Tongwei Co., Ltd.

Initial Issuer Report

Summary	
Issuer Rating	BBB+
Outlook	Stable
Location	China
Industry	Photovoltaic and Feed
Date	13 October 2023

Lianhe Ratings Global Limited ("Lianhe Global") has assigned 'BBB+' global scale Long-term Issuer Credit Rating to Tongwei Co., Ltd. ("Tongwei"). The Outlook is Stable.

Summary

The Issuer Rating reflects Tongwei's sizeable operating scale and leading market position in photovoltaic ("PV") industry, significant advantages in cost and operating efficiency, and the strong financial performance supported by high demand in PV power. However, Tongwei's rating is constrained by the strong cyclicality of the PV industry and the intensified market competition.

The Stable Outlook reflects our expectation that Tongwei would maintain its established market position and high operational efficiency, which could help the company to maintain its financial leverage and liquidity at a manageable level.

Key Rating Rationales

Global Leader in PV Industry: Tongwei is the world's largest producer of high-purity polysilicon and solar cells with total production capacity of 260,000 tons and 70 GW, respectively. The production output of high-purity polysilicon reached 267,000 tons in 2022, accounting for approximately 28% of the global market share, ranking first globally for two consecutive years, while solar cells' production output reached 49.2GW, accounting for approximately 13% of the global market share, ranking first globally for six consecutive years.

The company is also leading in production costs and technology. In 2022, the company boasted the industry lowest production costs in silicon materials of below USD8/kg, as compared to the industry average of around USD9/kg. For solar cells, Tongwei rapidly released the production capacity for 182 mm and larger PERC cells, the current mainstream product with relatively high cost efficiency, to match the market demand. In 2022, the company launched the TNC cell products based on new generation TOPCon technology, which has higher conversion efficiency. Tongwei can stably supply N-type silicon materials, the raw material for major new generation solar cells. We expect Tongwei to keep up with the fast technology updates of the PV industry given its high investment and strong ability in R&D.

Strong Market Demand but Intensified Competition: The demand for the PV power has been increasing in recent years against the background of carbon neutral and energy transition. The global installation of new PV power in 2022 reached an unprecedented level of 230 GW, marking a year-over-year growth of 35.3%. As the overall ramp-up of new production capacity could not keep pace with downstream demand, the price of silicon materials, Tongwei's main product and a critical upstream material, skyrocketed in 2022.

However, the lucrative returns in the PV industry have been drawing new participants into the sector. The total production capacity of silicon materials is expected to achieve above 2 million tons by end-2023 (2022: 983,000 tons), which could support the production of PV modules of above 847 GW, more than twice of expected global demand of the year. The majority of both the existing and planned silicon materials production capacity is situated within China. Furthermore, Chinese producers, including Tongwei, are confronting obstacles in some overseas markets. These regions have bolstered support for their domestic PV industries and erected barriers to the

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Applicable Criteria
General Corporate Rating Criteria (31 December 2021)
General Corporate Rating Criteria: Addendum (30 August 2022)

import of Chinese PV products. However, we anticipate that the reliance on Chinese products will remain high in the coming years, given Chinese producers' dominant position in the supply chain of PV industry.

Ongoing Capacity Expansion and Competitive Pricing to Secure Market: Tongwei has recently unveiled an ambitious capacity expansion strategy with the objective of multiplying its high-purity polysilicon production capacity by three or even four times, targeting an annual output of 0.8-1 million tons by 2026. It also plans to double its solar cell production capacity to reach 130-150 GW. We expect Tongwei's strong cost advantage and operating efficiency enable the company to offer competitive prices to withstand intensified market competition whiling maintaining its market share and leading position.

Agriculture and Animal Husbandry Business Adds Diversity and Stability: Tongwei's another major business, agriculture and animal, has exhibited steady growth over the past three years. The segment produces and sells aquatic and livestock feeds with a sales network covering around China and reaching southeast countries, such as Vietnam and Bangladesh. Tongwei has managed to sustain its strong market position in the feed industry, boasting a production capacity exceeding ten million tons. This segment serves as a dependable revenue stream for Tongwei, supported by the stable demand for feed products.

Cost Advantage and Operating Efficiency Underpin Profitability: Tongwei delivered remarkable operating results in the past three years, supported by the strong demand in PV power. Its total revenue grew strongly to RMB142.42 billion in 2022 from RMB44.20 billion in 2020, representing a remarkable compound annual growth rate of 79.5%. Its gross margin also demonstrated an upward trend over the same period, reaching 38.2% in 2022, up from 17.1% in 2020.

Nevertheless, with the gradual commencement of new facilities in 2023, the price of silicon materials experienced a considerable decrease, plummeting by 76% in August 2023 compared to the same period in the previous year, and the price of solar cells also fell sharply by 42%. Amid this precipitous price drop, Tongwei faced significant pressure on its profitability. Yet we expect Tongwei to maintain gross margin at above 20% in the next two to three years, given the company's substantial cost advantages and operating efficiency.

Increasing Debts but Leverage Remains Manageable; Adequate Liquidity: Tongwei's total debt increased significantly to RMB31.52 billion at end-2022 (including convertible bonds) from RMB13.60 billion at end-2020 owing to the company heavy investments in expanding its production capacity in the past three years. Yet Tongwei's financial leverage, as measured by debt/(debt+equity), stayed at a manageable level of approximately 30% over the same period given the company's strong profitability. We expect Tongwei's total debt to keep increasing, pushing up its financial leverage to 40%-50%, in the next two to three years to support its ongoing expansion, which necessitates substantial capital expenditure, estimated to be RMB23-27 billion annually from 2023 to 2026. We expect its debt serving capacity (as measured by total debt/EBITDA and EBITDA/Interest) to remain strong given its robust operational cash inflow and its new plants will be put into production gradually.

Tongwei's liquidity is adequate. The company had total cash on hand of RMB36.84 billion and financial assets that can be easily converted into cash of RMB4.30 billion at end-2022, compared with its short-term debt of RMB1.78 billion. In addition, Tongwei has access to multiple financing sources, including bank borrowings, with unused bank facilities amounting to a considerable sum of RMB54.21 billion at end-March 2023, bond issuances, and equity placements.

Rating Sensitivities

We would consider downgrading Tongwei's rating if (1) it were to pursue aggressive business expansions which results in an increase in its financial leverage as measured by its total debt/EBITDA consistently at above 3.5x or EBITDA interest coverage consistently at below 12x, or (2) its operating performance in terms of revenue, margin or cash flow from operations experience a material decline, or (3) its liquidity is materially worsened.

We would consider upgrading Tongwei's rating if (1) it were to improve its operating scale and market share significantly, and/or (2) it were to demonstrate its resilience and ability to maintain its operating and financial performance amid adverse market conditions.

Company Profile

Tongwei, initially established as Tongwei Feed Co., Ltd. in 1995, has evolved into a global leader in both the PV and feed products industries. The company, listed on the Shanghai Stock Exchange (600438.SH) since 2004, initially focused on the production and sale of feed products before entering the PV industry. By end-2022, Tongwei has become the world's largest producer of high-purity polysilicon and solar cells, leading both in terms of production capacity and output.

At end-2022, Mr. Liu Hanyuan, the founder of Tongwei, and his wife Ms. Guan Yamei, collectively held a significant 43.85% stake in the company through Tongwei Group Co., Ltd. The remaining 56.15% of the shares were publicly owned. Mr. Liu Hanyuan serves as a director of and the chairman of Tongwei Group Co., Ltd. In March 2023, his daughter, Ms. Liushuqi, was appointed as both the board chairperson and CEO of Tongwei.

Business Profile

Global Leader in PV Industry

Tongwei participates in PV and agriculture and animal husbandry industries. It is the world's largest producer of high-purity polysilicon and solar cells with total production capacity of 260,000 tons and 70 GW, respectively. The production output of high-purity polysilicon reached 267,000 tons in 2022, accounting for approximately 28% of the global market share, ranking first globally for two consecutive years, while solar cells' production output reached 49.2GW, accounting for approximately 13% of the global market share, ranking first globally for six consecutive years. Tongwei has developed a stable sourcing and marketing network by entering long-term agreements and equity cooperation with major players in the PV industry. The company has also expanded to the downstream PV modules production and Aquaculture-Photovoltaic Integration PV Powerplants operation businesses.

In addition to production capacity, Tongwei is leading in production costs and technology as well. In 2022, the company boasted the industry lowest production costs in silicon materials of below USD8/kg, as compared to the industry average of around USD9/kg. The cost advantage can be attributed to Tongwei's choice of locations for its production plants. Tongwei allocates its facilities in provinces like Sichuan, Yunan and Inner Mongolia, where electricity costs are lower. Given that electricity expenses account for a substantial 30% to 40% of total production costs of silicon materials, this has yielded substantial savings. Moreover, after years of development, the company has accumulated technical know-how to reduce electricity, steam and silicon consumption, improve its capacity utilization rate at 110%-120% level in the past three years (industry average: approximately 95%), and lower its capital expenditure for investing new production capacities.

For solar cells, Tongwei rapidly released the production capacity for 182 mm and larger PERC cells, the current mainstream product with relatively high cost efficiency, to match the market demand. In 2022, the company launched the TNC cell products based on new generation TOPCon technology, which has higher conversion efficiency. Tongwei is also able to stably supply N-type silicon materials, the raw material for major new generation solar cells. We expect Tongwei to keep up with the fast technology updates of the PV industry given its high investment and strong ability in R&D.

Intensified Competition

The lucrative returns in the PV industry have been drawing new participants into the sector. By end-2022, global production capacity of silicon materials was around 983,000 tons. Concurrently, an additional 353,000 tons of production capacity were under construction, and plans were announced for the creation of a further 1,256,000 tons of new production capacity. The total production capacity is expected to achieve above 2 million tons by end-2023, which could support the production of PV modules of above 800 GW, more than twice of expected global demand of the year. The majority of both the existing and planned production capacity of silicon materials is situated within China.

Furthermore, Chinese producers, including Tongwei, are confronting obstacles in overseas markets such as the United States, Europe, and India. These regions have bolstered support for their domestic PV industries and erected barriers to the import of Chinese PV products, driven by the considerations of manufacturing reshoring and energy security. However, we anticipate that the reliance on Chinese products will remain high in the coming years. This expectation stems from Chinese producers' dominant position in the PV industry, which claimed approximately 81%, 98%, 93% and 88% global production capacity of silicon materials, silicon wafers, solar cells, and PV modules, respectively.

Ongoing Capacity Expansion

Tongwei has recently unveiled a large-scale capacity expansion strategy with the objective of multiplying its high-purity polysilicon production capacity by three or even four times, targeting an annual output of 0.8-1 million tons by 2026. Concurrently, it also plans to double its solar cells production capacity to reach 130-150 GW. We expect the expansion plan to further strength Tongwei's leading market position in the PV industry, potentially securing a global market share of 30%-40% in high-purity polysilicon and solar cell products. For the downstream PV modules, the company plans to put 76 GW capacity into production in 2023, enlarging the total production capacity to above 80 GW. We expect Tongwei's strong cost advantage and operating efficiency enable the company to offer competitive prices to withstand intensified market competition whiling maintaining its market share and leading position.

Stable Agriculture and Animal Husbandry Business

Tongwei's agriculture and animal husbandry business has exhibited steady growth over the past three years, although its proportional contribution to total revenue has seen a decline due to the vigorous growth of the PV sector. The segment produces and sells aquatic and livestock feeds with a sales network covering around China and reaching southeast countries, such as Vietnam and Bangladesh. Tongwei has managed to sustain its strong market position in the feed industry, boasting a production capacity exceeding ten million tons.

This segment serves as a dependable revenue stream for Tongwei, supported by the stable demand for feed products. However, its gross margin declined in the past three years, which was primarily attributable to the rising costs of raw materials, including corn and soybean.

Tongwei's Revenue Breakdown by Industry

(RMB billion)	2020			2021		
Industry	**Revenue**	**%**	**Gross Margin (%)**	**Revenue**	**%**	**Gross Margin (%)**
Agriculture and Animal Husbandry	20.94	47.4	10.7	24.59	37.9	9.5
PV	22.50	50.9	23.2	38.18	58.9	39.8
Others	0.76	1.7	12.9	2.06	3.2	5.8
Total	**44.20**	**100**	**17.2**	**64.83**	**100**	**27.9**

(RMB billion)	2022			1H2023		
Industry	**Revenue**	**%**	**Gross Margin (%)**	**Revenue**	**%**	**Gross Margin (%)**
Agriculture and animal Husbandry	31.65	22.2	7.9	15.43	20.8	8.2
PV	109.83	77.1	47.1	58.16	78.5	41.0
Others	0.94	0.7	15.2	0.49	0.7	5.9
Total	**142.42**	**100.0**	**38.3**	**74.07**	**100**	**34.1**

Source: Tongwei and Lianhe Global's Calculation

Financial Profile

High Profitability Supported by Strong Demand for PV Products

Tongwei delivered remarkable operating results in the past three years. Its total revenue grew strongly to RMB142.42 billion in 2022 from RMB44.20 billion in 2020, representing a strong compound annual growth rate of 79.5%. Its gross margin also demonstrated an upward trend over the same period, reaching 38.2% in 2022, up from 17.1% in 2020.

This was supported by the strong domestic and global demand in PV power against the background of carbon neutral and energy transition. PV power has achieved grid parity since 2021 and contributed significantly to clean energy. Its demand was amplified by Russia-Ukraine conflict in 2022, which led to soaring fossil fuel prices and heightened concerns about energy security. As a result, the global installation of new PV power in 2022 reached an unprecedented level of 230 GW, marking a year-over-year growth of 35.3%.

This surge greatly benefited established players, like Tongwei, in the PV industry. As the overall ramp-up of new production capacity could not keep pace with downstream demand, the price of silicon materials, Tongwei's main product and a critical upstream material, skyrocketed in 2022. Tongwei delivered a notable performance improvement in 2022 with 180.1% increase in the PV sector's revenue and a high gross margin of 47.1%.

With the gradual commencement of new facilities in 2023, the price of silicon materials experienced a considerable decrease, plummeting by 76% in August 2023 compared to the same period in the previous year, and the price of solar cells also fell sharply by 42%. Amid this precipitous price drop, Tongwei faced significant pressure on its profitability. The PV sector's gross margin lowered to 41.0% in the first half of 2023. Yet we expect Tongwei to maintain gross margin at above 20% in the next two to three years, given the company's substantial cost advantages.

Increasing Debts but Leverage Remain Manageable

Tongwei's total debt increased significantly to RMB31.52 billion at end-2022 (including convertible bonds) from RMB13.60 billion at end-2020 owing to the company heavy investments in expanding its production capacity in the past three years. Yet Tongwei's financial leverage, as measured by debt/(debt equity), stayed at a manageable level of approximately 30% over the same period given the company's strong profitability. We expect Tongwei's total debt to keep increasing, pushing up its financial leverage to 40%-50% in the next two to three years to support its ongoing expansion, which necessitates substantial capital expenditure, estimated to be RMB23-27 billion annually from 2023 to 2026.

Tongwei's debt maturity profile largely matches its project funding needs, with short-term debts and long-term debts accounting for 5.6% and 94.4% at end-2022, respectively. We expect its debt serving capacity (as measured by total debt/EBITDA and EBITDA/Interest) to remain strong given its robust operational cash inflow and its new plants will be put into production gradually.

Adequate Liquidity

Tongwei's liquidity is adequate. The company had total cash on hand of RMB36.84 billion and financial assets that can be easily converted into cash of RMB4.30 billion at end-2022, compared with its short-term debt of RMB1.78 billion. In addition, Tongwei has access to multiple financing sources, including bank borrowings, with unused bank facilities amounting to a considerable sum of RMB54.21 billion at end-March 2023, bond issuances, and equity placements.

Key Assumptions

- Annual revenue growth rate: 3%-15% for 2023-2025
- Gross margin: 20%-25% 2023-2025
- Annual capital expenditure: RMB23-27 billion for 2023-2025
- Cash dividend payout ratio: 30%-50% for 2023-2025

Key Financial Metrics

2020A-2025F	Debt/EBITDA	EBITDA/Interest	Debt/Capitalisation	Quick Ratio
Weighted Average	2.2x	24.2x	41.3%	1.3x

Source: Tongwei and Lianhe Global's adjustments and forecasts

Appendix I: Tongwei's Rating Factors

Rating Factors	Weight	Initial Rating
I. Market Demand Analysis	**15.0%**	**a**
II. Business Analysis[1]	**45.0%**	**bbb**
III. Financial Analysis[2]	**40.0%**	**a+**
IV. Base Score	**100.0%**	**a-**
V. Industry Risk		**bb**
VI. Qualifiers		
Liquidity		Neutral
Corporate Governance		Neutral
Debt Structure and Financial Policy		Neutral
Idiosyncratic Analysis		Neutral
Stand-Alone Creditworthiness		**bbb+**
VII. External Support		**N/A**
Issuer Credit Rating		**BBB+**

Source: Lianhe Global

[1] Business Analysis contains sub-factors of market position, diversification, competitive position, operating efficiency and profitability.
[2] Financial Analysis contains sub-factors of debt/EBITDA, EBITDA interest coverage, debt/capitalisation and quick ratio.

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