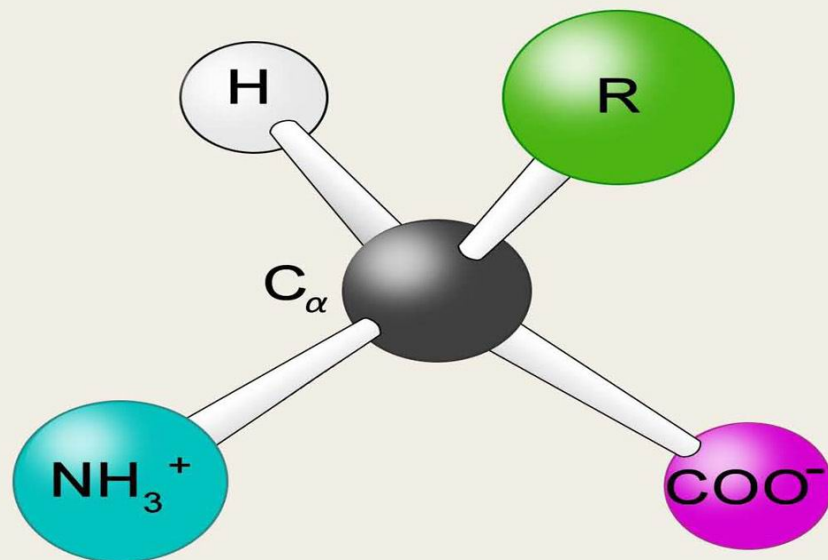


Amino Acids China E-News 202301

Issue 1 January 31 2023





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Headline

In 2022, China's lysine market displayed an overall surplus pattern, with limited growth in exports and modest growth in downstream demand. The downstream demand for lysine may increase in 2023 due to the continuous promotion of the low-protein diet strategy and a diminished effect of the COVID-19 pandemic.

On 27 Dec., 2022, it was reported that the local authority would approve the EI report of Guizhou Shousheng's 2,000 t/a refined amino acids project. On 3 Jan., 2023, the EI report of Haide Biotech's 1,050 t/a amino acid production line technical renovation project was approved by the local authority.

On 6 Jan., the EI report of Tianjin Changlu Haijing's "1,000 tonnes level biological fermentation R&D platform project" was accepted and publicised by the local authority.

On 30 Dec., 2022, the pre-submission publication of EI report of Inner Mongolia Xuanhong's "L-Glutamine and pharmaceutical intermediates project" was made on the website of the People's Government of Kailu County.

The EI report of Jiangsu Jiasheng's "new construction project of 3,500 t/a food additive amino acid series products and 500 t/a feed additive sodium chloride (by-product)" was approved on 27 Dec., 2022.

On 19 Jan., 2023, the EI report of Hongda Biotech's 10,000 t/a nicotinic acid production device technical renovation project was publicised.

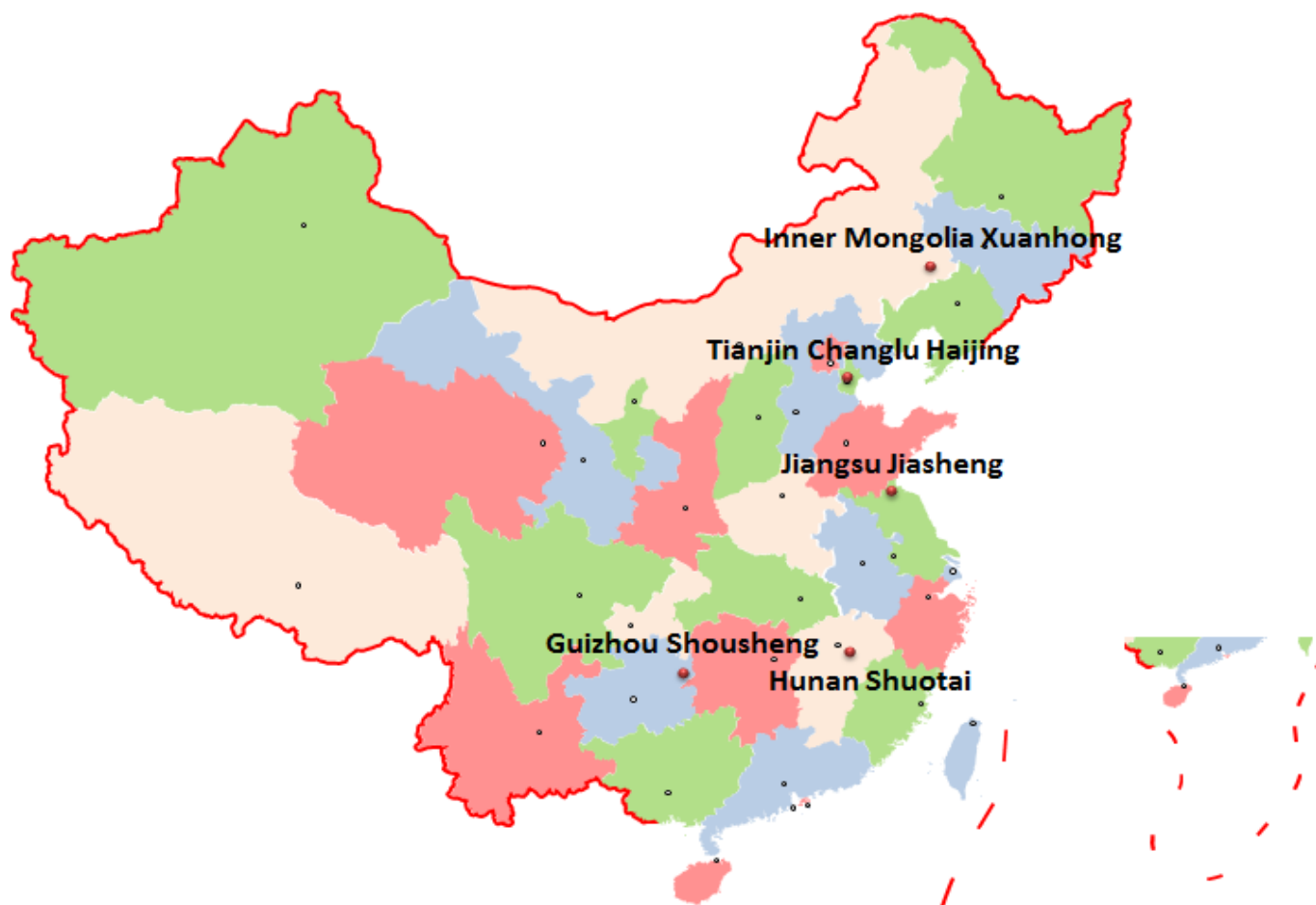
On 30 Dec., 2022, the pre-approval publication of EI report of Hunan Shuotai's "altered production project of 24,000 t/a specialty high molecular new materials" was made by the local authority. This project involves changing the 2,000 t/a solvent pressure sensitive adhesive production line to 600 t/a PASP production line.

On 22 Dec., 2022, the EI report (draft for soliciting public opinions) of Inner Mongolia Kingdomway's "construction project of 100 t/a S-Adenosyl-L-methionine, 100 t/a glutathione, 50 t/a phosphatidylserine, 5 t/a pyrroloquinoline quinone, and 5 t/a nattokinase" was publicised by the local authority.

From an all-year point of view, the price of methionine in 2022 first soared in Q1 and then started dropping, eventually becoming stable in Q4.

China's import volume of methionine in Nov. 2022 hit a new high in the year, while both the import price and export price in Nov. dropped month on month.







Editor's Note

Welcome to the January issue of Amino Acids China E-News.

With regard to project progress, the following projects are reported in this issue:

- Refined amino acid projects of Guizhou Shousheng and Haide Biotech;
- Tianjin Changlu Haijing's biological fermentation R&D platform project;
- Inner Mongolia Xuanhong's L-Glutamine and pharmaceutical intermediates project;
- Jiangsu Jiasheng's 3,500 t/a food additive amino acids project;
- Hongda Biotech's 10,000 t/a nicotinic acid technical renovation project;
- Hunan Shuotai introducing 600 t/a PASP;
- Inner Mongolia Kingdomway's SAM, GSH and other products project.

With regard to update on enterprises:

- Meihua Group's net profit for 2022 expectedly rises over 70%.
- Zhejiang NHU and ZRCC intend to jointly establish a joint venture.
- Star Lake Bioscience released earnings guidance for 2022.
- Northeast Fufeng's sales revenue for 2022 totals USD1.53 billion.
- Huaheng Biotech's net profit for 2022 is expected to climb by over 78% YoY.

Price: From an all-year point of view, the price of methionine in 2022 first soared in Q1 and then started dropping.

Import and export: China's import volume of methionine in Nov. hit a new high in 2022.

The USD/CNY exchange rate in this newsletter is USD1.00=RMB6.9475 on 3 Jan., 2023, sourced from the People's Bank of China. All the prices mentioned in this newsletter will include the VAT, unless otherwise specified.





Market Analysis

2022 review and 2023 forecast for lysine market

Summary: In 2022, China's lysine market displayed an overall surplus pattern, with limited growth in exports and modest growth in downstream demand. The downstream demand for lysine may increase in 2023 due to the continuous promotion of the low-protein diet strategy and a diminished effect of the COVID-19 pandemic.

In recent years, the domestic lysine market has been oversupplied. Due to limited export growth and small incremental domestic feed demand, the supply of China's lysine market outpaced the demand in 2022. The industrial concentration ratio increased as a result of some small and medium-sized firms (SMEs) experiencing significant losses and exiting the market due to rising costs. With the continuous promotion of the national low-protein diet strategy, the increase in lysine usage and the change in domestic and foreign demand will be key factors in the lysine market in 2023.

Supply

- 2022: As a result of increased competition and a low level of market prosperity, SMEs with inefficient production capacity increasingly left the market, which pushed up industry concentration. However, the domestic lysine production capacity still grew by almost 20% YoY to approximately 4 million t/a. Among the local major lysine producers, Meihua Holdings Group Co., Ltd. (Meihua Group; stock code: 600873.SH) activated all of its 300,000 t/a lysine project (put into operation in Nov. 2021) capacity through its Jilin Plant, and Global Bio-Chem Technology Group Co., Ltd. (Global Bio-Chem; stock code: 00809.HK) resumed the production of its Dehui Plant in mid-Dec. 2022. The total domestic lysine output in 2022 reached about 2.50 million tonnes under a 63% average industrial operating rate.
- 2023: As additional production capacity is put into operation and the process of production restart is under way, the total annual production capacity of lysine in China is anticipated to surpass 4.50 million t/a. The market's competition will intensify, and SMEs' operating rates are likely to stay low.

Demand

- Domestic feed demand: The feed sector accounts for about 90% of the downstream demand for lysine. According to statistics from the China Feed Industry Association (CFIA), China's feed production in 2021 rose by 16.10% YoY to 293 million tonnes. In contrast, a lesser increase in the yield is anticipated for 2022. During Jan.–Nov. 2022, China produced 268.31 million tonnes of industrial feed, an increase of 0.56% YoY. The output of additive premixed feed over the same reporting period dropped by 9.40% YoY to 5.59 million tonnes, reflecting decreased consumption needs, and the production for 2022 may fall.
- Foreign export demand: Since 2015, lysine exports have grown annually as a result of rising global demand. Statistics from China Customs showed that the country exported 927,182 tonnes of lysine, lysine esters and salts in 2022, an increase of 12.24% from 2021. Monthly exports were significantly imbalanced in 2022—exports soared in H1 2022 due to reduced production by international manufacturers and the impact of "Dual Control" policy (governmental control on energy consumption and energy intensity), while average monthly exports decreased in H2 2022 because of weaker overseas demand.
- The downstream feed demand for 2023 is predicted to progressively increase, and foreign export demand will grow slightly, given a faster advance in the production reduction and replacement of soybean meal and the low-protein diet policy, as well as the gradually relaxation of domestic pandemic control measures.

Price

- In 2022, the price of 98.5% lysine hydrochloride overall showed a downward trend, with an annual average price of USD1,619.63/t (RMB10,847/t), down 3.12% YoY; the price of 70% lysine sulfate dropped after rising, with an annual average price of USD980.41/t





(RMB6,566/t), down 2.31% YoY. Due to the limited increase in domestic demand and limited export growth in 2022, the market players were pressurised into lowering the prices.

- In terms of raw materials, the national corn price in 2022 gradually rose from the low level at the beginning of the year. In Dec. 2022, the average corn price was USD406.62/t (RMB2,896/t), up 15.06% YoY, while the average corn price for the entire year of 2022 grew by 2.92% YoY to USD406.93/t (RMB2,527/t).
- Market prices for lysine are expected to remain low in Q1 2023 due to a growing supply and could rise in Q2 2023 as domestic and foreign market demand picks up. In H2 2023, the market prices are predicted to have a range-bound oscillation as the upstream industry integrates and downstream demand for pig, poultry, and aquatic feed strengthens owing to modified downstream formulas.

Refined amino acid projects of Guizhou Shousheng and Haide Biotech

Summary: On 27 Dec., 2022, it was reported that the local authority would approve the EI report of Guizhou Shousheng's 2,000 t/a refined amino acids project. On 3 Jan., 2023, the EI report of Haide Biotech's 1,050 t/a amino acid production line technical renovation project was approved by the local authority.

Guizhou Shousheng's project

On 27 Dec., 2022, it was reported that the local authority would approve the Environmental Impact (EI) report of Guizhou Shousheng Technology Co., Ltd. (Guizhou Shousheng)'s "cleaner production project of high-performance organic new materials and pharmaceutical raw materials".

Project overview

- Type of project: New construction
- Total investment: USD28.79 million (RMB200 million)
- Construction site location: Wanshan Economic Development Zone, Wanshan District, Tongren City, Guizhou Province
- Site area: Roughly 56,666.95 square metres
- Construction details: Four production workshops will be built. Eight production lines will be built within the No.4 production workshop. Four production lines will be built within the No.3 production workshop. No.1 and No.2 production workshop will have six and four production lines built within respectively, used to produce non-amino acid products. A spray drying workshop, a sanding workshop, eight warehouses, and other supporting facilities will also be built.
- Designed production capacity: 14,510 t/a in total
 - No.4 production workshop: 2,000 t/a for refined amino acids (1,000 t/a for refined L-Valine, 800 t/a for refined L-Tryptophan, 100 t/a for refined L-Leucine, and 100 t/a for refined L-Isoleucine), 1,100 t/a for L-Prolinamide, 500 t/a for acetyl-L-asparagine, 15 t/a for phenylacetyl glutamine, 5 t/a for S-Acetyl-L-glutathione, 5 t/a for N-Phenylacetyl-L-Prolylglycine ethyl ester, 240 t/a for 4-Methyl-5-thiazoleethanol, and 20 t/a for propionyl-L-Carnitine chloride.
 - No.3 production workshop: 500 t/a for 4-Amino-2,6-dichlorophenol, 500 t/a for p-Aminobenzamide, 450 t/a for 3,5-Dichloroaniline, and 200 t/a for 4,4'-Diaminobenzanilide.
 - No.1 and No.2 production workshop: 6,800 t/a for dyes (disperse red, transparent red, disperse blue, disperse violet, etc.), 375 t/a for coumarin, 1,000 t/a for Naphthol AS-IRG, and 800 t/a for other product.
- Number of budgeted posts: 200 (production staff: 180; administrative and management staff: 20)
- Working schedule: For production workers, working schedule features three 8-hour shifts per working day and 300 working days per year.

Founded in July 2020 with a registered capital of USD3.15 million (RMB21.88 million), Guizhou Shousheng mainly engages in the





production and sale of dyes, dye intermediates, and pharmaceutical intermediates.

Haide Biotech's project

On 3 Jan., 2023, the EI report of Ningbo Zhenhai Haide Biotech Co., Ltd. (Haide Biotech)'s 1,050 t/a amino acids production line technical renovation project was approved by the local authority.

Project overview

- Type of project: Expansion construction
- Total investment: USD1.44 million (RMB10 million)
 - Investment for environmental protection purposes: USD35,984 (RMB250,000)
- Construction site location: Petrochemical Economic and Technological Development Zone, Zhenhai District, Ningbo City, Zhejiang Province
- Construction details: In an existing workshop where a 300 t/a L-Ornithine L-Aspartate production line was built within, a refining production line for L-Ornithine hydrochloride will be introduced. In an existing workshop where a 150 t/a L-Arginine hydrochloride production line was built within, a refining production line for L-Lysine hydrochloride, methionine, and tryptophan will be introduced.
- Designed production capacity: 100 t/a for L-Ornithine hydrochloride ($\geq 99\%$), 650 t/a for L-Lysine hydrochloride ($\geq 99\%$), 250 t/a for methionine ($\geq 99\%$), and 50 t/a tryptophan ($\geq 99\%$).
 - The production processes of L-Lysine hydrochloride, methionine, and tryptophan are the same; those three products will be produced on the same line. In terms of actual production, the proportion of the products refined will depend on the market situation, but the total capacity of this shared production line will not exceed 950 t/a.
- Number of budgeted posts: The company will deploy some of its employees from the existing production plant to this project's production, instead of recruiting new ones.
- Working schedule: Three 8-hour shifts per working day
- Construction period: Six months

Founded in Feb. 2004 with a registered capital of USD6.91 million (RMB48 million), Haide Biotech specialises in the production, refining, and sale of amino acids.





Company Dynamics

El report of Tianjin Changlu Haijing's biological fermentation R&D platform project enters approval process

Summary: On 6 Jan., the EI report of Tianjin Changlu Haijing's "1,000 tonnes level biological fermentation R&D platform project" was accepted and publicised by the local authority.

On 6 Jan., the Government Affairs Service Office of the People's Government of Binhai New Area, Tianjin Municipality announced that the Environmental Impact (EI) report of "1,000 tonnes level biological fermentation R&D platform project", submitted by Tianjin Changlu Haijing Group Co., Ltd. (Tianjin Changlu Haijing), entered the approval process and was publicised. As the "industry-university-research" collaboration in the biological fermentation industry has become increasingly close over the recent years, Tianjin Changlu Haijing intends to cooperate with Tianjin Institute of Industrial Biotechnology, Chinese Academy of Sciences, so as to build the biological fermentation pilot-scale experiment platform project ("1,000 tonnes level biological fermentation R&D platform project"). This project features the pilot-scale experiments of L-Hydroxyproline and 5-Aminolevulinic acid (5-ALA). The objectives of this project include:

- acquiring the technological parameters for bacterial strain culture, fermentation process, separation and extraction that are conducted at the pilot scale;
- establishing a quality control system and a treatment process for "three wastes" (waste gas, waste water, and waste residue);
- forming a relatively complete process package;
- and laying a solid foundation for production at the next larger scale.

Project overview

- Type of project: New construction
- Construction site location: Binhai New Area, Tianjin Municipality
- Total investment: USD6.75 million (RMB46.92 million)
 - Investment for environmental protection purposes: USD427,492 (RMB2.97 million), accounting for 6.3% of the total investment
- Site area: 6,768.49 square metres
- Construction details: A R&D workshop for biological fermentation products and its supporting facilities including fermentation room, extraction room, drying room, packaging room, and research room will be built. Those facilities will be used to conduct the pilot-scale experiments of L-Hydroxyproline and 5-Aminolevulinic acid (5-ALA).
- R&D plan: Researching and developing 135 t/a of L-Hydroxyproline and 2.1 t/a of 5-ALA
- Major raw materials: 2.05 t/a of peptone, 10.36 t/a of yeast extract powder, 10.11 t/a of ammonium sulphate, 0.89 t/a of ammonium chloride, and 5.44 t/a of glycine
- Number of budgeted posts: 48
- Working schedule: 335 working days per year
- Construction period: Jan.–June, 2023

This project is only implemented to conduct the pilot-scale experiments of L-Hydroxyproline and 5-ALA, and does not involve production at any scale. It comes with a time limit of five years for research and development.

Established in June, 1995 with a registered capital of USD371.36 million (RMB2.58 billion), Tianjin Changlu Haijing is a state-owned enterprise and a large producer that comprehensively utilises bittern. The company specialises in traditional salt manufacturing, salt-based chemicals, and chemical pharmaceutical production, and is capable of producing more than 2 million t/a of high-quality industrial





salt. One of the largest production bases of sea salt in China, Tianjin Changlu Haijing is the Tianjin municipal pilot-scale experiment base of salt for pharmaceutical use, boasting its domestically-leading production process, techniques, and equipment for sea salt and chemical products.

EI report of Inner Mongolia Xuanhong's L-Glutamine and pharmaceutical intermediates project to enter approval process

Summary: On 30 Dec., 2022, the pre-submission publication of EI report of Inner Mongolia Xuanhong's "L-Glutamine and pharmaceutical intermediates project" was made on the website of the People's Government of Kailu County.

On 30 Dec., 2022, the pre-submission publication of Environmental Impact (EI) report of "L-Glutamine and pharmaceutical intermediates project", which was from Inner Mongolia Xuanhong Biomedicine Co., Ltd. (Inner Mongolia Xuanhong), was made on the website of the People's Government of Kailu County; the EI report will soon enter the approval process. Relying on the carbohydrate chemistry, this project features making use of the huge output of corn in Kailu County and extracting L-Glutamine by applying biological fermentation technology and purification technology. L-Glutamine produced will be further used to produce intermediates for anti-tumour drugs (such as 3-Amino-2,6-piperidinedione hydrochloride) and active pharmaceutical ingredient (API) products. This will help the company lay a good foundation for the quality of follow-up products.

Compared to the previous second-time publication of EI report on 4 Aug., 2022, the pre-submission publication made this time disclosed more details about the project; notably, the new production capacity for sarcosine that was originally planned to be introduced has been cancelled.

Project overview

- Type of project: New construction
- Construction site location: Kailu Industrial Park Zone, Kailu County, Tongliao City, Inner Mongolia Autonomous Region
- Total investment: USD8.64 million (RMB60 million)
 - Investment for environmental protection purposes: USD0.87 million (RMB6.05 million), accounting for 10.08% of the total.
- Site area: 31,799.45 square metres
- Floor area: 12,422.48 square metres
- Construction details: Major construction sections include production workshops, a raw material bank, a warehouse, two storehouses (respectively for temporary storage of hazardous waste and storage of non-hazardous solid waste), a power station, a comprehensive office building, and a wastewater treatment plant.
- Designed production capacity:
 - 300 t/a for L-Glutamine (259.76 t/a will be for sold as a product, and 40.24 t/a will be used as a raw material for the company's own production of 3-Amino-2,6-piperidinedione hydrochloride)
 - 20 t/a for 3-Amino-2,6-piperidinedione hydrochloride (11.147 t/a will be sold as a product, 4.323 t/a will be used as a raw material for its own production of lenalidomide, and 4.53 t/a will be used as a raw material for its own production for pomalidomide)
 - 5 t/a for 3-fluorophthalic anhydride
 - 5 t/a for lenalidomide
 - 5 t/a for pomalidomide





- 200 t/a for 2-Methyl-2-thiopseudourea sulfate
- 50 t/a for 2,4-Thiazolidinedione
- Number of budgeted posts: 60
- Working schedule:
 - L-Glutamine workshop: Production staff divided into four groups; three 8-hour shifts per working day; 300 working days per year
 - Workshop for other products: Production staff divided into four groups; three 8-hour shifts per working day; 280 working days per year
- Construction period: Jan., 2023–Oct., 2023
- Production process of L-Glutamine: With *Corynebacterium glutamicum* as the major raw material, production process involves steps including bacterial strain culture, fermentation, filtration, decolourisation, concentration & crystallisation, centrifugation, and drying. Eventually, L-Glutamine will be produced.

Inner Mongolia Xuanhong was founded in June, 2021 with a registered capital of USD5.76 million (RMB40 million). Inner Mongolia Xuanhong has a related company called Shandong Xuanhong Biopharmaceutical Co., Ltd. (Shandong Xuanhong), which was founded by Dr Li Zhanjiang, a post-doctoral research fellow at University of Pennsylvania, in 2015. Shandong Xuanhong provides Inner Mongolia Xuanhong with major production techniques for biomedicine products and pharmaceutical intermediates; it has established tight cooperation relationships with research institutes and universities like Chinese Academy of Sciences, Tianjin University, and Shandong University. Such cooperation relationships further enhanced the company's competitive edge in the fields of pharmaceutical R&D and manufacturing of pharmaceutical products.

EI report of Jiangsu Jiasheng's 3,500 t/a food additive amino acids project approved

Summary: The EI report of Jiangsu Jiasheng's "new construction project of 3,500 t/a food additive amino acid series products and 500 t/a feed additive sodium chloride (by-product)" was approved on 27 Dec., 2022.

Submitted by Jiangsu Jiasheng Science and Technology Development Co., Ltd. (Jiangsu Jiasheng), the Environmental Impact (EI) report of "new construction project of 3,500 t/a food additive amino acid series products and 500 t/a feed additive sodium chloride (by-product)" was approved by the local environmental authority on 27 Dec., 2022.

Project overview

- Type of project: New construction
- Total investment: USD7.20 million (RMB50 million)
 - Investment for environmental protection purposes: USD287,873 (RMB2 million)
- Construction site location: Ganyu District Economic Development Zone, Lianyungang City, Jiangsu Province
- Site area: 6,137 square metres
- Construction details: A new production workshop for food additives, a warehouse, a R&D building, and five production lines will be built. 140 (sets of) devices will be purchased, such as centrifuge, dryer, enamel reaction kettle, and electrolyser.
- Production process:
 - First production line: The raw materials, namely L-Cystine and hydrochloric acid, will undergo electrolysis and refining. In this way, L-Cysteine, L-Cysteine hydrochloride monohydrate, and L-Cysteine hydrochloride will be produced.
 - Second production line: The raw materials, namely L-Methionine and acetic anhydride, will undergo acylation and refining.





Eventually, N-Acetyl-L-methionine will be produced.

- Third production line and fourth production line: The raw materials, which are amino acids like L-Lysine hydrochloride, will be dissolved and refined, eventually becoming the final products.
 - Fifth production line: Three generated things from other production lines, including centrifugation mother liquor from the production of L-Cysteine at the first production line, concentrated mother liquor and salt-containing wastewater generated by alkali absorption tower from the production of N-Acetyl-L-methionine at the second production line, will be recycled by the fifth production line and then be refined, for the purpose of producing feed additive sodium chloride.
- Number of budgeted posts: 30
 - Working hours: 24 working hours per working day; 300 working days per year
 - Construction period: 24 months



TABLE 1: Designed production capacity of Jiangsu Jiasheng's new project

Production line	Product	Production capacity, t/a	Annual working hours, h
First production line	L-Cysteine	100	800
	L-Cysteine hydrochloride monohydrate	750	6,000
	L-Cysteine hydrochloride	50	400
Second production line	N-Acetyl-L-methionine	600	7,200
Third production line	L-Lysine hydrochloride	800	7,200
Fourth production line	L-Leucine	100	600
	L-Tyrosine	100	600
	L-Threonine	250	1,500
	L-Tryptophan	100	600
	L-Arginine	100	600
	L-Valine	50	300
	L-Methionine	50	300
	L-Isoleucine	100	600
	L-Glycine	100	600
	L-Alanine	100	600
	DL-Methionine	50	300
	L-Glutamic acid	50	300
	L-Histidine	50	300
Fifth production line	Sodium chloride	500	2,400

Source: Jiangsu Jiasheng



TABLE 2: Major raw materials used in Jiangsu Jiasheng's new project

Number	Raw material	Specifications	Consumption volume, t/a	Source
1	L-Cystine	98.5%	664	Purchased from suppliers
2	L-Methionine	98.5%	472	Purchased from suppliers
3	L-Lysine hydrochloride	98.5%	802	Purchased from suppliers
4	L-Leucine	98.5%	101	Purchased from suppliers
5	L-Tyrosine	98.5%	101	Purchased from suppliers
6	L-Threonine	98.5%	254	Purchased from suppliers
7	L-Tryptophan	98.5%	101	Purchased from suppliers
8	L-Arginine	98.5%	101	Purchased from suppliers
9	L-Valine	98.5%	51	Purchased from suppliers
10	L-Isoleucine	98.5%	101	Purchased from suppliers
11	L-Glycine	98.5%	101	Purchased from suppliers
12	L-Alanine	98.5%	101	Purchased from suppliers
13	DL-Methionine	98.5%	51	Purchased from suppliers
14	L-Glutamic acid	98.5%	51	Purchased from suppliers
15	L-Histidine	98.5%	51	Purchased from suppliers
16	Acetic anhydride	98.5%	161	Purchased from suppliers

Source: Jiangsu Jiasheng

Founded in July, 2022 with a registered capital of USD1.44 million (RMB10 million), Jiangsu Jiasheng mainly engages in the production and sale of food additives.

El report of Hongda Biotech's 10,000 t/a nicotinic acid technical renovation project publicised

Summary: On 19 Jan., 2023, the EI report of Hongda Biotech's 10,000 t/a nicotinic acid production device technical renovation project was publicised.

On 19 Jan., 2023, Shandong Hongda Biotechnology Co., Ltd. (Hongda Biotech) publicised the Environmental Impact (EI) report of a project undertaken by its subsidiary, Shandong Kunda Biotechnology Co., Ltd. (Kunda Biotech), on its official website. This project is





named "10,000 t/a nicotinic acid production device technical renovation project". Due to the rapid growth of market demand for isonicotinic acid and hydroxyproline, Hongda Biotech intends to invest in and construct this technical renovation project.

The production processes of isonicotinic acid and nicotinic acid are the same except that they use different major raw materials. To implement this project, Hongda Biotech will retrofit its existing 10,000 t/a nicotinic acid production line and introduce new devices. The raw material for nicotinic acid will be changed from 3-Cyanopyridine to 4-Cyanopyridine; the operating conditions of production devices will be slightly adjusted. In this way, the retrofitted production line will be able to produce isonicotinic acid.

The production devices needed in the production process that uses fermentation method to produce hydroxyproline are basically identical to those in the existing nicotinic acid production line. Therefore, the devices in the existing production line, including fermentation device, purification device, multiple-effect evaporation device, drying and packaging device, can also be used to produce hydroxyproline after the project is completed.

Project overview

- Type of project: Technical renovation
- Total investment: USD2.99 million (RMB20 million)
 - Investment for environmental protection purposes: USD14,394 (RMB100,000), accounting for 0.5% of the total investment
- Area: Site area is 4,379.35 square metres; total floor area is 9,813.8 square metres.
- Construction site location: Production Plant of Shandong Kunda Biotechnology Co., Ltd., Yishui County Economic Development Zone, Yishui County, Linyi City, Shandong Province
- Construction details: The existing production devices for nicotinic acid will be retrofitted. The floor area will remain unchanged. New production devices like decolourisation kettle and filter will be introduced. Upon completion of this project, the workshop's total production capacity will stay the same as before; designed capacity will be 8,500 t/a for nicotinic acid, 1,000 t/a for isonicotinic acid, and 500 t/a for hydroxyproline.
- Production details: Nicotinic acid, isonicotinic acid, and hydroxyproline will be produced on the same production line, but they will not be simultaneously produced. Annual production hours of the production line total 7,200h, of which 6,120h are for nicotinic acid, 720h are for isonicotinic acid and 360h are for hydroxyproline.
- Construction period: One year
- Usage of major raw materials and auxiliary materials: 7,184 t/a of 3-Cyanopyridine, 1,448 t/a of yeast extract powder, 3,847 t/a of concentrated sulphuric acid, 1,693 t/a of glucose, and 845 t/a of 4-Cyanopyridine
- Production process: The production process of isonicotinic acid is the same as that of nicotinic acid, which is divided into three sections including preparation of biocatalyst, synthesis of isonicotinic acid, and ammonium sulphate. The production process of hydroxyproline are divided into three sections including transformation of crude hydroxyproline through biological fermentation, purification of hydroxyproline, and evaporation-concentration-crystallisation.

Additionally, Hongda Biotech is also advancing the "reconstruction and expansion project of food additives and feed additives", which features utilising existing vitamin K2 production devices and redistributing the production hours that are condensed from VK2 production to the production of newly-introduced products.

Kunda Biotech, a subsidiary of Hongda Biotech, was founded in May 2009 and covers an area of roughly 477,743 square metres.





Engaging in fine biological chemistry, Kunda Biotech produces aldehydes, acids, amines, and pyridine; its main products include potassium sorbate, 3-Picoline, 3-Cyanopyridine, and nicotinamide.

Founded in March 2004, Hongda Biotech, covering an area of 222,000 square metres, is an accredited high and new technology enterprise producing ethanol and downstream products; its main products are acetaldehyde, food-grade acetic acid, and food-grade carbon dioxide. Also, Hongda Biotech owns the longest alcohol industrial chain in the world, with assets totalling USD374.24 million (RMB2.6 billion), comprehensive production capacity reaching 1 million t/a, and annual comprehensive output value hitting USD1.44 billion (RMB10 billion). In terms of market share in China, its ethyl amines take up about 40% and pyridine products account for roughly 40%. Its output of sorbic acid (and potassium sorbate), 80% of which are exported, takes up 30% of the total output in China. With cassava as the major raw material, Hongda Biotech has formed the industrial chain of "cassava-ethanol-acetaldehyde-pyridine-nicotinamide" and the industrial chain of "cassava-ethanol-acetaldehyde-crotonaldehyde-sorbic acid (and potassium sorbate)".

Hunan Shuotai to introduce 600 t/a PASP by altering ongoing project

Summary: On 30 Dec., 2022, the pre-approval publication of EI report of Hunan Shuotai's "altered production project of 24,000 t/a specialty high molecular new materials" was made by the local authority. This project involves changing the 2,000 t/a solvent pressure sensitive adhesive production line to 600 t/a PASP production line.

On 30 Dec., 2022, the pre-approval publication of Environmental Impact (EI) report of "altered production project of 24,000 t/a specialty high molecular new materials", which was from Hunan Shuotai High Molecular New Material Co., Ltd. (Hunan Shuotai), was made by the local authority.

In 2020, in order to meet market demand, Hunan Shuotai planned to invest USD10.08 million (RMB70 million) in the construction of "production project of 24,000 t/a specialty high molecular new materials", which features building three production lines respectively for styrene-acrylate water-based laminating adhesive, vinyl acetate-butyl acrylate water-based laminating adhesive, and solvent pressure sensitive adhesive. On 21 Dec., 2020, the EI report of this project was approved by Ecological Environment Bureau of Zhuzhou City.

During the implementation of original project, the company realised that poly-L-aspartic acid (PASP) was extensively applied, as its application could be found in several fields including water treatment, pharmaceuticals, agriculture, and daily chemicals. Currently, there are several PASP producers in China. PASP that they produce is mostly used in water treatment and agriculture. As for the high-quality PASP needed in the fields of daily chemicals and pharmaceuticals, nearly no scaled production capacity can be found in China, which leaves a huge gap to be filled in the market. It can be estimated from the overall market landscape that the PASP market in China, which is currently at the introductory period, will enter growth period in 2025. That is to say, China's PASP market will make its way into a fast development period after 2025 and market space will be further expanded. Hunan Shuotai decided to adjust production strategy by changing the solvent pressure sensitive adhesive production line into a PASP production line, so as to seize the opportunity and capture the PASP market.





Project overview

- Type of project: New construction
- Total investment: USD11.51 million (RMB80 million)
- Construction site location: Youxian High-tech Industrial Development Zone, Zhuzhou City, Hunan Province
- Alteration: This project involves changing the 2,000 t/a solvent pressure sensitive adhesive production line to 600 t/a PASP production line.
- Designed production capacity (after alteration):
 - 600 t/a for poly-L-aspartic acid (PASP): 30 t/a for PASP dry powder, 200 t/a for PASP-C series compound solution, and 370 t/a for PASP-A agricultural additive
 - 20,000 t/a for styrene-acrylate water-based laminating adhesive
 - 2,000 t/a for vinyl acetate-butyl acrylate water-based laminating adhesive
- Production process of PASP: The raw materials, with L-Aspartic acid as the major one, will undergo controlled polymerisation and hydrolysis, eventually becoming the crude PASP. About 64% of the crude PASP will be used to produce PASP compound solution and PASP solution for PASP dry powder. The remaining 46% will be used as solution for secondary reaction in the production of PASP-A agricultural additive, a by-product. Two kinds of solutions will be put through ultrafiltration membrane for the purpose of separation.
- Major raw materials for PASP: 120 t/a of 99% L-Aspartic acid and 25 t/a of 99% 1,4-Butanediol
- Number of budgeted posts: 55 (after alteration)
 - 35 workers will be responsible for production of styrene-acrylate laminating adhesive and vinyl acetate-butyl acrylate laminating adhesive.
 - 20 workers will be responsible for production of poly-L-aspartic acid (PASP).
- Working schedule for PASP production: Eight working hours per working day, with no night shift; 330 working days per year.

Founded in Dec., 2019 with a registered capital of USD1.44 million (RMB10 million), Hunan Shuotai engages in the R&D, production, and sale of resin matrix composite materials and related products, adhesive materials, and water-soluble adhesives.

EI report of Inner Mongolia Kingdomway's SAM, GSH and other products project publicised

Summary: On 22 Dec., 2022, the EI report (draft for soliciting public opinions) of Inner Mongolia Kingdomway's "construction project of 100 t/a S-Adenosyl-L-methionine, 100 t/a glutathione, 50 t/a phosphatidylserine, 5 t/a pyrroloquinoline quinone, and 5 t/a nattokinase" was publicised by the local authority.

Submitted by Inner Mongolia Kingdomway Pharmaceutical Co., Ltd. (Inner Mongolia Kingdomway), the Environmental Impact (EI) report (draft for soliciting public opinions) of "construction project of 100 t/a S-Adenosyl-L-methionine, 100 t/a glutathione, 50 t/a phosphatidylserine, 5 t/a pyrroloquinoline quinone, and 5 t/a nattokinase" was publicised on the website of the People's Government of Tuoketuo County on 22 Dec., 2022.

Project overview

- Type of project: Reconstruction and expansion
- Construction site location: Tuoketuo Industrial Park Zone, Hohhot City, Inner Mongolia Autonomous Region
- Land use: The company will use the block of land that it is currently using to carry out this project, without acquiring new land.
- Total investment: USD7.92 million (RMB55.00 million)
 - Investment for environmental protection purposes: USD232,458 (RMB1.62 million)





- Construction details: Construction sections include main sections, ancillary facilities, and environmental protection facilities, some of which are detailed as follows:
 - The existing warehouses that were originally constructed for the sodium hyaluronate project will be reconstructed into extraction & refining workshops in order to serve this project.
 - The existing spare fermentation workshop and its supporting facilities will be used by this project. The production of nattokinase (NK) and phosphatidylserine (PS) in this project will utilise the spare fermentation tanks in the old vitamin K2 project. The production of S-Adenosyl-L-methionine (SAM), glutathione (GSH), pyrroloquinoline quinone (PQQ) in this project will utilise the spare fermentation tanks in the old sodium hyaluronate project. Apart from re-utilised devices mentioned above, the devices used in this project will all be newly purchased.
 - The existing office area, living area, and ancillary facilities such as water circulating system and water cooling system will also be used by this project, instead of building new exclusive ones.
- Designed production capacity: 100 t/a for S-Adenosyl-L-methionine, 100 t/a for glutathione, 50 t/a for phosphatidylserine, 5 t/a for pyrroloquinoline quinone, 5 t/a for nattokinase
- Budgeted posts and working schedule: 249 new budgeted posts; four working groups on shifts in rotation; three 8-hour shifts per working day; 330 working days/7,920 working hours per year
- Construction period: 24 months

Founded in March, 2004 with a registered capital of USD41.60 million (RMB289 million), Inner Mongolia Kingdomway specialises in the production of active pharmaceutical ingredients (APIs), foods, food additives and feed additives. Its main products include coenzyme Q10, DHA algae oil, arachidonic acid (ARA) oil, vitamin K2, and β -Nicotinamide mononucleotide (NMN). The company passed the ISO9001 quality management system, ISO14001 environmental management system, U.S. Pharmacopeia (USP) verification, FSSC22000 certification, HACCP management system, Kosher certification, and Halal certification. Xiamen Kingdomway Group Company Limited (Kingdomway) holds 100% of shares in Inner Mongolia Kingdomway. Listed on the Shenzhen Stock Exchange (stock code: 002626) in 2011, Kingdomway mainly engages in production and sale of ingredients for nutritional dietary supplements, pharmaceutical raw materials, and nutritional dietary supplement end-products.





Price Update

The prices of major amino acid varieties in China, January 2023

TABLE 3: The prices of major amino acid varieties in China, Dec., 2022–Jan., 2023

Product	Price in Jan. 2023, USD/t	Price in Dec. 2022, USD/t	MoM change (calculated with RMB prices)
98.5% Lysine	1,229.82	1,272.20	-3.33%
70% Lysine	810.37	860.57	-5.83%
98% Tryptophan	9,449.84	9,828.01	-3.85%
Methionine (liquid)	2,077.92	2,091.96	-0.67%
Methionine (solid)	2,753.57	2,797.82	-1.58%
99% Threonine	1,252.63	1,279.51	-2.10%

Note:1. "Methionine (liquid)" refers to liquid methionine hydroxy analogue;

2. The USD/RMB exchange rate in this Report is USD1.00=RMB6.9475 on 3 Jan., 2023, sourced from the People's Bank of China. All the prices mentioned in this Report will include the VAT, unless otherwise specified.

Source:CCM

2022 methionine price: rises in Q1 and then starts dropping

Summary: From an all-year point of view, the price of methionine in 2022 first soared in Q1 and then started dropping, eventually becoming stable in Q4.

The average price of methionine in 2022 was USD2,480/t, which has not fluctuated much compared to that in 2021—USD2,706/t.

The large increases in the output of and capacity for methionine were witnessed in 2022. In terms of methionine imports and exports during Jan.–Nov., trade surplus was seen in some months. And the growth in the demand side was limited. Under those circumstances, the market landscape of methionine is gradually changing.

Price-wise

- The price of methionine in China averaged USD2,847/t in Q1 2022. Bolstered by the favourable factor from the soybean meal, rises in raw material costs, and producers' joint efforts to sustain the price, the average market price of methionine climbed to an all-year highest point to USD2,936/t in Q1.
- In Q2, the supply side and demand side of methionine market entered into a "seesaw battle". The market price of methionine averaged USD2,689/t in Q2. During this quarter, the market suppliers adjusted their sales strategies and downstream customers were having abundant stocks of methionine. As a result, the market price of methionine started dropping and presented downtrend.
- In H2 2022, the market price first rebounded and then continued to decline; it averaged USD2,282/t in Q3 and averaged USD2,101/t in Q4. The price rebound at first was attributed to the overhaul carried out by producers, output decrease arising from overhaul and downstream customers' move to make purchase for restocking. The subsequent price fall was because of the following factors: producers completed overhaul and resumed their production; downstream customers' demand became sluggish, and some





enterprises in need of methionine only made purchases when they needed it; the transactions in the market were being conducted in a smoother way.

Soybean meal

- The price of soybean meal in 2022 was much higher than that in last year. After Spring Festival, soybean meal price climbed along with the price of US soybean; spot price of soybean meal surged to USD746/t but fell afterwards.
- During May–July, the quantities of soybean arriving at the ports increased; thus, the suppliers were pressurised into lowering the spot price. In early July, the spot price dropped to USD582/t, but this was also higher than that in the same periods of recent years.
- During Aug.–Oct., the soybean meal price presented uptrend, as the quantities of soybean arriving at the ports decreased and the weather factors of US soybean imposed certain effects. And relevant downstream producers needed to step up their production during Mid-Autumn Festival (mid-Sept.) and China's National Day (Early Oct.) and therefore were having increased demand. Those factors all contributed to the rise in soybean meal price in the period.
- During Oct.–Nov., the supply of soybean was rather tight and the inventory of soybean meal had been showing new lows. Soybean meal price in China had been buoyant in the period, recording a new high of USD821/t in Nov.
- In Dec., the spot price of soybean meal declined, because large quantities of imported soybean arrived at ports and the profitability of the downstream farming industry was not satisfactory.

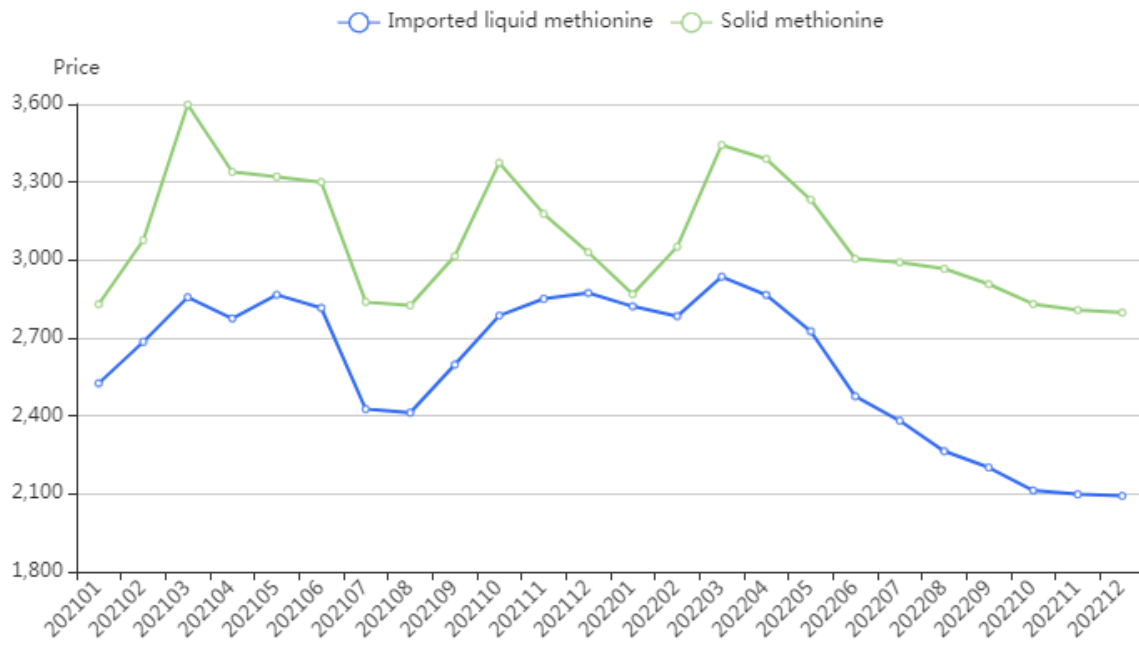
Demand side

- In terms of feed output, the output of industrial feed in China during Jan.–Nov. 2022 totalled 268.31 million tonnes, up 0.56% YoY.
- In terms of hog farming, the hog price in China averaged USD2.71/kg in 2022, down 4.56% YoY. The overall demand for hog was sluggish. It is estimated that the hog price may continue to drop after Spring Festival.
- In terms of broiler chicken, the price of white-feather broiler chicken in China averaged USD0.32/kg in 2022, up 6.62% YoY. Due to the increase in costs that arouse from rises in raw material prices and feed prices, the operating rates of chicken farmers/producers went down significantly. The supply and demand of chicken became imbalanced in the short term. Under the backdrop of oversupply, the price of live broiler chicken first dropped and then climbed; it has been currently fluctuating at a low level.
- In terms of eggs, the prices of eggs in the major producing areas of China averaged USD0.34/kg in 2022, up 10.62% YoY. It is estimated that after the Spring Festival, the supply of eggs in the market will exceed demand, and egg price will go down slightly.

The market price of methionine after the Spring Festival is expected to fluctuate at a low level in the short term. However, the increase in demand for methionine as one of the major feed additives can be expected, because of the hopeful expectation of consumption in 2023 as well as Chinese agricultural authority's advocacy of reducing the usage of soybean meal in feed and replacing soybean meal in feed with other alternatives.



FIGURE 1: Monthly average price of methionine in China, 2021–2022



Source: CCM



Import and Export

Import and export data of five amino acid varieties in China, November 2022

TABLE 4: Import data of five amino acid varieties in China, November 2022

Product	Import volume, tonne	MoM change	Import value, USD	MoM change
Lysine	0.002	/	5,291	/
Lysine ester and salt	52.150	/	101,792	/
Methionine	23,551.104	43.52%	50,661,612	42.18%
Glutamic acid	0.380	/	19,104	/
Cystine	1.360	/	88,523	/

Source: China Customs

TABLE 5: Export data of five amino acid varieties in China, November 2022

Product	Export volume, tonne	MoM change	Export value, USD	MoM change
Lysine	9.800	131.68%	140,167	83.18%
Lysine ester and salt	57,732.869	-21.93%	69,915,569	-20.72%
Methionine	8,706.310	28.29%	22,384,598	24.49%
Glutamic acid	7,626.531	16.70%	10,086,349	12.55%
Cystine	39.136	-23.19%	850,941	-10.82%

Source: China Customs

China's import volume of methionine in Nov. hits new high in 2022

Summary: China's import volume of methionine in Nov. 2022 hit a new high in the year, while both the import price and export price in Nov. dropped month on month.

China's import volume of methionine in Nov. 2022 totalled 23,551 tonnes, up 43.52% MoM; average import price of methionine in Nov. was USD2,151/t, down 0.93% MoM. China's export volume of methionine in Nov. 2022 totalled 8,706 tonnes, up 28.29% MoM; average export price of methionine in Nov. was USD2,571/t, down 2.96% MoM.

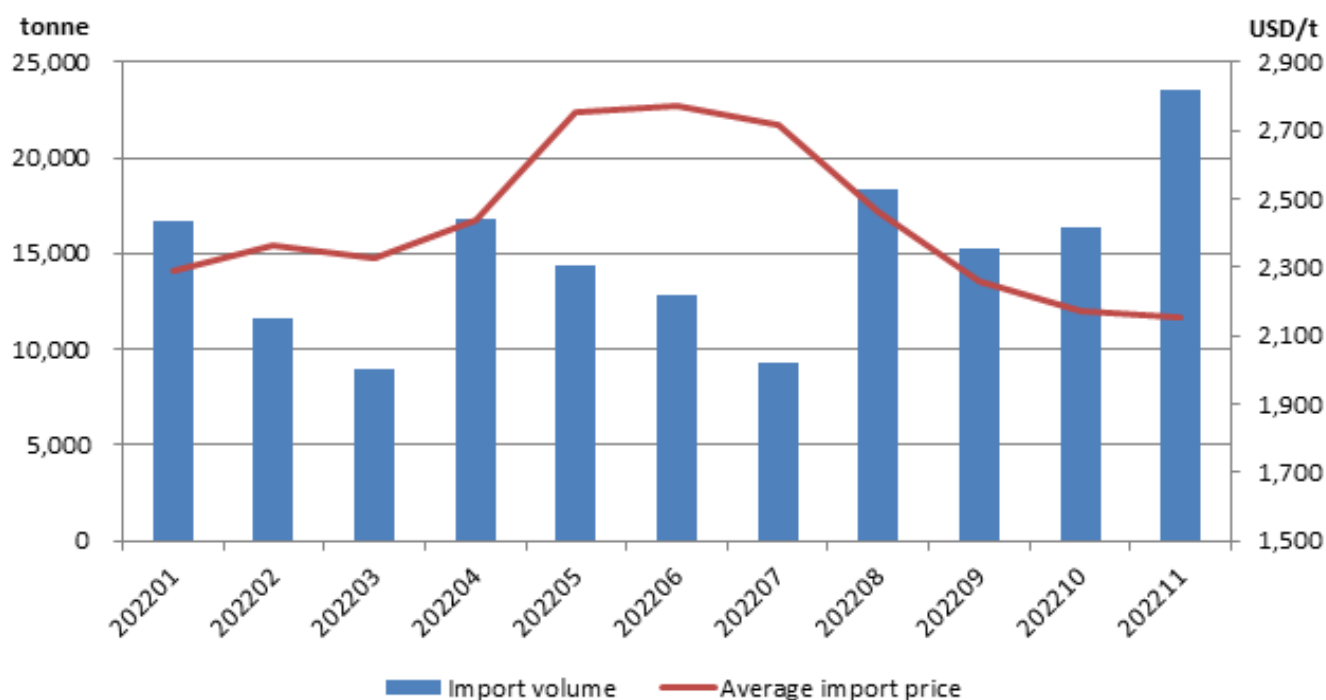
With regard to methionine imports, China's average import volume of methionine in the last four months ranging from Aug. to Nov. 2022



was 18,370 tonnes, which are 42% higher than the average import volume in the first seven months of 2022—12,940 tonnes. That means the methionine imports in the last four months became invigorated compared to that in the first seven months; especially the import volume in Nov. hit a new high in 2022. The monthly average import price of methionine rose from about USD2,400/t in April to a point above USD2,700/t in May; the price continued to stay above that during May–July. In the following four months, the import price kept dropping and the import price in Nov. declined to the lowest point in 2022 so far.

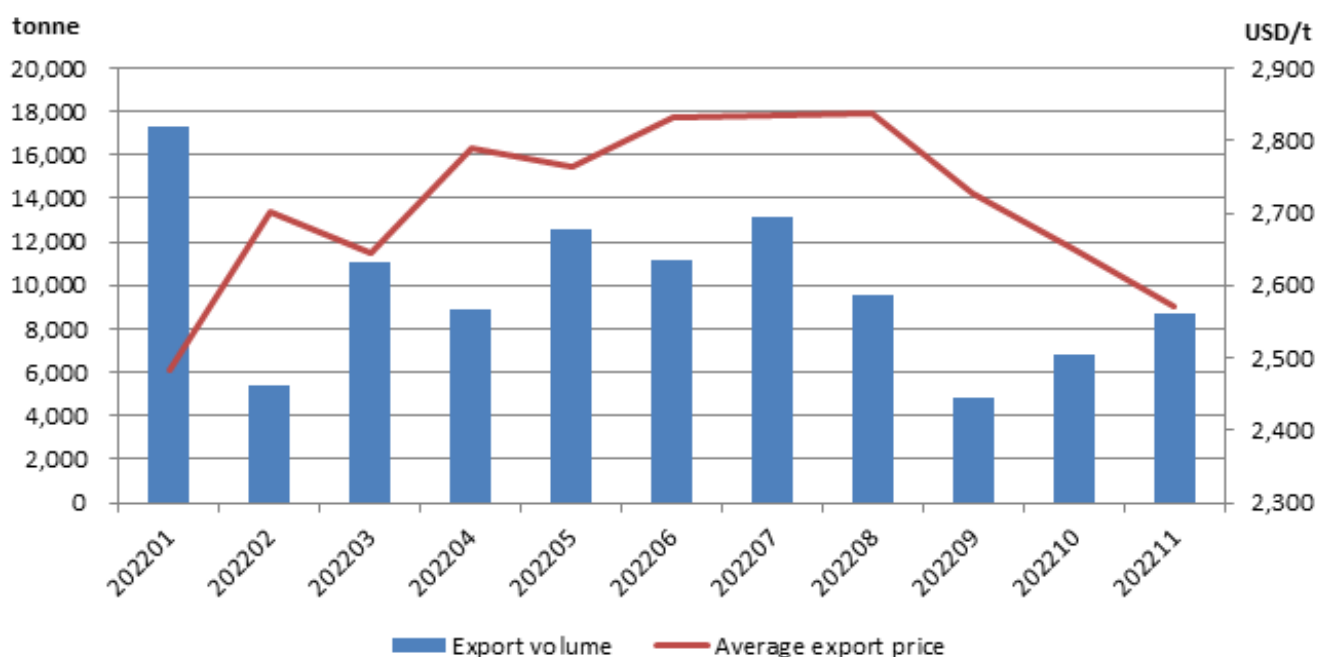
With regard to methionine exports, the export volume in Jan. was 17,293 tonnes, which is the highest so far in 2022. Aside from that in Jan., the export volume during Feb.–Nov. averaged 9,200 tonnes, but the monthly export volume in the last three months are all lower than that average figure. The trend of export price is similar to that of import price; it climbed to a certain point and afterwards started dropping. The monthly average export price in 2022 increased from USD2,484/t in Jan. to a point above USD2,800/t in June; it stayed above that point in the following three months and then started dropping in Sept.

PICTURE 1: China's import volume and average import price of methionine, Jan.–Nov. 2022



Source: China Customs & CCM

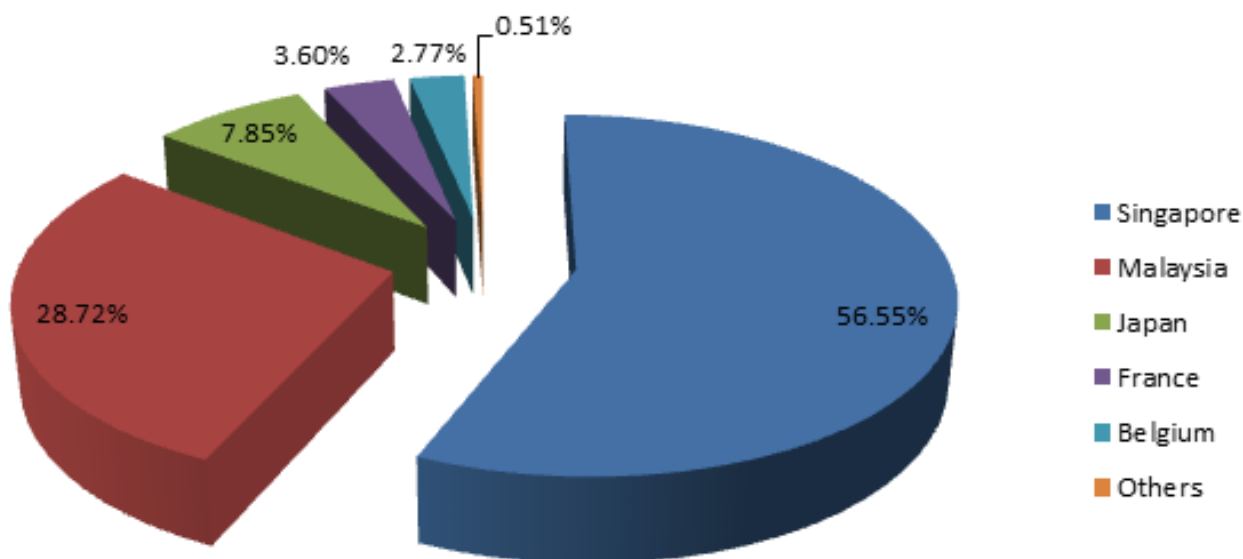
PICTURE 2: China's export volume and average export price of methionine, Jan.–Nov. 2022



Source: China Customs & CCM

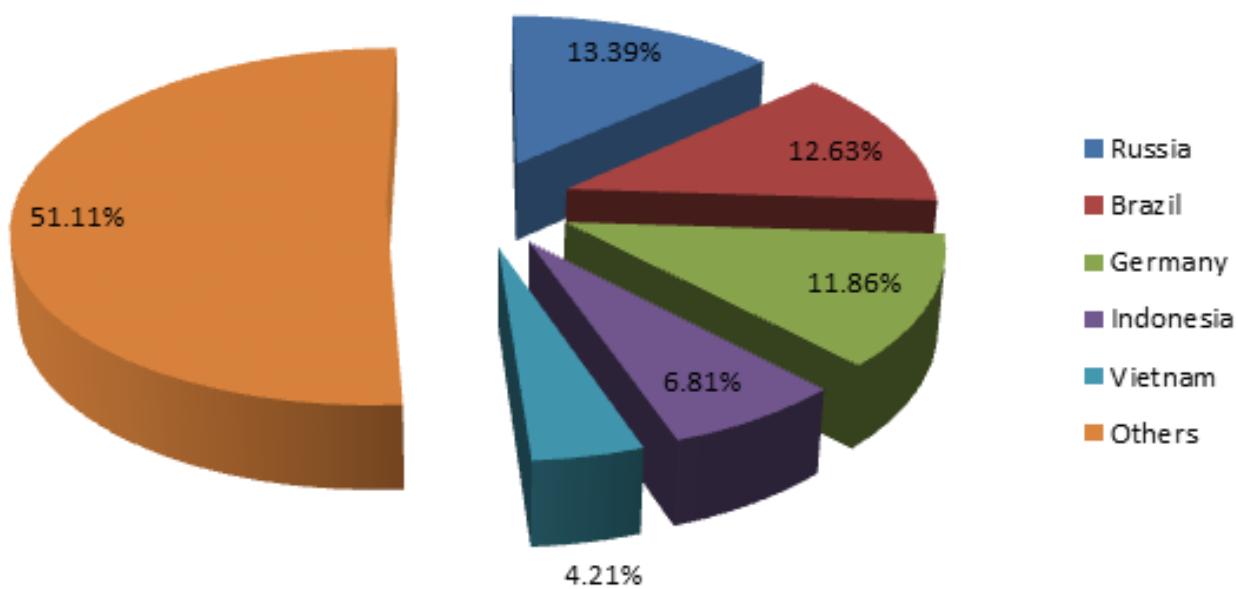
During Jan.–Nov. 2022, the top five origins of China's methionine imports are Singapore, Malaysia, Japan, France, and Belgium, where China imported 92,780 tonnes, 47,177 tonnes, 12,875 tonnes, 5,900 tonnes, and 4,552 tonnes of methionine respectively during the period; China also imported 840 tonnes of methionine from other countries during the period. During Jan.–Nov. 2022, the top five export destinations of China's methionine exports are Russia, Brazil, Germany, Indonesia, and Vietnam, which imported 14,641 tonnes, 13,809 tonnes, 12,971 tonnes, 7,443 tonnes, and 4,599 tonnes of methionine respectively from China; China also exported 55,883 tonnes of methionine to other countries during the period.

PICTURE 3: Top five import origins of China's methionine imports, Jan.–Nov. 2022



Source: China Customs & CCM

PICTURE 4: Top five export destinations of China's methionine exports, Jan.–Nov. 2022



Source: China Customs & CCM



News in Brief

Meihua Group's net profit for 2022 expectedly rises over 70%

On 9 Jan., 2023, Meihua Holdings Group Co., Ltd. (Meihua Group) released the earnings guidance for 2022, the figures in which are as follows:

Estimated results for 2022

- Estimated net profit attributable to equity holders of the Company: USD575.75 million–USD647.72 million (RMB4.0 billion–RMB4.5 billion), up by 70%–91% YoY
- Estimated net profit attributable to equity holders of the Company after deduction of non-recurring loss/profit: USD561.35 million–USD618.93 million (RMB3.9 billion–RMB4.3 billion), up by 91%–111% YoY

Business results for 2021

- Net profit attributable to equity holders of the Company: USD338.40 million (RMB2.35 billion)
- Net profit attributable to equity holders of the Company after deduction of non-recurring loss/profit: USD293.77 million (RMB2.04 billion)

The expected growth of the business results for 2022 is mainly attributed to the rise in operational profits. Meihua Group's thriving business enabled its major business segments to deliver increases in revenues and profits:

- Jilin Meihua Amino Acid Co., Ltd., a subsidiary of Meihua Group, activated the production capacity of its third-phase lysine project, which led to rises in the sales volume of lysine and revenue of a major business segment.
- In 2022, Meihua Group seized the opportunities in the market and raised the prices of its main products including gourmet powder (MSG), lysine, xanthan gum, and other feed amino acid products. Those price adjustments brought growth in net profit.

Shandong Aobo: EI reports of two projects approved

Submitted by Shandong Aobo Biotechnology Co., Ltd. (Shandong Aobo), the Environmental Impact (EI) report of 500 t/a amino acid via biological enzyme method project was approved by the local environmental authority on 1 Dec., 2022.

Overview of 500 t/a amino acid via biological enzyme method project

- Type of project: Technical renovation
- Total investment: USD892,407 (RMB6.2 million)
- Construction site location: The Pilot Park Zone of Transition Between Old and New Growth Drivers, Gaotang County, Liaocheng City, Shandong Province
- Construction details: Some of the existing devices in the company's production plant and an existing workshop will be retrofitted in order to build a production line for amino acid (500 t/a for L-Norvaline).

On the same day, the EI report of Shandong Aobo's 1,500 t/a food additives via biological enzyme transformation method project was also approved; upon completion of this project, the company will have 500 t/a of production capacity for γ -Aminobutyric acid and 1,000 t/a for L-Tyrosine.

Founded in May, 2014 with a registered capital of USD431,810 (RMB3 million), Shandong Aobo mainly engages in the production and sale of amino acid products, choline products, betaine, and pharmaceutical intermediates.





Longxing Chemical reschedules time period for debugging of glycine project (Phase I)

On 3 Jan., 2023, Kaifeng Longxing Chemical Co., Ltd. (Longxing Chemical) disclosed on a publication platform that the time period for debugging of its 20,000 t/a glycine (via mixed solvent method) project (Phase I) had been rescheduled. The details are as follows:

- Project location: Fine Chemical Industrial Centralised Area (Cluster), Kaifeng City, Henan Province
- Product scheme (Phase I): 10,000 t/a for industrial-grade glycine and about 9,200 t/a for ammonium chloride (by-product)
- Production technique: Chloroacetic acid ammonolysis method
- Debugging period: 1 Jan., 2023–1 June, 2023

On 30 Sept., 2022, Longxing Chemical disclosed the original time period for debugging: 1 Oct., 2022–31 Dec., 2022. This means the post-completion environmental protection acceptance inspection on this project will be postponed by five months.

Shijiazhuang Kerong to build capacity for electronic-grade glycine

Submitted by Shijiazhuang Kerong New Material Co., Ltd. (Shijiazhuang Kerong), the Environmental Impact report of glycine and relevant products production project was publicised on 30 Dec., 2022.

Project overview

- Type of project: New construction
- Total investment: USD6.48 million (RMB45.02 million)
 - Investment for environmental protection purposes: USD43,181 (RMB300,000), accounting for 0.7% of the total investment
- Construction site location: Hebei Shijiazhuang Circulating Chemical Industrial Park Zone, Hebei Province
- Site area: 1,153 square metres
- Construction details and designed production capacity:
 - Three production lines will be built. 86 (sets of) devices will be introduced.
 - Upon completion of this project, the company will have 3,000 t/a of production capacity for electronic-grade glycine (99.5% purity, using industrial-grade glycine purchased from suppliers as the raw material), 1,000 t/a for refined products of chloride salts and bromide salts, and 2,000 t/a for sub-packaged reagents.
- Number of budgeted posts and working schedule: 22 budgeted posts; one 8-hour shift per working day; 300 working days per year
- Construction period: 12 months

Established in April, 2022 with a registered capital of USD1.44 million (RMB10.00 million), Shijiazhuang Kerong specialises in the production of chemical reagents and auxiliaries.

Zhejiang NHU to establish joint venture

On 3 Jan., 2023, Zhejiang NHU Co., Ltd. (Zhejiang NHU, stock code: SZ002001) released an announcement involving the progress of a joint investment made with Sinopec Zhenhai Refining & Chemical Co., Ltd. (ZRCC) in late 2021.

According to the announcement, the two parties (Zhejiang NHU and ZRCC) recently signed the Shareholders' Agreement and will jointly establish a joint venture (JV) tentatively named "Ningbo Zhenhai Refining and Chemical NHU Biotechnology Co., Ltd.". The registered





capital of the new JV is set at USD112.03 million (RMB778.36 million). 50% of shares in the new JV will be owned by Zhejiang NHU, with remaining 50% of shares to be owned by ZRCC. Upon its formal establishment, the new JV will invest USD373.45 million (RMB2.59 billion) in building production facilities with 180,000 t/a (figure based on active ingredient content of 100%) of capacity for liquid methionine (most likely referring to methionine hydroxy analogue, as Zhejiang NHU has not disclosed the actual active ingredient of the mentioned product).

Zhejiang NHU stated that this investment is made to further make use of the company's technological advantage in the methionine field and improve the company's comprehensive competitiveness. Zhejiang NHU currently has 150,000 t/a of production capacity for methionine. The construction of its methionine (Phase II) project (100,000 t/a production device has been built and 150,000 t/a device is still under construction) is expected to be completed in June 2023; after that, the company's capacity for solid methionine will hit 300,000 t/a.

Star Lake Bioscience releases earnings guidance for 2022

On 20 Jan., 2023, Guangdong Zhaoqing Star Lake Bioscience Co., Inc. (Star Lake Bioscience) released the earnings guidance for 2022. Star Lake Bioscience's estimated total assets, production structure, and estimated sales revenue for 2022 all largely increase compared to that in 2021, which is mainly attributed to the fact that the company completed the major material asset reorganisation by acquiring Ningxia Eppen Biotech Co., Ltd. (Eppen Biotech) during the reporting period. Star Lake Bioscience's estimated performance results are significantly improved compared to that prior to reorganisation, which are detailed as follows.

Estimated performance results of Star Lake Bioscience for 2022

- Net profit: USD15.83 million–USD17.27 million (RMB1.10 billion–RMB1.20 billion);
- Net profit attributable to equity holders of the Company: USD80.60 million–USD89.24 million (RMB560 million–RMB620 million),
 - expectedly going up by 425.97%–482.32% compared to that in 2021 (based on financial statistics from statutory disclosure);
 - expectedly going up by 257.11%–295.37% compared to that in 2021 (based on statistics from the restatement of financial statements in last year).
- Net profit attributable to equity holders of the Company after deduction of non-recurring loss/profit: USD14.39 million–USD17.27 million (RMB100 million–RMB120 million),
 - expectedly going up by 3.32%–23.98% compared to that in 2021 (based on financial statistics from statutory disclosure);
 - expectedly going up by 49.71%–79.65% compared to that in 2021 (based on statistics from the restatement of financial statements in last year).

Reasons for restatement of financial statements in last year include:

- The figures of costs of trial production carried out in last year have been altered.
- After the acquisition of Eppen Biotech, the financial statistics of Eppen Biotech are incorporated into the company's Consolidated Financial Statement.

Northeast Fufeng: sales revenue for 2022 totals USD1.53 billion

The sales revenue of Hulun Buir Northeast Fufeng Biotechnology Co., Ltd. (Northeast Fufeng) for 2022 totalled USD1.53 billion (RMB10.6 billion); its export earnings for 2022 totalled USD55.42 million (RMB385 million). Founded in May, 2010, Northeast Fufeng is the largest amino acid producer in China. The company has formed a circular economy development mode featuring "agriculture—biomanufacturing—amino acids and microbial polysaccharides—fertilisers—agriculture".





Currently, the company has 2.2 million t/a of deep processing capacity for corn, 600,000 t/a of production capacity for MSG (gourmet powder), 150,000 t/a for threonine, 600,000 t/a for fertilisers, 500,000 t/a for feed, and 1.8 million t/a for starch. Every year, 9.5 million tonnes of goods are freighted from Northeast Fufeng.

Additionally, Northeast Fufeng is making preparation for 500,000 t/a amino acids and ancillary facilities project, total investment in which amounts to USD1.44 billion (RMB10 billion). It is scheduled that by the end of 2025, Fufeng Group Limited (Fufeng Group)'s investment made in Zalantun City will have reached USD2.88 billion (RMB20 billion), and Fufeng Group's processing capacity for corn will have exceeded 3 million t/a.

Two amino acid projects in Jiangxi Province filed for record

On 8 Dec., 2022, two amino acid projects in Jiangxi Province, which will be undertaken by Jiangxi Tianxin Pharmaceutical Co., Ltd. (Tianxin Pharma) and Jiangxi Rongda Bioengineering Co., Ltd. (Rongda Bioengineering) respectively, were approved by the local authority and were filed for record.

Tianxin Pharma's 5,000 t/a β -Alanine project

- Construction site location: Leping City, Jingdezhen City, Jiangxi Province
- Total investment: USD8.92 million (RMB62 million)
- Site area: 7,400 square metres
- Floor area: 12,000 square metres
- Construction details: A 5,000 t/a β -Alanine production line, a wastewater treatment facility, and ancillary facilities will be built.
- Major raw material: D-Glucose monohydrate
- Scheduled date of construction completion: 2024

Rongda Bioengineering's construction project of production lines for L-Proline and L-Hydroxyproline

- Construction site location: Fengcheng City, Yichun City, Jiangxi Province
- Total investment: USD14.39 million (RMB100 million)
- Area of production plant: 30,000 square metres
- Product scheme (designed production capacity): 2,000 t/a for L-Proline and 200 t/a for L-Hydroxyproline
- Major raw material: Glucose

Qinhuangdao Huaheng obtains food production licenses of three amino acids

On 31 Dec., 2022, upon the request of Qinhuangdao Huaheng Bioengineering Co., Ltd. (Qinhuangdao Huaheng), the Administrative Examination and Approval Bureau of Qinhuangdao City organised a remote inspection for food additive experts at both provincial and municipal level to inspect the essential conditions of Qinhuangdao Huaheng's production of three food additives, namely L-Alanine, DL-Alanine, and β -Alanine. Having successfully passed the inspection, Qinhuangdao Huaheng obtained the food production licenses of those three amino acid food additives.

In early 2022, Qinhuangdao Huaheng launched a production project for these three food-grade amino acids—L-Alanine, DL-Alanine, and





β-Alanine.

With synthetic biology technologies as its core, Qinhuangdao Huaheng, which has been accredited as a high and new technology enterprise by China's Torch Program and nationally accredited as a green factory company, specialises in the R&D, production, and sale of amino acids and their derivatives. The company has been producing industrial-grade products. Qinhuangdao Huaheng was also nationally accredited as a "Little Giant" enterprise in Aug., 2022.

Huaheng Biotech: net profit for 2022 expected to climb over 78% YoY

On 20 Jan., 2023, Anhui Huaheng Biotechnology Co., Ltd. (Huaheng Biotech) released the earnings guidance for 2022, which estimates the company's net profit for 2022 will increase year on year. The company attributes the estimated increase in net profit to the successful activation of operation of two projects, namely "technical renovation and capacity expansion project of 5,000 t/a alanine via fermentation method" and "alternate production project of 25,000 t/a alanine and valine", which also means the new production capacity has been put into use. The gross margin of the company's products is also expected to rise.

Estimated performance results of Huaheng Biotech for 2022:

- Net profit attributable to equity holders of the parent company: USD43.18 million–USD46.78 million (RMB300 million–RMB325 million), expectedly going up by 78.32%–93.18% compared to that in 2021.
- Net profit attributable to equity holders of the parent company after deduction of non-recurring loss/profit: USD41.02 million–USD44.62 million (RMB285 million–RMB310 million), expectedly going up by 96.12%–113.32% compared to that in 2021.

Performance results for 2021:

- Net profit attributable to equity holders of the parent company: USD24.22 million (RMB168.24 million)
- Net profit attributable to equity holders of the parent company after deduction of non-recurring loss/profit: USD20.92 million (RMB145.32 million)



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Publisher : Kcomber Inc.

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