

Hanwha Newsletter

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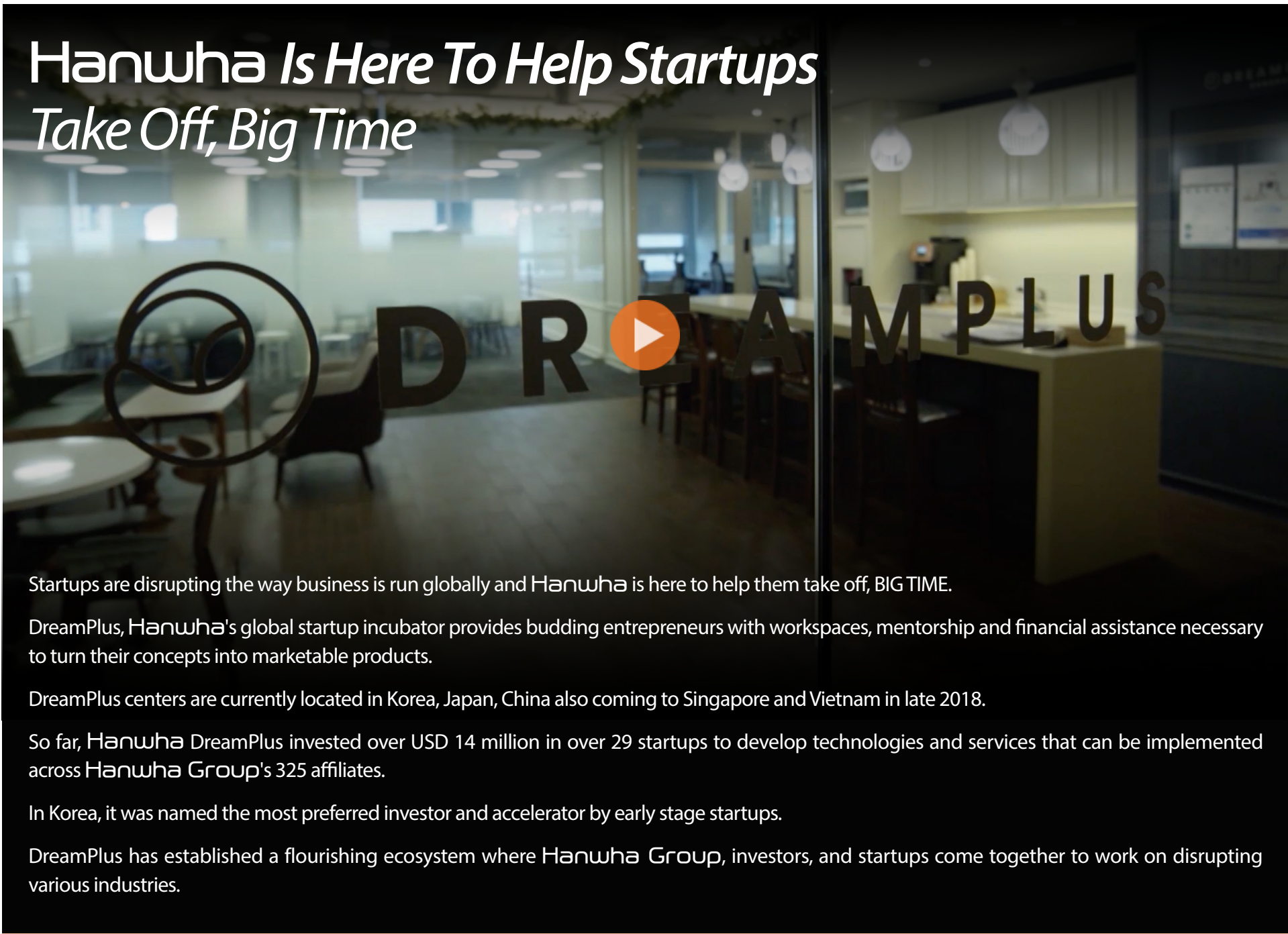
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04 Hanwha Worldwide News

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



Hanwha Is Here To Help Startups Take Off, Big Time



Startups are disrupting the way business is run globally and Hanwha is here to help them take off, BIG TIME.

DreamPlus, Hanwha's global startup incubator provides budding entrepreneurs with workspaces, mentorship and financial assistance necessary to turn their concepts into marketable products.

DreamPlus centers are currently located in Korea, Japan, China also coming to Singapore and Vietnam in late 2018.

So far, Hanwha DreamPlus invested over USD 14 million in over 29 startups to develop technologies and services that can be implemented across Hanwha Group's 325 affiliates.

In Korea, it was named the most preferred investor and accelerator by early stage startups.

DreamPlus has established a flourishing ecosystem where Hanwha Group, investors, and startups come together to work on disrupting various industries.

To watch the video, please go to : www.hanwha.com/en/dreamplusvideo ■

Hanwha DreamPlus Where Disruptive New Business Models Take Flight

During its first year of operation in 2016, Hanwha DreamPlus was named the most preferred investor and accelerator by early-stage startups in Korea. Not due to its super fancy co-working space, but the real benefit that no other accelerator but DreamPlus can offer: an opportunity to tap into Hanwha Group's large global network of 325 international businesses.

To give you a glimpse into how innovative ideas are molded into disruptive business at DreamPlus, QARAsoft and LuxRobo share their experience and insiders' tips on how others may benefit by joining the program.



QARAsoft is a FinTech company that developed the world's first AI financial forecasting app, KOSHO.

Having recently entered into the beta stage, the app utilizes deep learning algorithms to accurately predict market trends based on historical data from the past 30 years. The app also offers gamification features for users to test their financial forecasting skills against the AI to earn coins for in-app purchases.



LuxRobo is an Internet of Things (IoT) company that created the MODI home IoT kit and MODI OS.

Made up of simple interlinking blocks, users can create devices as simple as a light switch and as complex as a motion-controlled car by assembling the MODI kit's components in different ways. The OS can be used to build and operate smart hubs that control various connected devices and gadgets.

What made you join DreamPlus, of all accelerators?

QARAsoft (QS): Initially we needed a working space large enough to accommodate our growing team. Turned out, that wasn't the biggest benefit for us. By joining DreamPlus, we were able to attend networking events where we met investors and partners to help us grow further. We also started to give seminars on fintech and the latest financial trends to potential customers.



QARAsoft raised over US \$1 million in pre-series A round from UK and Korean venture capital firms

Thanks to these opportunities, we were able to raise over US \$1 million in pre-series A investment and are now working with companies in the US, Japan, and Singapore. This really helped us improve brand awareness, and also the quality of our service.

LuxRobo (LR): It's a different story for us since we weren't looking for a working space and we were already quite well connected in terms of securing investment. We joined DreamPlus for the potential business opportunities we could secure through Hanwha's network.

DreamPlus facilitates innovation, by supporting startups with technologies and products that could potentially benefit Hanwha Group's businesses. I thought that this was a great idea. Also, Hanwha is such a large global corporation so I was sure there would be at least one or two business areas that MODI OS can fit into.

It all sounds great, but does "collaboration" actually happen between startups and Hanwha Group?

LR: Yes, I can definitely vouch for that. There are dedicated teams that help startups set up meetings with the right Hanwha affiliates and gauge business opportunities together. Since joining DreamPlus I have made several business suggestions and the staff here have been really helpful and easy to approach.

Obviously, not all of them led to actual business, but they keep encouraging you to try again with a different approach - you get a lot of moral support, which is important for rookie startup founders like me.



LuxRobo Founder & CEO SangHun Oh shows off the MODI Expert Kit

QS: We also got to work directly with several different Hanwha affiliates that are in the online financial services space, including Hanwha Life and Hanwha Asset Management - they adopted our deep learning financial analysis system. Thanks to this endorsement, several other Korean financial institutions have begun to use our system as well.

What is the biggest benefit DreamPlus can offer to startups?

QS: Technologies like AI, deep learning, and blockchain are transforming the financial services industry. Young companies like QARAsoft are already coming to play an important role next to established financial companies such as Goldman Sachs and JP Morgan. However, it is extremely difficult for startups with limited

resources to scale quickly and be able to compete against these big names, without help.

The DreamPlus accelerator model, where large companies collaborate with startups to build a new business model, rather than providing funds and mentorship, is much more practical. With such support, I expect to see a unicorn startup (valued at more than one billion US dollars) in the finance sector in the next five to ten years.



QARAsoft raised over US \$1 million in pre-series A round from UK and Korean venture capital firms

LR: Despite the innovative technology, it's still difficult for a startup like us with limited references and portfolio to sign a profitable business deal. That's where Hanwha DreamPlus can step in and make a real difference. As an investor and accelerator, Hanwha knows our business through and through - so they can effectively validate our technology.

For example, LuxRobo recently signed an MOU with Hanwha E&C (Engineering and Construction) to build smart homes, which now allows us to be a part of multi-million dollars projects overseas. It would have taken us a few more decades to be able to work on projects at such a scale if Hanwha E&C wasn't there to vouch for our product, which is mostly in the conceptual stage.



On April 3, 2018, Hanwha E&C signed an MOU with LuxRobo to build smart homes

What does Hanwha get out of this?

LR: Hanwha Group has the resources and brand name to pull off international projects like that, but it can be difficult sometimes for large established companies to think outside the box. Startups are lean and innovative, not scared to take risks, so we in turn can help Hanwha change the way they work.

For instance, Hanwha E&C is primarily focused on building houses and apartment blocks based on the needs of the Korean market. Thanks to our MODI OS, they can immediately implement smart home technologies without spending years in

R&D, and jump into the global race to build smart cities. What are your plans moving forward?



DreamPlus is a flourishing ecosystem where Hanwha Group and startups collaborate in a shared space

LR: LuxRobo is running an IoT acceleration program in partnership with Hanwha DreamPlus. There are lots of small to mid-sized companies that want to provide built-in appliances to construction projects but don't have the engineering capacity to add smart functionality to those appliances.

With support from DreamPlus, LuxRobo will build a working prototype for these companies and even help out with the registration process. So all they will have to do is manufacture and make a profit.

QS: We've spent the past four years establishing ourselves within the business community. Now we're moving towards providing more B2C services. We just released a beta version of our KOSHO app this June. Our short-term goal with KOSHO is to have at least 10% of the world's asset management transactions take place through the app. ■

The Sun Will Come Out Tomorrow At Hanwha, Today

Hanwha is the world's leading solar energy solution provider with annual solar cells and modules production capacity of 8GW.



What makes Hanwha even more extraordinary is the social value it creates. By leveraging its cutting-edge technology to produce renewable energy solutions, Hanwha is helping the environment and making the local communities better.



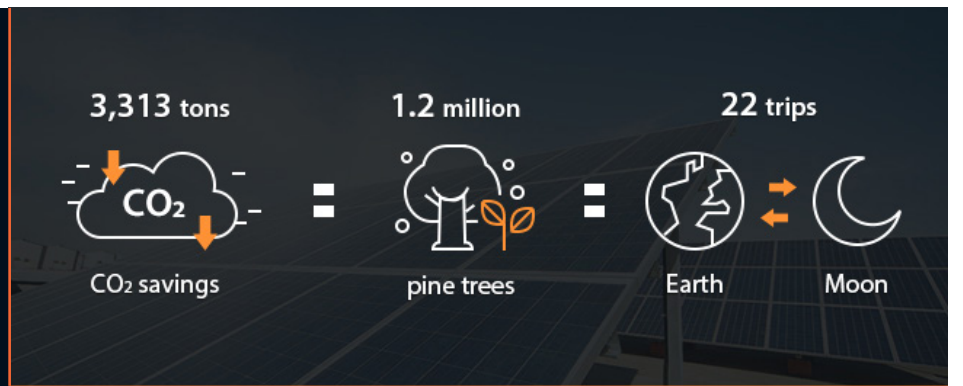
Happy Sunshine Campaign

Since its inception in 2011, Hanwha has supplied 1,527kW of power that can generate 7.3 million kwh of energy to 217 community welfare centers in South Korea.



Happy Sunshine Campaign

The Happy Sunshine campaign can be credited for reducing 3,313 tons of CO2 emissions. This amount is equivalent to what 1.2 million pine trees can do in a year or the equivalent of gasoline-engine car making 22 round trips between the earth and the moon.



Happy Sunshine Campaign

Hanwha also operates Hanwha Hope Project, an initiative that donated solar power generation systems to elementary schools in underserved areas in China.



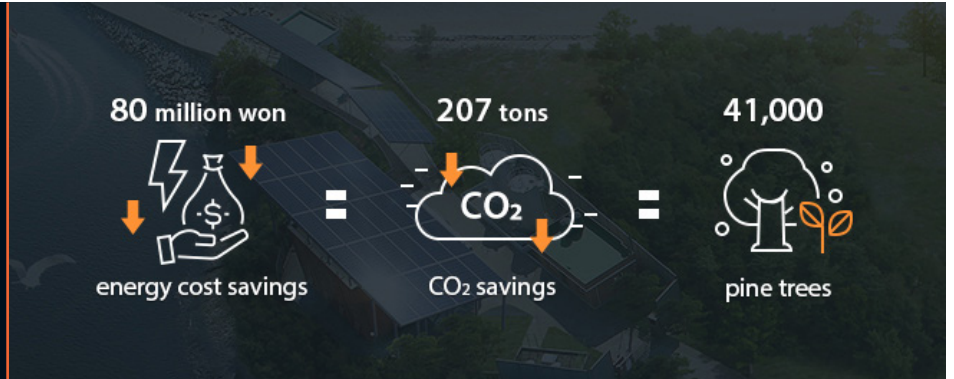
Renewable Energy Island

Hanwha donated solar power generation assets that collectively could produce 210kW of solar power and an Energy Storage Systems that could store 900kWh of energy, effectively making Jukdo island in South Korea 100% energy-independent. Using Hanwha Energy's solar generation and storage system, the residents of Jukdo island can enjoy 1,120kWh of electricity per day.



Renewable Energy Island

Thanks to Hanwha, the island of Jukdo can now save approximately 80 million won(\$80K USD) in power production costs per year while reducing 207 tons of CO2 emission. This is about the same as planting 41,000 pine trees.



Renewable Energy Island

Jukdo residents are also doing their part to contribute to the reduction of the carbon footprint by turning to green tourism. They've set up eco-friendly camping sites, reduced fees to promote fishing at parks and adopted other efforts such as the use of green energy supplies, recycling and keeping "green" at the forefront of everyone's minds as part of their pursuit to improve the island's economy.



Going further, together is how Hanwha not only powers its own business but also how it contributes to the vision to increase the social value for the global society. ■



CAN A BUSINESS WITH A CONSCIENCE BE SUCCESSFUL?

Hanwha Life Vietnam was named among Vietnam's Top 10 Sustainable Businesses by the Vietnam Chamber of Commerce and Industry (VCCI) in December of 2017. This assessment measures businesses through three key criteria – economic, social, and environmental influence.



A Helping Hand

Hanwha Life Vietnam helped build houses, schools, and health centers across the country and donated almost one million US dollars in sponsorship funds for people in need.



165
BIKES FOR CHILDREN
TO GET TO SCHOOL



160
HOUSES IN THE
MEKONG DELTA

VND 22 Billion
DONATED IN TOTAL
CSR ACTIVITIES
*U.S. \$960,000



37,500
HEALTH INSURANCE CARDS
WORTH VND 9.4 BILLION
*U.S. \$413,000



Years of Robust Growth

Hanwha Life opened its first Vietnamese office in 2005. Since officially launching in 2009, Hanwha Life Vietnam has quickly established itself as one of the Vietnamese insurance industry's fastest growing companies.

From 2012 to 2017 Hanwha Life Vietnam Saw



41%
NEW POLICY
REVENUE GROWTH



54%
TOTAL PREMIUM
GROWTH



108
CUSTOMER
SERVICE CENTERS



VND 500 Billion
IN REVENUE
*U.S. \$2,200,000



40,000
FINANCIAL CONSULTANTS
RECRUITED



A Successful Business With A Conscience

Hanwha Life Vietnam's vigorous expansion allowed it to improve its service quality. The company was awarded the Golden Dragon Award* for Best Financial Services for 6 consecutive years from 2010 to 2015.



Now, Hanwha Life Vietnam is helping

200,000

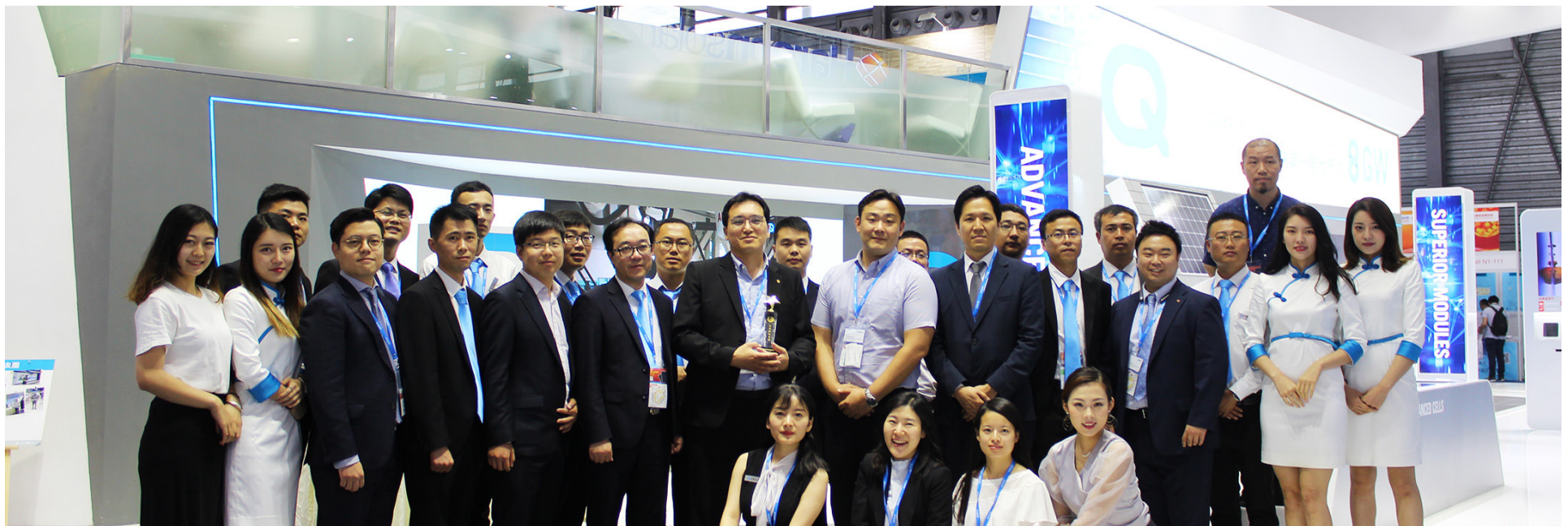
customers across Vietnam
secure their futures

* Awarded by the Vietnam Economic Times, VCCI,
and the Ministry of Planning and Investment in Vietnam



Hanwha Q CELLS Launches New Q.PEAK Solar Module at World's Largest Solar Exhibition

- Hanwha Q CELLS displays major presence at Shanghai New Energy Conference 2018, with the largest booth ever constructed by the company at this conference's history
- Company hopes to expand number of Chinese partner companies through its Q.PARTNERS program production



Hanwha Q CELLS promoted its products and services in the largest booth ever constructed at the Shanghai New Energy Conference

Hanwha Q CELLS demonstrated its commitment to the Chinese solar market at the 12th annual Shanghai New Energy Conference (SNEC), held in the Shanghai New International Expo Centre, from May 28 to May 30. SNEC is regarded as one of the world's Big Four solar exhibitions with around 1,800 companies and 220,000 visitors last year.

This year, Hanwha Q CELLS held the largest booth it has ever constructed for SNEC, to launch its Q.PEAK-G5 solar module and also to introduce its new partners program, Q.PARTNERS. Over the three days of conference, potential customers and partners gathered to its booth to see Hanwha Q CELLS' latest product offering.

An Ideal Solution for Real, Severe Conditions

The Q.PEAK-G5 solar module is the latest Hanwha Q CELLS product available on the Chinese market. Comprising monocrystalline solar cells that use the company's proprietary Q.ANTUM cell technology, the module is an ideal solution for residential buildings. The 60-cell Q.PEAK-G5 is capable of producing up to 310Wp while the 72-cell Q.PEAK L-G5 can produce up to 370Wp.

The module also incorporates Anti-PID technology, Hot-Spot Protect, Traceable Quality Tra.Q™, and Anti-LID technology to maximize power generation. The world-record cell design was developed to achieve the best performance under real conditions – even with low radiation intensity and on clear, hot summer days.

Learn more about the Q.PEAK-G5 solar module. (Note: Video has no audio.)

Solidifying Market Leadership in China

Hanwha Q CELLS also announced its intention to expand its network of Chinese partner companies through its Q.PARTNERS program. First launched in China in 2017, Q.PARTNERS provides cooperative services such as product training and marketing materials provision for local Q CELLS partner companies. Hanwha Q CELLS currently has over 600 partner companies in Europe and over 800 partner companies in Japan.

In addition to the exhibition booth, Hanwha Q CELLS also attended the SNEC Conference, which was an opportunity for Hanwha Q CELLS to promote its advanced technology and solidify its position as the world's leading solar energy brand. Hanwha Q CELLS (Qidong) Co., Ltd. Module Development Team Leader, Liu Zhenyang, delivered a lecture on Q.ANTUM technology and solar module testing at the Kerry Hotel Pudong on May 29.

"China is one of our main production bases as well as the world's largest solar market," says Hanwha Q CELLS CEO Sungwoo Nam, adding: "We plan to use our advanced technology and production capabilities to firmly position ourselves in the Chinese market and lead the rapidly growing global solar market."

Hanwha Q CELLS Korea to Build Photovoltaic Manufacturing Facility in Georgia, USA

- Construction of solar module production facility in Georgia will commence in 2018 and is scheduled to be completed in 2019
- Hanwha Q CELLS aims to maintain leading market position in the U.S. by delivering high quality solar modules through local U.S. production



Hanwha Q CELLS Korea Corporation is building a solar module manufacturing facility in the US. Construction for the factory in Whitfield County, Georgia will commence in 2018 and is scheduled to be completed in 2019. Its capacity will exceed 1.6 GW per year. The high quality modules manufactured by Hanwha Q CELLS Korea in the U.S. will be provided to Hanwha Q CELLS, which will have access to 100% of the facility's production volume.

Maintaining a leading market position in the US

With the completion of the production facility in Georgia, Hanwha Q CELLS Korea, together with Hanwha Q CELLS, another affiliate of Hanwha Group, will have manufacturing facilities in South Korea, Malaysia, China, and the U.S., at its

disposal. The new manufacturing fab is testament to Hanwha Q CELLS Korea's commitment to the U.S. market, in spite of the recently imposed trade barriers.

According to Solar Power Europe, the U.S. was the second largest solar market in 2017. Furthermore, the U.S. market is also one of the most important markets for Hanwha Q CELLS Korea. Upon commencement of manufacturing activities in the U.S. fab, Hanwha Q CELLS Korea will supply high quality PERC modules to the roof-top and ground-mounted segments in the U.S. As the U.S. market has traditionally been a market that valued performance and quality, the new plant is expected to enable Hanwha Q CELLS Korea to widen its customer base in the U.S.



Hanwha Q CELLS Korea to Install Solar Panels at Gas Stations Across South Korea

- Hanwha Q CELLS Korea signs MOU with KOSA, Dongwon EnC Corp., Dasstech Co., Ltd., and Jeonbuk Bank Ltd to develop solar-powered gas stations
- Innovative project to utilize unused roof space of gas stations to potentially power households with renewable energy



Hanwha Q CELLS' Solar panels installed onto the roof in downtown Frankfurt, Germany

Hanwha Q CELLS Korea recently inked a multi-party memorandum of understanding (MOU) in a landmark project to install solar panels across gas stations in South Korea. The project will see Hanwha Q CELLS Korea provide solar modules to members of the Korea Oil Station Association (KOSA), with Dasstech Co., Ltd. supplying the power inverters for efficient energy conversion. Dongwon EnC Corp. will manage the installation process, while Jeonbuk Bank Ltd is offering financial support for the project.

Hyun-Soo Cho, President and CEO of Hanwha Q CELLS Korea, was on hand at the signing ceremony to sign the MOU with Young-Hwa Lee, President of KOSA, Jun-Ho Kang, CEO of Dongwon EnC Corp., Jung-Yang Kum, Vice President of Dasstech Co., Ltd., and Gyeong-Sik Shim, Branch Manager of Jeonbuk Bank Ltd, for their involvement and investment to develop these solar-powered gas stations.

One of the main benefits of this project is that it helps to conserve land space usually required for solar panels by utilizing the unused space of a gas station's rooftop. The roofs of Korean gas stations are typically higher than those of adjacent structures, making them ideal for harnessing solar energy, and are also highly accessible for maintenance purposes. Another positive aspect and long-term potential of this project is that the solar energy can be used in a distributed generation system.

By installing solar panels, gas station owners will receive Renewable Energy Certification and up to 50% more benefits than if they only use conventional power sources. If all 13,000 gas stations in Korea are fitted with solar panels, they would be capable of generating 300MW of power, which can meet the electricity demands of about 90,000 local households every year. The installation cost for 300MW PV systems reach approximately 300 billion won.

Numerous companies abroad have embarked on similar projects to develop solar-powered gas stations. In 2016, French energy company Total S.A. invested \$300 million with the goal of installing a total of 200MW of solar panels across 5,000 service stations worldwide over the next five years. The ENOC (Emirates National Oil Company) Group announced in 2017 that it will install solar panels at all its new gas stations, beginning with installations in Dubai.

"This exciting project is part of Hanwha Q CELLS Korea's ongoing efforts to continue to increase the development of solar power generation and expand market demand," said Hyun-Soo Cho, President and CEO of Hanwha Q CELLS Korea. "Solar-powered gas stations are an interesting hybrid concept that combines solar energy with fossil fuels, illustrating how both energy sources can work side-by-side in a real business environment." ■

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



China



Hanwha Total Petrochemical Trading (Shanghai)

Hanwha Total Petrochemical Shanghai Hosts Technical Seminar Ahead of CHINAPLAS 2018

On April 24, Hanwha Total Petrochemical hosted a technical seminar for 100 attendees during CHINAPLAS 2018, the leading international plastics and rubber trade fair, in Shanghai. The seminar was part of the company's ongoing efforts to educate and support key customers that attend the annual exhibition. At the session, Hanwha Total Petrochemical introduced its latest products and sample items, and shared its insights on upcoming industry trends.

The seminar's highlight was a showcase of the company's newest plant, which utilizes the Advanced Double Loop (ADL) construction method. Visitors also learned more about the plant's anticipated production capacity, processes, and product applications after it is built. Hanwha expects to complete construction by December of 2019.



Germany



Hanwha Europe GmbH

Hanwha Europe GmbH Sets Attendance Record at Wire 2018

From April 16 to 20, Hanwha Europe GmbH attended Wire 2018, the world's largest wire and cable exhibition, held in Dusseldorf, Germany. During the event, representatives of wire and cable companies from around the world shared perspectives on the industry, promoted their latest products, and engaged in various networking opportunities. Hanwha Europe GmbH set a record during the exhibition, holding 90 meetings with the highest number of attendees at its booth. It also set a new record for the highest number of technical seminar attendees as 64 technical professionals from 28 companies participated in Hanwha's sessions.





Korea



Hanwha Total Petrochemical Begins Commercial Production of N-Heptane

Hanwha Total Petrochemical now commercially produces high purity normal heptane (n-heptane) at its Daesan plant in South Chungcheong Province, Korea. The company invested KRW 30 billion (USD 29 million) to build the n-heptane production facility. Through its proprietary process technology, Hanwha Total Petrochemical's Daesan plant produces 12,000 tons of high value-added petrochemical products a year, including 7,500 tons of high purity n-heptane.

Overall manufacturing efficiency will be boosted by producing n-heptane with 99% purity that can be applied to various petrochemical products. With an expected KRW 20 billion (USD 19 million) increase in profits through this commercial production, Hanwha Total Petrochemical will continue to increase its competitiveness in the industry by promoting high value-added byproducts and large-scale production.



Hanwha Advanced Materials Cheer on Hanwha Eagles

On April 16, 190 employees from Hanwha Advanced Materials, including President and CEO Sun Suk Lee, went out to a baseball game at Daejeon Hanwha Life Eagles Park to cheer on the Hanwha Eagles as the team faced off against the KT Wiz. Employees from Hanwha Q CELLS also attended the game.

Twenty students from the Neulhaerang Choir kicked off the game by singing the Korean national anthem. These students are sponsored by Hanwha Advanced Materials as part of its efforts to provide educational opportunities to disadvantaged children.



The employees had a great time at the game, cheering for the Hanwha Eagles. Thanks to the positive feedback, Hanwha Advanced Materials is planning more outings to increase employee engagement.



Mexico

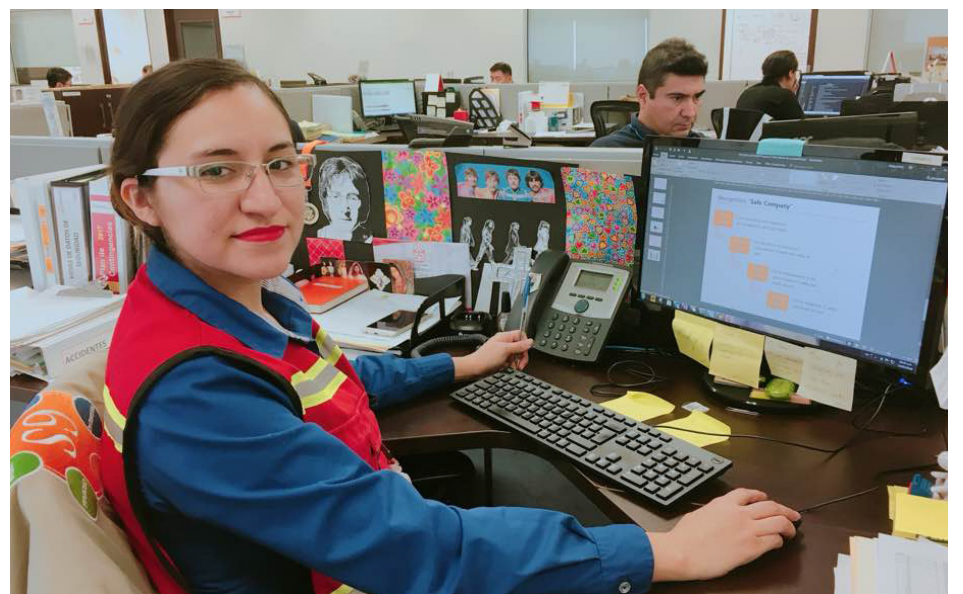


Hanwha Advanced Materials Mexico S. De R.L. De C.V.

Hanwha Advanced Materials Mexico Aims for the Top Safety and Health at Work with PASST Certification

Hanwha Advanced Materials Mexico (HAMX) is working to comply with the Mexican government's Programa de Autogestion de Seguridad y Salud en el Trabajo (PASST), or Occupational Health and Safety-Self-Management Program, in order to be certified as a safe and hygienic workplace. There are four levels of PASST certification that companies can obtain, beginning with Level 1. Many international companies in Mexico strive to achieve this certification.

Hanwha Advanced Materials Mexico spent two months preparing to receive PASST certification. The Secretaria del Trabajo y Prevision Social (STPS), or Mexican Secretariat of Labor and Social Welfare, will evaluate HAMX for six months before conducting an audit in November of 2018. If HAMX passes the audit, the company will receive a Level 1 PASST certification.



"I'm glad I was able to participate in this program," says Mabeli Carolina Cebeda Arias of HAMX's Environment, Health and Safety Team. "I hope all employees understand how important safety and health is at the workplace and how this program helps improve our work environment."

HAMX is aiming to receive Level 4 certification by 2025.



Hanwha Advanced Materials

Hanwha Advanced Materials Mexico S. De R.L. De C.V.

Hanwha Advanced Materials Mexico Begins Thermoforming Production Line for BMW

Hanwha Advanced Materials Mexico recently set up a thermoforming production line to manufacture wheel arch liners for the BMW G2X platform. Technicians, manufacturers, and maintenance teams from Hanwha Advanced Materials headquarters collaborated extensively during the production process to minimize every technical issue. Installation of the thermoforming production line was completed in May of 2018. Production testing is underway and mass production of the wheel arch liners is scheduled to begin in April of 2019. ■