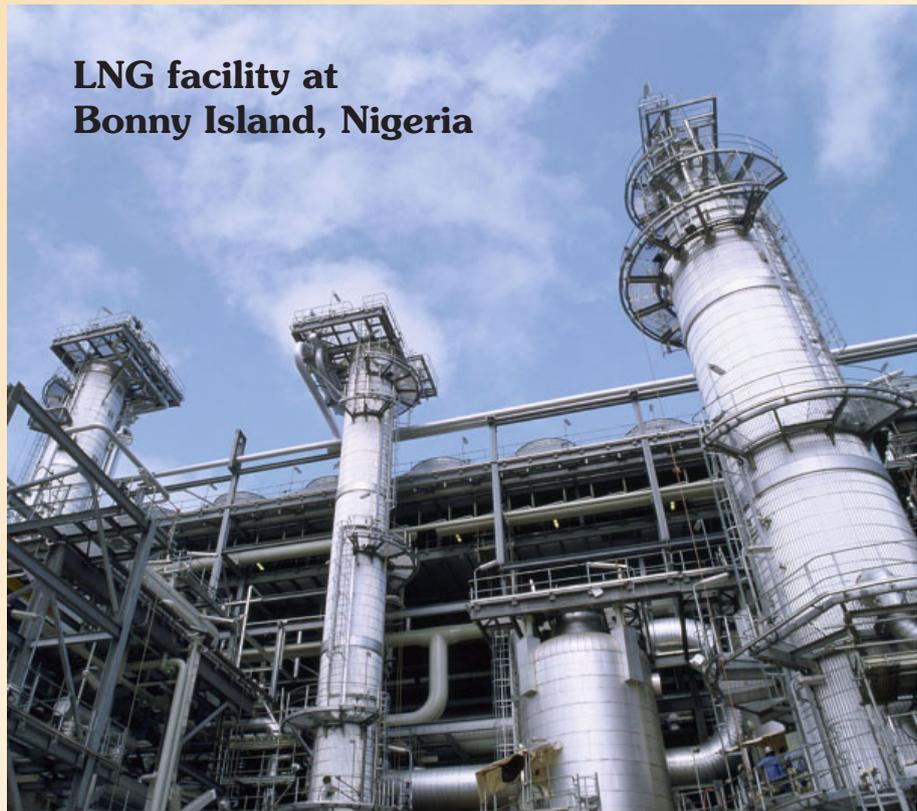
Forget “Oil Addiction.” Petroleum is still the lynchpin of U.S. energy. *p. 9*

An international market place for emissions. *p. 30*

Ethanol dominates alternative fuels. But corn might not be the best route. *p. 32*

EPRI offers a roadmap that could help keep the lights lit. *p. 35*

LNG facility at  
Bonny Island, Nigeria



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Rating Refiners • Going Bankrupt • Patent Protection

# Patent Pollution

## *Strategies for protecting clean energy technology.*

If there is an energy crisis, it is temporary. The quality and quantity of alternative energy innovation is dramatic and meaningful. If global warming is a by-product of our collective lust for energy, that will be remedied. However, the companies that reap the benefits of the successful commercialization of clean alternatives to fossil fuels might not be those with the best technology.

One of the most important tools in the fight for energy independence, clean air, and a fruitful alternative to fossil fuels is the same tool which, if ignored, can stop innovation in its tracks. The same tool that protects the research dollar of one company can render valueless the research of another. This legal tool is the patent, a legal instrument which encourages innovation by allowing an innovator to prevent others from exploiting that which falls within the scope of the patent.

This article will explain the importance of the patent to companies who are innovating in the clean technology space.

### **The Patent System**

At the heart of the patent system is the “right to exclude”. For someone who invents, whether it be a new apparatus, a new method, an improvement to an old apparatus, the patent system allows the inventor to apply for a patent.

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A U.S. patent application must describe the invention in sufficient detail so that a person “skilled in the art” to which the invention pertains can make and use the invention without undue experimentation. In addition, the innovator must include in the application the best way the inventor knows of for implementing the invention.

In simple terms the application must have enough detail to enable the invention to be made and used, and the inventor is prohibited from hiding any of the good tricks needed to make and use the invention. An invention must be new, useful, and must not be an obvious variation of the “prior art”, that which came before the invention. The precise scope of the patent is determined after some negotiation between the Patent Office and the inventor.

The idea behind the patent system is simple. In exchange for innovators disclosing inventions to the public, the public will give to the inventor a right to exclude others from practicing the invention for a period ending 20 years after the date of the filing of the patent application. Without the patent system, the most profitable companies might be those who do no research and development. The most profitable companies might be those who are second to market with copycat products.

One of the most important concepts in patent law is that a patent does not give the owner of the patent the right to use that which is covered by the patent. This concept is illustrated in the following hypothetical:

**Year One:** Innovator A is the first person to invent a hybrid automobile which automatically switches between an electric mode and a gasoline mode. Even though the automobile does not improve energy efficiency, Innovator A is awarded a patent for the broad concept of a hybrid car because the concept is not obvious in view of the prior art. The embodiment of the invention described in the patent is not commercially viable because it is expensive and inefficient.

**Year Two:** Innovator B figures out a control circuit which allows a hybrid car to be efficient. Innovator B is awarded a patent for a hybrid automobile which includes a specific control circuit. The reason that the patent is awarded is because Innovator B’s invention is not obvious in view of the broad concept of a hybrid car. Innovator B has invented a commercially interesting automobile because of its great efficiency.

**Year Three:** Innovator C improves battery technology and is awarded a patent on an improved battery. The battery can be used in many environments including with a hybrid car

Even though Innovator B has invented and received a patent for a commercially interesting automobile, the right that the innovator received with the patent is the right to exclude. Thus, Innovator B can stop anyone who makes a hybrid automobile with the control circuit. Unfortunately for Innovator B, he/she can not practice his/her own invention without permission from Innovator A, the inventor of the broad hybrid car concept.

Innovator B may have invested millions of dollars into research and may be in possession of the only commercially interesting hybrid automobile, but Innovator B can not practice his/her own invention without permission from the owner of the broad hybrid automobile patent. In fact, under current law, Innovator A could get an injunction against Innovator B, even if Innovator A's invention was a "paper patent". A "paper patent" is one which protects a product or method which is never exploited by the owner. In the hypothetical, the invention of Innovator A was not commercially viable and may well have been a paper patent.

Innovator C is obviously free to sell his battery to whomever he chooses. However, he/she must always make certain that he/she is not inducing infringement by knowingly selling to a hybrid car company which does not have a license from Innovator A.

If the perfect hybrid car uses the circuit of innovator B and the battery of Innovator C, no company can sell the perfect hybrid car without obtaining the appropriate patent licenses.

The real world does not differ from the hypothetical world. There are many innovations in the energy and environmental arena which are emerging from universities, research laboratories, garages, start ups and large companies. Many of these innovations are protected by patents. Therefore, as the title of this paper suggests, the energy patent landscape is polluted. It is polluted with thousands of patents.

This pollution, however, is both a hazard and an opportunity. All of the patents enjoy what lawyers call a presumption of validity. Because a trained Patent Examiner has determined patentability, the patent is presumed to be valid unless it can be shown to be invalid by "clear and convincing" evidence. This standard is not as high as the standard in criminal law (beyond a reasonable doubt) but it is nevertheless an extremely high standard. Juries and judges tend to assume that a Patent Examiner was properly trained and did a thorough job of determining patentability. There is something magical about the fancy document with the

ribbon, as in—the U.S. Letters Patent.

Even though patents are presumed to be valid, there are a few secrets about the patent system which are not generally known by the public:

Even though it may take years to obtain a patent, most of this time is spent in the queue to be examined.

Patent Examiners are given a certain amount of time to examine a patent application. Generally, the amount of time that a Patent Examiner has to examine a patent application will range from 10-25 hours depending on the area of technology and the experience of the Examiner. This is the time that the Examiner has to read the application (which may average around twenty pages but could be as long as one hundred pages or more), look for prior art, and negotiate with the innovator regarding the scope of the patent.

- Patent Examiners do not have enough time and resources to always find the best prior art.
- Patent Examiner performance is measured by the volume of cases examined more than the quality of the examination.
- Patent Examiners do not generally have a background in either the law or patents when they are first hired. Generally, Patent Examiners only have a technical degree and no other formal training when they are first hired. Many Examiners attend law school while working at the U.S. Patent and Trademark but oftentimes leave shortly after receiving a law degree.
- The ability to enforce a patent depends upon the quality of the patent application drafting and remarks made before the United States Patent and Trademark Office.
- Given the imperfections of the patent examining process, there are patents which are invalid. In addition, the owner of many patents do not fully understand the scope of their own patents. However, before giving up on the patent system it is important to understand that one of the only ways to protect the investment made in research is to obtain patents.

### **The Patent Landscape**

The raw volume of patents in the clean technology space is mind boggling.

While the purpose of this paper is not to provide a definition of "Clean Technology", everyone can agree that certain areas of technology fall squarely within the meaning of clean technology. For example, clean alternatives to fossil fuels are generally regarded as being encompassed by the definition of clean technology. Would it surprise you to know that the term "solar panel" is used in 2742 patents since 1975? The following chart illustrates the number of patents which have issued since 1975 using certain terms common to the clean technology industry.

Solar panel	2742
Biomass	8507
Wind energy	1076
Hybrid car	219
Fuel cell	9373
Geothermal energy	615
Acoustical heat pumping engine	7

Even technologies as obscure as acoustical heat pumps and a term as narrow as "acoustical heat pumping engine" uncovered seven patents!

With so many patents, it is critically important that all companies understand the landscape in their industry. This will enable companies to innovate without being blindsided by a patent infringement suit or a threatening letter from a competitor.

It is worth noting that there is a school of thought that companies should not study the patent landscape because by knowing of a patent makes a company vulnerable to a claim of willful infringement. If a company is aware of a patent and ignores the patent, it is possible that they could be found to be willfully infringing. If a company is found to be a willful infringer, the Court may treble damages at the discretion of the Court. In addition, if the case is "exceptional", the infringer may have to pay the attorney fees of the patent owner.

It is a more common view that knowledge is better than ignorance. Knowing the patents of others will enable a company to avoid infringement. As a beneficial byproduct, a company can learn a lot about technology from the

patents of its competitors. It can also glean where the industry may be going.

### **A Few Tips**

Best practices dictate that companies in the clean technology space consider taking the following steps to avoid patent problems:

- **Study Expired Patents.** There is a basic principle of patent law that an expired patent is in the public domain. A corollary principle is that technologies which obvious variations of expired patents are also in the public domain. Thus, expired patents can be a rich resource for ideas. In addition, the expired patents can provide comfort that a certain technology can be used without a license. Although many expired patents are old, there are many technologies developed during the 1970s and 1980s that have applicability today. It should be noted that not all expired patents are old. Some expire for failure to pay certain fees which must be paid to maintain an enforceable patent.

- **Study Foreign Patents.** Often-times an inventor will file a patent application in a foreign country but not in the United States. This may allow some freedom to operate in the U.S.

- **Look at U.S. Patents for Use in Available Markets.** Just because a patent application was filed in the U.S. does not mean that the application was filed abroad. Generally, a foreign case must be filed within one year of filing the case in the U.S. in order for the foreign country to recognize the U.S. filing date. There are huge markets outside the U.S. for energy and environmental inventions. Therefore, the U.S. Patents may help a company learn new and interesting technologies which it can freely exploit outside the U.S. With emerging energy markets such as China, some of the best commercial opportunities may be outside of the United States.

- **Study Unexpired U.S. Patents.** If a company understands the patent landscape, the company is able to avoid infringement. A sad but often occurring nightmare takes place when an honest, innovative company introduces a new product with a particular infringing fea-

ture in the product which is simply not a necessary part of the product. For example, perhaps a solar panel has a coating with a particular polymer. The coating makes the product infringe. However, a different (non-infringing) coating could have been substituted if the company only knew of the infringement problem. Unfortunately, once a solar panel is coated, it may be impossible to “un-coat” the panel. The company is left with inventory that is un-saleable

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## **Patent protection is the most important tool in the fight for energy security.**

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because it failed to understand the patent landscape.

- **Obtain Patents for Core Technologies.** While it is axiomatic that companies do not have unlimited resources, a company that fails to protect its inventions might as well hand its competitors a bag of money. By failing to protect innovation, a competitor is allowed to legally copy an innovator’s technology by reverse engineering that technology. Instead of spending years of research, a competitor can buy a copy machine! The investment made by a company in research is oftentimes the most valuable asset of the company. The Intellectual Property of a company (of which patents are a large component) can determine the value of the company. For a start-up which desires to be acquired as an exit strategy, the patent portfolio may not only determine the price of the company but also whether the deal is consummated. After all, why should a large energy company buy a small start up if it can duplicate the technology?

- **Obtain Patents for Revolutionary Ideas.** It is not uncommon for a company to make discoveries which do not ultimately end up in a commercial product. Looking back at the innovator who invented the hybrid automobile in the hypothetically posed earlier in this

paper, he/she did not produce a saleable product. However, by protecting the invention with a United States Patent, Innovator A was in a position to collect a royalty from anyone who exploited a hybrid automobile in the United States. In the alternative, Innovator A could prevent others from exploiting the hybrid technology. There are often times business reasons for preventing a competitor from using a technology, even if that technology is not being commercialized by the innovator.

- **Obtain Patents for Evolutionary Ideas.** Most ideas are not revolutionary. However, if an idea is not obvious, it is proper subject matter for a patent. In addition, an evolutionary idea can be the idea which makes a product saleable. It is often times evolutionary patents which are used as cross licensing fodder. This intellectual property will give a company the currency it needs to negotiate with its competitors. Supporting new ideas in a regular patent program can reward inventors and create a culture of innovation that leads to even more revolutionary ideas.

- **Take Advantage of Special Provisions of the Patent Rules.** There is generally a motivation to obtain patent protection as quickly as possible. The U.S. Patent and Trademark recognizes the importance to the public of inventions which will help the environment and inventions which help relieve our energy problems. For this reason, the U.S. Patent and Trademark Office will examine patent applications relating to clean technology ahead of other patent applications. This provision of the Patent Office guidelines can be taken advantage of with a simple petition.

### **Conclusion**

It surprises most people to learn that the clean technology landscape includes a plentiful and rich supply of patents. These patents can be deadly weapons if not treated properly. They can also be a source of knowledge and technology and business opportunity. In tandem with a culture of innovation, an effective patent strategy may differentiate those companies that successfully commercialize clean alternatives to fossil fuels.