Into Troubled Waters…

Scotland and South Korea plan to generate alternative energy and unoriginal ideas

May 16, 2013

On Monday, May 6, 2013, Scottish Development International (SDI), the investment and trade promotion arm of the Scottish government, and Incheon Metropolitan City in South Korea signed a Memorandum of Understanding (MOU) to share ideas, knowledge, and technology.[1] SDI has also stated that it wishes to create a new export market for Scottish tidal energy companies. While the nations' collaborative impulse is laudable, it is important to note that innovation enabling tidal energy generation is neither new nor in its nascent stages.

South Korea has two tidal power stations and a third, larger one under construction. The Uldolmok Tidal Power Station generates 1.5 Megawatts (MW) and was built in 2009. Two years later the Sihwa Lake Tidal Power Station was built and generates 254 MW, making it the world's largest tidal power installation. The Incheon Tidal Power Station is expected to have 1,320 MW capacity and to be finished in 2017 costing $3.4 billion. This station will generate 60% of household energy in Incheon.[2]

In a quest to stimulate greater use of renewable energy sources and technologies, Scotland has offered a £10 million award to the wave or tidal energy project which generates the most electricity over a two year period.[3] It also commissioned a Strategic Environmental Assessment of Tidal and Wave Power in 2007[4] in which the potential environmental impact of wave power generation was studied.

The market for tidal power inside of Scotland and Europe is slowly rising. £32 million of approximately £1 billion in grants from the European Commission have been allocated to two sites in Scotland.[5] These grants were created in an effort to stimulate the growth of the renewable energy industry in Europe. Scotland's first minister, Alex Salmon boasted that Pentland Firth will be the "Saudi Arabia" of marine energy.[6] In the same vein, Yoon-soo Park, director of Incheon Metropolitan City green energy policy division, is quoted as saying that the MOU with Scotland will establish Incheon as a "mecca" for tidal energy. These countries would both benefit from being fully informed of all current research, innovations and entities engaged in projects around the world if they desire success from this MOU. This would help them to avoid potentially squandering public resources on misappropriated "innovations" which are neither new nor proprietary and exist in the long-abandoned commons.

The first modern scale study of tidal energy was conducted in 1924 in the Fundy Bay.[7] In 1966, France installed the first tidal power station at La Rance which still generates 240 MW of capacity. In the seventies, a natural gas shortage and two oil crises spurred the need for viable alternative sources of energy. Many patents were filed to further develop tidal energy at that time. Many of those innovations are now in their second or third life cycles, or are now in the public domain.

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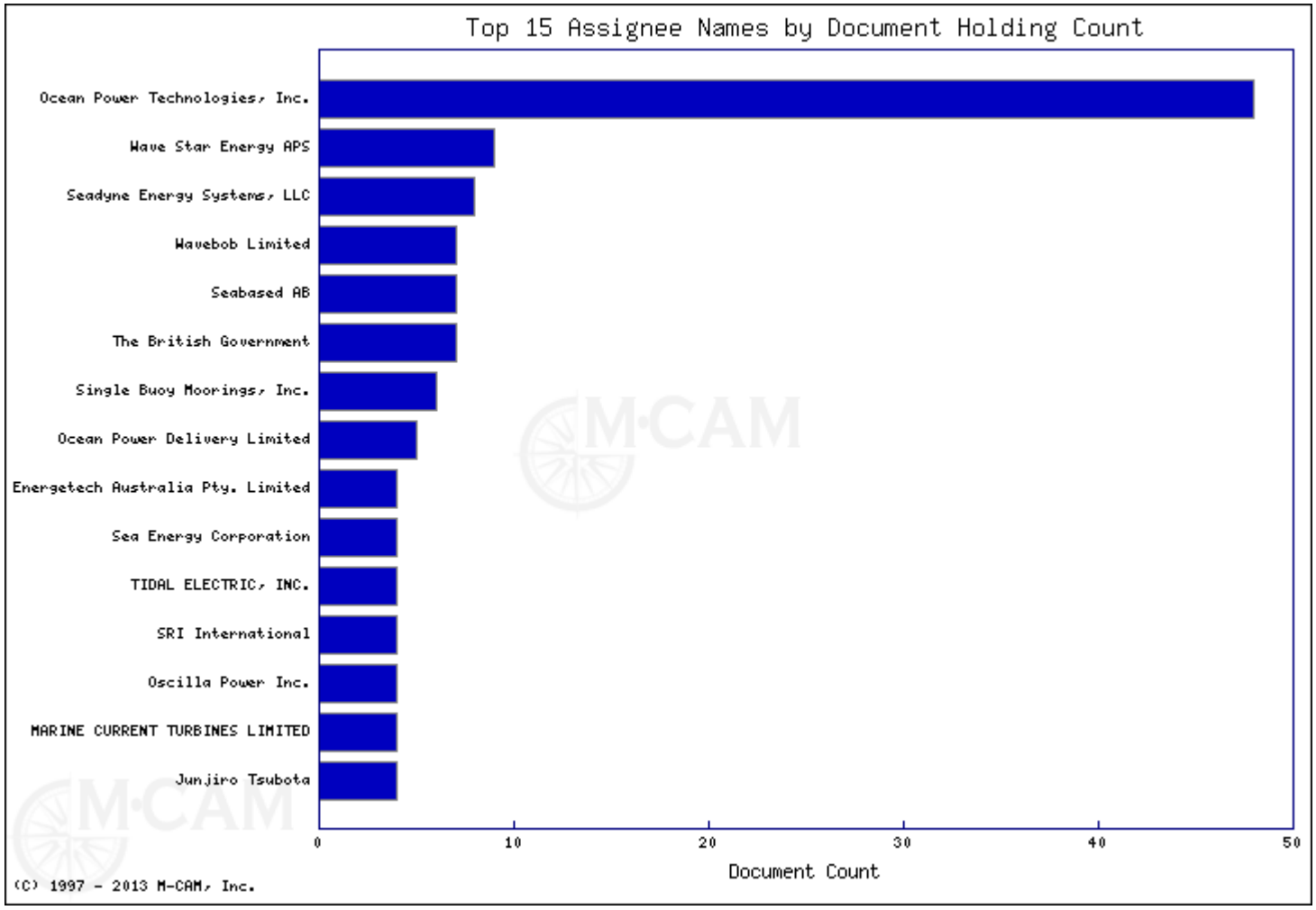
[1] http://www.heraldscotland.com/news/environment/scotland-signs-marine-energy-deal-with-south-korea.1367865939
[2] https://www.koreatimes.co.kr/www/news/biz/2010/04/123_59412.html
[3] http://www.sdi.co.uk/news/2012/08/four-marine-energy-firms-in-scotlands-10-million-challenge.aspx
[4] http://www.scotland.gov.uk/Publications/2007/03/seawave
[5] http://www.bbc.co.uk/news/uk-scotland-scotland-business-20777294
[6] http://www.economist.com/node/21526931
[7] http://books.google.com/books?id=zigDAAAAMBAJ&pg=PA29&dq=Popular+Science+1933+plane+%22Popular+Science%22&hl=en&ei=MIb5TZaFEajx0gGxtaHPAw&sa=X&oi=book_result&ct=result&resnum=4&ved=0CDUQ6AEwAzhQ#v=onepage&q&f=true

Innovation Space

Using data drawn from the Global Innovations Commons, we compiled a list of approximately 1,000 properties in the tidal and wave power space.[8] Below is a graphical display of the top 15 intellectual property holding entities from that list.



Ocean Power Technologies (OPTT) is the clear leader in this space and Scotland partnered with the company to develop the Mark 3 PowerBuoy® in 2011. This generator reached a peak capacity of 866 Kilowatts[9] and has completed ocean trials. OPTT has a market cap of approximately $19 million and it had a net loss of $15.1 million in 2012.

Single Buoy Moorings is a subsidiary of SBM Offshore which designs, manufactures, and supplies loading and offloading mooring terminals. Their tidal power assets are part of their renewable energy R&D efforts. Since they provide systems and service to the oil and gas industry, this would provide an ideal partnership with Scotland, which has significant offshore oilfields in the North Sea.

After a number of ocean trials off the Irish coast, Wavebob Limited went into liquidation in April 2013 after failing to find sustained funding or a strategic partner. A South Korean or Scottish enterprise could easily acquire its assets and grow inside the U.S. and European markets.

[8] http://www.globalinnovationcommons.org/discover/subcategory/tidal-power
[9] http://www.oceanpowertechnologies.com/scotland.html

Oscilla Power is another potential partner since it completed a field trial of a magnetostrictive wave energy generator in March 2013. So far, it has received $2.7 million in research grants and contracts from the U.S. National Science Foundation, the U.S. Department of Energy, and the U.S. Department of Commerce.[10]

Junjiro Tsubota's now-expired patents are examples of properties issued in Japan in the late seventies to mid-eighties in the aftermath of the energy crises. South Korea and Scotland would be doing their tax-paying citizens a great service by expanding their inquiry into, and use of these and other important undeployed innovations. The British government's patents were also filed in that time period. Titles of the UK holdings include "Devices for extracting energy from waves" and "Wave energy device". It has been estimated that tidal power can provide 20% of Great Britain's demand for electricity.[11]

University partners could be invited to deploy commons-disclosed expired patented technologies to engineer the most efficient power plants. While Scotland has already engaged national universities such as the University of Edinburgh and Strathclyde University,[12] it could also partner with the University of Maine in the U.S. because of its Maine Tidal Power Initiative[13] or with the University of Otago in New Zealand because of its turbine farm research.[14] The University of Oxford has a Tidal Energy Research Group.[15] Representatives of the Ocean University of China visited the European Marine Energy Centre in 2011[16] which could indicate that some Chinese universities would be open to partnerships as well.

Conclusion

In order for Scotland and South Korea to succeed in their efforts, they would benefit from learning more about who is currently active in tidal power globally and what innovation they hold. This would enable them to become aware of entities which hold the rights to current innovations. They could become fully informed of the best practices in the industry and work with other companies who exemplify these practices. In addition, they would gain valuable corporate and academic partners to add to their consortium. However, their greatest contribution to their energy requirements and to the nature of next-generation bilateral and multilateral technology development may very well come from a more careful integration of expired innovations which are accessible in the Global Innovation Commons – a resource that enables commodity producers to develop technologies at commodity prices. As each of these countries wishes to establish itself as a global leader in the tidal power industry, they would do well to be better informed of the substantial sea of earlier tidal power intellectual properties and innovations already held by companies which currently engineer these projects.

M·CAM's Patent Glossary

[10] http://usaspending.gov/search?form_fields=%7B%22search_term%22%3A%22Oscilla+Power%22%7D
[11] http://www.bbc.co.uk/news/science-environment-20983645
[12] http://www.sdi.co.uk/~/media/SDI/Files/documents/energy/Brochures/16642%20SDI%20Wave%20and%20Tidal%20Energy%20October%202012%20Final.pdf
[13] http://umaine.edu/mtpi/
[14] http://www.otago.ac.nz/marinescience/po/projects/turbineFarms.htm
[15] http://www-civil.eng.ox.ac.uk/research/tidal/
[16] http://www.scotland.cn/en/business-scotland/renewable-energy

Aligned Sector: The business sector in which the product(s) resulting from the patent(s) is currently or intended to be sold.

Applicant: The person or corporation that applies for a patent with the intent to use, manufacture or license the technology of the invention; under U.S. law, except in special situations, the applicant(s) must be the inventor(s).

Application: Complete papers submitted to the U. S. Patent and Trademark Office seeking a patent including oath, specification, claims, and drawings. This usually does not signify a Provisional Patent Application, but only a regular patent application.

Art: The established practice and public knowledge within a given field of technology. This also identifies a process or method used to produce a useful result. A term used in consideration of the problem of patentable novelty encompassing all that is known prior to the filing date of the application in the particular field of the invention.

Assignee: The person(s) or corporate body to whom the law grants or vests a patent right. This refers to the person or corporate entity that is identified as the receiver of an assignment.

Business Method Patent: A patent that controls the way a business process is undertaken. The issuance of these patents by the United States Patent and Trademark Office (USPTO) is new and controversial, since many allege that it is unfair to allow a patent on a way of doing business.

Citation: This may include patents or journal articles that the applicant or examiner deems relevant to a current application. A reference to legal authorities or a prior art documentation are examples of a citation.

Claim: The language in a patent application that defines the legal scope of the patent. Most patents have numerous claims. This is typically the single most important section in the application.

Concurrent Art: Concurrent art occurs when related patent applications are being examined by the USPTO at the same time. It is difficult for any company or inventor to know, at the time they file for a patent, whether a "related" patent application exists.

Filing Date: The date when a properly prepared application reaches the patent office in complete form.

Innovation Cycle: A description of the commercialization timeframe for the intellectual property.

Innovation Space: M·CAM's representation of the innovation(s) that occur before, during, and after the pending period of the subject patent. The innovation space is the first place to look for patents that are closely related to the subject patent and that may impact the defensibility of the subject patent or create opportunities for patent licensing.

Issue Date: Not to be confused with the filing date, which is the date the patent application was physically received by the U.S. Patent and Trademark Office. This is the date on which the patent actually issues.

Non-Aligned Sector: Any sector in which the patent can be used or sold, other than the sector for which the patent or resultant product was invented or intended.

Pod: A group of patents owned by a company that should be treated as a single unit of innovation (e.g., a certain group of patents that comprise a single product or multiple related products).

Prior Art: Any relevant patent that was issued before the patent being analyzed. If this previous patent was specifically mentioned in the new patent's application, the previous patent is referred to as "cited prior art". If it was NOT mentioned, then that previous patent is referred to as "uncited prior art".

Subsequent Art: Any patent that has a filing date with the USPTO that is after the issuance date of the subject patent. This subsequent art patent may or may not have cited (see "Citation" above) the subject patent. As subsequent art represents more recent innovation than the subject patent, it has great potential to shrink the market opportunity for the subject patent.

A Brief Primer on the Patent System

In recent years, the importance of patents and intellectual property rights as an important variable in the marketplace has come to the forefront of the public consciousness as world leaders declare their country's lead in the innovation race. Damaging intellectual property litigation is becoming increasingly common across all industries. This is exacerbated when patent rights are granted for non-novel ideas. A vast amount of precedent innovation is unconsidered by patent-granting authorities in the creation of new IP rights. Patent granting authorities including the United States Patent and Trademark Office (USPTO), European Patent Office (EPO), Japanese Patent Office (JPO), Chinese State Intellectual Property Office (SIPO), Korean Intellectual Property Office (KIPO) and many others are constrained by the use of patent classification systems which are routinely circumvented by patent applicants.

There is a two-way social contract underlying the patent system. In the United States, patent terms are generally limited to 20 years from the date of application. By statutory intention, once a patent has expired, the patent holder loses the right to exclude others from fully utilizing any innovation described in the patent. A large number of patents enter the public domain when they are "abandoned" – when owners discontinue paying patent maintenance fees. Patents also only provide an exclusionary right in the country for which the patent is filed. As demonstrated by the Global Innovation Commons[17] (G.I.C.), using intellectual property available in the public domain eliminates the need to pay licensing fees on those innovations in countries where the patent was never registered, or worldwide, if abandoned.

Patently Obvious® is a weekly report focusing on select groups of patents in order to increase transparency in markets, addressing information asymmetries, and providing a more level playing field for all parties.

[17] http://www.globalinnovationcommons.org/