



中节能翼和

2022

# Sustainability Report

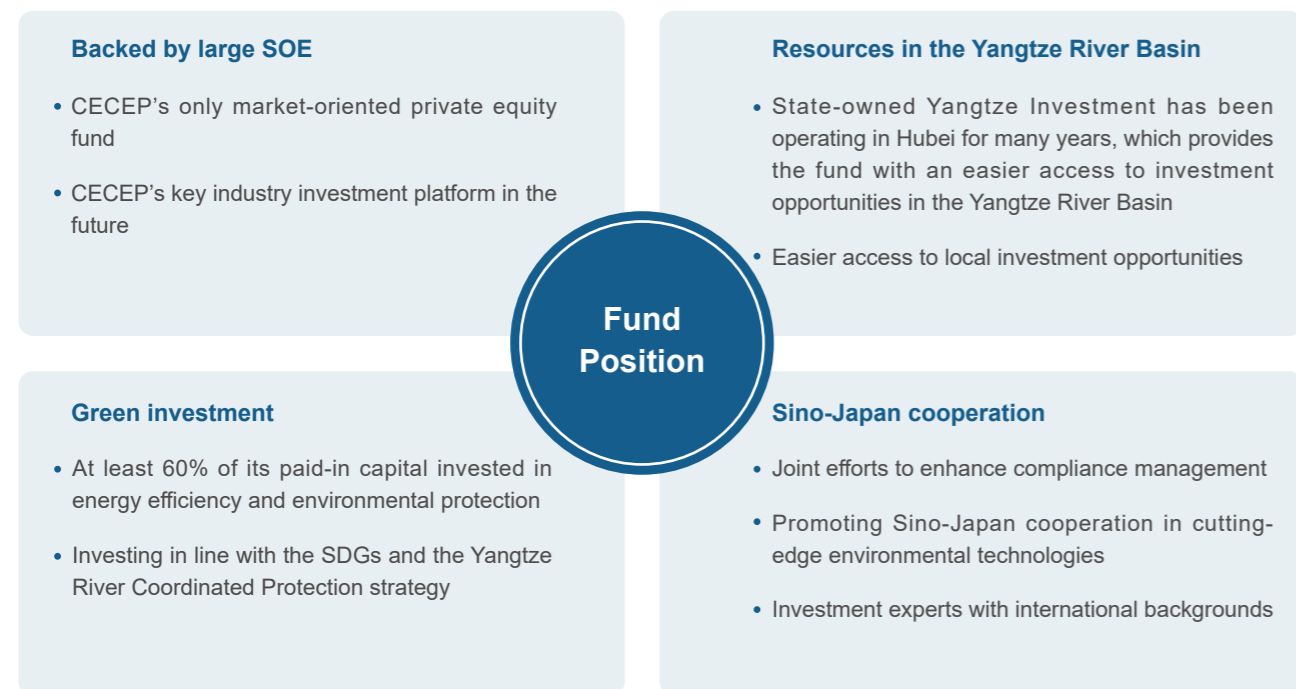
CECEP (Hubei) SDG Industry Equity  
Investment Fund Limited Partnership

This report is an English translation of the Chinese report. In the event of any differences in interpreting the report, the Chinese version shall prevail.

# About Us

## Company Profile

CECEP (Hubei) SDG Industry Equity Investment Fund Limited Partnership (“CECEP (Hubei) Fund”) was co-founded by CECEP Capital, Daiwa Corporate Investment, and Hubei Wings Investment in Wuhan, Hubei on October 26, 2020, and registered with the Asset Management Association of China on June 11, 2021.



## Investment Philosophy

The 17 Sustainable Development Goals (SDGs) are a blueprint created by UN to achieve a better and more sustainable future for all. Set to be achieved by 2030, these objectives interlink to ensure that no one is left behind on the path towards a sustainable future.

It is the mission of today's world to explore a harmonious relationship between human and nature, and to achieve sustainable economic and social development. CECEP Yihe (Hubei) Private Equity Fund Management Co., Ltd., as the fund manager, is committed to implementing responsible investment as required by the SDGs and the great protection of the Yangtze River strategy.



## Investment Standards

CECEP (Hubei) Fund invests in line with the SDGs. We give priority to SDG-compliant projects, particularly those related to SDG 3 (good health and well-being), SDG 6 (clean water and sanitation), SDG 7 (affordable and clean energy), SDG 8 (decent work and economic growth), SDG 9 (industry, innovation and infrastructure), SDG 11 (sustainable cities and communities), SDG 12 (responsible consumption and production), SDG 13 (climate action), and SDG 15 (life on land). The fund manager assesses investees' contributions to the SDGs according to information — including qualitative and quantitative operating indicators — provided by them periodically.

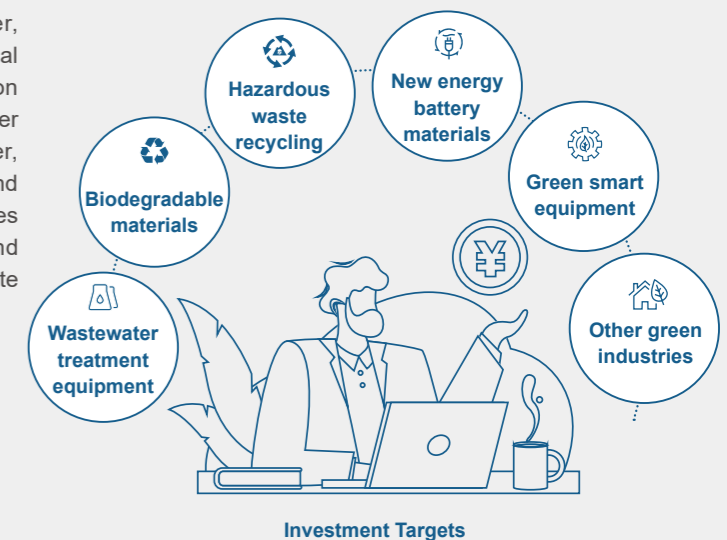


## Investment Priorities

Home to the largest tributary system of the Yangtze River, Hubei Province attaches great importance to the environmental protection of the river basin. CECEP (Hubei) Fund, relying on the industry resources of its founders, targets the Yangtze River Economic Belt and the largest cities along the Yangtze River, investing at least 60% of its paid-in capital in energy efficiency and environmental protection. Investment priorities include companies using cutting-edge environmental protection technologies and materials, and those providing products and services that promote environmental protection.



Invested at least **60%** of its paid-in capital in energy efficiency and environmental protection



## Financing Progress in 2022

In June 2018, the National Green Development Fund Co., Ltd. (NGDF) was established according to the *Opinions on Comprehensively Strengthening Ecological and Environmental Protection and Resolutely Fighting the Tough Battle of Pollution Prevention and Control* released by the CPC Central Committee and the State Council. It is China's first national green development fund with ¥ 88.5 billion under management.

In 2022, NGDF invested in CECEP (Hubei) Fund, making it its first investee in Hubei, and second sub-fund in China. This means that NGDF fully recognizes our efforts and contribution to green development under the guidance of Xi Jinping's Thought on Ecological Civilization. Our cooperation with NGDF focuses on protecting the Yangtze River, sharing resources in industry development, project development and collaborative investment, linking capital with projects, and empowering the environmental protection industry of Hubei.

### National Green Development Fund Co., Ltd. (NGDF)



#### About NGDF

NGDF was co-founded by the Ministry of Finance, Ministry of Ecology and Environment, and Shanghai Municipal People's Government. The Ministry of Finance contributes as authorized by the State Council, and entrusts Shanghai to manage the green fund.

#### Position of NGDF

NGDF is a national fund that invests in line with Xi Jinping's Thought on Ecological Civilization, with the mission of building a beautiful China. According to the requirements of ecological civilization, it diverts capital to market-oriented projects related to air, water, soil and solid waste governance, promoting green efforts such as pollution control and ecological restoration which are essential for high-quality economic growth.



#### Focuses of NGDF

NGDF conducts policy-guided, market-oriented investments to achieve three focuses.

- 1 Implementing long-term strategic environmental protection tasks assigned by the CPC Central Committee and the State Council;

- 2 Diverting capital to market-oriented projects related to air, water, soil and solid waste governance;
- 3 Promoting green development and lifestyles, the modernization and eco-friendly transformation of traditional industries, and the development of green industries related to energy efficiency, environmental protection, ecological restoration, and landscaping, contributing to high-quality economic growth.

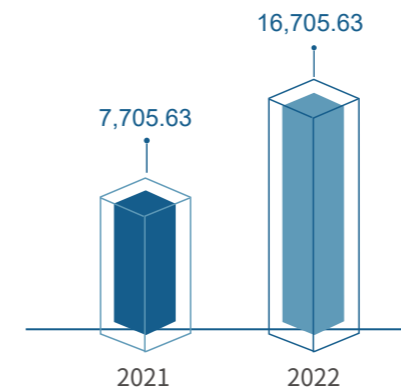
#### Mission of NGDF

NGDF initially raised ¥88.5 billion from the central government, 11 provinces and municipalities along the Yangtze River Economic Belt, and private investors. As a company, it conducts market-oriented investments. The initial contributions will mainly be invested in the above-mentioned 11 provinces and municipalities, including Shanghai, Jiangsu, Zhejiang, Anhui, Jiangxi, Hubei, Hunan, Chongqing, Sichuan, Guizhou, and Yunnan. The remaining small part will go to other regions to explore replicable investment models.

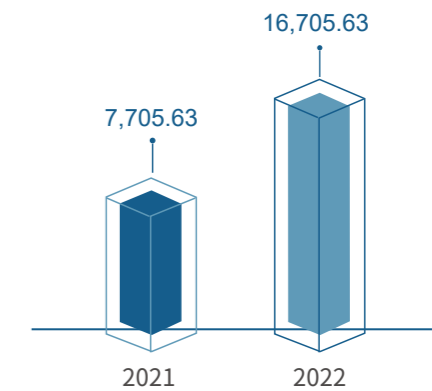
## Data in 2022

CECEP (Hubei) Fund totally invested ¥167.0563 million in 2022, a year-on-year increase of 168%. All the four investments are related to green industries<sup>1</sup>, such as energy efficiency and environmental protection industries (including clean energy industries).

Investment scale in green industries (RMB 10,000)



Investment scale in environmental protection industries (including clean energy industries) (RMB 10,000)



Percentage of investment in green industries in 2022

100%

Percentage of investment in energy efficiency and environmental protection in 2022

100%

<sup>\*1</sup>: Referring to the *Green Industry Guidance Catalogue (2019 Edition)* jointly issued by the National Development and Reform Commission, Ministry of Industry and Information Technology, National Energy Administration, etc. Green industry includes: energy conservation and environmental protection industry, clean production industry, clean energy industry, ecological environment industry, green upgrading of infrastructure, and green services.

## Key SDG Performance Indicators in 2022



- Easy-Sight created an output of pipeline repair materials and services, maintenance equipment is **¥220** million, ensured the water safety of **5.437** million people, reduced deaths and illnesses caused by water pollution
- 3R reduced industrial wastewater discharge

- Yingfa Ruineng produced **5.6116** GW of solar cells, generated **10.894** billion kW·h of clean electricity
- Yacheng New Energy produced **8,000** tons of cobalt tetroxide, **1,800** tons of cobaltous hydroxide, and **210,000** tons of iron phosphate, which can be used to generate **1.5** million kW·h of clean electricity

**The four projects provided 4,757 jobs in 2022, Where**

- Easy-Sight provided **370** jobs, of which **1** is for a disabled person, and **23%** are for females
- 3R provided **652** jobs, of which **13%** are for females
- Yingfa Ruineng provided **2,610** jobs, of which **29%** are for females
- Yacheng New Energy created **1,125** jobs (**17%** for females)

**The four projects spent ¥299.117 million on R&D in 2022, Where**

- **¥16** million of R&D expenditure of Easy-Sight, percentage of R&D personnel at **18%**. Obtained **175** technical patents in total, including **19** invention patents, **113** utility models, **43** appearance patents
- **¥14.137** million of R&D expenditure of 3R. Obtained **35** patents in total, including **19** inventions and **16** utility models. Obtained **4** software copyrights, led or participated in the formulation of **8** national standards and **23** industry standards
- **¥207.22** million of R&D expenditure of Yingfa Ruineng, percentage of R&D personnel at **13.68%**. Obtained **96** patents in total, including **11** inventions granted, **85** utility models granted, and **27** invention are under application
- **¥61.76** million of R&D expenditure of Yacheng New Energy, percentage of R&D personnel at **22%**, obtained **67** patents in total, including **43** inventions and **24** utility models



- Easy-Sight produced **1,150** sets of inspection equipment, and **36** sets of repair equipment. Produced **210,000** meters of repair materials, and assisted in repairing about **190,000** meters of sewage pipelines
- 3R produced **203,500** tons of ferric chloride and its polymers, and ferrous chloride using Fe<sup>2+</sup> and Fe<sup>3+</sup> recycled from waste acids

- 3R recycled hazardous wastes, including **202,000** tons of waste acids
- The Fishpond Solar Farm system of Yingfa Ruineng, which saves land resources while generating clean energy, provides an economical, eco-friendly, and social beneficial way that promotes green economy

**The four projects will reduce 9,022,108.6 tons<sup>1</sup> of CO<sub>2</sub> emissions in 2022, Where**

- 3R reduce **666.6** tons of CO<sub>2</sub> emissions, contributing to carbon peaking and neutrality
- Yingfa Ruineg save **3,284,500** tons of standard coal, reduce **9,020,200** tons of CO<sub>2</sub> emissions, **1,100.29** tons of sulfur dioxide emissions, **1,655.89** tons of nitrogen dioxide emissions, and **239.67** tons of carbon dust emissions, contributing to carbon peaking and neutrality
- Yacheng New Energy reduce **452.25** tons of coal consumption and **1,242** tons of CO<sub>2</sub> emissions

■ Easy-Sight  
 ■ 3R  
 ■ Yingfa Ruineng  
 ■ Yacheng New Energy

\*Note 1: According to the *Annual Report on Development of China's Power Industry 2022* issued by the China Electricity Council, in 2021, the standard coal consumption of thermal power plants with a capacity of 6,000 kW and above was 301.5 g/kW·h, the CO<sub>2</sub> emissions per unit of thermal power generation was about 828 g/kW·h, and the emissions of soot, sulfur dioxide, and nitrogen oxides per unit of thermal power generation were 22 mg/kW·h, 101 mg/kW·h, and 152 mg/kW·h, respectively. In this case, the generation of every 1 kW·h of solar electricity may save 301.5 g of standard coal per year, and reduce CO<sub>2</sub>, sulfur dioxide, nitrogen dioxide, and carbon dust emissions by 828 g, 0.101 g, 0.152 g, and 0.022 g respectively.

# Project Progress in 2022

## Project 1

## Anhui Yingfa Ruineng Technology Co., Ltd.

### Company profile

Founded in June 2016, Anhui Yingfa Ruineng Technology Co., Ltd. (Yingfa Ruineng) focuses on the design, R&D, manufacturing, sales, installation and service of solar cells, with the ambition of becoming an industry leader.



#### Date of Investment

CECEP (Hubei) Fund signed a cooperation agreement with Yingfa Ruineng in August 2022.



#### Company Name

Anhui Yingfa Ruineng Technology Co., Ltd.



#### Date of Establishment

June 23, 2016



#### Registered Capital

¥340 million



#### Legal Representative

Zhang Fayu



#### Information of the Investee



#### Registered Address

Jingliu Road and Weisan Road, Economic Development Zone, Tianchang City, Anhui Province



#### Main business

Processing, manufacturing and sales of solar wafers and solar cells; R&D of solar energy and light energy technologies



#### Industry Classification<sup>\*1</sup>

C38 electrical machinery and equipment manufacturing



#### Qualification

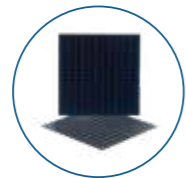
National Specialized, Elaborative, Characteristic and Innovative "Little Giant" Enterprise<sup>\*2</sup>

\*1: Classified with reference to the Guidelines on Industry Classification of Listed Companies (Revised in 2012)

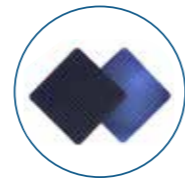
\*2: Refer to the Notice on the Development of Specialized, Elaborative, Characteristic and Innovative "Little Giant" Enterprise issued by the Ministry of Industry and Information Technology, etc.

### Business Focuses of Investees

Yingfa Ruineng mainly produces monocrystalline cells based on PERC and TOPCan technology. Yingfa Ruineng mainly produces monocrystalline cells based on PERC technology. The manufacturing of solar cells, known as "photovoltaic chips", adopts a semiconductor-like process. Through diffusion, coating and metallization, silicon wafers are processed into solar cells that directly convert light energy into electricity. Solar cell manufacturing constitutes a key part of the photovoltaic industry. Solar cells are connected into modules and installed on grasslands, deserts, tidal flats, fishponds or roofs to generate electricity as a solar power system.



PERC bifacial solar cell



DeCon bifacial solar cell

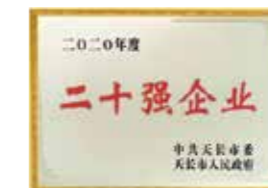
As a main solar cell supplier, Yingfa Ruineng has formed strategic partnerships with China's top five solar module manufactures, including LONGi, Jinko Solar, Trina Solar, Canadian Solar, and JA Solar.



Boasting imported cutting-edge equipment and sophisticated technologies, Yingfa Ruineng is committed to becoming a global leader in solar cell manufacturing. Its R&D building covers an area of 4,000 m<sup>2</sup>, equipped with the world's best photovoltaic testing and experimental equipment, and a mature solar cell R&D system. These facilities enable Yingfa Ruineng to develop new technologies and conduct precise testing and analysis of wafers, solar cells, and solar modules.



### Awards and Honors



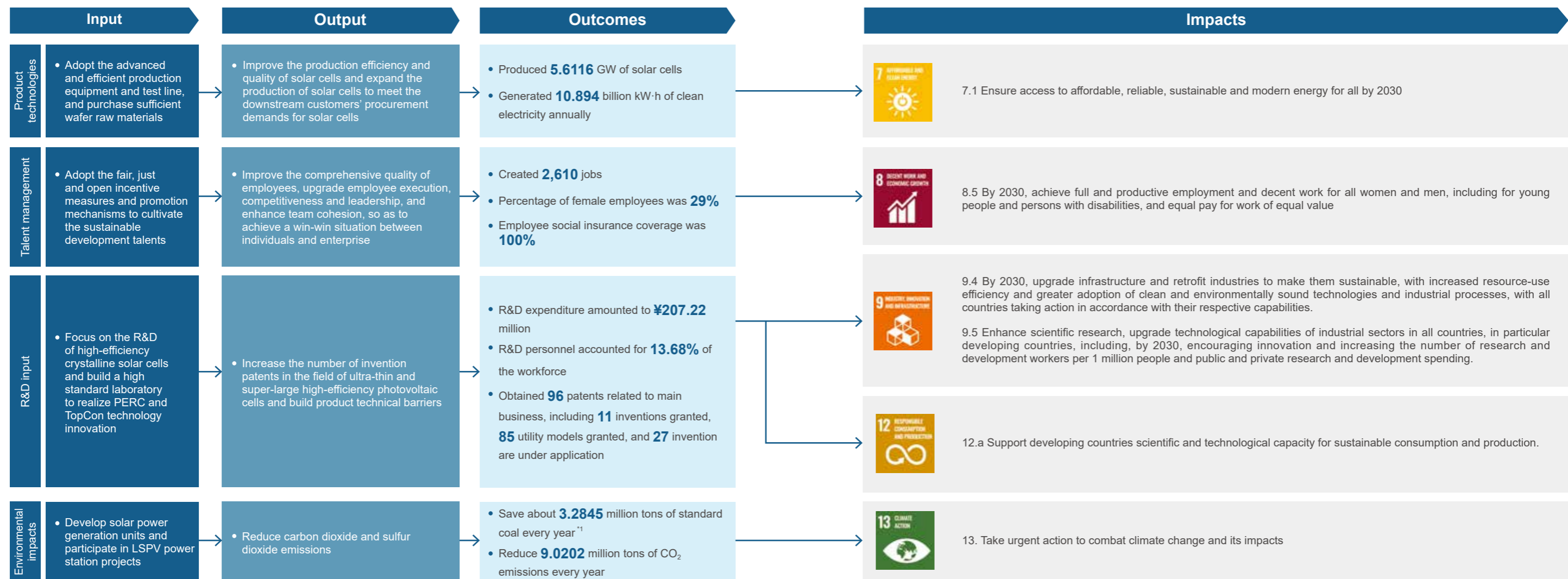
## Contribution to sustainable development

According to the *UN Sustainable Development Goals Report 2022*, China has achieved remarkable results in Industry, Innovation and Infrastructure, Responsible Consumption and Production, Decent Work and Economic Growth, Sustainable Cities and Communities, and Climate Action, and has made improvements in Affordable and Clean Energy and other aspects. These achievements demonstrate China's unremitting efforts in fulfilling international commitments and achieving SDGs with the rest of the world.

Sustainable development of modern energy necessarily requires low-carbon development models, and a faster transformation from fossil energy to clean and low-emission energy. Solar energy, which is renewable and eco-friendly, is essential for low-carbon energy transition. Yingfa Ruineng as a top solar cell manufacturer in China, plays a key role in the photovoltaic industry. As one of the largest independent third-party solar cell suppliers in China, it enjoys high brand awareness and reputation. With superior products and reliable modern energy services, it promotes the development of the photovoltaic industry, and helps reduce CO<sub>2</sub> emissions, contributing to China's carbon peaking and neutrality.

Yingfa Ruineng contributes to the five following goals:

- SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all;
- SDG 8: Full employment and decent work with equal pay;
- SDG 9: Promote inclusive and sustainable industrialization and foster innovation;
- SDGs11: Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal waste management;
- SDGs13: Take urgent action to combat climate change and its impacts



\*Note 1: According to the *Annual Report on Development of China's Power Industry 2022* issued by the China Electricity Council, in 2021, the standard coal consumption of thermal power plants with a capacity of 6,000 kW and above was 301.5 g/kW-h, the CO<sub>2</sub> emissions per unit of thermal power generation was about 828 g/kW-h, and the emissions of soot, sulfur dioxide, and nitrogen oxides per unit of thermal power generation were 22 mg/kW-h, 101 mg/kW-h, and 152 mg/kW-h, respectively. In this case, the generation of every 1 kW-h of solar electricity may save 301.5 g of standard coal per year, and reduce CO<sub>2</sub>, sulfur dioxide, nitrogen dioxide, and carbon dust emissions by 828 g, 0.101 g, 0.152 g, and 0.022 g respectively.

## Sustainable development cases

### Case Yibin Yingfa Deyao 20 GW High-Efficiency Crystalline Solar Cell Project promotes the development of low-carbon industries



#### SDG Contributions

- Boost Yibin's new energy industry and other low-carbon industries in the whole Sichuan Province.
- Create 3,600 jobs which will promote local rural revitalization
- Promote Yibin's high-quality economic development and manufacturing transformation
- Reduce 1.1457 million tons of coal consumption and 3.146 million tons of CO<sub>2</sub> emissions each year, contributing to carbon neutrality

#### Project progress

As the first key photovoltaic energy project in Yibin City, the 20 GW facility is a top focus of both Yibin City and Xuzhou District. A total of ¥11 billion was used to complete the project in two phases (10 GW in each phase). On September 13, 2022, the main structure of phase 1 was completed, 7 days ahead of schedule. On November 18, 2022, phase 1 started its trial operation, accompanied by the launch of phase 2.



Yingfa Group attaches great importance to the project, as it will greatly increase Yingfa's solar cell manufacturing capacity, making it one of the largest solar cells manufactures in China. Moreover, the project is expected to speed up the formation of a photovoltaic industrial cluster in Yibin, Sichuan, improving the overall competitiveness of Sichuan in photovoltaic energy development.

Driven by the "dual carbon" strategy, the photovoltaic industry has been expanding quickly. This means Yingfa Ruineng is expected to see growing competitiveness and a steadily increasing market share, thanks to its professionalism, dedication, cutting-edge technologies, and low costs.

The project is designed to provide 3,600 jobs, create an annual output of ¥20 billion, and reduce 1.1457 million tons of coal consumption and 3.146 million tons of CO<sub>2</sub> emissions each year. These figures indicate a great importance of the project in promoting the high-quality economic development and manufacturing transformation of Yibin City, and propelling the low-carbon industries of the entire Sichuan Province.

### Case 300 MW Fishpond Solar Farm Project



#### SDG Contributions

- Promote manufacturing transformation and the development of low-carbon industries
- Create jobs which will promote local rural revitalization
- Phase 1 will reduce 31,000 tons of coal consumption and 80,000 tons of CO<sub>2</sub> emissions each year
- The project is designed to generate 285 million kW-h of clean electricity, saving about 100,000 tons of standard coal each year
- Generate up to 350 million kW-h of clean electricity each year

#### Project progress

On September 14, 2022, the ¥1.2 billion fishpond solar farm project was launched at Jiepai Community, Renhe Town. It is invested and constructed by Tianchang Huahui Photovoltaic Power Co., Ltd., a subsidiary of Yingfa Group, with a total installed capacity of 300 MW, including phase 1's 80 MW, phase 2's 70 MW, and phase 3's 150 MW. The solar farm is designed to generate 285 million kW-h of clean electricity each year saving 100,000 tons of standard coal each year.

Phase 1 has been connected to the grid in early 2022, with an annual capacity of 110 million kW-h. It will reduce coal consumption by 31,000 tons and CO<sub>2</sub> emissions by 80,000 tons each year. The 300 MW project is designed with an annual capacity can reach up to 350 million kW-h.



A priority of both Tianchang City and Yingfa Group, this modern public utility will contribute to China's carbon peaking and neutrality, overall green transformation, and a harmonious relationship between human and nature. The project combines fish farming with photovoltaic power generation, creating a new resource utilization model that makes full use of space, saves land, generates clean energy, and boosts local green economy. Its economic, environmental and social benefits are immense.




Project 2

# Hunan Yacheng New Energy Co., Ltd.

## Company profile


Hunan Yacheng New Energy Co., Ltd. ("Yacheng New Energy") was established in 2007 and acquired by Beijing Hezong Science & Technology Co., Ltd. (300477.SZ) in 2017. It is located at Yacheng Industrial Park, Xinkang Road, Ningxiang National Economic and Technological Development Zone, Xiangjiang New Area, Hunan Province. The company focuses on the R&D, production and sales of precursors — mainly tricobalt tetroxide, cobalt hydroxide, and iron phosphate — for the cathodes of lithium batteries. It is a national high-tech enterprise integrating the functions of production, talent training and research.

Internally, relying on its own R&D center, it has developed a product R&D system and a range of core technologies with independent intellectual property rights. Externally, it cooperates with Central South University and Changsha Research Institute of Mining and Metallurgy in personnel training and incorporates their technical consulting and guidance into independent R&D, which lays a solid foundation for the R&D of new technologies and products.




**Date of Investment**

CECEP (Hubei) Fund signed a cooperation agreement with Yacheng New Energy in December 2022.




**Company Name**

Hunan Yacheng New Energy Co., Ltd.




**Registered Capital**

¥504.602887 million




**Registered Address**

Xinkang Road, Ningxiang Economic and Technological Development Zone, Changsha City, Hunan Province




**Industry Classification<sup>\*1</sup>**

C26 Chemical raw material and chemical product manufacturing industry




**Date of Establishment**

July 2007




**Legal Representative**

Li Zhijun



**Main business**

Manufacturing and sales of lithium-ion batteries; production, sales and R&D of lithium-ion battery materials



**Qualification**

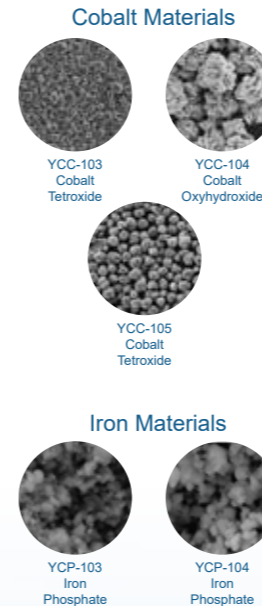
Hunan Specialized, Elaborative, Characteristic and Innovative "Little Giant" Enterprise<sup>\*2</sup>

\*1: Classified with reference to the Guidelines on Industry Classification of Listed Companies (Revised in 2012)

\*2: Refer to the Notice on Printing and Distributing the "Hunan Province Specialized, Elaborative, Characteristic and Innovative 'Little Giant' Enterprise Cultivation Plan (2021-2025)" issued by the Industry and Information Technology Department of Hunan Province

## Business Focuses of Investees

Yacheng New Energy mainly focuses on the production and R&D of battery materials. It has developed a technological system for the production of several types of precursors, including a full range of precursors for lithium cobalt oxide batteries, a full range of precursors for lithium iron phosphate batteries, a full range of ternary precursors, and precursors for lithium manganese iron phosphate batteries.



Yacheng New Energy currently produces 210,000 tons of iron phosphate annually, and a 100,000 tons new plant in Weng'an County, Guizhou Province which will reach its designed capacity in Q1 2023.

With years of efforts, Yacheng New Energy has developed cutting-edge impurity removal technology superior to the industry average. Its iron phosphate single crystals feature small particle size, uniform dispersion, excellent processing performance, high low-temperature charge and discharge performance, and stable quality. With a full range of products meeting various levels of demands, it has become the supplier of many famous down-stream customers, such as BYD, Gotion High-Tech Co., Ltd., Sichuan Liyuan New Materials Co., Ltd., Pulead Technology Industry Co., Ltd., Inner Mongolia Sheng Vanadium Technology New Energy Co. Ltd., and Hunan Yuneng New Energy Battery Materials Co., Ltd.

The strength of Yacheng New Energy has been proved by many honors and titles, such as Integrity Model in Hunan Province, AAA Product Quality Enterprise in Hunan Province, "Little Giant" Enterprise in Changsha City, Top 300 Star Enterprise<sup>1</sup> in Changsha City, New Material Enterprise in Hunan Province, Intelligent Manufacturing Enterprise in Changsha City, and Energy-Saving Model in Changsha City. It is also one of the seventh batch of innovative organizations in Changsha, and one of the first batch of advanced manufacturing enterprises in Ningxiang.

## Awards and Honors



\*1: According to the implementation measures of the "Top 300 Star" echelon development plan for small and medium-sized enterprises in Changsha

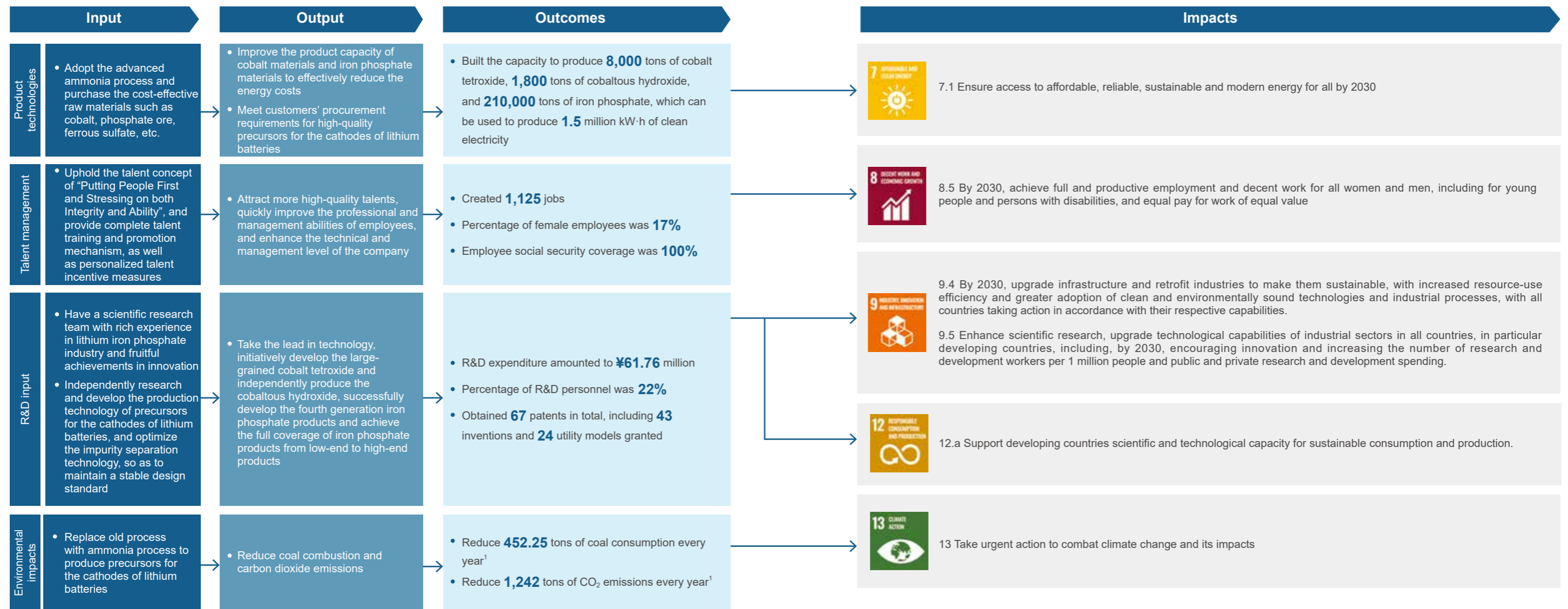
## Contribution to sustainable development

In line with the *United Nations Framework Convention on Climate Change* and its *Paris Agreement*, China has developed a set of active strategies and actions to promote climate change mitigation and adaption, accelerate green development transformation, participate in global climate governance efforts, and increase nationally determined contributions.

The fast-growing new energy vehicle market has led to an explosive demand for batteries, which indicates a huge market potential for lithium iron phosphate and iron phosphate. Yacheng New Energy is one of the earliest companies engaged in the R&D and manufacturing of precursors for the cathodes of lithium batteries. With a mature and stable technology roadmap, expandable capacity, and energy-efficient low-carbon technologies, it is able to satisfy downstream demand for different types of iron phosphate. In line with the carbon peaking and neutrality strategy, Yacheng New Energy is playing an active role in promoting China's new energy business, and reducing CO<sub>2</sub> emissions.

### Yacheng New Energy contributes to the five following goals:

- SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all;
- SDG 8: Full employment and decent work with equal pay;
- SDG 9: Promote inclusive and sustainable industrialization and foster innovation;
- SDG 12: Ensure sustainable consumption and production patterns
- SDGs13: Take urgent action to combat climate change and its impacts



<sup>1</sup>Note 1: According to the *Annual Report on Development of China's Power Industry 2022* issued by the China Electricity Council, in 2021, the standard coal consumption of thermal power plants with a capacity of 6,000 kW and above was 301.5 g/kW·h, the CO<sub>2</sub> emissions per unit of thermal power generation was about 828 g/kW·h, and the emissions of soot, sulfur dioxide, and nitrogen oxides per unit of thermal power generation were 22 mg/kW·h, 101 mg/kW·h, and 152 mg/kW·h, respectively. In this case, the generation of every 1 kW·h of solar electricity may save 301.5 g of standard coal per year, and reduce CO<sub>2</sub>, sulfur dioxide, nitrogen dioxide, and carbon dust emissions by 828 g, 0.101 g, 0.152 g, and 0.022 g respectively.

## Sustainable development cases

• Case

### Hunan Yacheng Phase 3 50,000 t Battery-Grade Iron Phosphate Expansion Project sets an example of new energy battery manufacturing



#### SDG Contributions

- Low-carbon technical design is expected to decrease manufacturing energy consumption by 30%
- Promote the development of the new energy industry and other low-carbon industries
- Create jobs locally
- Create an output of about ¥ 900 million, promoting the high-quality economic development of Ningxiang

#### Project progress

The ¥502 million expansion project covers an area of about 60 mu (approx. 4.02 ha.). Existing facilities include a ferrous dissolution and filter-pressing workshop, and an environmental protection workshop. The expanded part will be more automatic, intelligent, and green. Low-carbon manufacturing technologies, including solar cells, will be used to decrease manufacturing energy consumption by 30%.

Intelligence upgrading of Phase 3 includes a smart three-dimensional warehouses, intelligent logistics, and intelligent manufacturing and testing equipment. Since project commissioning on September 15, manufacturing efficiency and product quality have been improved to industry-leading levels.

The expansion will increase the plant's capacity to 110,000 tons per year, making it one of the largest iron phosphate manufactures in China. The project will provide a 50,000 t expansion model that can be copied quickly in the future.



• Case

### Weng'an 300,000 t Battery-Grade Iron Phosphate Integration Project promotes the growth of the new energy battery industry



#### SDG Contributions

- Promote Weng'an's new energy battery industry and manufacturing transformation
- Create 1,000 jobs which will promote local rural revitalization
- Create an estimated annual output of ¥5.4 billion and ¥220 million of tax revenue after completion, promoting the high-quality economic development of Weng'an County.

#### Project progress

Located in Weng'an County, the ¥3.94 billion integration project adopts modular intelligent iron phosphate manufacturing technologies, which ensure its technological superiority in China while greatly reducing manufacturing costs.

The project covers an area of about 1,120 mu (approx. 75.04 ha.) and will be implemented in two phases: the ¥1.2 billion Phase 1 across 220 mu (approx. 14.74 ha.) and ¥2.74 billion Phase 2 across 900 mu (approx. 60.3 ha.). Phase 1 is designed to produce 100,000 tons of iron phosphate every year. It was in production in December 2022, and is estimated to create ¥1.8 billion of output and ¥70 million of tax revenue every year. Phase 2 is designed to produce 200,000 tons of iron phosphate, 400,000 tons of phosphoric acid from phosphate ore, and 600,000 tons of sulfuric acid from pyrite every year. It is estimated to create ¥5.4 billion of output and ¥220 million of tax revenue every year, and provide more than 1,000 jobs.



The project is now progressing quickly, thanks to Yacheng New Energy's financial, technical and market strength. The project is expected to further promote the upgrading of Weng'an's chemical industry, and expand the phosphorus-based battery industry. Such upgrading and expansion will surely boost local high-quality economic development.

# Sustainable Management of Existing Projects in 2022

## Project 3

## Wuhan Easy-Sight Technology Co., Ltd.

### Company profile

Easy-Sight is a high-tech company engaged in the R&D and manufacturing of technologies, equipment and materials related to drainage network inspection, evaluation, maintenance, and rehabilitation, with the aim of providing comprehensive intelligent drainage network operation & maintenance solutions for cities. It operates in consistent with China's environmental protection policies, such as the Great protection of the Yangtze River strategy, heavily polluted water body restoration action, urban flooding control plan, and innovative connection of wastewater treatment plants with sewage networks. Easy-Sight is known as an expert in sewage network inspection, evaluation, maintenance, and rehabilitation.



#### Date of Investment

CECEP (Hubei) Fund signed a cooperation agreement with Easy-Sight in August 2021.



#### Company Name

Wuhan Easy-Sight Technology Co., Ltd,



#### Date of Establishment

Thursday, November 18, 2010



#### Registered Capital

¥42,575,384



#### Legal Representative

Zheng Hongbiao



#### Information of the Investee



#### Registered Address

221 Guanggu 2nd Road, East Lake High-Tech Development Zone, Wuhan



#### Main business

R&D, manufacturing and sale of testing and rehabilitation equipment and materials



#### Industry Classification

C35 Special equipment manufacturing industry<sup>\*1</sup>



#### Qualification

National Specialized, Elaborative, Characteristic and Innovative "Little Giant" Enterprise<sup>\*2</sup>

\*1: Classified with reference to the Guidelines on Industry Classification of Listed Companies (Revised in 2012)

\*2: Refer to the Notice on the Development of Specialized, Elaborative, Characteristic and Innovative "Little Giant" Enterprise issued by the Ministry of Industry and Information Technology, etc.

## Business Focuses of Investees

Easy-Sight works on enabling faster inspection, repair and maintenance of sewage networks, and applying big data to these processes and the bigger wastewater treatment industry. It has successfully integrated cutting-edge technologies into the inspection, maintenance, repair, management, and after-sales service of sewage networks. In 2020, Easy-Sight was selected by the E20 Institute of Environment Industry<sup>1</sup> as a “water market segment leader”, and “leader in the municipal pipe market”.



Pipeline Inspection Robots



X5-HMA Pipeline CCTV Inspection Robot



T Series Box Culvert Inspection Robot



Mobile Control Cabinet

Awards and honors in 2022 include the Science and Technology Progress Award, Five-Star After-Sales Service System Certificate, 2021-2022 Excellent High-tech Enterprise in Wuhan City<sup>2</sup>, 2022-2023 “Gold Seed” IPO Candidate in Hubei Province<sup>3</sup>, Specialized, Elaborative, Characteristic and Innovative “Little Giant” Enterprise, Intellectual Property Management System Certificate<sup>4</sup>, First-Level CS Information System Development and Service Certificate<sup>5</sup>, 2022 AA Credit Rating Certificate<sup>6</sup>, Technology Enterprise in East Lake High-tech Development Zone, 2022 “Gold Seed” IPO candidates in the High-tech Zone<sup>7</sup>, IT-Industrialization Integrated Management System Certificate<sup>8</sup>, and the first prize of the Yangtze River Science and Technology Award<sup>9</sup>.

<sup>\*1</sup> E20 is an environmental in-depth ecological platform initiated by Beijing E20 Environment Co., Ltd., a new third board company. The E20 Research Institute was formerly known as the Water Policy Research Center of Tsinghua University  
<sup>\*2</sup> According to the “2022 Wuhan Excellent High-tech Enterprises Selection Method”  
<sup>\*3</sup> According to the list issued by the Hubei Provincial Leading Group Office for Enterprise Listing  
<sup>\*4</sup> According to Enterprise intellectual property management (GB/T29490-2013)  
<sup>\*5</sup> According to the Capability Requirements for Information System Construction and Service Capability Evaluation System issued by the China Information Technology Industry Federation (T/CITIF 001-2019)  
<sup>\*6</sup> Issued by Hubei Branch of United Credit Rating Co., Ltd  
<sup>\*7</sup> According to the announcement issued by the Financial Work Bureau of Wuhan East Lake New Technology Development Zone  
<sup>\*8</sup> According to Integration of informatization and industrialization management systems—Requirements (GB/T23001-2017) 、 Integration of informatization and industrialization management systems—Requirements for enhanced capability grading (GB/T23006-2022)  
<sup>\*9</sup> According to the list published by the Yangtze River Institute of Technology and Economics



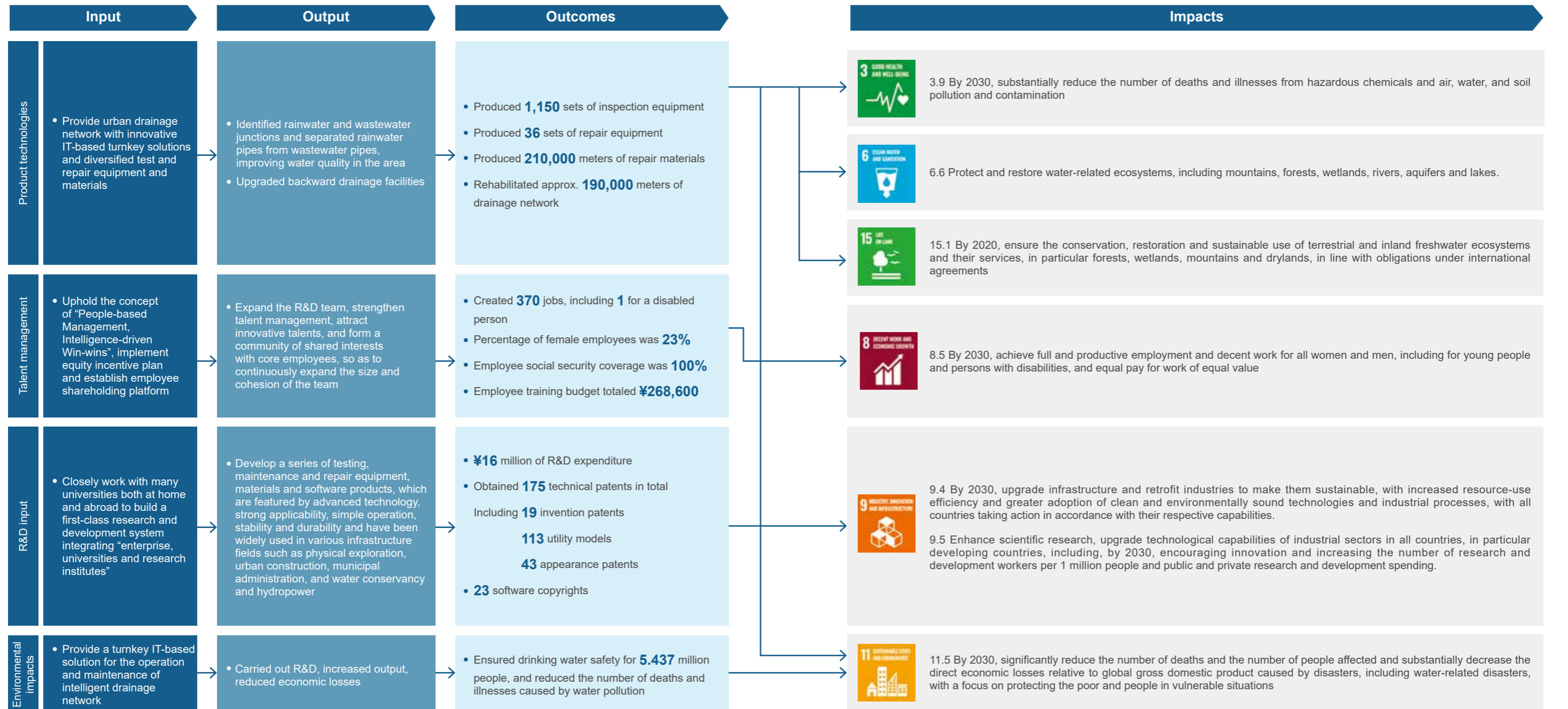
## Awards and Honors



## Contribution to sustainable development

The *UN Sustainable Development Goals Report 2022* shows that China moved up one place in the SDG Index ranking, but still confronted with significant challenges in achieving some goals. For instance, China saw steady improvements in “annual mean concentration of PM2.5”, and “access to improved water source, piped”, but challenges still remained. China also made noteworthy progress in improving the lives of proportion of urban population living in slums, so that they get access to improved water, access to improved sanitation, sufficient living area, housing durability, and security of tenure. These efforts help create more inclusive, safe, resilient and sustainable cities and communities.

Damages to municipal pipeline networks can hardly be detected and fixed. Once a pipe is broken, the road above needs to be dug up, which means a heavy workload, and a serious impact on traffic. If the problem cannot be fixed quickly, groundwater pollution may happen. Easy-Sight' pipe inspection robots can replace workers in detecting damages to a pipe and fixing it accurately in the pipe, without causing road excavation. Easy-Sight's robot solutions can greatly mitigate damage to the environment, reduce impacts on traffic, and decrease cost, time and labor required. Moreover, they can prevent sewage from polluting soil and groundwater, protect water ecosystems, and reduce deaths and illnesses caused by water pollution.



## Sustainable development cases

### Case Yichang Downtown WWTP-Network System Phase 2 PPP Project realizes the integrated intelligent management of WWTPs, sewage networks, rivers (lakes) and their surrounding water utilities



#### SDG Contributions

- Ensure the physical security of urban sewage networks and other related public infrastructure
- Improve the water environment and basically realize the full collection and treatment of urban sewage
- Significantly reduce sewer overflow pollution in the rainy season
- Significantly improve wastewater treatment efficacy and sludge treatment capacity
- Realize the intelligent integrated management of wastewater treatment plants (WWTPs), sewage networks, rivers (lakes) and their surrounding water utilities
- Ensure the water safety of a large number of permanent residents

#### Project progress

The ¥3.9 billion project aims to realize the integrated management of WWTPs and sewage networks in the downtown area of Yichang City. Efforts include the inspection, dredging, and repair of about 900 km of pipelines in 1,738.8 km of sewage networks, benefiting 3.91 million people across 21,000 km<sup>2</sup> of 13 areas. Related rivers are the Yangtze River, Qingjiang River, Juzhang River, and Xiangxi River, and related WWTPs include Linjiangxi WWTP, Yichang Yiling District WWTP, and Yichang Shahe WWTP.

The project involves 5,600 meters of photocuring, 123 repair spots, and the mortar spraying (repair) of 160 inspection shafts. As a part of the project, the Yichang Downtown WWTP-Network Integrated Management System was created for the lifecycle management of the project, from design, budgeting, construction to inspection and acceptance. The system enables the management of approval, progress control, and inspection by work order.



Basically realizing the full collection and treatment of wastewater in the downtown area, the project is of great importance in increasing the influent COD concentrations of WWTPs, reducing sewage overflow pollution in rainy seasons, improving the treatment efficiency of WWTPs, and addressing urban flooding. It also contributes to the construction of riverside ecological corridors.

### Case Xiantao Four-Pronged Water Governance Project improves local water environment



#### SDG Contributions

- Investigate, monitor and track sewage networks and related outlets to reduce the amount of sewage
- Create a restoration management information system to achieve sustainable industry development
- Restore sewage networks to ensure the security of public infrastructure
- Promote the governance of local water environment
- Ensure the water safety of a large number of permanent residents

#### Project progress

Xiantao City in Hubei Province is one of the most sensitive, important and fragile areas in the water environment of the Yangtze River Basin. The four-pronged (including water resource protection, aquatic ecosystem improvement, water environment governance, water culture promotion) water governance project focuses on the detection, inspection and restoration of Xiantao's sewage networks, including 668 km of pipeline detection, 400 km of pipeline CCTV inspection, and 400 km of dredging and washing.



The project covers 633.4 km of sewage networks, benefiting 1.527 million people across 2,538 km<sup>2</sup>. Related rivers mainly include the Han River, Dongjing River, Tongshun River, and Tongzhou River. The Han River and Dongjing River are focuses of governance. The former runs 91.2 km across Xiantao, and the latter flows 103.34 km, with a catchment area of 2,520 km<sup>2</sup>. Related WWTPs are Chengdong WWTP, Xianxiahe WWTP, Chengxi WWTP, Advanced Urban Wastewater Treatment Plant, and Xianyuan WWTP.

Sewage outlet tracking and governance is a focus of the project. Efforts were made to investigate, monitor and track sewage networks and related outlets, to identify the discharge status and sources of wastewater, and related problems which were later classified and assigned to corresponding task teams. So far, Xiantao has named and coded 358 sewage outlets along related rivers, and customized governance requirements for each one. According to such requirements, 204 outlets have been disposed, of which 44 have been blocked, 75 have been upgraded technically, and 85 have been upgraded in other ways. These measures have improved local water environment, contributing to the Great protection of the Yangtze River strategy.

“ Sewage outlet tracking and governance, together with the Xiantao Four-Pronged Water Governance Project, has further promoted the governance and improvement of local water environment.

—Officer from the Housing and Construction Bureau of Xiantao City

Project 4

# 3R Environmental Technology Co., Ltd.

## Company profile

3R is a high-tech company that recycles hazardous industrial wastes to produce specialty chemicals such as water treatment agents and etching agents. It mainly focuses on collecting hazardous industrial wastes and recycling them into ferric salt and other specialty chemicals.

📅
Date of Investment

CECEP (Hubei) Fund signed a cooperation agreement with 3R in October 2021.

<div style="margin-bottom: 10px;"> <span style="font-size: 24px;">📖</span> <p><b>Company Name</b></p> <p>3R Environmental Technology Co., Ltd.</p> </div> <div style="margin-bottom: 10px;"> <span style="font-size: 24px;">💰</span> <p><b>Registered Capital</b></p> <p>¥85 million</p> </div> <div style="margin-bottom: 10px;"> <span style="font-size: 24px;">📍</span> <p><b>Registered Address</b></p> <p>Laoweixia Village, Yonghu Town, Huiyang District, Huizhou City, Guangdong Province</p> </div> <div> <span style="font-size: 24px;">🏭</span> <p><b>Industry Classification</b></p> <p>C42-Comprehensive utilization of waste resources<sup>*1</sup>; C26-Chemical raw materials and chemical products manufacturing industry</p> </div>	<div style="margin-bottom: 10px;"> <span style="font-size: 24px;">📅</span> <p><b>Date of Establishment</b></p> <p>Wednesday, April 30, 2003</p> </div> <div style="margin-bottom: 10px;"> <span style="font-size: 24px;">👤</span> <p><b>Legal Representative</b></p> <p>Ding Decai</p> </div> <div style="margin-bottom: 10px;"> <span style="font-size: 24px;">📄</span> <p><b>Main business</b></p> <p>Recycle hazardous industrial wastes to extract useful substances and turn them into specialty chemicals, such as ferric trichloride and its polymer, ferrous chloride, and ferric sulfate and its polymer.</p> </div> <div> <span style="font-size: 24px;">🏆</span> <p><b>Qualification</b></p> <p>High-tech enterprise<sup>*2</sup></p> </div>
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\*1 Classified with reference to the Guidelines on Industry Classification of Listed Companies (Revised in 2012)  
\*2 Refer to the Administrative Measures for the Identification of High-tech Enterprises issued by the Ministry of Science and Technology, etc.

## Business Focuses of Investees

3R is permitted to treat over 300,000 tons of waste acid annually. According to data provided by the departments of ecology and environment of Guangdong and Hebei, its subsidiaries in Jieyang and Tangshan have the high approved waste acid reuse capacities in the two provinces respectively.

It plans to build waste acid treatment plants in cities along the Yangtze River, an effort to perform its responsibility of protecting the Yangtze River. Moreover, it will continuously increase its hazardous waste treatment capacity as business grows, contributing to the Yangtze River protection.

3R has deployed several plants in South and North China to recycle hazardous industrial wastes into specialty chemicals. Its honors and certificates include the Clean Production Certificate<sup>1</sup>, Famous Brand in Guangdong Province, etc.



## Awards and Honors



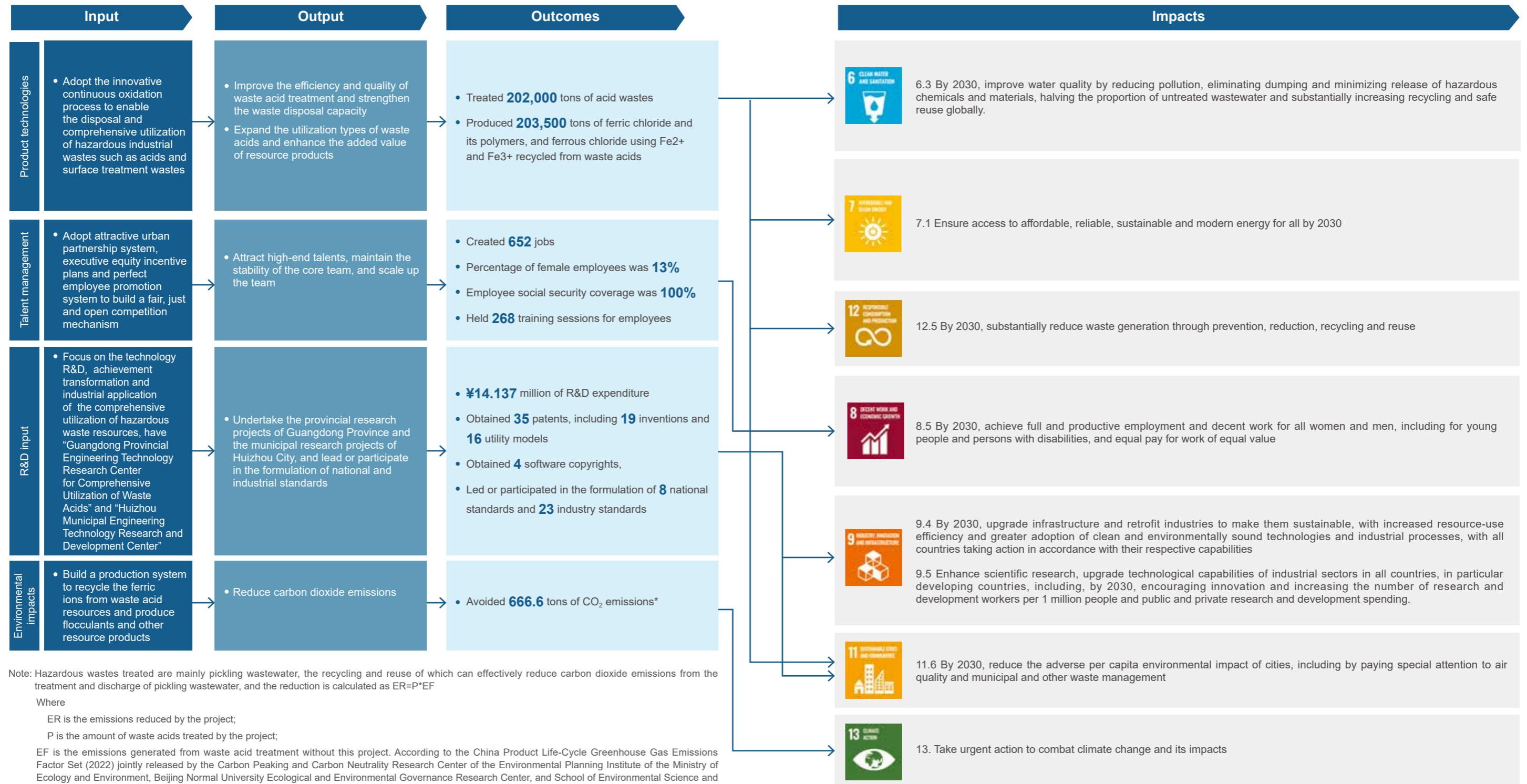
\*1 According to the Notice on Publishing the Evaluation and Acceptance Results of the First Batch of Cleaner Production Enterprises in Huizhou in 2020



## Contribution to sustainable development

The *UN Sustainable Development Goals Report 2022* warns that climate crisis, COVID-19 epidemic, and increasing conflicts around the world have put the 17 SDGs at risk. Even though, China still moved up one place in the SDG Index ranking, with satisfactory performance in achieving SDG 6 (clean water and sanitation).

3R recycles a large amount of iron materials, mainly Fe<sup>2+</sup> and Fe<sup>3+</sup>, from spent pickling acid from steel rolling, and uses such materials to produce pollution treatment agents such as wastewater treatment agents. In this way, industrial wastewater is used to treat itself. This process is of great strategic importance in promoting sustainable economic development, reducing environmental pressure, and managing urban pollution. It also contributes to the Great protection of the Yangtze River strategy.



Note: Hazardous wastes treated are mainly pickling wastewater, the recycling and reuse of which can effectively reduce carbon dioxide emissions from the treatment and discharge of pickling wastewater, and the reduction is calculated as ER=P\*EF

Where

ER is the emissions reduced by the project;

P is the amount of waste acids treated by the project;

EF is the emissions generated from waste acid treatment without this project. According to the China Product Life-Cycle Greenhouse Gas Emissions Factor Set (2022) jointly released by the Carbon Peaking and Carbon Neutrality Research Center of the Environmental Planning Institute of the Ministry of Ecology and Environment, Beijing Normal University Ecological and Environmental Governance Research Center, and School of Environmental Science and Engineering of Sun Yat-sen University, the downstream emissions factor of pickling wastewater is 3.3 kgCO<sub>2</sub>e/t.

Calculation result shows that **666.6** tons of CO<sub>2</sub> emissions can be avoided.

## Sustainable development cases

### Case Continuous oxygen oxidation process enables comprehensive resource utilization



#### SDG Contributions

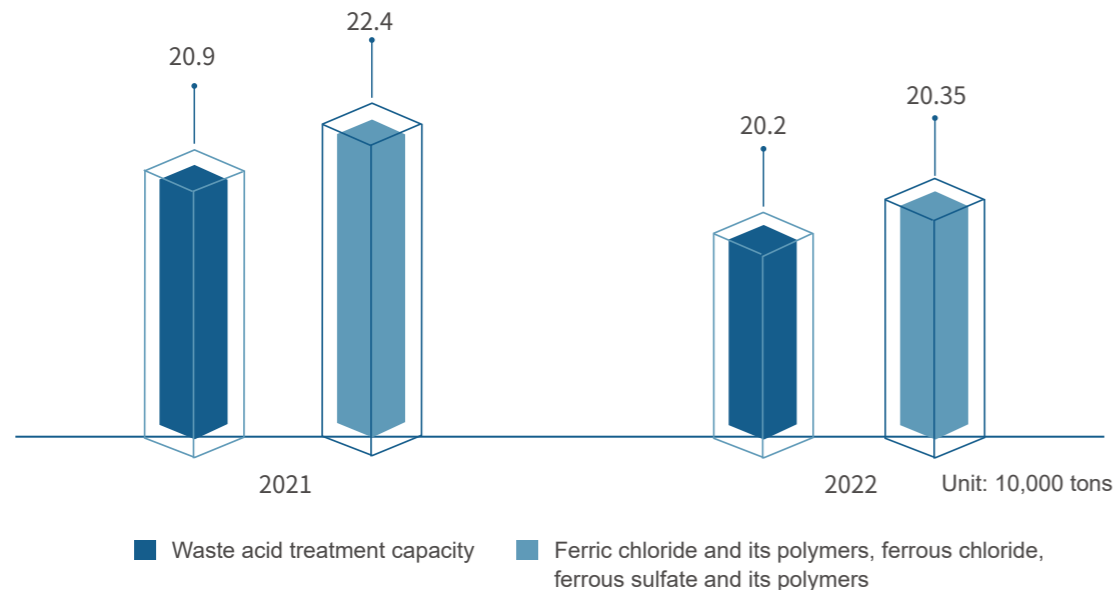
- Produced and sold waste acid treatment chemicals such as water treatment agents
- Regenerated wastewater containing hazardous wastes
- Increased the industry's treatment capacity of hazardous and chemical wastes
- Contributed to the collection, storage and comprehensive utilization of hazardous industrial wastes such as waste acids and surface treatment wastes.
- Recycled waste acids
- Reduced CO<sub>2</sub> emissions

#### Project progress

3R focuses on recycling waste acids from steel rolling. Most steel rolling plants do not have sufficient waste acid storage tanks, and thus need professional treatment companies to safely transport waste acids away as soon as possible. 3R can well meet such need relying on its treatment capacity and transport fleets, at a cost lower than industry average.

3R has led or participated in the formulation of 31 national and industry standards. Besides, it has developed several core comprehensive resource utilization technologies, such as the cutting-edge continuous oxygen oxidation technology, and mixed acids processing technology. These technologies can greatly improve production efficiency and product quality.

In 2022, 3R produced 203,500 tons of ferric chloride and its polymers, and ferrous chloride using Fe<sup>2+</sup> and Fe<sup>3+</sup> recycled from waste acids.



### Case 3R develops new technologies to manufacture new energy materials



#### SDG Contributions

- Regenerated wastewater containing hazardous wastes
- Increased the industry's treatment capacity of hazardous and chemical wastes
- Contributed to the collection, storage and comprehensive utilization of hazardous industrial wastes such as waste acids and surface treatment wastes.
- Recycled waste acids
- Developed new energy materials to promote clean energy
- Reduced CO<sub>2</sub> emissions

#### Project progress

Relying technical advantages in manufacturing iron salt products, 3R has developed new processes to produce iron oxyhydroxide and iron phosphate. Compared with similar processes adopted by other new material manufacturers in China, these processes are simpler, generate fewer by-products, and cost less. Laboratory and pilot tests have proved their efficacy and qualification for mass production. So far, 323.94 tons of iron oxyhydroxide has been sold, and iron phosphate samples have been used by many customers to test the electrical performance of lithium-ion cylindrical batteries.

In 2022, 3R changed its 100,000 t/y Ferric Chloride and 200,000 t Chemical Storage Project to 350,000 t/y Precursor Production and Storage Project with an budget of ¥22 million. The new project mainly produces ferrous chromium chloride solution (200,000 t/y), ferric hydroxide oxide (100,000 t/y), ferric phosphate dihydrate (20,000 t/y), anhydrous ferric phosphate (20,000 t/y), and polyferric chloride (10,000 t/y) after being put into production.



• Case **3R develops iron-chromium flow battery electrolyte, promoting the development of clean energy**



**SDG Contributions**

- Regenerated wastewater containing hazardous wastes
- Increased the industry's treatment capacity of hazardous and chemical wastes
- Contributed to the collection, storage and comprehensive utilization of hazardous industrial wastes such as waste acids and surface treatment wastes.
- Recycled waste acids
- Developed iron-chromium flow battery electrolyte, promoting the development of clean energy
- Reduced CO<sub>2</sub> emissions

**Project progress**

The R&D of iron-chromium flow battery electrolyte is a strengths-based step taken by 3R to promote the development of clean energy.

In September 2021, 3R and Beijing Herui Energy Storage Technology Co., Ltd. signed a strategic cooperation framework agreement on the R&D and manufacturing of flow battery electrolyte. The electrical performance of pilot testing samples has been confirmed by Beijing Herui through laboratory tests.

In March 2022, 3R invested ¥22 million to establish Huizhou New Energy Co., Ltd., a subsidiary of 3R Environmental Technology Co., Ltd. The construction of the production base has been completed, with a design capacity of 30,000 tons of iron phosphate dihydrate and 30,000 tons of ferric hydroxide oxide every year.

In March 2022, the 30,000 t/y New Energy Battery Material (Ferric Phosphate) Project was basically completed, and the project registration certificate has been obtained. At present, large equipment has been ordered, and infrastructure facilities have been partly completed.



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