

# KEEEN: The Keen Success in Public-Private Partnerships

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## Introduction

Public-private partnerships are essential in driving the innovation cycle. This is since the public sector is usually keen on discovery research, whereas the private entity specializes in product development and market access. In developing nations, where small and medium enterprises make up the large portion of the economy and reliance is heavily on research conducted in academic and public institutes, public-private partnerships are even more crucial in driving the nation's economy. When properly managed, the partnership can be extremely rewarding for both parties. A good example is the case of development of bioremediation products under the brand name KEEEN, undertaken in Thailand. KEEEN products are the result of collaboration between the National Center for Genetic Engineering and Biotechnology (BIOTEC) and KEEEN Limited (previously known as Hi Grimm Environmental and Research Co., Ltd.).

## From Inspiration to Innovation

In 2009, KEEEN established their company at Thailand Science Park, home to sixty start-up companies, the National Science and Technology Development Agency (NSTDA) and four NSTDA research centers which include BIOTEC. KEEEN was founded in 1992 as an industrial ecology management company, providing products and services in environmental management, specializing in oil cleanup. Being on Thailand Science Park campus in the proximity of research centers has inspired KEEEN to develop its own technology and products. KEEEN was also aware of the global concern over environmental conservation and an increasing demand from the industrial sector for green products and thus set an eye on developing bioremediation agents. Recognizing BIOTEC's expertise in microbial biotechnology and biological waste treatment, KEEEN started

exploring collaboration with BIOTEC. The two parties embarked on a joint research project to develop a commercial bioremediation agent in November 2008. Led by Dr. Somkiet Techkarnjanaruk of BIOTEC and Dr. Watson Ariyaphattarat of KEEEN, the project involved screening for the most effective oil-degrading microorganisms, designing the cultivation of selected microorganisms, product formulation, product testing and large-scale production. Information provided by the engineering and environmental teams of KEEEN was extremely crucial to the success of the project, as it addressed actual industrial environments and conditions for BIOTEC researchers to screen for suitable microbes that could perform well in the field. The project also benefited from KEEEN's experience in product formulation and field testing. This is a good example of joint effort where both parties worked closely and collaboratively to overcome the "valley of death" and realize an actual commercial product.



KEEEN's products for oil spill clean-up operation

## From Innovation to 'Greenovation'

KEEEN bioremediation agent was launched to a warm welcome by the market in October 2010, offering solutions to wastewater treatment; oil tank degassing and cleaning remediation; oil spill response and clean up; industrial application and site remediation; and sanitary treatment. KEEEN built its market through technology and product demonstration. Over a period of five years, the company has been able to secure major clients in various business operations, namely gas stations, restaurant chains, automotive assembly and repair, automotive service center, petrochemical and also government sector, etc.

To demonstrate the effectiveness of its products for oil spill clean-up operation, KEEEN's team, in close collaboration with Thailand Pollution Control Department, responded promptly to the 20,000L oil spill caused by the accident of a liquid petroleum gas tanker truck overturning in Songkhla Province in May 2013 and again to the oil slick washing ashore on the famous Bang Saen beach in Chonburi Province in October 2013.

KEEEN's product was tested by Minibea, a major manufacturer of high-precision small motors and other electronic devices and components, in de-greasing and cleaning of finishing parts and

components. The test showed that the use of KEEEN's product is more economical than the current chemical cleaning agent, and in addition, creates a safer working environment for its workers and the waste stream from this process is easier and more cost-effective to treat due to its biological characteristics as opposed to chemical.

## From 'Greenovation' to Satisfaction

The role of the public sector organizations such as NSTDA is not limited to technology development. Technology Management Center (TMC), an industrial liaison body of NSTDA, operates several programs to foster business development such as joint venture (under NSTDA Investment Center), low-interest loan for business operators to upgrade their products and processes and a business incubation program. NSTDA's business incubation program provides a helpful environment and facilities to nurture and groom new technopreneurs. This includes workshops, training, consultation, exhibition, networking, business and fund matching to its member companies. KEEEN joined the NSTDA business incubation program in 2012. Under this program, KEEEN had opportunities to enter a number of innovation competitions and proudly took home several awards, notably Golden Medal Award from the 2012 Taiwan International Invention Show and Technomart; Grand Prize from the Asian Science Park Association in 2012 and Gold Medal from the 42nd International Exhibition of Inventions at Geneva in 2014.

Participation in these overseas competitions provides exposure to prospective partners and clients. KEEEN currently has two official representatives in Singapore and Finland, covering the Asia-Pacific region and European, Russian and the Middle Eastern region, respectively. Its products have been shipped to South Korea, Malaysia, Singapore, Japan, Indonesia, India, etc. With its European partner, KEEEN is working around the clock to register its product in Europe, Russia and CIS and Middle East, known for its stringent standards. In July 2014, KEEEN European Center will be opened in Lahti, Finland, as a distribution center, training center, and also packaging manufacturer in the near future. KEEEN aims to move from a local brand to a global brand, or to put it in KEEEN's terms, from "local ignition into global satisfaction".



Awards received by KEEEN



## Constant Innovation

Despite all its success, KEEEN has realized that innovative technology is like good quality milk. Just like milk, the quality will always diminish over time until it spoils. Therefore, KEEEN constantly strives to develop innovative and practical solutions for various industries, using bioremediation agents as a foundation for development. Under the collaboration with a Japanese partner, an automotive-part cleaning unit is designed to re-circulate both water and bioremediation agent, resulting in water and reagent saving. The cleaning unit is highly suitable for automotive repair shops. "Bio Wet Scrubber Remediation Agent" has recently been developed in collaboration with BIOTEC and Mahidol University. This product is specially formulated to enhance the efficiency of wet scrubbers in removing organics and hydrocarbons from gaseous waste streams. As the product contains non-pathogenic sporulating bacteria, inorganic nutrients, a stabilizer and biodegradable surfactants, it is biodegradable and thereby reduces the need for expensive waste handling and disposal. This technology is very useful for petrochemical industries. KEEEN has

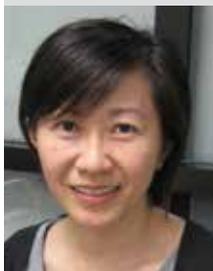
recently teamed up with BIOTEC to develop a small-scale mobile microbial reactor for on-site bioremediation. This reactor will allow on-site production of microorganisms used in the treatment of oil-contaminated wastewater. It will eliminate the cost of packaging and transportation of bioremediation agents, making it suitable for industrial sites that need to regularly manage oil-contaminated wastewater in high volume.

Within a relatively short period of time, KEEEN has been able to expand and solidify its product portfolio and market. The authors do hope that this story will inspire other local companies to take advantage of technical and financial supporting schemes made available by public organizations such as NSTDA to develop its own innovation for long-term sustainable business.

## About the Authors



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