A unicorn company contributing to the future

Clean Planet Inc.

May 19, 2021

Special Corporate Report: Developing “Quantum Hydrogen Energy”, a future energy for the earth

Hideki Yoshino, the founder and president of Clean Planet Inc., established the company in 2012 with the aim of developing clean energy for the future society after the natural disasters caused by the Great East Japan Earthquake and the secondary damage caused by the nuclear power plant. In 2015, in collaboration with an industry-university research team led by Professor Yasuhiro Iwamura of Tohoku University, the company established a joint research division to create quantum hydrogen energy, a clean energy source. In Japan, the New Energy and Industrial Technology Development Organization (NEDO)’s advanced research program for energy and environmental technologies (FY2015 to FY2017) has conducted demonstration work on the basic technology for quantum hydrogen energy, and it was well-received. Overseas, competition for the development of quantum hydrogen energy is intensifying around the world, especially in Europe and the United States, and major companies representing various industries have recently begun to enter the race to develop quantum hydrogen energy. In this context, the company has been attracting attention as a world-leading developer of quantum hydrogen energy. Currently, the company is expanding from the stage of empirical research of basic technologies to the stage of starting practical experiments in collaboration with leading companies in various industries. At present, the company has applied for 17 families of patents, and is gradually expanding its business in Japan and 16 countries, and has received 6 patent decisions in Japan and 20 overseas so far.
In 1995, Mr. Yoshino founded GABA, a one-on-one English conversation school, which was revolutionary at the time. He is a business person who sold the company to a fund in 2004 for further growth. We have high expectations for how he tackles new challenges.

The term “quantum hydrogen energy” refers to the thermogenic reaction that occurs due to quantum phenomena during the diffusion process when hydrogen is stored in nanoscale metallic composites at several hundred degrees Celsius.

Professor Yasuhiro Iwamura of Tohoku University (right) and Takehiko Ito, Director and CTO of the company (Visiting Associate Professor), working on a basic experiment.

1. Revolutionary Energy
2. One gram of hydrogen can provide as much heat energy as 8 tons of gasoline.
3. Clean, reliable, and safe

According to common sense in current physics, a reaction field in a plasma state of 100 million degrees Celsius or higher is necessary for the sustained transformation of elements, and the development of ITER, which will create such a field, is underway under international cooperation, but its practical application has been significantly lagging behind. In contrast, quantum hydrogen energy, which is being researched by the joint research division consisted of Clean Planet and Tohoku University’s Research Center for Electron-Photon Science, generates heat through quantum phenomena of hydrogen atoms at low temperatures ranging from room temperature to several hundred degrees Celsius. Specially-Appointed Professor Iwamura and Visiting Associate Professor Ito of Tohoku University are both world-leading researchers who were involved in research on “new elemental transformations” at Mitsubishi Heavy Industries, Ltd. and have achieved world-class results. The duo is aiming to realize innovative energy that can be put to practical use by using the heat generated from new elemental changes as an energy source. Based on the power generation method using “quantum hydrogen energy” established through research with Tohoku University, Clean Planet aims to spread the use of the new energy by incorporating it into products and mass-producing it.

Quantum Hydrogen Energy (QHE)

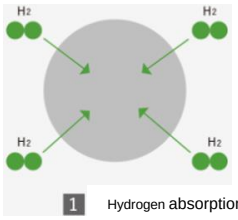
When we make nanoscale metal composites absorb hydrogen and interact with each other by applying stimuli under certain conditions, they release innovative energy that is orders of magnitude greater than any known chemical reaction without emitting any CO_2. It is said that one gram of hydrogen has an energy content equivalent to 8 tons of gasoline.

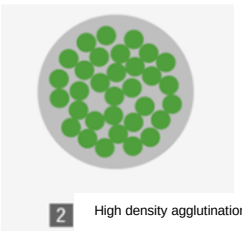
Innovative energy with no CO_2 emissions and no radiation

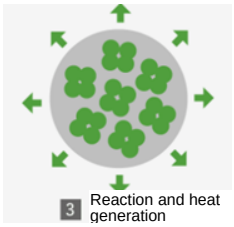
Quantum hydrogen energy is extremely clean energy, and the reactions do not occur in a chain reaction, so there is no danger of out-of-control accidents such as the meltdown feared in nuclear power generation. The fuel is hydrogen, which is inexpensive and inexhaustible on the earth. The utilization of heat energy is expected to be replaced by the conversion to electric energy.

Quantum Hydrogen Energy
(Stable, vast energy)

1. A thermogenic phenomenon in which special nanoscale metals (e.g., nickel and copper nanofilms) absorb hydrogen and, when stimulated to interact with each other under certain conditions, release more than 1,000 times as much energy per gram of hydrogen as a normal combustion reaction without emitting any carbon dioxide (CO_2).
2. In the proprietary thermogenic method developed by the Clean Planet/Tohoku University team, nanoscale materials, mainly inexpensive metals (nickel and copper), and the light hydrogen stored in them interact with each other when stimulated under certain conditions, causing thermogenic phenomena in the low-temperature range below 1,000°C.
3. The "reaction part," the heart of the proprietary heat-generating phenomenon, leads to the advantage of being able to design inexpensive and compact final products, which can be easily mass-produced. It also achieves the world's highest level of heat-generating energy density per gram of hydrogen.







The estimated market size is 1 trillion yen in Japan and over 200 billion US dollars (about 22 trillion yen) worldwide after 2026. (the company's forecast)

<Business Roadmap>

Clean Planet is conducting a series of basic and practical research on "quantum hydrogen energy" and aims to be the first in the world to put it to practical use. Through the design of small generators with extremely high power generation efficiency and the licensing of their technology, the company will spread the new, safe, stable, and affordable clean energy to every corner of the world.

Growth Phase	PHASE 1≫ 1989-2016	PHASE 2≫ 2017	PHASE 3≫ 2018-	PHASE 4≫	PHASE 5≫
Phase Content	Basic research (confirmation of generation of excess heat by NEDO)	Under verification study	Towards completion of product engineering	Practical application for daily life / industrial infrastructure, Establishment of recognition as de facto standard	Activation of Japanese-led energy revolution, Global launch
Research Partners	MIT, SRI, Mitsubishi Heavy Industries, Technova, selected by experts in nuclear physics / electrochemistry, ect. from Osaka, etc.	Completion of verification experimentation in alliance with Tohoku University (Completion of new nitrogen energy device (100W model))			
Industrial Partners			Business with one company for industrial energy generation, and one company for household generation	Business with one automobile manufacturer, one household appliance manufacturer, one trading company, etc.	Business with one overseas energy infrastructure company in each country
Market Scale Estimate (Estimate by Nikkei BP)				One trillion yen	Ten trillion yen

Corporate Profile:

Company Name	Clean Planet Inc.
Representative Director & CEO	Hideki Yoshino
Headquarters	10th Floor, Shin-Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6510 JAPAN
Main Office	21st Floor, Shiodome Shibarikyu Building, 1-2-3 Kaigan, Minato-ku, Tokyo 105-0022 JAPAN
Clean Energy Engineering & Products	1-12 Minami Watarida-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa-ken 210-0855 JAPAN
Advanced Research Laboratory	Research Center for Electron Photon Science, Tohoku University, 1-2-1 Mikamine, Taihaku-ku, Sendai-shi, Miyagi-ken 982-0826 JAPAN
Capital, etc.	Capital: 78.88 million yen, Capital surplus: 756.21 million yen (as of August 28, 2020)
Established	September 2012

Management team

CLEAN PLANET Inc.
Founder and CEO
Hideki Yoshino

・He founded GABA Corporation (a one-on-one English school) in 1995. Until GAVA was sold to NIF Venture in 2004, he was a President and CEO of the company.

・Graduated from Kaisei Academy, University of Tokyo BA in Law, London Business School MSc in Finance

Shotaro Hirano (Director and CFO, Certified Public Accountant)
- After working at Ernst & Young ShinNihon LLC and EY Transaction Advisory Service Co., Ltd. (EYTAS), he works for Regional Economy Vitalization Corporation of Japan, and served as Auditor of GABA Corporation and Director of HIROSHIMA METAL & MACHINERY CO.,LTD.
- Graduated from Keio High School, Keio University BA in Economics

Takehiko Itoh (Director and CTO)
- After serving as chief researcher of the Advanced Projects Group of the Yokohama Research Institute of Mitsubishi Heavy Industries, Ltd., he was appointed a director of Clean Planet Inc. In April 2015, he was appointed as Associate Professor, Research Center for Electron Photon Science, Tohoku University,
- Graduated from Shizuoka Prefectural Fuji Senior High School, Kyoto University MA in Science, Kyoto University BA in Science

Ichiro Asahina (Outside Director)
- After working at the Ministry of International Trade and Industry (currently the Ministry of Economy, Trade and Industry), he established Aoyama Shachu Corporation and became its largest representative (current position). He currently serves as a visiting professor at Business Breakthrough University and as an advisor to many local governments.
- Graduated from Shumei High School, Tokyo University BA in Law, Harvard University Kennedy School of Government MA

Akio Sekiai (Auditor)
- After transferring to Nippon Telegraph and Telephone Corporation and NTT DATA Corporation, he was appointed President and Representative Director of NTT DATA ENGINEERING SYSTEMS Corporation (currently QUNIE CORPORATION). Subsequently, after serving as Managing Director and General Manager of the Corporate Planning Division of NTT DATA SOFIA CORPORATION, he served as Full-time Auditor of XNET Corporation and Adviser of Data Links Corporation
- Tohoku University BA in Law

Kazunori Watanabe (Auditor, Certified Public Accountant)
- After serving as Managing Director (Representative Employee) of Ernst & Young ShinNihon LLC, Auditor of Canon Inc., he serves as Auditor of BellSystem24, Inc. (current) and Director of Mitsubishi Electric Corporation (current).
- Graduated from Kaisei Academy, Hitotsubashi University BA in Sociology

George Ikegawa (Auditor, Certified Public Accountant)
- After working at Ernst & Young ShinNihon LLC, he served as Partner of Aoyama Trust Accounting Firm Co.Ltd., and Auditor of gumi Inc.
- Graduated from Kaisei Academy, Hitotsubashi University BA in Commerce