

Hanwha Newsletter

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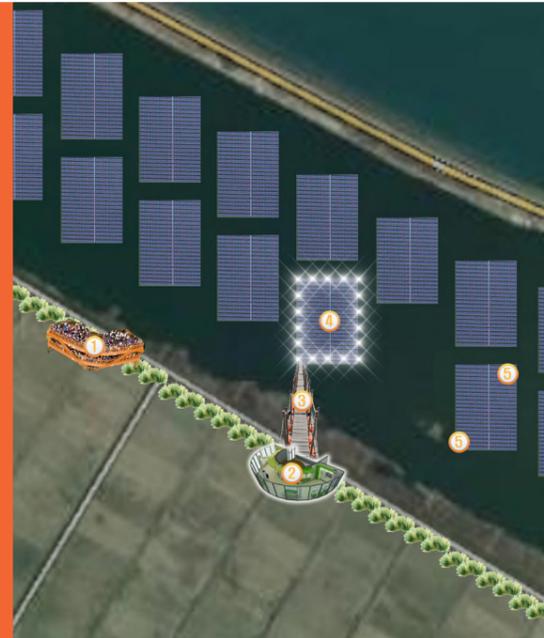
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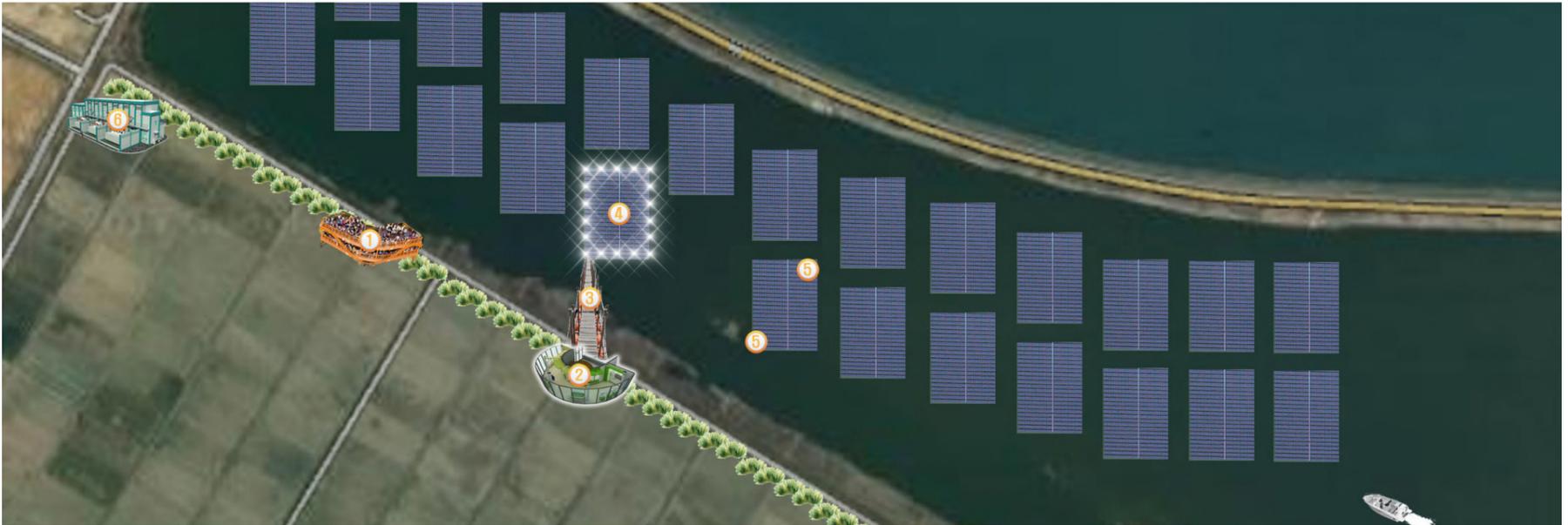
Explore this month's news of Hanwha and its affiliates, taking the initiative in all corners of the world.



Business Highlights

Hanwha to Build World's Largest Floating Solar Farm

· Hanwha wins bid to construct a 100-megawatt solar farm in South Korea to supply enough energy for 140,000 people



Aerial view of the floating solar farm on Seokmun Lake

The Hanwha Group will build the world's biggest floating solar farm capable of generating 100 megawatts of electricity in South Korea.

A floating solar farm is a collection of conventional solar panels installed on a structure that floats over a body of water. This new technology has myriad of benefits such as improving the quality of water around the solar farm, more efficiency (since panels cool over water faster), and greater energy production.

Hanwha General Chemical and its partner KOMIPO (Korea Midland Power Co., Ltd.), were selected to construct the solar power farm on the Seokmun Lake in Dangjin, Chungcheongnam-do province of South Korea, a project led by the Korea Rural Community Corporation.

Of the structure that will ultimately generate 100 megawatts, approximately 80% will be built by Hanwha General Chemical in partnership with KOMIPO, and the remaining 20% by the Korea Rural Community Corporation. Hanwha General Chemical plans to break ground in 2019 after the necessary approvals and permits are obtained. The plant is expected to be fully operational by 2020.

Once completed, the Seokmun Lake floating solar farm will become the largest operational floating solar farm in the world. Once complete, it will cover 1.2 million square meters of Seokmun lake, equal to 168 soccer fields. And the 100 megawatts of electricity generated at the solar farm will be enough to supply the power needs of approximately 140 thousand residents.

"As the leading global player in solar energy, Hanwha Group is committed to delivering solar technology to every corner of the world by leveraging its industrial leadership not only in solar power generation on land but also in floating solar farms worldwide," said Moon Hwan Cha, CEO of Hanwha Solar Power, the solar arm of Hanwha General Chemical and also the actual executor of the project.

Hanwha Group's solar energy affiliate, Hanwha Q CELLS boasts 6.8 gigawatts cell and module production capacity. It is the world's No. 1 manufacturer in terms of cell capacity. Hanwha Q CELLS represents the Hanwha Group's foray and expansion into diverse areas of business, as well as leadership in the global solar market.

Hanwha Q CELLS and Hanwha Q CELLS Korea each manufactures cells and modules. While Hanwha Q CELLS supplies them for the global market and builds solar power plants around the world, Hanwha Q CELLS Korea currently focuses on constructing solar farms only in Korea.

Hanwha Energy project manages and operates solar power plants for the global market. Similarly, Hanwha Solar Power, a subsidiary of Hanwha General Chemical established in June, is also responsible for project managing and operating solar farms but primarily in Korea. ■

Big Data Boosts Smart Plant Innovation



World's Largest Market Share in EVA for Solar and HDPE Bottle Cap

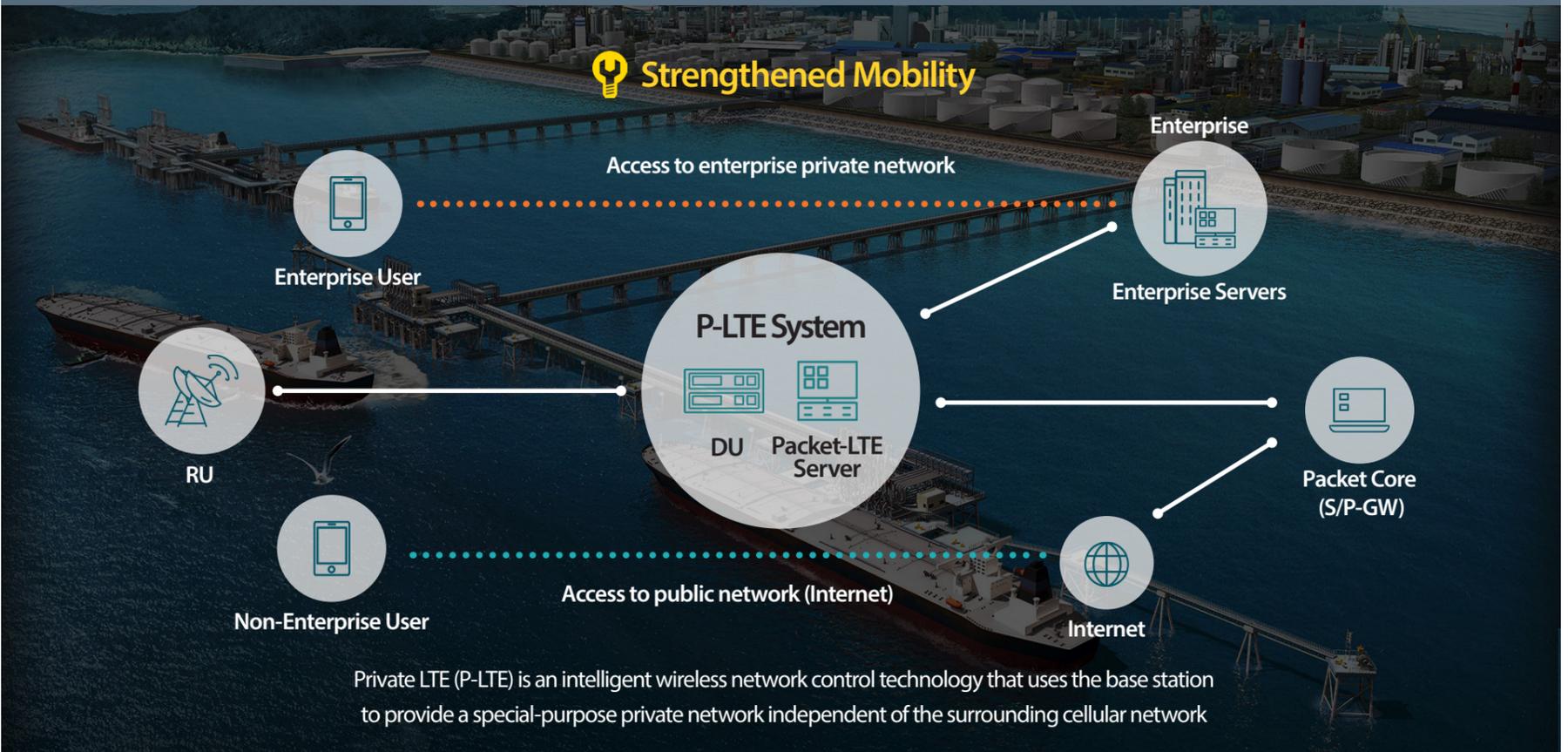
Hanwha Total Petrochemical is a global leader in the field of petrochemicals, engaged in the manufacture and sale in more than 130 countries worldwide. The company boasts No. 1 market share in EVAs for solar cells and HDPE bottle caps on the world market. To be at the forefront of the fourth industrial revolution, Hanwha Total Petrochemical is implementing a big-data-driven smart plant solution.

What Makes Hanwha's Smart Plant "Smart"

Analysis Based on Big Data

Improve reliability, efficiency, and availability of critical assets by analyzing big data with SmartSignal

Hanwha Total Petrochemical's smart plant will be able to execute big-data-based analysis through SmartSignal, a predictive maintenance system by GE. SmartSignal compares real-time data to that of normal and predicted values. It performs correlative analysis and then provides early and actionable warnings of any anomalies that when corrected, can lead to significant reduction in maintenance, asset downtime, and equipment replacements.



Hanwha Total Petrochemical's smart plant is installing a dedicated wireless network (P-LTE) throughout the plant and adopting explosion-proof smartphones to enable real-time task management over the network. This will maximize operational efficiency by providing mobility across sales, logistics, and purchasing.

RPA-powered Task Automation



Working time
reduced
by **80%**

Robotics Process Automation (RPA) is a virtual robot programming technology that increases productivity and efficiency, and reduces cost by automating simple, repetitive tasks

Productivity and efficiency can be significantly improved by adopting the RPA system. RPA reduces working time by approximately 80 percent, freeing up employees to spend their time on more productive, high value-added, and creative tasks.

Bringing Traditional Industries and IT Together



Smart plants are expected to increase operational efficiency and allow for a quicker decision making by diagnosing the plant's status, detecting abnormal operations in advance, and managing the plant in real-time remotely. Hanwha Total Petrochemical's smart plant illustrates how through convergence with information technology, a traditional process industry can be transformed, harnessing the opportunities created by the fourth industrial revolution. ■



The flame for the Olympic Winter Games PyeongChang 2018 reached South Korea on November 1, 100 days ahead of the opening of the games, landing at Incheon International Airport. The flame was lit in Greece – the birthplace of the ancient Olympics – on a torch created by Hanwha. The torch will be carried by 7,500 torchbearers along a route measuring 2,018 kilometers over a period of 101 days until it finally reaches PyeongChang to kick off the opening ceremony.

Olympic Torch Born from Hanwha's Passion

**Passion.
Connected.**






Total  **9,640**
A total of 9,640 torches for the relay

 **-35°C**

 **35m/sec**

}

 **Time**
15:00

The torch is designed to stay lit for at least 15 minutes even in temperatures as low as 35 degrees Celsius below zero and endure wind speeds of up to 35 meters per second.



↑ ↓

700 mm

The torch measures 700 mm in length, reflecting PyeongChang's altitude of 700 meters above sea level

The torch, which will be used to signal the official opening of the Olympic Winter Games was made by Hanwha Corporation.

The company combined its cutting-edge research with advanced materials to make a total of 9,640 torches for the relay. The torch is designed to stay lit for at least 15 minutes even in temperatures as low as 35 degrees Celsius below zero and endure wind speeds of up to 35 meters per second. The torch measures 700 mm in length, reflecting PyeongChang's altitude of 700 meters above sea level. The flame-shaped golden badge at the top of the torch embodies the games' slogan, "Passion. Connected." Pieces of metal from the barbed-wire fence at the DMZ were used to make the top portion of the torch to symbolize peace on the Korean Peninsula and throughout the world.

This is not the first time Hanwha has contributed to the Olympic Games, with the company also providing torches for the Seoul 1988 Olympic Games. The torch for the PyeongChang games is all the more meaningful as it symbolizes the revival of the Olympic flame from 1988.

Hanwha's Flame, the Symbol of the Olympic Winter Games PyeongChang 2018

The flame – ignited by Hanwha's passion – has now set off on a journey to the grand opening of the Olympic Winter Games PyeongChang 2018. While the eyes of people worldwide are set on the international sporting event, the Olympic torch will forever symbolize the spirit of PyeongChang 2018. ■

Hanwha Global Communications Workshop Strengthens Global Connections



Hanwha global reporters from different parts of the world gathered to take part in the 2017 Hanwha Global Communications Workshop held from October 25 to 27 in Korea. Global reporters play a pivotal role in connecting Hanwha across the globe by sharing news from their local establishments through the in-house global communications channel, Hanwha Newsletter.

A group of 34 global reporters from 21 subsidiaries and representing nine companies participated in the three-day workshop to develop an in-depth understanding of the Hanwha Group and its businesses as well as their roles and responsibilities as global reporters in addition to learning measures to strengthen global communication across Hanwha.

Understanding Hanwha: Hanwha Group and Its Businesses

The group of global reporters learned about Hanwha's history, core values, and brand management, visiting Hanwha's history Museum to uncover the company's impact, bolstering their pride as members of the Hanwha family. The global reporters took turns introducing their companies and businesses in person, helping colleagues gain a better understanding of Hanwha's global network and business capabilities. Participants also went on a field trip to Hanwha Q CELLS' Eumseong solar module plant for a firsthand experience of Hanwha's top-tier solar technology.



Developing Communication Skills

In addition, participants received training and engaged in activities designed to improve news article writing and the production of visual content. This training also served as an opportunity to establish common ground among the global reporters, preparing them for their roles and responsibilities as well as providing insight into the importance of global communication.

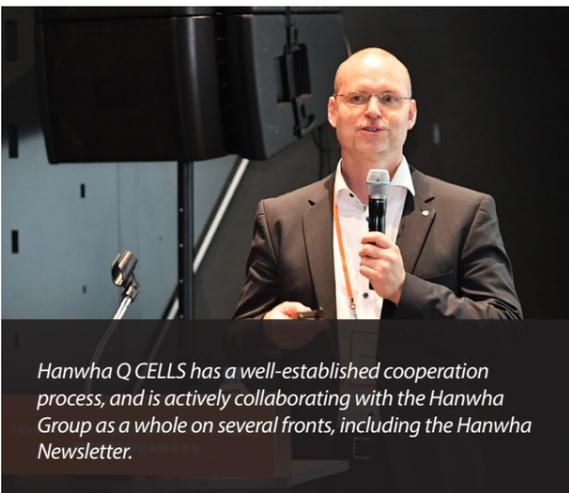


A Forum for Exchange

The workshop also served as the perfect forum for exchange, communication, and mutual understanding between headquarters and subsidiaries while also acting as a platform to strengthen bonds among a diverse group of employees. Hanwha Q CELLS, Hanwha Advanced Materials, and Hanwha Life Vietnam shared their contributions to the Newsletter, highlighting their active involvement in global and local communication activities over the past year. This was followed by a highly productive and insightful discussion among global reporters on ideas to facilitate the Newsletter and the spreading of Hanwha's core values.



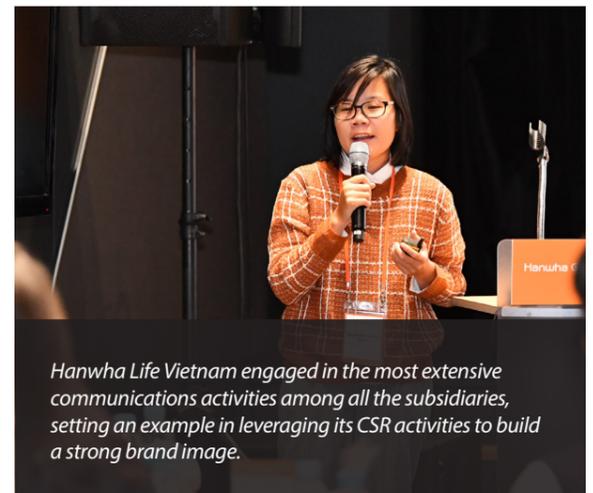
Hanwha Q CELLS, Hanwha Advanced Materials, and Hanwha Life received the Best Activity Award in recognition of their contributions in boosting Group global internal communications over the past year.



Hanwha Q CELLS has a well-established cooperation process, and is actively collaborating with the Hanwha Group as a whole on several fronts, including the Hanwha Newsletter.

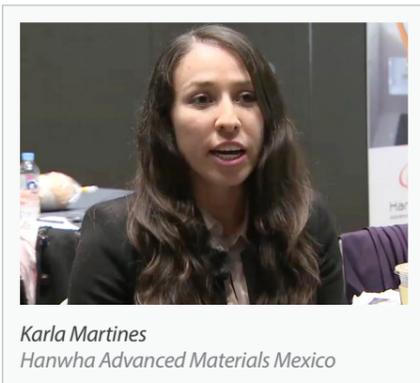


Global reporters of Hanwha Advanced Materials demonstrated active participation in local news submissions, the Hanwha Core Value Essay contest and other related activities, boosting the company's global communication profile.



Hanwha Life Vietnam engaged in the most extensive communications activities among all the subsidiaries, setting an example in leveraging its CSR activities to build a strong brand image.

Hanwha Newsletter Brings Global Communication to Another Level



*Karla Martines
Hanwha Advanced Materials Mexico*



*Katayama Junichi
Hanwha Q CELLS Japan*

"I was able to learn new, helpful skills that I can bring to my job as a global reporter," said Karla Martines of Hanwha Advanced Materials Mexico. Katayama Junichi from the marketing team of Hanwha Q CELLS Japan commented that he "learned about the history and values of Hanwha" and that he is going to "incorporate the new skills in future tasks."

Launched in September 2015 as an in-house communications channel for global employees, Hanwha Newsletter recently celebrated its second anniversary. By sharing local news and business achievements as well as Hanwha's vision and values with the global employees, Hanwha Newsletter serves as a medium to bring Hanwha employees together. ■

Explore This Month's News of Hanwha and Its Affiliates, Taking the Initiative in All Corners of the World



China

Hanwha Hotels & Resorts

Foodist Food Culture(Shanghai) Co., Ltd

Mid-Autumn Day is a major harvest festival celebrated by the Chinese on the 15th of August of the lunar calendar. It's a traditional holiday celebrated throughout Asia. During the festival, families get together and wish for a good harvest under a full moon. They also perform ancestral rituals to the moon, eat mooncakes, and admire laurel tree flowers that folklore says, has existed on the moon and has healing properties.

Foodist Food Culture Shanghai celebrated Mid-Autumn Day by making more than 1,000 mooncakes in Schaeffler stores owned by the company. These special mooncakes were then handed out to employees and clients.



France

Hanwha Q CELLS

Hanwha Q CELLS SAS

Q.FLAT-G4 Powers Doming Plant in France

After revealing Hanwha Q CELLS' Q.FLAT-G4.1 flat-roof system to European markets at Intersolar Europe in June, the company embarked its first system in operation.

The 84 kW Q.FLAT-G4.1 has been installed in east-west orientation on a flat roof of a manufacturing plant of CN Industries—a doming company applying 3D coating to objects and surfaces—in the French Auvergne region. The photovoltaic solution comprises of 280 Q.PEAK-G4.1 300 Wp modules and will produce around 116,280 kWh of clean electricity. This will allow CN Industries save up to 5,218 kg carbon emission per year by using 70% of the self-produced solar electricity to power its doming production.

Q.FLAT-G4.1 flat-roof system is the central element of Hanwha Q CELLS' market strategy for flat roofs of commercial, industrial and public customers in Europe. Since the system comes with a complete one-stop-shop system solution



including planning, documentation, delivery and installation, it enables fast, simple and secure method of installation that does not require roof penetration for the customers. In the future, Hanwha Q CELLS will continue to provide better flat roof solutions for its customers.



Germany



Hanwha Europe GmbH

On September 15th through the 16th, Hanwha Europe GmbH held its 2017 Group Europe Network Strategic Conference in Eschborn Germany. This two-day conference is annual meeting started last year, seeking to spur business cooperation between major European branches, share key business insights and discuss important issues common to all.

A total of 25 representatives from 13 European networks including the UK and Germany attended the conference. Topics included human resources, sales and resolution to key issues that could benefit and create synergy between the networks.



Mexico



Hanwha Advanced Materials Mexico

Hanwha Advanced Materials Mexico has seen great success in the automotive industry in Mexico. The company has experienced rapid growth in a brief time from close relationships with carmakers such as KIA, BMW, Mercedes-Benz, Volkswagen and Ford.

On top of high-profile projects already under way, Hanwha Advanced Materials Mexico expects to begin manufacturing automotive parts for Volkswagen by the end of the year. More projects are expected to follow including parts for Mercedes-Benz in 2018 and BMW and Ford in 2019.

These achievements can be attributed to the dedication of the HAMX team. All of its members had demonstrated dedication, earning the praise of CEO Chong Woo Nam, "I truly appreciate all our employees and their work".



HAMX will embrace more challenges and continue to expand the company's business portfolio in the future.



United States of America



Universal Bearings LLC

On September 21st, Universal Bearings LLC received the prestigious Eaton Corporation Supplier Excellence Award for 2016. This award was presented to only 10 global suppliers in recognition for meeting or exceeding a stringent set of quality performance criteria, delivery standards, and business support requirements in their cross-functional support to the entire Eaton Corporation.

Universal Bearings has been an excellent companion to the Eaton Corporation, helping the company become a leader in the Power Delivery Systems market in the automotive, aerospace, and industrial area.



Hanwha Asset Management

On October 18th, Hanwha Asset Management held a ceremony to officially launch its U.S. subsidiary in New York. The company's CEO Yong-Hyun Kim attended the event.

At the helm of the new U.S. subsidiary will be CEO Jung Woo Sung. Mr. Sung will lead a team of four asset managers at the Manhattan, New York based Hanwha Asset Management USA Ltd., as the firm's alternative investment expert.

By using the American subsidiary as its base, Hanwha Asset Management seeks to directly manage sovereign bonds of advanced economies, including the U.S., while expanding alternative investments in overseas markets.

As a part of the plan, the company took over the New York subsidiary of Hanwha Life last February and filed with the SEC to become an RIA (Registered Investment Advisor). CEO Sung co-heads the alternative investments of Hanwha Asset Management.

The company's entrance into the U.S. market is a part of its long-term strategy to become a global asset manager by increasing expertise and efficiency in asset management.

Led by CEO Yong-Hyun Kim, the company has been largely fortifying its overseas and alternative investment businesses in an effort to nurture new growth engines in overseas markets and alternative assets. And as part of this



effort, Hanwha Investment Management Ltd. in Tianjin, China was established as a solely owned investment house last year. The investment house in China handles stocks, bonds, and alternative investments for the region.

The company's third subsidiary based in Singapore will focus on stocks, bonds, and alternative assets in Australia and in Asian countries other than China.

"With the launch of our U.S. subsidiary, we have completed our trilateral network connecting China, Singapore, and the U.S.," said a spokesperson of Hanwha Asset Management. "Once we receive the approval for managing private equity funds from the Chinese regulators, we will be able to become a truly international asset manager." ■