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# LONGi SOLAR UNDERLINES ITS BANKABILITY AS IT STRENGTHENS ITS POSITION AS THE WORLD'S LARGEST SOLAR PANEL MANUFACTURER

WHITE PAPER

Reliable, Bankable Solar

# LONGi SOLAR STRENGTHENS ITS POSITION AS LARGEST SOLAR PANEL MANUFACTURER IN THE WORLD

## STRENGTH IN BUSINESS SUCCESS

LONGi is the leading global supplier of solar monocrystalline products and recently announced the commissioning of a 5GW (Gigawatt) high-efficiency monocrystalline panel assembly factory in Chuzhou, Anhui, China. This is another step forward in the company's enhancement of its high-efficiency monocrystalline module capacity to meet the rising global demand for high-efficiency solar products, which is transforming the solar energy industry.

The construction of LONGi's 5GW production plant in Chuzhou was announced and commenced in May 2018 and was completed during the same year. After equipment commissioning, capacity ramp-up, efficiency stabilization and finalization work, the plant rolled out its first high-efficiency monocrystalline panel in January 2019.

Phase 1 of the project with 2.5GW is currently in full swing, providing panels for a number of global customers.

LONGi Chuzhou is fully automated with leading-edge equipment that will produce the company's Hi-MO3 bifacial mono half-cut PERC module and other cutting-edge next-generation products.

The Phase 2 capacity is in the commissioning stage and will shortly start full production, bringing the total capital expenditure at the plant to approximately US\$328 million.

The significance of the 5GW plant cannot be overestimated. The globally renowned solar industry media website PV Tech recently reported that the new production plant will bring LONGi's total nameplate panel assembly capacity to a figure in excess of 13GW in 2019, the highest of any solar panel manufacturer in the world.

Li Wenxue, President of LONGi Solar, said at the plant's opening: "In 2019, our company identified a gap between fast-growing global orders and our high-efficiency cell and module capacities. Our Chuzhou factory will greatly narrow this gap. Besides manufacturing, the factory will also facilitate the transformation of technological and technical achievements to the mass production of new products."

LONGi has also recently announced plans to build a 1GW monocrystalline solar cell manufacturing plant in the Shama Jaya Free Industrial Park, Kuching City, Sarawak, Malaysia at a cost of approximately US\$126 million. The company already operates a 500MW monocrystalline solar cell plant and 500MW of panel assembly production in Kuching.

The capacity expansion was needed to both meet demand in overseas markets and further strengthen LONGi's manufacturing footprint outside China for strategic reasons.

As a result, under existing plans, in-house monocrystalline solar cell capacity is expected to exceed 6GW in 2019.

Having the financial strength that comes from its ongoing business success, LONGi Solar continues to secure major panel supply deals around the world.

In mid-2018, for example, the company secured a panel sales contract, valued at approximately US\$600 million, for its leading-edge high-efficiency P-type monocrystalline panels with a major PV power plant developer in the United States. The deal started at the beginning of 2019 and is contracted through to 2022.

In February 2019, LONGi announced that it had been awarded the supply contract for the largest "bifacial + tracker" power generation project in the United States, providing mono "bifacial" PERC panels for the 224MW project, which is to be built in Mitchell County, Georgia during 2019.

The panels will provide clean electricity to more than 30,000 households and, in the first 10 years of operation, will generate more than US\$12 million of income for the local economy.

In 2018, Bloomberg New Energy Finance (BNEF) ranked LONGi Solar in the top 3 most bankable PV module brands with 1,025MW of loan-financed PV projects in the previous two years. LONGi's ranking had risen four places from the year before in BNEF's "2018 PV Module Brand Bankability Report".

BNEF's 2018 Report also provided Altman-Z scores for the world's largest PV module makers in Q1 2018, with LONGi Solar ranking ahead of its rivals in the manufacturer credit ratings. BNEF also made specific reference to LONGi's credit worthiness standing out among its competitors. Among the technical reasons for this were the greatly increased production efficiency achieved by the adoption of the recharging Czochralski technology and the use of diamond wire slicing. Strategically, LONGi also avoided the price decline issues suffered by many in times of oversupply, as it focused in the early years on expansion in only mono ingot and wafer production, a policy from which the company has derived significant advantages.

BNEF has additionally featured the "PV Module Reliability Scorecard" released by the authoritative certification institution DNV GL. LONGi Solar has been recognized as a "TOP PERFORMER" module maker by DNV GL for two consecutive years.

Li Wenxue concluded, "Strong financials and bankability that are independently verified by Bloomberg NEF are two of many validations of LONGi as a reliable company with reliable products. Our strength in product, technology and financial health provides the best guarantee for our customers."

According to highly respected technology market research company Solar Intelligence, LONGi is currently ranked as the sixth largest solar cell manufacturer in the world. Significantly, LONGi is unique in being dedicated to high-efficiency P-type mono PERC (Passivated Emitter Rear Cell) production and is continually evaluating its demand driven capacity expansions and geographical footprint to meet growing global demand for its products.

## LONGi SOLAR HAS THE STRONGEST SUPPLY CHAIN PARTNERS IN THE INDUSTRY

### LONGi GREEN ENERGY

LONGi Solar's parent company, LONGi Green Energy, which is the world's largest high-efficiency monocrystalline ingot and wafer producer, has recently announced plans to invest approximately US\$773 million in expanding monocrystalline ingot and wafer capacity at three separate production sites, primarily in Yunnan Province, China, taking advantage of the availability there of hydro-electric power.

## LONGi SOLAR STRENGTHENS ITS POSITION AS LARGEST SOLAR PANEL MANUFACTURER IN THE WORLD

LONGi is expected to take nameplate mono wafer capacity to approximately 38GW in 2019.

The expansions go hand in hand with the solar industry's migration to high-efficiency mono products, which are expected to lead all wafer types in 2019 - a major milestone, according to numerous market research organizations.

LONGi also recently reiterated that it will move ahead with its 45GW monocrystalline silicon ingot and wafer capacity expansion plans for 2020.

### TONGWEI

Another key supplier to LONGi is merchant solar cell producer, Tongwei. During the past few months, Tongwei has officially moved into the top position as the leading solar cell manufacturer - by production volume - serving the PV industry, according to market research firm, Solar Intelligence.

Tongwei is expected to be the first manufacturer to produce more than 10GW of solar cells in a single year, ahead of strong growth that may see this doubling within just 3 years, according to the market research firm.

LONGi is the major high-efficiency wafer supplier to Tongwei, while Tongwei is in turn a major supplier of high-purity polysilicon to LONGi. As a strategic partner, Tongwei had expanded its high-purity polysilicon production by 5,000MT in 2017, bringing nameplate capacity to 20,000MT. However, the company is currently expanding polysilicon production with the building in China of two 50,000MT polysilicon plants in Leshan and Baotou.

As the new facilities are built and ramped, Tongwei is expected to have a polysilicon nameplate capacity of 120,000MT from some of the most advanced facilities, producing the lowest cost, highest purity polysilicon to meet demand for P-type monocrystalline wafers.

### DAQO NEW ENERGY

LONGi has secured a number of high-purity polysilicon supply deals in 2018. The company signed a 39,600MT deal with China-based polysilicon producer Daqo New Energy that stretches from April 2018 to December 2020.

Daqo is expanding high-purity semiconductor grade polysilicon capacity to a total annual nameplate capacity of over 30,000MT (Metric Tonne) by the end of the second quarter of 2019. Daqo is also starting a Phase 4A polysilicon expansion, which is intended to increase annual polysilicon capacity by 35,000MT. Total annual capacity of 65,000MT is expected to be achieved by the first quarter of 2020.

Earlier in 2018, LONGi signed a 64,638MT deal with Korean-headquartered polysilicon producer OCI, which was said to be worth around US\$1.02 billion. The supply contract would last three years. OCI is expanding its production of high-purity polysilicon to meet greater demand for P-type monocrystalline wafers from around 42% of capacity in 2018 to around 60% of total capacity.

### STRENGTH IN R&D INVESTMENT

As the leading global supplier of high-efficiency solar monocrystalline products, LONGi has been fully committed to significant R&D investment.

As of H1 2018, LONGi's total assets were USD 5.54 billion, with revenue of USD 1.46 billion, an increase of 59.36% year on year; the net profit attributable to the parent company was USD 191.08 million, a year on year increase of 5.73%.

Between 2012 and 2017, LONGi's revenue grew steadily, with both gross and net profit remaining at a high level. During this period, the company's debt ratio remained at a more than acceptable industry level, demonstrating strong risk resistance capability. According to PV Tech's annual R&D spending report on the 20 leading PV manufacturers, LONGi set three new solar industry records in 2017.

Not only did LONGi surpass the two historical R&D spending leaders (First Solar and SunPower Corp) in 2017, but the company also spent more on R&D in one year than any PV manufacturer to date.

Furthermore, with the LONGi Group's total revenue reaching US\$1.46 billion in H1 2018, up almost 61.80% from the previous year, R&D spending accounted for 7.18% of revenue, the highest ratio ever seen in the industry. According to PV Tech's analysis, only SunPower has come close to that ratio when, in 2015, R&D spending accounted for 6% of revenue. First Solar's R&D spending ratio to revenue topped 5.1% in 2011.

## LONGi HAS NOW INCREASED R&D SPENDING FOR SIX CONSECUTIVE YEARS

### RECORD CELL AND PANEL CONVERSION EFFICIENCIES

This consistent commitment to R&D has in recent years resulted in a string of verified world record solar cell and panel conversion efficiencies for mono PERC products. LONGi reported verified record PERC cell conversion efficiencies of 23.6% in February 2018. In August 2018, the company achieved the highest efficiency of P-type mono-PERC bifacial solar cells in China with a conversion efficiency of 23.11%.

At the beginning of 2019, the National Center of Supervision and Inspection on Solar Photovoltaic Product Quality (CPVT) in China tested LONGi's monocrystalline bifacial PERC cells, setting a new solar cell world record conversion of 24.06%.

"LONGi Solar has made great strides in setting world record PERC solar cell conversion efficiencies as we demonstrate our continuing ability to provide high-efficiency products to the global solar market," stated Li Wenxue, President of LONGi Solar. "Our latest record solar cell conversion efficiencies also endorse the success of our R&D investments, which have set the benchmark for the industry in recent years."

"This is the first time that the efficiency of monocrystalline PERC solar cells in commercial dimensions has exceeded 24 percent," added Dr. Li Hua, LONGi's Vice President of Cell R&D. "In each of the last three years LONGi Solar has developed new generations of 'Hi-MO' products based on PERC technology, which are setting the efficiency and reliability benchmarks for high-efficiency PERC technology within the industry."

LONGi carried its cell efficiency records through to the panel when, in November, 2018, the company reported that TÜV-SÜD had verified its 60-cell P-type monocrystalline PERC module to have a conversion efficiency of 20.83% - yet another new industry record and the fourth such record set in 2018. *Reliable Bankable Solar*