





Solargiga Energy

Solargiga Energy Holdings Limited

阳光能源控股有限公司

2021 Annual Results
二零二一年度全年业绩
香港联交所上市股份编号：757

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PART 01

Corporate Overview



- Established in 2001, Solargiga is the largest and top-ranked photovoltaic manufacturer in Northeast China, focusing on manufacturing monocrystalline products, providing one-stop solutions including monocrystalline ingots, wafers, modules and development, design, construction, operation and maintenance of power generation system.

Achievements

Listed in Hong Kong on 31 March 2008 (757.HK); Top 20 PRC PV Module Companies in 2021 (No.11); Global Top 500 New Energy Companies in 2021 (No.173) ; Top 500 PRC Energy Group Companies in 2021 (No.267); Top 100 New Energy Companies Global Competitiveness (No.92)



**Mr. Tan Wenhua
and his associates**
21.43%



Hiramatsu International Corp.
9.15%

**Madam Sze
Tan Hung**
7.14%

HKEX
香港交易所

Public shareholders
62.28%



Solargiga Energy

Solargiga Energy Holdings Limited
阳光能源控股有限公司

Number of issued shares 3,323,771,133



Mainland China

- Main production base located at Jinzhou of Liaoning, Qujing of Yunnan and Yancheng of Jiangsu
- Monocrystalline silicon ingot capacity: 5.7GW
- Monocrystalline silicon wafer capacity: 4.1GW
- Photovoltaic module capacity: 7.2GW
- Group's marketing centers located in Beijing and Shanghai

Japan, Germany, Hong Kong

- Established subsidiaries to enrich our distribution channels of all products and expand customer base
- A joint venture company DCH Solargiga GmbH with power plant construction company in Germany, which is mainly engaged in photovoltaic systems business

Others

- Developing EPC business in America, Turkey, Pakistan, Southeast Asia and Africa

Map note:

-  Manufacturing base
-  Marketing centers
-  Subsidiaries





国家电投
SPIC

SHARP

夏普



中国三峡
China Three Gorges Corporation

中广核 CGN



信义光能控股有限公司
XINYI SOLAR HOLDINGS LIMITED

Stock Code : 00968

阳光电源
SUNGROW

BG北控 北京控股集团有限公司
BEIJING ENTERPRISES GROUP COMPANY LIMITED



中国华电集团公司
CHINAHUADIANCORPORATION



MOTECH



MEYER BURGER

捷泰科技
JIETAI TECHNOLOGY



中润光能集团

Mono-crystalline Silicon Ingot



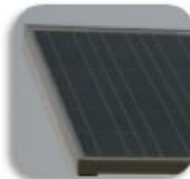
- 5.7GW

Mono-crystalline Silicon Wafer



- 4.1GW

Module



- 7.2GW

System

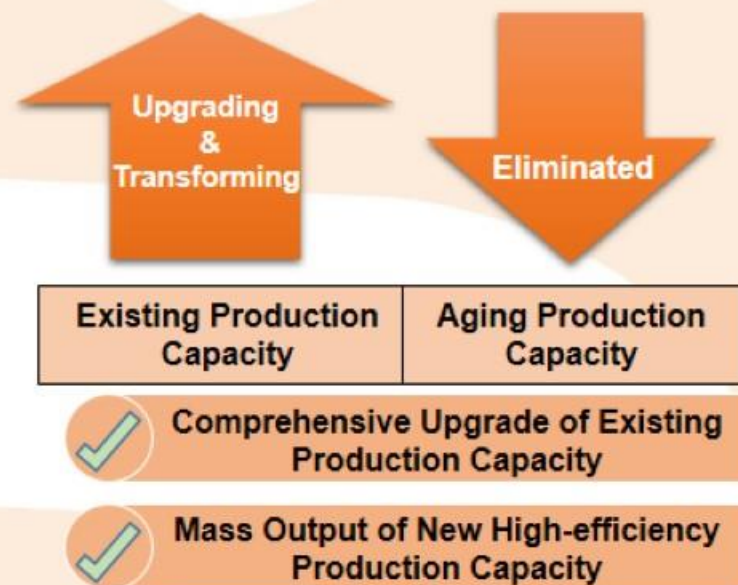


The Group's photovoltaic system business includes traditional distributed power station EPC business, Building Applied Photovoltaics (BAPV) business and Building Integrated Photovoltaics (BIPV) business. Relying on the rich technological experience accumulated in the photovoltaic industry, the Group is carrying out a series of research and development projects in cooperation with Shenyang Jianzhu University, the National Housing and Residential Environment Engineering Technology Research Center and other institutions, of which four series of BIPV products have passed China Compulsory Certificate ("CCC") certification, China Quality Certificate Centre ("CQC") certification, and GB8624-2012 building materials and products combustion performance test certification.

As a clean energy source, photovoltaic power generation had to rely on government subsidies to compete with the selling price of traditional petrochemical energy in the past. With the rapid advancement of photovoltaic production technology in the past ten years, the production cost per watt of power generation has dropped sharply and reached the target of grid parity, and explosive sales growth is foreseeable in the future.

Since 2018, the Group has been investing in upgrading and transforming existing production capacity and invest in low-cost, high-efficiency new production capacity. Mass output by comprehensive upgrade of production capacity and new high-efficiency production capacity have also been realized.

Strategy: Focusing on upstream monocrystalline silicon ingot and downstream modules as dual major products, followed by silicon wafer production capacity, and withdraw from the solar cells manufacturing in the midstream, to effectively utilize its existing resources.



Focus on its limited resources on the Development



PART 02

Silicon Ingots and Silicon Wafers

- ◆ Operation Strategy
- ◆ Product Process
- ◆ Operating Performance

- The Group's new production base of low-cost and high-efficiency monocrystalline silicon ingot and wafer products in Qujing, Yunnan, has begun to show results gradually after production adjustment, and the production efficiency is comparable to that of the industry. It will become the main production base of monocrystalline silicon ingot and wafer products of the Group.
- The previous production base in Jinzhou, Liaoning Province, after the Group's technical transformation and upgrading, can highlight its advantages of output improvement and cost reduction, which would continuously strengthen the Group's overall gross profit margin.
- The production of upstream monocrystalline silicon ingot and wafer products, the gross profit margin driven by its production efficiency has increased significantly during the period.





- Solargiga focuses on monocrystalline production. So far, it has 21 years of experience in the production of N-type/P-type monocrystalline silicon ingots. The Group is the only monocrystalline silicon manufacturer who has obtained the national product quality exemption certificate. Currently, the Group owns 38 national utility model patents.
- In recent years, through the transformation and upgrading of the ingot growing furnace (長晶爐), and participated in the research and design of the TDR140-CL and TDR160-CL ingot growing furnace (單晶爐), the amount of the material put into production has reached more than 800kg and is capable for production of 10 inch and 12 inch ingot. This achieved continuous drawing of multiple output resulted in strengthen the advanced electronic liquid level control system, automatic control process, reducing labor costs and being stable quality of the crystalline ingots. During the research and development process, the Group obtained 1 invention patent, 14 utility model patents, and 2 software copyrights.
- the Group's monocrystalline silicon ingot production system adopted fast closing technology, which shortened the closing time by 70%. Further, through the transformation and upgrading of the water cooling device, the growth rate of monocrystalline silicon ingot can be increased from 1.25mm/min to 2.0mm/min.

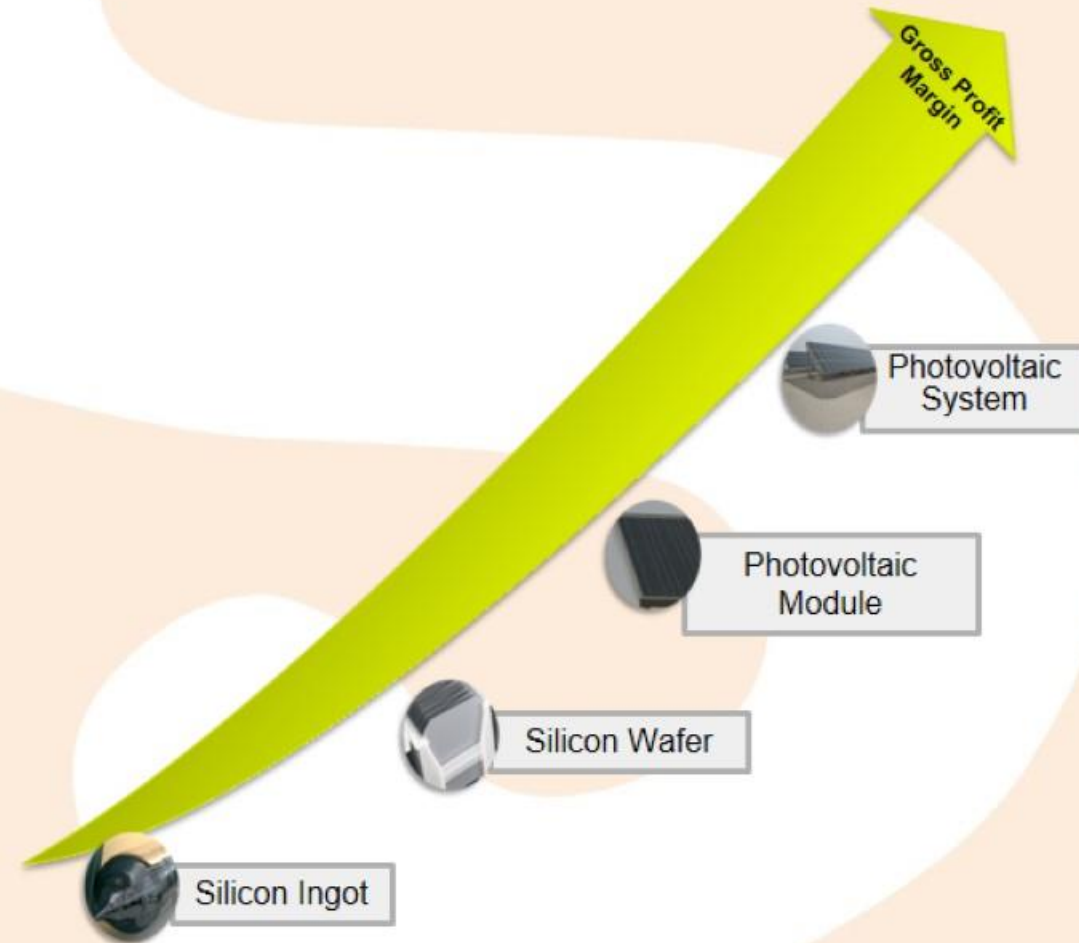


- The Group had developed a 500-hour long-life crucible, a major auxiliary material for the production of monocrystalline silicon ingot, jointly with specific suppliers, it could realize the RCZ production process of continuously drawing several ingots in one pot, which can significantly reduce the production cost.
- Monocrystalline silicon ingots are excellent in terms of technical indicators, and oxygen content is controlled to below 14 ppm, forming a strictly reliable crystalline ingot index detection system.
- According to customer's requirements, the Group provides various specifications and sizes of N-type and P-type monocrystalline products, and also provides the highest quality silicon ingots for downstream modules.

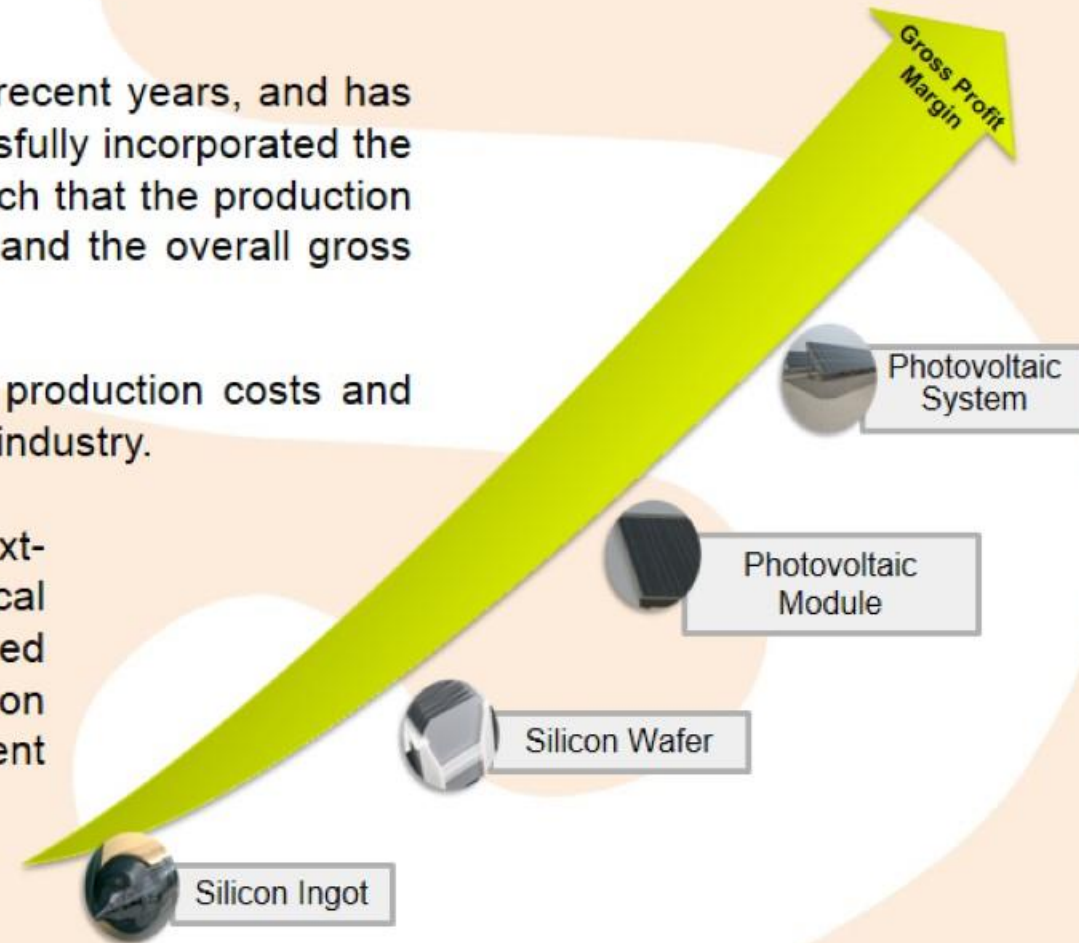


- Solargiga has 16 years of wafer slicing experience and is one of the pioneers of large-size silicon wafers in the industry. According to customer's requirements, the Group provides various specifications and sizes of N-type and P-type monocrystalline products, and also provides the highest quality silicon wafers for downstream modules. Currently, the Group has 2 national invention patents and 8 national utility model patents.
- The 170 μ m thin-slice technology has matured and has been supplying to the market. It has also developed and put thinner silicon wafers into production, which will turn to 160 μ m in 2022, effectively increasing the output rate by more than 5%.
- Diamond wire of abrasive slicing machines are in use and the output of wafer increased by more than 17% over the same period that reduced manufacturing costs.
- The research and development of the thin wire technology on the above transformed slicing equipment was completed. The entire production line completed the switch from 52 μ m electroplated diamond saw wire (金鋼綫) to 45 μ m electroplated diamond saw wire, and the output increased by more than 15% over the same period of last year.

- As the Group gradually got rid of performing long-term contracts for the purchase of high-priced polysilicon materials, coupled with the economic scale of high-efficiency production capacity, the Group has successfully turned from loss to profit during the period and was back on the profitable track.
- The total shipment volume of major products, monocrystalline silicon ingots and wafers, increased from 3,856.6 MW in 2020 to 4,501.4 MW in 2021, representing a growth rate of 17%.
- During the year, market demand for monocrystalline silicon ingots and wafers continued to rise and the Group's high-efficiency production capacity through better production technology process has been greatly released, thus, the shipment volume increased.



- ■ ■ Maintain leading technology in the ever-advancing photovoltaic industry to build up a cost advantage in order to continuously make profits.
- ■ ■ The Group has gained success in research and development in recent years, and has overcome various production bottlenecks. The Group has successfully incorporated the most advanced production technologies into mass production, such that the production costs of our various product lines have significantly decreased, and the overall gross profit margin has hence increased.
- ■ ■ Various advanced production technologies significantly reduced production costs and ensured product quality and stability is in a leading position in the industry.
- ■ ■ For high quality N-type silicon wafers required for the next-generation N-type cell, the Group has also reached the technical position and accomplished marketisation ahead, and has achieved the development direction of leading N-type crystalline silicon products which could readily meet the market demands for shipment in large quantities at any time.



PART 03

Modules

- ◆ Operation Strategy
- ◆ Product Process
- ◆ Operating Performance
- ◆ Product Certification

- Since the photovoltaic module customers are mostly domestic state-owned enterprises or large multinational corporations, the market position and strength possessed by these module customers are the strongest in the overall photovoltaic industry chain.
- The Group has established a direct supply relationship with large module customers through significant module production capacity, which not only maintains a more stable terminal product estuary, but also indirectly drives the sales of monocrystalline silicon rods and silicon wafers in the upstream of the group.
- In addition to the module production capacity owned by Jinzhou, Liaoning, the new module manufacturing base in Yancheng, Jiangsu has also been put into production. The module production capacity has reached the current 5.4 GW, significantly improving the economic scale advantage of module products.



Establish a Direct Supply Relationship with Large Module Customers

Photovoltaic Module Customers

- ✓ Maintains a More Stable Terminal Product Estuary
- ✓ Indirectly drives the sales of monocrystalline silicon rods and silicon wafers in the upstream of the group

Domestic State-owned Enterprises/ Large Multinational Corporations

- ✓ Market Position
- ✓ Strength





- The first largest ODM module manufacturer in PRC supplied to SHARP Japan for nine consecutive years. Developed the anti-PID technology of module and mastered the design and production of high-end module in the Japanese market. Its ODM module accounted for more than 90% of the Sharp shipments of module in Japan.

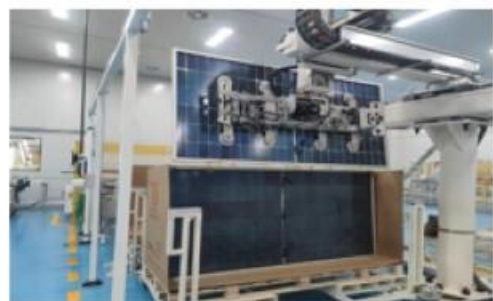


- The unique quality control standards for Japanese production include a total of 104 inspection items from the auxiliary materials, process control requirements, and 3 to 10 times the finished module products in the environmental testing system requirements of the IEC standard.



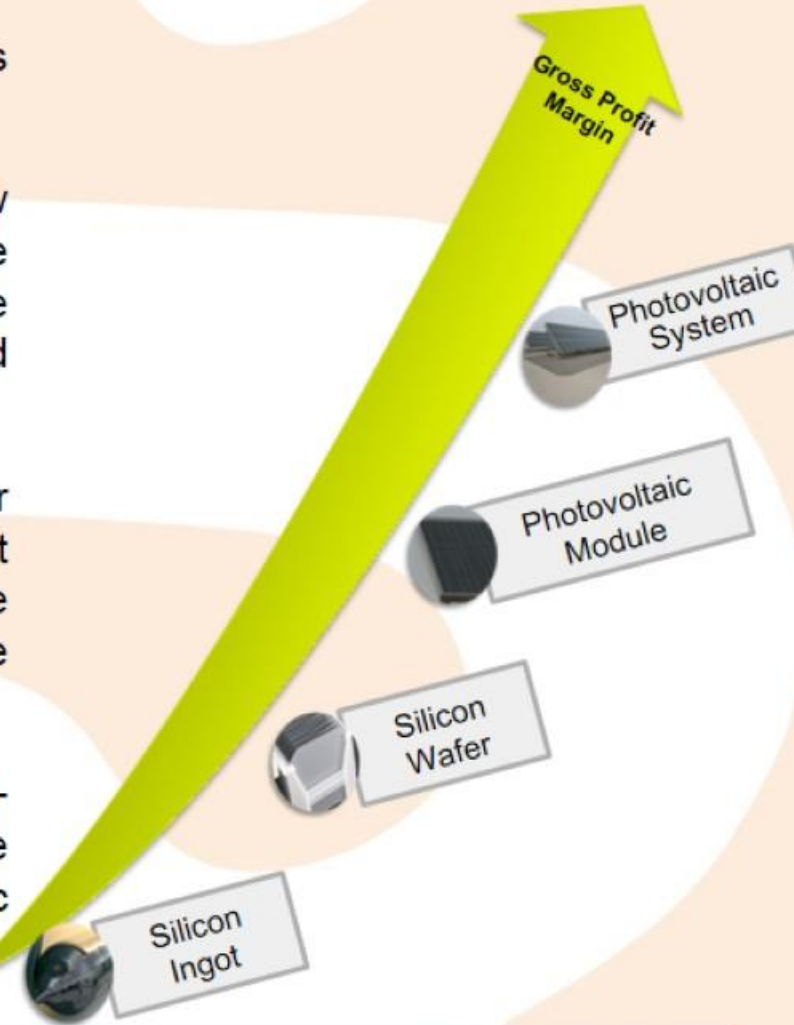
- Master core technologies for the design and production of different modules such as lightweight components, ski components, and high-load components. Mastered the design and production technology of two-sided cell (P-PERC, N-PERT.HIT) module, and shipment for double glass components for seven consecutive years.

- Developed and mastered half-slice modules, multi-gate cell modules, double-sided cell modules, high-efficiency ribbon modules and other design techniques related to Super Top Runner Program high-end products.

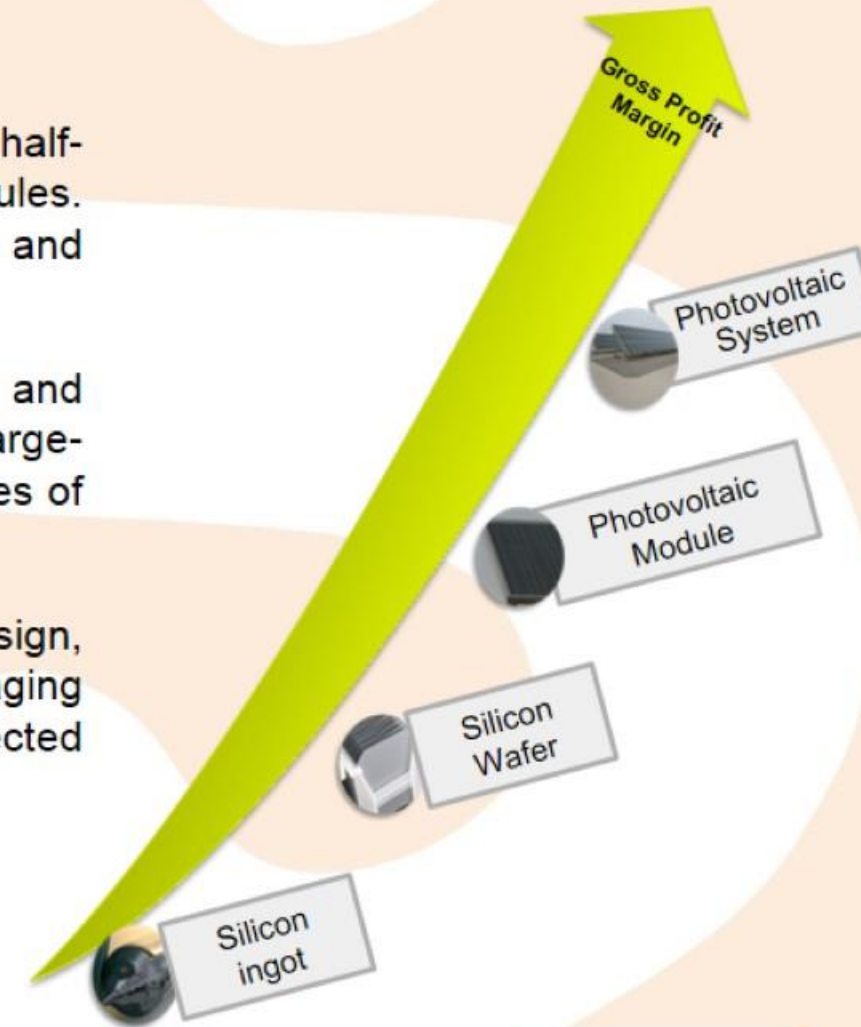


- The module production line of the Group can also produce multi-busbar half-cell double-sided double glass 182mm and 210mm large-size modules which the conversion could reach more than 540 watts and 600 watts respectively.
- Master the capabilities of manufacturing IBC cell modules. IBC cell modules have high output performance, open circuit voltage, fill factor and other electrical performance advantages. The same-surface interconnected module process, the perfect appearance of almost black also meets the aesthetic requirements of mass consumers.
- Owned 93 national utility model patents and 18 invention patents.

- The external shipment volume of another major product, photovoltaic modules was 2,842.3MW in 2021, which was similar to 2020.
- For photovoltaic module products, in the first half of this year, the cost of raw and auxiliary materials for the production of photovoltaic modules continued the trend of increase since the second half of 2020. This led to increase of purchase cost of the Group for raw and auxiliary materials. This also subsequently caused unsmooth production and sales of modules.
- In the second half of 2021 and the newly signed module orders could transfer the price risk of the raw and auxiliary materials to customers, it is expected that external shipment volume of modules will increase significantly with the expansion of production capacity, and profitability could also be improved in the future.
- The Group devoted to the development and sales of monocrystalline high-efficiency module products. In particular, BS module products of N-type monocrystalline IBC cell uses the internationally leading and the first domestic FPC module packaging technology, and is in the leading position in the industry



- The module production line of the Group can also produce multi-busbar half-cell double-sided double glass of 182mm and 210mm large-size modules. They could further enhance the Group's ability to increase the selling price and provide opportunity for a substantial increase in gross profit margin.
- The Group is also carrying out a number of research projects for G12 and BIPV products, aiming to upgrade the mass production technology of large-size module products and BIPV products, so as to expand the market sales of corresponding products.
- Other production technology research and development for frame design, junction box and tin block design, packaging material optimization, packaging method optimization, solar cell thickness optimization, etc. are also expected to continuously reduce production cost of module products.



- TUV/JET/UL/VDE/CE/BIS/CQC Certification
- First batch of Photovoltaic Power Generation Top Runner Program (领跑者) certified enterprises



PART 04

Financial Review

Shipment Volume (for the past years)



Revenue (RMB million)



Financial Highlight

Continuing Operations	2021	2020	Change
Revenue (RMB million)	7,105.0	6,052.0	+17.4%
Gross Profit (RMB million)	879.1	585.9	+50.0%
Gross Profit Margin (%)	12.4%	9.7%	+2.7pp
EBITDA (RMB million)	799.7	276.0	+189.7%
Profit/(loss) attributable to shareholders of the parent company (RMB million)	193.2	(215.6)	N/A
Basic earning/(loss) per share (RMB cents)	5.84	(6.82)	N/A

2021 Revenue Breakdown

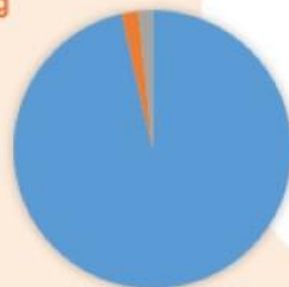


Operating Business Distribution

Segment	Operating business	2021 (RMB '000)	2020 (RMB '000)	Change
A	The manufacture of, trading of, and provision of processing services for polysilicon and monocrystalline silicon solar ingots/wafers	2,463,728	1,709,095	+44.2%
B	The manufacture and trading of photovoltaic modules	4,480,398	4,272,656	+4.9%
C	The construction and operation of photovoltaic power plants	116,795	10,383	+1024.9%
D	The manufacture and trading of semiconductor and the trading of monocrystalline silicon solar cells	44,071	59,822	-26.3%
	Total	7,104,992	6,051,956	+17.4%

2021

Processing
service,
2.0%



Construction
services,
1.6%

Sales of
industrial
products,
96.4%

2020

Processing
service,
7.4%



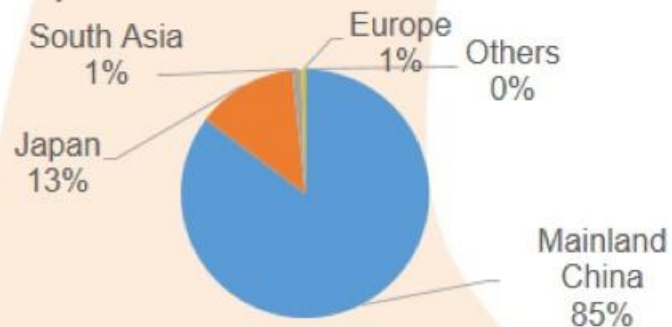
Construction
services,
0.2%

Sales of
industrial
products,
92.5%

Disaggregated Revenue

Types of goods and service	2021 (RMB '000)	2020 (RMB '000)	Change
Sales of industrial products	6,849,638	5,595,037	+22.4%
Processing service	139,100	447,113	-68.9%
Construction services	116,254	9,806	+1085.5%
Total	7,104,992	6,051,956	+17.4%

Proportion of revenue in 2021



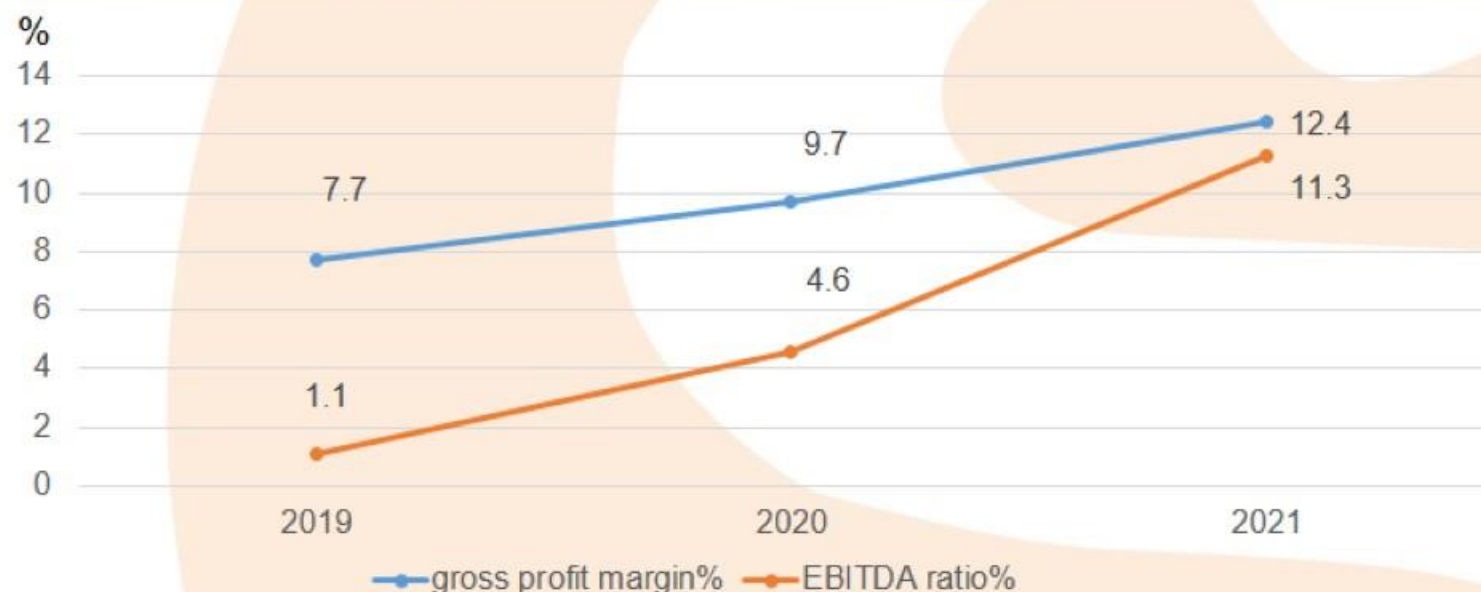
Proportion of revenue in 2020








■ Mainland China ■ Japan ■ South Asia ■ Europe ■ Others ■ Mainland China ■ Japan ■ South Asia ■ Europe ■ Others

Market
Distribution

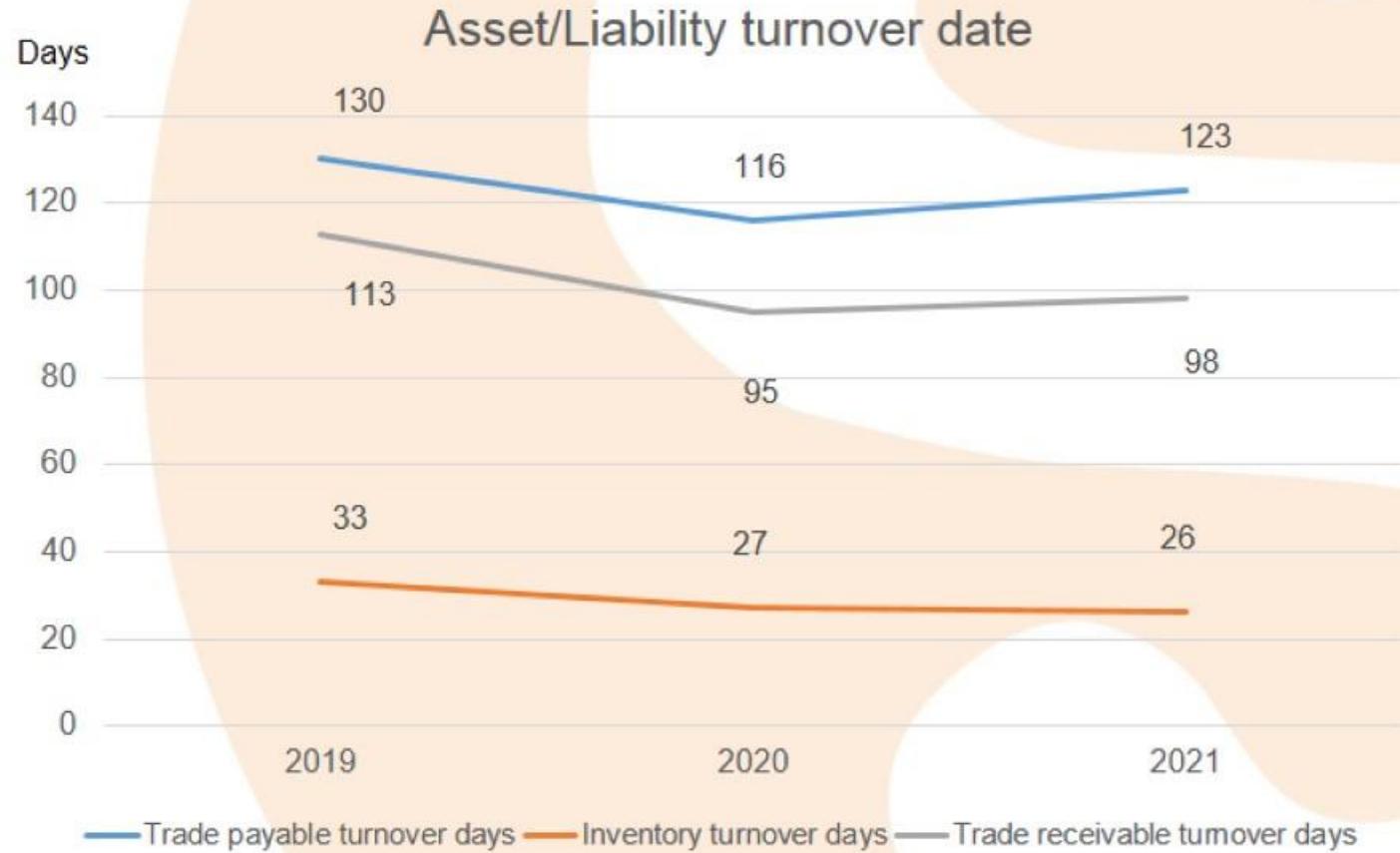
Revenue (RMB '000)	2021	2020	Change
Mainland China	6,054,079	4,634,081	30.6%
Japan	933,043	1,144,637	-18.5%
South Asia	84,847	232,092	-63.4%
Europe	32,993	38,444	-14.2%
Others	30	2,702	-98.9%
Total	7,104,992	6,051,956	+17.4%




-  The Group recorded a gross profit of RMB879.1 million and a gross profit margin of 12.4% in 2021, as compared to a gross profit of RMB585.9 million and a gross profit margin of 9.7% in 2020, which increased significantly by 50.1% and 2.7% points respectively. The growth was mainly attributed to the increase in sales of one of the Group's major products, monocrystalline solar wafers in 2021, as the gross profit margin of which was higher than other products.
-  During the year, earnings before interest, taxes, depreciation and amortization ("EBITDA") amounted to RMB799.7 million (11.3% of the revenue), represented a significant increase of 189.7% as compared to RMB276.0 million (4.6% of the revenue) during the year ended 31 December 2020. The main reason for the increase in EBITDA was attributed to the growth in gross profit, the achievement of efficiency in production and improvement in control on expenses during the year.

-  The Group has been focusing its efforts in raising the inventory turnover and lowering the inventory turnover days in order to mitigate the risk of rapid decline inventory prices caused by continuous technological advancement of photovoltaic products, and at the same time, reducing the backlog of funds and further strengthen the Group's operation working capital. The inventory turnover days of the Group during the year remain stable at 26 days.
-  The sales of photovoltaic modules accounted for about 60% of the Group's overall sales in 2021 and 2020. According to the standard terms of the industry's module sales contracts, the recovery of module receivables depends on the construction progress of the photovoltaic power plant. For instance, some trade receivables can only be recovered after the customer's photovoltaic power plant is connected to the grid. Therefore, the trade receivables turnover days of module business are generally longer. Trade receivables turnover days for the year has slightly increased to 98 days.
-  The Group would like to utilize its operating funds in a more strategic manner for business growth, yet paying our suppliers within the credit period. The Group has formed strategic partnerships with our major suppliers. Under stable and frequent co-operations, the suppliers have gradually increased our credit lines and payment terms.

Turnover Day Analysis	2021	2020	Change
Inventory Turnover (Days)	26	27	-1
Trade Receivables Turnover (Days)	98	95	+3
Trade Payable Turnover (Days)	123	116	+7



-  The Group showed a significant turnaround from loss to profit during the year; the Group continued to invest and upgrade the existing production capacity which, together with the economies of scale reflected in high-efficiency production capacity, resulted in a significant increase in operating profit, the net cash flows from operating activities increased substantially by 82.8% from RMB563.5 million in 2020 to RMB1,030.4 million in 2021.

Condensed cash flow	2021 (RMB million)	2020 (RMB million)	Change (RMB million)
Net cash inflow from operating activities	1,030.4	563.5	466.9

PART 05

Market Overview

China



- The year 2021 marked the first year of the “14th Five-Year Plan” and was an important year for the development of China’s photovoltaic market. . In October 2021, China’s National Development and Reform Commission issued the “Notice on Further Deepening the Market-oriented Reform of Feed-in Tariffs for Coal-fired Power Generation” , which ensures a stable income for new projects and marks the official entry of photovoltaics into the grid parity era.
- The proportion of photovoltaic power generation increased rapidly during the year. According to the National Energy Administration, photovoltaic power generation totaled 325.9 billion kWh in 2021, with a year-on-year increase of 25.1%. The State Council also issued “An Action Plan for Peaking Carbon Emissions before 2030” in October 2021, which pointed out that it is necessary to develop new energy and promote the largescale and high-quality development of solar power generation comprehensively. It is also essential to ensure the realisation of the carbon peaking target by 2030.
- According to the National Energy Administration, by the end of 2021, China’s new installed capacity of photovoltaic power generation was approximately 54.9 GW, an increase of nearly 14% compared with 48.2 GW in 2020. Among them, centralised-scale projects have contributed 25.6 GW, and distributed solar installations added approximately 29.3 GW. In addition, China’s photovoltaic installed capacity exceeded 300 million kilowatts, ranking first in the global photovoltaic market for the seventh consecutive year.
- The China Photovoltaic Industry Association predicts that China’s new installed capacity will reach 75 to 90 GW in 2022, and notes that the state’s intensive targets and policies provide a rare opportunity for the photovoltaic industry, which has enhanced the influence and social attention of the photovoltaic industry.



- Based on the Solar Energy Industries Association's (SEIA) Solar Market Insights Report 2021 Year in Review, the United States solar market installed a record 23.6 GW of solar capacity in 2021, a 19% increase over 2020. The report also notes that solar accounted for 46% of all new electricity generation capacity added in the United States in 2021. This represents the third consecutive year that solar has made up the largest share of new generation capacity in the United States.
- Analysts at international energy consultancy Wood Mackenzie predict that solar power generation in the United States will increase by 31%, or 43.5 GW, over the next five years due to the introduction of government policies. For example, federal clean energy incentives such as the Build Back Better Act (BBB Act) are likely to pass in the future. S&P Global Market Intelligence, a research firm, believes that solar energy in the United States will continue to grow at an astonishing rate and will almost double, predicting that 44 GW of solar energy will be available in the United States in 2022.

Europe & India



According to SolarPower, the European solar industry sets another record in 2021. 2021 is estimated to be the best year in European solar history, with 25.9 GW of new solar photovoltaic capacity connected to the grids in 2021, an increase of 34% over the 19.3 GW installed the year before. It is forecasted that the European Commission will hit the 30 GW installation level at the end of 2022, including 1.5 million new solar roofs.



According to Mercom India Research, India's cumulative installed photovoltaic capacity reached approximately 49 GW at the end of 2021. India added 10 GW of new solar capacity in 2021, up 210% from the 3.2 GW installed in 2020. ICRA believes clean energy capacity additions in 2022–23 will be driven by solar, and India will add 16.1 GW of renewable energy generation capacity in 2022–2023, 12.5 GW of which will come from photovoltaic projects, accounting for more than 77%.

Other regions

At the UN Climate Change Conference, or COP26, in November 2021, governments reached a consensus on the 10-year Glasgow work program. The members agreed to commit to ambitious carbon emissions reduction targets for 2030 and reduce carbon emissions significantly within a decade. Brazil and Korea also announced that they will raise their 2030 emission reduction targets to 50% and 40%, respectively.

PART 06

Future Prospects and Strategies

- In the planning for 2022, the upstream monocrystalline silicon ingot production capacity will be significantly higher than the downstream module production capacity. It is to consider that the future supply and demand is growing rapidly. Compared with downstream modules, production of upstream monocrystalline silicon ingot needs higher technical thresholds and higher gross profit margins. Therefore, the oligopoly market trend of the monocrystalline silicon ingot suppliers will continue to exist.
- The Group's current overseas positioning is mainly to cooperate with Sharp Corporation. The future strategy is to increase overseas sales and enhance the sales of self-owned module brand. The Group's robust business and clear strategic focus make us well positioned for capturing the opportunities ahead.

Products	Production capacity (GW)		
	2022	2021	Change
Monocrystalline silicon ingot	7.4	5.7	+30%
Monocrystalline silicon wafer	7.4	4.1	+80%
Module	8.2	7.2	+14%

阳光能源

THANK YOU

诚信 创新 竞争 卓越