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Hanwha Q CELLS

# COMPANY INTRODUCTION

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# OUR OBJECTIVE: MAKING SOLAR ENERGY COMPETITIVE

Hanwha Q CELLS Co., Ltd. (NASDAQ:HQCL) is one of the world's largest and most recognized photovoltaic manufacturers for its high-quality, high-efficiency solar cells and modules. It is headquartered in Seoul, South Korea (Global Executive HQ) and Thalheim, Germany (Technology & Innovation HQ). With its diverse international manufacturing facilities in South Korea, Malaysia and China, Hanwha Q CELLS is in a unique position to flexibly address all global markets. Hanwha Q CELLS offers the full spectrum of photovoltaic products, applications and solutions, from modules to kits to systems to large scale solar power plants.

Through its growing global business network spanning Europe, North America, Asia, South America, Africa and the Middle East, the company provides excellent services and long-term partnership to its customers in the utility, commercial, government and residential markets. Hanwha Q CELLS is a leader in the world's solar industry and a flagship company of Hanwha Group, a FORTUNE® Global 500 firm and among the eight biggest business enterprises in South Korea. Hanwha Q CELLS' cell production capacity of 5.7 GW and its solar module manufacturing capacity of 5.7 GW makes the company the largest cell and one of the biggest solar module manufacturers in the world.

Our mission is to leverage continual PV innovations and continue to extend our lead in the global solar industry, while remaining a partner our customers can depend on.

## OUR TWO MOST IMPORTANT CORPORATE OBJECTIVES ARE TO ...

- Quickly and sustainably reduce the cost of photovoltaics;
- Make solar energy competitive.

## TO ACHIEVE THESE GOALS, WE WILL ...

- Support the development of innovations and new technologies which will lead to a reduction in energy costs (LCOE, or Levelised Cost of Electricity);
- Expand our EPC business (engineering, procurement and construction) in addition to developing opportunities in project development.



# Hanwha Q CELLS TECHNOLOGY AND QUALITY LEADERSHIP IS OUR STRENGTH






THE PRODUCT BRAND OF HANWHA Q CELLS IS THE RENOWNED Q CELLS BRAND. THE Q CELLS PRODUCT BRAND MARKETS A PREMIUM MODULE PORTFOLIO INCLUDING Q.PLUS, Q.PEAK, Q.POWER, AND Q.PRIME.

Q CELLS SOLAR MODULES MEET THE HIGHEST QUALITY STANDARDS, ARE EXTREMELY RELIABLE, AND ACHIEVE OUTSTANDING ENERGY YIELDS.

## KEY BENEFITS:

- Q.ANTUM technology:**  
 Q CELLS modules achieve higher yields per surface area, have lower BOS costs, reach higher power classes, and boast excellent efficiency rates.
- Triple Yield Security:**  
 The Q CELLS Triple Yield Security combines the guaranteed resistance to potential induced degradation (PID) with protection against hot-spots and product forgery.
- Engineered in Germany:**  
 Q CELLS modules are engineered in Germany. At our headquarters for technology and innovation in Thalheim, Germany, we constantly explore new methods and technologies to maintain our leading global position.
- VDE Quality Tested:**  
 Q CELLS modules, solar power plants, and EPC services have been certified by the strict Quality Tested Program of the VDE certification institute.

## THE IDEAL SOLUTION FOR:

- 
**Commercial and industrial rooftop installations**
- 
**Private rooftop installations**
- 
**Solar power plants on the ground**

**Q.PLUS**



**Q.PEAK**



**Q.HOME / Q.HOME+**



**Q.POWER**



**Q.PRIME**



Hanwha Q CELLS never stops improving its products. Our premium solar modules are the result of our industry-leading technical expertise. More than 400 scientists and engineers research, develop, and conduct tests in our four R&D centers and in our module test center. Altogether more than 1,300 employees work in our four R&D centers and in our manufacturing plants for innovation and improvement in technology and quality. It is no coincidence that our solar modules have set numerous world records for efficiency. We have been awarded the 2016 Top Brand PV Seal in Europe, the USA and Australia, which shows that our customers place trust in quality and performance of our products.

# BACKED BY A STRONG PARTNER



As a member of **Hanwha** Group — one of South Korea's eight largest corporations — **Hanwha Q CELLS** is backed by a strong partner with a proud 64-year history.

At **Hanwha**, the philosophy of giving – and earning – trust and loyalty has long been the foundation of our success. It is at the center of everything we do, constantly driving us to develop better solutions that will improve the future for our communities and the people who live in them across the world.

Driven by this corporate philosophy, **Hanwha** is able to meet the energy needs of people and institutions in such diverse fields as manufacturing, construction, finance, services, and leisure. Our full-scale entry into the photovoltaic business in 2010 was a natural extension of this mission, allowing us to offer a world-class array of sustainable, efficient solar products and services.

Consequently, our clients today benefit from a full menu of totally integrated energy solutions, ranging from polysilicon production via the manufacturing of solar cells and modules, to the development and construction of power generation facilities.

No matter what solution we devise, **Hanwha** is committed to delivering the kind of positive energy that helps ensure a sustainable future for both mankind and the planet.



A WORLD-CLASS ORGANISATION BENT ON

# BUILDING A BETTER WORLD

It is easy to claim to be a global leader and innovator, but the proof is in the details. **Hanwha's** experience, broad expertise and financial strength uniquely position us to address our clients' energy needs today – and tomorrow.

## 64 YEARS

Experience can't be achieved overnight; it takes time — in our case, more than six decades of hard work and dedication. From our beginnings in the manufacturing industry, we've grown to become a diverse worldwide organization as a FORTUNE® Global 500 company through both organic expansion and acquisitions. Today, we are among the eight largest companies in South Korea.

## 226 GLOBAL NETWORKS

Being a global leader requires a local presence. Our network of offices spans Europe, Asia, Australia and the Americas — which allows us to maintain a team of experts on the ground to address customers' needs in real time.

## 56 DOMESTIC AFFILIATES

Our family of companies specializes in everything from energy to chemicals to life insurance, making us one of South Korea's eight largest enterprises.

## 145.38 BILLION USD IN ASSETS

A strong balance sheet is the key to being able to implement and manage long-term solar energy solutions. It is also a fundamental strength that enables us to foster long-lasting relationships with customers.



# Hanwha GROUP CORPORATE SOCIAL RESPONSIBILITY

## OUR FOCUS ON COMMUNITY IS MAKING A BRIGHTER TOMORROW.

We are committed to fulfilling our corporate social responsibility in such areas as social welfare, arts and culture, public services, and foreign aid. Led by the Hanwha Social Responsibility Center, our more than 70 workplaces in Korea and worldwide strive to share the energy of life with our neighbors, communities, and the world.

### THE HANWHA SOLAR FOREST CAMPAIGN

In collaboration with the UN Convention to Combat Desertification, Hanwha Group donated a solar power plant, providing power to a 3,200m<sup>2</sup> tree nursery for the reforestation of the Mu Us Desert. Hanwha Group also planted 230,000 trees in the Nature Conservation Area in Tuijin Nars, Selenge, Mongolia, creating the first Solar Forest in 2012. In September 2013, the second Solar Forest was established in the Mu Us Desert of Lingwu City, China. Hanwha Group introduced its third Solar Forest in 2014 in Seoul, Korea, letting children experience nature free from dust and yellow sand. Hanwha Group's anti-desertification efforts contribute to water purification and pest control. The Fourth Hanwha Solar Forest was created in 2015 as a school forest in Yinchuan City, Ningxia, China. Yinchuan City is home to the Hui nationality, and for the students of Jinglong Huimin Primary School, Hanwha planted 10,000 of various trees and flowers at the school. Along with the tree planting event, an educational program for



the students to help them understand the value of environment and become ecologically sensitive was also provided. In May 2016, through laying the groundwork for 1,700 seedlings in Seosan, Hanwha Group has successfully planted its 5th Solar Forest under the theme "encouragement and effort for growth".

### SUPPORTING THE "GREENER DAVOS INITIATIVE"

Hanwha Q CELLS also supports the "Greener Davos" initiative by the municipality of Davos and the World Economic Forum by sponsoring its high efficiency Q.PEAK modules for a 340kWp PV solar system on the rooftop of the Davos Congress Center. The solar system helps to lower the environmental impact of the annual meeting by creating enough energy to save more than 10 tons of CO<sub>2</sub> emissions each year. The sponsoring project underlines the dedication of Hanwha Q CELLS' parent company, Hanwha Group, to making our world more sustainable and addressing the combined challenges of a dynamic economy, climate change and the depletion of our worldwide energy resources.

### REDUCING THE CARBON FOOTPRINT IS A KEY INITIATIVE

Reducing greenhouse gas emission is at the top of the agenda for all companies around the world. In 1999 Hanwha Group officially embarked upon its efforts to reduce its carbon footprint by organizing an energy task force to reduce CO<sub>2</sub> emissions and save energy. In 2014 Hanwha Q CELLS put a 500 kilowatt PV plant on the rooftop of its own car park into operation. The plant, comprising about 2,000 Q CELLS modules will produce around 9.44 gigawatt hours and save around 5,000 tons of CO<sub>2</sub> emissions over a period of 20 years. The system's east-west orientation doubles the performance density compared to a south orientation and maximizes the yield based on the available roof surface. Hanwha Q CELLS consumes 100% of the electricity from this system on-site. The rooftop plant powers the R&D center as well as the office buildings at Hanwha Q CELLS' headquarters for technology & innovation in Germany. In 2015 Hanwha Q CELLS set up a second freefield solar power plant with an overall capacity of 3.8 MW. A flock of mini sheep from Brittany were moved into the area of the PV plant. The around 150 animals are small enough to fit under the module tables of the PV plant. Thus, they are ideally suited to constantly keep the vegetation short throughout the power plant.





# EXPERIENCE THE POWER OF A GLOBAL COMPANY OPERATING AS ONE

## Hanwha Chemical

As a leading Korean chemical manufacturer, **Hanwha Chemical** is pioneering next-generation solutions in solar energy through significant investments in the production of polysilicon and EVA resin, a raw material used in the creation of EVA sheets.

## Hanwha Corporation/Machinery

Using advanced technologies, **Hanwha Corporation/Machinery** develops automated industrial equipment used to manufacture everything from solar modules to automobiles.

## Hanwha Advanced Materials

With plants in the USA, Canada, China and the Czech Republic—and an ever-expanding production capability — **Hanwha Advanced Materials** produces high-tech materials such as EVA sheets for photovoltaic module encapsulation.

## Hanwha Q CELLS

**Hanwha Q CELLS** is one of the world's leading photovoltaic companies and offers a wide range of photovoltaic solutions. As a global leader, **Hanwha Q CELLS** is committed to maintaining our excellent quality, combined with industry-leading technological innovations.

Hanwha Advanced Materials

Hanwha Chemical

Hanwha Corporation/Machinery

Hanwha Q CELLS

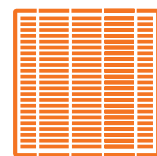
Hanwha Q CELLS



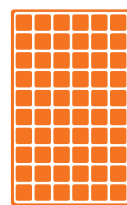
POLY SILICON



INGOTS & WAFERS



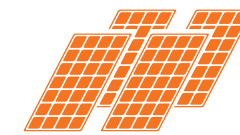
CELLS



MODULES



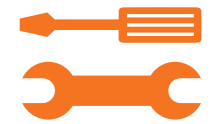
RESIDENTIAL SYSTEMS



EPC / SYSTEMS



MONITORING



O&M



01 OUR SOLAR BUSINESS IN FOCUS

## CAPACITY

THE LARGEST CELL PRODUCTION CAPACITY IN THE WORLD

5.7 GW\* Total Annual Cell Production Capacity

# NO.1

Hanwha Q CELLS is the world's largest producer of photovoltaics, boasting annual cell production of 5.7 GW\*. Hanwha Q CELLS operates a strategically diversified manufacturing footprint that gives it a significant competitive advantage. And, with a production capacity of 5.7 GW\*, it is also one of the world's largest solar module manufacturers. (\*as of end of 2016)





## 02 OUR SOLAR BUSINESS IN FOCUS

# QUALITY

### WORLD-CLASS QUALITY

Hanwha Q CELLS is one of the most trusted names in the global solar industry, with top-quality solar products and services. Hanwha Q CELLS features cutting edge solar cell technologies and maintains state-of-the-art research and development capabilities. Its products have been independently tested and verified by the rigorous and independent quality assurance programme of the German certification institute, VDE.

Hanwha Q CELLS operates its own VDE-certified testing laboratory to test products under extreme conditions such as hail showers and desert heat. The outstanding quality of its products has been proven by the 2013 and 2014 PHOTON yield measurement: in a comparison of over 170 modules, the Q.PRO-G2 235 solar module was named the best polycrystalline solar module of the year.



## 03 OUR SOLAR BUSINESS IN FOCUS

# R&D

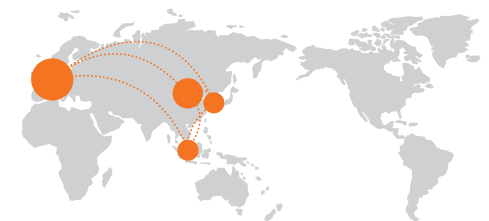
### A GLOBAL R&D NETWORK

# 4 COUNTRIES

To remain a leading global solar company, we constantly explore new methods and technologies. Our outstanding R&D lets us improve both our products and the methods we use to manufacture them — allowing us to stay two steps ahead of the rest of the industry.

In fact, many of our production lines feature innovations developed by our own dedicated technologists, scientists and engineers, working hand-in-hand with equipment manufacturers. At our four state-of-the-art R&D centres — located in Germany, Korea, China and Malaysia — we continue to set the standard in technology, economies of scale and quality control.

Current R&D projects include research into increasing efficiency and lowering costs. We are studying solar cells using cost-efficient silicon, ultra high-performance cells, Hot-Spot Protect, Anti PID (Potential Induced Degradation) technology, along with many other innovative ideas. New breakthroughs are introduced to production as soon as possible, resulting in innovative new products from Hanwha Q CELLS and its partners around the globe.



# OUR RELIABILITY IS PROVEN BY OUR RESULTS

Our accomplishments have taken us from the Pacific Rim to the European continent. That growth stems from a marriage of innovative technology and the fact that we deliver integrated, efficient solutions across the entire value chain.



SEONAM, KOREA



INDIANAPOLIS, USA

## INSTALLATION HIGHLIGHTS

**BRIEST, GERMANY**  
91 MWp

**FENLAND FARM, UK**  
20.4 MWp

**ROVIGO, ITALY**  
30 MWp (of 70 MWp)

**CANHA, PORTUGAL**  
13.3 MWp

**ARNEDO, SPAIN**  
33.6 MWp

**INDIANAPOLIS, USA**  
10.8 MWp

**GUANGDONG, CHINA**  
31 MWp

**LISBON, PORTUGAL**  
17.8 MWp

**GOLMUD (QINGHAI), CHINA**  
20 MWp

**DIGOS, PHILLIPINES**  
28.6 MWp

**MA'AN CITY, JORDAN**  
11.5 MWp

**SEONAM, KOREA**  
3 MWp

**MARAS CITY, TURKEY**  
8 MWp

**MIYAMA CITY, JAPAN**  
23 MWp



**CANHA, PORTUGAL**

13.3 MWp,  
2014

Canha, Portugal was the first solar park to be realized by Hanwha Q CELLS as engineering, procurement and construction provider (EPC). The installation in the municipality of Montijo (South-East of Lisbon) features around 51,000 Q CELLS Q.PRO-G3 modules. The power plant was fully connected to the grid in May 2014. The 13.3 MWp plant provides clean energy to some 5,475 local households with an average consumption of 4,000 kWh per year. Hanwha Q CELLS built the plant within five weeks, plus additional time for connecting it to the grid and completing all test runs.



**FENLAND FARM, UK**

20.4 MWp,  
2015

The Fenland Farm power plant was completed by the Hanwha Q CELLS system specialists during the first quarter of 2015. It is a customized solar power plant, which utilises 79,074 Q CELLS Q.PRO-G3 solar modules with a capacity of 20.4 MWp. The overall construction time was just 12 weeks. All modules, as well as the entire engineering, planning and construction (EPC), were provided and implemented by Hanwha Q CELLS. Hanwha Q CELLS is also responsible for the operation and maintenance (O&M) of the Fenland Farm solar power plant.



**KITSUKI, JAPAN**

24 MWp,  
2015

The "Hanwha Solar Power Kitsuki" in Kitsuki, Oita prefecture in Japan was realized by Hanwha Q CELLS Japan in January 2015. It is a customized solar power plant, which utilizes 100,000 Q CELLS Q.PRO-G3 solar modules with a capacity of 24 MWp. This power plant generates clean energy for 7,000 households. Hanwha Q CELLS Japan delivered all modules, as well as the entire engineering, planning and construction services (EPC) for the project and acts as an Independent Power Producer (IPP).



**BRANDENBURG-BRIEST, GERMANY**

91 MWp,  
2011

Realized in only twelve weeks. Since 2011, the former military airport in Briest has been one of the largest power plants for solar electricity in the world with 91 MWp. Across an area the size of 280 football fields, the solar power plant generates electricity for over 22,000 households and prevents 50,000 tons of CO<sub>2</sub> emissions per year. All three sections were completed in a record time of just twelve weeks.

## THE RESULTS SPEAK FOR THEMSELVES

We are reinforcing our leadership position with an expanding network and industry-leading achievements.



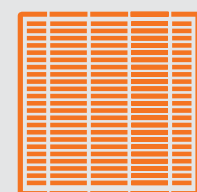
## BEST PERFORMING MODULE **NO.1** YIELD MEASUREMENT

Hanwha Q CELLS' Q.PRO-G2 235 solar modules outperform the competition, and were named the no. 1 polycrystalline module by the 2013 and 2014 PHOTON module yield measurement test.



## **TIER 1** BLOOMBERG RATING

Hanwha Q CELLS has a Tier 1 Bloomberg rating. That makes us the perfect partner for investors.



## **+2.5 GW** Q.ANTUM TRACK RECORD

Hanwha Q CELLS mass produced more than 2.5 GW of polycrystalline solar cells (i.e. 550 million cells) using Q.ANTUM technology. (\*as of end of 2016).



## **25**-YEAR WARRANTY

Hanwha Q CELLS produces top-quality solutions and guarantees corresponding performance with a 25-year linear performance warranty. Hanwha Q CELLS also offers a 12-year workmanship warranty.



## **4** R&D CENTERS

With scientists in Germany, China, Korea and Malaysia, Hanwha Q CELLS continues to innovate at the forefront of the global solar industry. Hanwha Q CELLS has three manufacturing sites in Malaysia, Korea, and China.



## **NO.1** LARGEST CELL MANU- FACTURER

Hanwha Q CELLS' cell production capacity of 5.7GW and its solar module manufacturing capacity of 5.7GW makes the company the largest cell and one of the biggest solar module manufacturers in the world.



## **+36** COUNTRIES

The global footprint of our sales network spans more than 36 countries across Europe, Asia-Pacific, the Americas and Africa.

- COMPANY HEADQUARTERS
- COMPANY HEADQUARTERS FOR TECHNOLOGY AND INNOVATION
- SALES NETWORK
- RESEARCH & DEVELOPMENT
- MANUFACTURING



# WELCOME TO OUR GLOBAL NETWORK

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We are leading  
the world's  
solar energy  
industry  
to provide  
our customers  
with energy  
for life.

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