2025 ∘ IMPACT 50: Pioneering Startups in Sustainable Innovation

IMPACT HUB Shanghai

MAKEABLE

IMPACT 50

INTRODUCTION

Innovation is a key driver of sustainable development. In today's world, marked by slowing global growth, geopolitical tensions, and an escalating climate crisis, advances in technology and business models are powering a shift in how societies and economies progress. These innovations are helping us redefine growth in a way that seeks balance between economic performance and environmental and social well-being.

As one of the world's leading platforms for sustainable innovation and entrepreneurship, Impact Hub Shanghai is dedicated to supporting early-stage impact ventures in scaling and commercializing their solutions. Our mission is to accelerate the industrialization and mainstream adoption of innovations that address sustainability challenges—this is the driving force behind the launch of the ***2025 Impact 50: Pioneering Startups in Sustainable Innovation*** (hereinafter *Impact 50*).

In this edition of *Impact 50*, we draw on research and years of field experience to identify emerging innovation trends across key sustainability topics and industries. We highlight 50 high-potential Chinese ventures that align with these trends and demonstrate strong prospects for scale and impact. By showcasing these trends and real-world cases, we aim to bridge the gap between emerging solutions and market demand, amplifying the visibility of promising startups while helping entrepreneurs, industries, and investors uncover where the next opportunities in sustainable innovation may lie.

Our selection is guided by a comprehensive evaluation framework built around four key dimensions: technological or business model innovation, market traction, scalability in industrial contexts, and environmental and social impact. Leveraging our proprietary startup database, expert nominations, and public data sources, cross-validated for accuracy, we evaluated nearly 900 ventures to arrive at the 50 featured in this report.

These 50 ventures span 42 focus areas, from energy, materials, and waste regeneration, to agriculture, food, synthetic biology, AI-enabled solutions, rural revitalization, and accessibility. They address urgent environmental and social challenges through both technology and services. While all are early-stage (pre-Series B), their progress ranges from pilot completion to early commercialization, each showing strong momentum and future potential.

Notably, over the past three years, Chinese technology ventures have reached internationally competitive levels in several low-carbon sectors, including solar photovoltaics, carbon capture, advanced materials, and sustainable agriculture. Meanwhile, enabling technologies such as artificial intelligence and synthetic biology are gaining momentum, accelerating progress in decarbonization, innovation, and inclusive development.

We believe sustainability is not a distant aspiration. It is a practical, achievable path. Real transformation comes from turning early innovation into applied solutions that drive industrial upgrading and systems change. A sustainable future is not born in a single lab; it takes root across thousands of factories, farms, and communities—and grows through the hands of those building it every day.

We hope *Impact 50* serves not just as a case collection, but as a practical guide for shaping a more resilient innovation ecosystem: offering strategic insight for industries in transition, new opportunities for impact-driven ventures, and clear signals for investors. More than highlighting technology and business value, this report is ultimately about the possibility of building a more inclusive, resilient, and sustainable world.

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Artificial Intelligence (AI)+ Material Synthesis

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SELECTED VENTURES: OVERVIEW AND INSIGHTS

Basic Profile

Drawing on national policy priorities, market needs, and emerging innovation trends, the *2025 Impact 50* compiles 50 outstanding early-stage Chinese ventures*. These ventures were selected through a comprehensive evaluation framework that assesses technological or business model innovation, market traction, scalability, and environmental and social impact. Together, they represent a broad spectrum of sectors, from energy, materials, and agriculture, to synthetic biology, AI-enabled solutions, and rural revitalization.

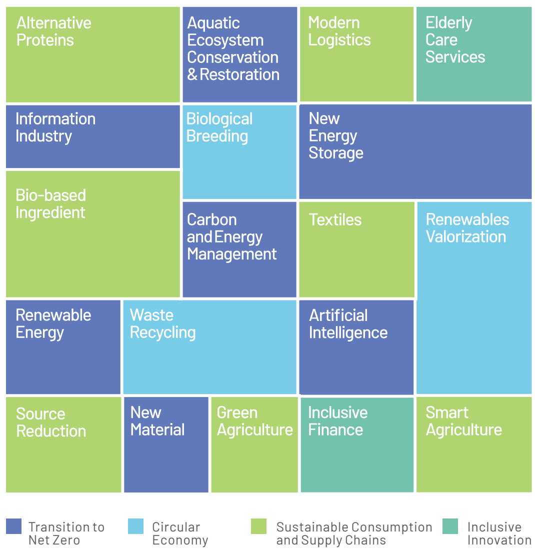


Figure 1: Industries covered by the selected ventures

Figure 2: SDGs covered by selected ventures

Based on the core focus areas of Impact Hub Shanghai, the 50 selected ventures are categorized into four thematic groups: Transition to Net Zero, Circular Economy, Sustainable Consumption and Supply Chains, and Inclusive Innovation. In addition, each venture has been mapped to the United Nations Sustainable Development Goals (SDGs) based on its impact.

Collectively, these ventures contribute to 13 of the 17 SDGs, with most commonly addressed goals being: SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) .

* Ventures previously selected for the Impact 50 or 2024 Asia Climate Pioneers 100 are excluded from *2025 Impact 50* (see Appendix for the full list of past recipients).

SELECTED VENTURES: OVERVIEW AND INSIGHTS

Under China's "dual carbon" goals, innovation in environment-focused sectors has grown rapidly, with a steady stream of new technologies and best practices emerging. However, inclusive innovation remains underrepresented. These ventures often operate with a public-interest orientation, using business as a tool to drive social value. Yet, they tend to face challenges in profitability and commercial scalability, which limits their access to funding.

That said, we believe that inclusive innovation is essential to the achievement of sustainable development. With greater attention and support from investors and corporate partners, these ventures can unlock sustainable growth models that align social impact with financial sustainability.

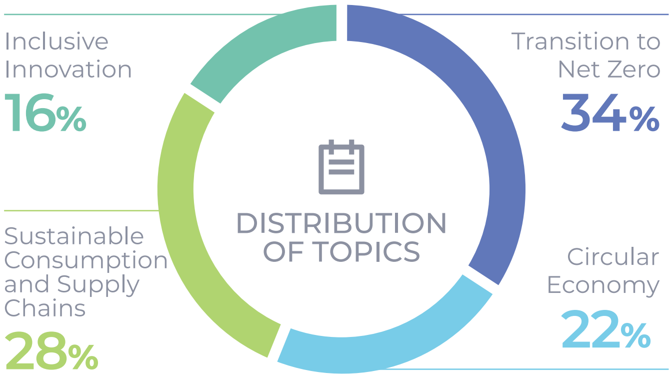


Figure 3: Statistics on the distribution of topics

Over 80% of the selected ventures were established between 2017 and 2022, indicating that most are still in their early or growth stage. These ventures have generally completed initial technology validation and are refining their business models, with the next key step being scaling up to expand market reach. The report also includes two startups founded in 2023–2024, which focus on carbon capture, utilization and storage (CCUS) and AI-enabled materials synthesis, both areas considered as strategic emerging industries.

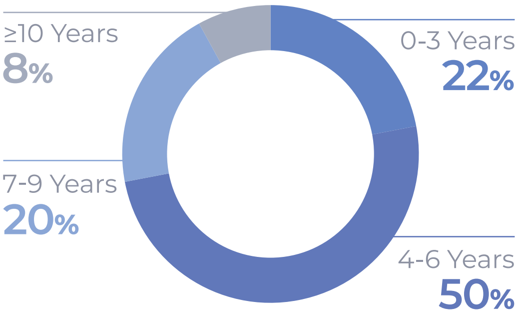


Figure 4: Statistics on the founding year

Gender diversity presents another important lens through which to understand the innovation landscape. Female founders are more prominently represented in inclusive innovation, where social impact is a central focus. Conversely, women remain underrepresented in technology-intensive sectors, although their presence is still visible across all focus areas.

We hope to see more women enter the field of technological innovation in the future, bringing diverse perspectives and creative energy to China's sustainable innovation ecosystem.

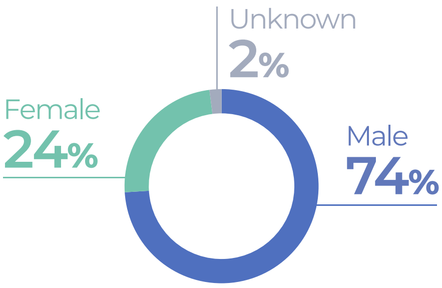


Figure 5: Gender ratio of selected business founders*

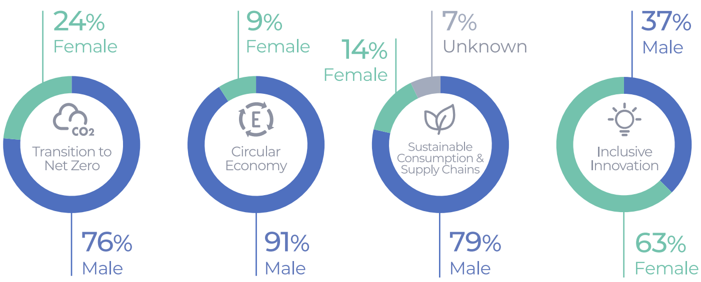


Figure 6: Gender ratio of selected business founders by topics

* "Unknown" indicates founders whose gender could not be determined based on publicly available information.

Geographic Distribution

As illustrated in the chart, a majority of selected ventures are concentrated in China's eastern coastal regions, with over 70% based in four key provinces and municipalities: Shanghai, Guangdong, Jiangsu, and Beijing. Shanghai excels in Transition to Net Zero category, with strong representation in sectors such as new energy, energy storage, and new materials. This is supported by its robust industrial base, high concentration of research institutions, and its role as an international financial center with strong policy support.

Noteably, Guangdong exhibits a more balanced development across the four themactic areas, with strengths in inclusive innovatin, particularly in creating opportunities for persons with disabilities and women entrepreneurs.

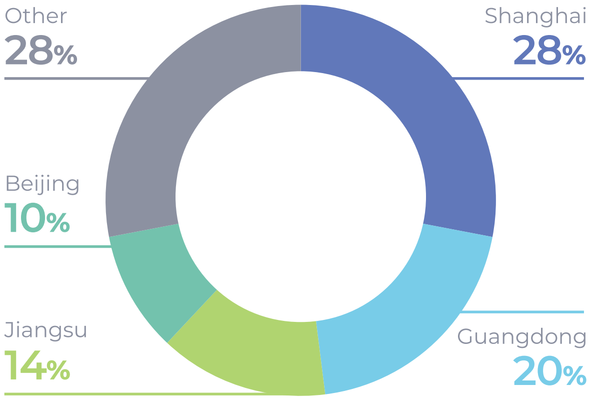


Figure 7: Statistics of the provinces

It is also worth highlighting that among the 10 Guangdong-based ventures, 7 are located in Shenzhen, covering all four thematic areas. Shenzhen has developed notable clusters in electrochemical energy storage* and bio-based new materials, aligns with the city's recent industrial support policies for new materials and energy storage. These developments illustrate a dynamic innovation ecosystem shaped by strong policy incentives and market demand.

Funding Overview

In terms of funding status, 34 of the selected ventures (68%) have secured external investment. Among them, the most recent funding rounds are primarily concentrated at the angel and Series A stages, accounting for 24 ventures in total. More than 80% of the funded ventures completed their latest funding within the past three years (since January 2022). Notably, seven ventures raised new funding in 2025, spanning sectors such as renewable energy, battery recycling, carbon capture, utilization and storage (CCUS), AI-enabled materials synthesis, sustainable aviation fuel (SAF), alternative proteins, and sustainable packaging.

Figure 8: Proportion of the latest funding round

* Among the selected ventures, a flow battery venture from Hong Kong, China, and a solid-state battery venture from Zhuhai, Guangdong, have also established branches in Shenzhen.

SELECTED VENTURES: OVERVIEW AND INSIGHTS

In terms of sector trends, ventures driving the net-zero transition have attracted considerable investor interest, especially in sectors such as renewable energy, energy storage, low-carbon materials, CCUS, and AI+ materials. Most are in the angel or Series A stage, reflecting investors' growing appetite for early-stage deep-tech investments.

Backed by favorable policy tailwinds and rapid industry growth, ventures working on sodium-ion batteries, low-carbon building materials, and AI+ materials have raised rounds in the hundreds of millions of RMB, signaling strong investor confidence in their long-term potential.

Among the ventures focused on sustainable consumption and supply chains, those that have secured funding are distributed across sectors such as bio-based material alternatives, alternative proteins, agriculture, and packaging. The majority of ventures in bio-based materials, alternative proteins, and agriculture remain in the early stages, with funding concentrated at Series A or earlier. In contrast, the more mature sustainable packaging sector sees funding rounds primarily at Series A to Series B stages, with larger investment volumes. Notably, ventures specializing in single-material recyclable packaging have already secured investments in the range of hundreds of millions of RMB, reflecting strong market demand and investor enthusiasm for green transformation in the packaging industry.

In addition, we have observed the growing potential of AI to drive sustainable development. From enabling smart factory energy management, to accelerating innovation in materials, proteins, and related fields, to fostering new business models, AI is increasingly aligned with market expectations for sustainable and high-quality transformation. It is becoming a powerful force in driving corporate innovation toward greater sustainability.

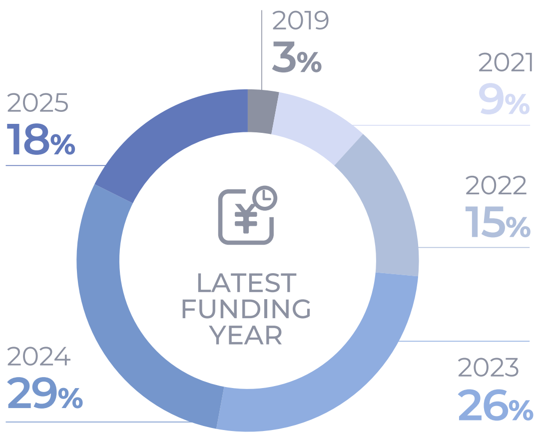


Figure 9: Proportion of the latest funding year

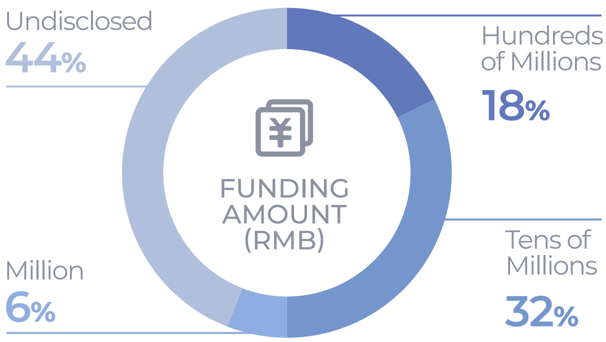


Figure 10: Proportion of latest funding amount

Technology Readiness Level

Among the 50 selected ventures, 43 are technology-driven, while the remaining 7 focus on business model innovation, primarily within inclusive innovation. Since market validation and scalability potential were key selection criteria, most of the technology-driven ventures are positioned at the later stages of the TRL* scale—specifically, 7 to 9, which correspond to commercialization phases.

Over 70% of the selected tech-driven ventures have already commercialized their technology or products, while nearly 30% are still in the pilot phase or early commercialization.

Our analysis suggests that ventures developing zero-carbon technologies face significant hurdles on the path to commercialization. Among the ventures at 8, 25% are developing carbon capture and utilization (CCU) or direct air capture (DAC) solutions, while half are active in the energy storage space, including solid-state batteries, hydrogen, compressed air storage, and flow batteries. These areas are typically both R&D- and capital- intensive, with high technical complexity and long commercialization cycles.

Despite technological progress, at this stage, many ventures remain dependent on policy incentives than on actual market demand. This dependance is primarily due to high deployment costs and lack of scalable demonstration environments. To scale effectively, these ventures need more than just technological breakthroughs—they require long-term financial support, access to pilot programs, and open innovation ecosystems that enable collaboration across industry, academia, investors, and government.

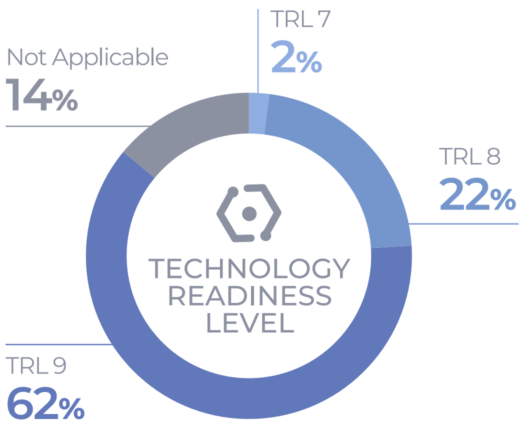


Figure 11: Statistics of technology readiness level

* The Technology Readiness Level (TRL) framework is an internationally established method for evaluating a technology's development stage, from basic research to commercial application. The 1–9 scale (TRL1–9) systematically tracks progress through conceptual, developmental, and operational phases. TRL7–9 represent the final commercialization stages, where technologies progress from pilot production (TRL7) to certified mass-production readiness (TRL8) and ultimately to full market deployment (TRL9).

TRANSITION TO NET ZERO

China has established the "1+N" policy framework to achieve its carbon peaking and carbon neutrality goals. Net-zero and negative-carbon technologies are playing a critical role in enabling the transition in key sectors, such as energy, industry, transportation, and construction. At the same time, strategic emerging industries such as advanced materials and biotechnology are becoming new engines of low-carbon economic growth.

Impact Hub Shanghai has maintained a strong focus on climate issues, with a particular emphasis on the real-world deployment of climate tech innovations. In this report, we showcase 17 representative cases across six key areas of the net-zero transition: renewable energy and storage, energy and carbon management, low-carbon materials, AI+ materials, CCUS, and environmental governance and climate adaptation. These cases highlight emerging technological trends and provide practical insights for advancing toward a net-zero future.

Renewable Energy and Storage

The energy sector remains the largest contributor to global carbon emissions. According to the International Energy Agency (IEA)'s *CO_2 Emissions in 2023* report, energy-related carbon emissions reached a record of 37.4 billion tonnes in 2023, with China accounting for 34%—the highest share globally[1]. A rapid and far-reaching energy transition is pivotal to China's dual carbon goals.

In recent years, China has made significant progress in scaling up renewable energy. Data from the National Energy Administration shows that by 2023, China's installed capacity for wind and solar power had increased tenfold compared to a decade ago. By 2024, China's annual hydrogen production capacity exceeded 50 million tonnes, with both production and consumption continuing to rise. This progress has been underpinned by advances in technology, supported by a comprehensive R&D, design, and manufacturing system across the entire renewable energy value chain[2].

Despite these advances, challenges remain. Wind power still face cost-related barriers, while solar photovoltaic systems often encounter limitations in scalability and deployment flexibility. Hydrogen production technologies, meanwhile, are generally characterised by high energy consumption and low conversion efficiency. Furthermore, the inherent intermittency and volatility of renewable energy highlight the need for complementary technologies—particularly in energy storage and grid integration—to support large-scale and stable deployment. These challenges underscore the urgency of achieving technological breakthroughs, especially in the development of long-duration energy storage solutions.

In addition, to support the decarbonization of hard-to-abate sectors such as aviation and maritime transport—where the direct use of renewable electricity remains technically challenging—many countries are actively investing in alternative fuels. One promising solution is Sustainable Aviation Fuel (SAF), which can be produced from feedstocks such as forestry residues, agricultural waste, used cooking oil, and municipal solid waste. Compared to conventional fossil-based jet fuel, SAF has the potential to reduce carbon emissions by up to 85% over its lifecycle[3]. In China, however, SAF production capacity is still in its early stages, and large-scale commercialization has yet to be achieved.

According to research and observations by Impact Hub Shanghai, perovskite solar cells are emerging as a promising alternative to conventional crystalline silicon-based photovoltaic technologies. Their key advantages—including low-cost raw materials, simple fabrication processes, and high photovoltaic conversion efficiency—make them a strong contender for **next-generation solar energy solutions**.

In the field of hydrogen production, Anion Exchange Membrane (AEM) electrolysis offers a promising balance between cost and performance: combining the affordability of Alkaline Water Electrolysis (ALK) with the high dynamic responsiveness of Proton Exchange Membrane (PEM) systems. Solid Oxide Electrolysis Cells (SOEC), meanwhile, stand out for their significantly lower energy consumption and higher efficiency compared to other methods. Together, these two technologies represent key directions for the future development of hydrogen production.

In the SAF sector, the Fischer–Tropsch (FT) synthesis route, which utilizes biomass as feedstock, aligns well with China's abundant biomass resources and the pressing need for large-scale waste-to-resource conversion. Meanwhile, the Power-to-Liquid (PtL) route, which uses carbon capture through Direct Air Capture (DAC), offers substantial emissions reduction potential and is also expected to play an increasingly important role in the future.

In the field of energy storage, mainstream long-duration technologies include mechanical, thermal, electrochemical, and chemical storage systems. Each pathway faces unique challenges: mechanical storage is constrained by site-specific geographic requirements and high capital costs; thermal storage is limited by low energy density and short storage durations; electrochemical storage (e.g., flow batteries) is hindered by high upfront investment and electrolyte costs; and chemical storage often suffers from limited dynamic response and high material costs.

We identify compressed air energy storage (CAES) and sulfur- or iron-based flow batteries as particularly promising due to their high flexibility, low cost, and favorable energy density. Other emerging technologies, such as fuel cells, solid-state batteries, and sodium-ion batteries, also show strong potential, especially in terms of adaptability to extreme environments, enhanced safety, and economic viability.

DaZheng (Jiangsu) Micro Nano Technology Co.,Ltd.

#Solar Energy #Perovskite

Introduction

DaZheng Micro Nano is a Chinese leader in flexible perovskite thin-film solar cells. Its technology has overcome the installation constraints of crystalline silicon modules in complex environments, enabling their application in lightweight and bendable products, addressing the challenges of bulky size and limited installation flexibility in traditional silicon-based components.

DaZheng Micro Nano is also the world's first venture to achieve the mass production of hundred-megawatt-scale flexible perovskite. It has completed the world's first demonstration project integrating flexible perovskite solar modules with building structures, as well as an outdoor demonstration project featuring lightweight flexible perovskite solar panels installed on vertical surfaces. The venture's flexible perovskite photovoltaic modules achieve a conversion efficiency of 21.09% (aperture area: 21.07cm^2), a metric that leads global industry benchmarks.

Est. Year	Location	TRL
2018	Zhenjiang, Jiangsu	9

Latest Funding Year	Funding Stage	Funding Amount
2025	Series B	Undisclosed

SDGs

7 AFFORDABLE AND CLEAN ENERGY · 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE · 13 CLIMATE ACTION

Shanghai Lanze Energy Technology Co.,Ltd.

#Sustainable Aviation Fuel

Introduction

LanZe Energy is an innovative technology venture specializing in green fuel R&D and carbon-neutral solutions, with a focus on the industrialization of low-carbon energy technologies such as green methanol and sustainable aviation fuel (SAF).

In SAF production, LanZe Energy has developed a proprietary one-step Fischer–Tropsch (FT) synthesis process for producing SAF from syngas, significantly streamlining conventional routes, demonstrating high CO conversion rates, excellent product selectivity and operational stability. By integrating hydrogen production with downstream chemical processes through advanced catalysts and system design, the technology drastically reduces carbon emissions across the SAF production and utilazation chain, while enabling by-product valorization from electrolysis.

LanZe's kiloton-scale flexible pilot project has completed its second-phase testing, with CO total conversion rates and jet fuel fraction selectivity outperforming laboratory benchmarks.

Est. Year	Location	TRL
2019	Shanghai	7

Latest Funding Year	Funding Stage	Funding Amount
2025	Series A+	Undisclosed

SDGs

7 AFFORDABLE AND CLEAN ENERGY · 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE · 11 SUSTAINABLE CITIES AND COMMUNITIES · 13 CLIMATE ACTION

EVE 亿纬氢能

Huizhou EVE Hydrogen Energy Co., Ltd.

#AEM

Introduction

EVE Hydrogen Energy is an innovative venture specializing in anion exchange membrane (AEM) electrolysis technology. Its proprietary 100kW AEM electrolyzer achieves an operating current density of 10,000 A/m^2, doubling the industry's state-of-the-art AEM benchmarks (~4,000 A/m^2) and delivering higher hydrogen production efficiency.

In terms of load flexibility, the electrolyzer operates stably at 10%-120% of rated power, significantly outperforming Chinese leading alkaline electrolyzers (25%-110%), enhancing energy utilization efficiency and achieving superior energy consumption ratios. The system's weight is only 1/4 of traditional alkaline electrolyzers at equivalent power, enabling groundbreaking lightweight design.

Est. Year	Location	TRL
2021	Huizhou, Guangdong	8

Funding Status:

No public funding information available

SDGs

7 AFFORDABLE AND CLEAN ENERGY · 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE · 13 CLIMATE ACTION

Additionally, EVE Hydrogen Energy's "Wukong" AEM hydrogen production system adopts modular architecture, allowing scalable electrolyzer configurations tailored to diverse application scenarios.

E-GEN

Shanghai EGEN Energy Technology Co., Ltd.

#SOEC

Introduction

EGEN Energy is a technology innovator specializing in solid oxide electrolysis cell (SOEC) hydrogen production systems. Currently, SOEC commercialization faces two key challenges: high equipment costs and limited operational lifespan.

To reduce costs, EGEN Energy has developed SOEC systems that are free of precious metals in their design, and at gigawatt-scale production, the material costs are already lower than those of alkaline electrolyzers. Moreover, thanks to an electrolysis efficiency exceeding 84%, the system's energy consumption per unit is significantly reduced—cutting electricity use by 28% compared to traditional alkaline and proton exchange membrane (PEM) electrolyzers. This effectively addresses the issue of electricity accounting for up to 80% of total hydrogen production costs.

Est. Year	Location	TRL
2020	Shanghai	9

Latest Funding Year	Funding Stage	Funding Amount
2024	Angel	Tens of millions of RMB

SDGs

7 AFFORDABLE AND CLEAN ENERGY · 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE · 13 CLIMATE ACTION

To tackle the challenge of short lifespan, EGEN Energy has successfully extended the durability of key SOEC stack components to over 100,000 hours, with a degradation rate of less than 1% per 1,000 hours—an internationally leading performance. By continuously overcoming the barriers of cost and durability, EGEN Energy offers a highly competitive solution for large-scale, low-energy green hydrogen production.

Sushui Energy Technology (Shanghai) Co., Ltd.

#Fuel Cell

Introduction

Sushui Tech is a renewable energy venture specializing in methanol fuel cell technology, dedicated to addressing challenges of traditional batteries such as low energy density, slow startup, and unstable power generation, providing clean and reliable power solutions for remote and extreme environments.

The venture's direct methanol fuel cell (DMFC) features wide-temperature operation without degradation, long endurance, low heat/noise/maintenance, and eco-safety, with broad applications in portable power, off-grid power supply, unattended offshore systems, vehicle-mounted, and defense.

Sushui Energy's solutions have been deployed in remote regions like Xinjiang and Tibet, delivering reliable energy support for geological disaster monitoring, emergency response, and security systems under extreme conditions.

Est. Year	Location	TRL
2017	Shanghai	9

Latest Funding Year	Funding Stage	Funding Amount
2024	Series Pre-A	Undisclosed

SDGs: 7, 9, 11, 13

Shenzhen Jana Energy Technology Co., Ltd.

#EnergyStorage #Sodium-ion Battery

Introduction

Jana Energy is a sodium-ion battery technology venture dedicated to the R&D and manufacturing of high-safety, long-cycle, low-cost sodium-ion battery materials and systems. Compared to lithium-ion batteries, sodium-ion batteries eliminate reliance on scarce precious metals, and exhibit superior thermal stability and broader operating temperature ranges, enabling stable performance in extreme environments. However, sodium-ion battery costs have remained elevated due to unscaled production of key materials.

In 2023, Jana Energy commissioned a kiloton-scale production line for sodium iron phosphate composite (NFPP), a key cathode material for sodium-ion battery, followed by a 10,000-ton-scale facility in 2024. This marks the NFPP system's entry into industrial-scale production, poised to accelerate cost reduction and broader market adoption of sodium-ion batteries.

Est. Year	Location	TRL
2022	Shenzhen, Guangdong	9

Latest Funding Year	Funding Stage	Funding Amount
2024	Series A	Hundreds of millions of RMB

SDGs: 7, 9, 13

High Energy Era (Guangdong Hengqin) New Energy Technology Co., Ltd. (GTC-POWER)

#EnergyStorage #Solid-state Battery

Introduction

GTC-POWER is a venture focused on the research, development, and production of sulfide-based all-solid-state lithium batteries. In 2024, it became the first in China to complete technical validation of a pilot production line for sulfide-based all-solid-state batteries.

The venture has developed a composite cathode material along with its preparation method and application, effectively addressing issues related to interfacial contact and crystal boundary resistance. By innovatively designing the components of the composite cathode, GTC-POWER has significantly enhanced battery capacity and rate performance, while also improving cycle stability.

Est. Year	Location	TRL
2021	Zhuhai, Guangdong	8

Latest Funding Year	Funding Stage	Funding Amount
2024	Series B+	Undisclosed

SDGs

The venture's sulfide-based all-solid-state cells can achieve an energy density of up to 400 Wh/kg. Its mass-produced 20Ah cells enable electric vehicles to reach a range of over 1,000 kilometers. In addition, its 1.46Ah all-solid-state cell—meeting the capacity specifications for 3C consumer electronics—maintains 84% capacity after 300 cycles, while the 5Ah cell retains over 90% performance after nearly 200 cycles, both representing industry-leading levels. These advancements demonstrate the strong potential of sulfide-based all-solid-state batteries across applications in passenger vehicles, consumer electronics, and beyond.

Luquos Energy Limited

#Energy Storage #Flow Battery

Introduction

Luquos Energy is a high-tech venture dedicated to the R&D and industrialization of sulfur-based flow battery energy storage systems. The venture's sulfur-based flow batteries reduce electrolyte costs to approximately 1/20 of all-vanadium redox flow batteries (VRFB), overcoming the cost limitations of traditional VRFB technology.

To address challenges such as limited operational durability and sulfur crossover in sulfur-based systems, Luquos Energy developed the Charge-Reinforced Ion-Selective (CRIS) membrane, which stabilizes charge-discharge curves and extends battery lifespan. Additionally, its catalytic acceleration technology enhances polysulfide conversion kinetics, enabling long-term sulfur stability and higher energy efficiency.

Est. Year	Location	TRL
2020	Hong Kong	8

Funding Status:

No public funding information available

SDGs

In 2024, Luquos Energy partnered with Towngas Smart Energy to deploy China's first grid-connected sulfur-based flow battery energy storage system in a charging station demonstration project.

博睿鼎能
BORUI ENERGY

Changsha Borui Energy Technology Co., Ltd.

#EnergyStorage #Compressed Air Energy Storage

Introduction

Borui Energy is a Chinese high-tech venture dedicated to the R&D and industrialization of liquid carbon dioxide (CO_2) energy storage technology, with a core focus on long-duration energy storage. The venture provides CO_2-based storage system solutions and technical services tailored to a wide range of scenarios.

Leveraging the principles of the Brayton and reverse Carnot cycles, Borui Energy has developed a CO_2 energy storage system with a maximum design efficiency of up to 75%, a service life of 30 to 50 years, and a levelized cost of storage as low as RMB 0.2/kWh (approximately USD 0.03/kWh). Compared to other compressed air energy storage (CAES) technologies, Borui's system offers higher cycle efficiency, longer operational lifespan, and lower system costs.

Furthermore, by integrating carbon capture, utilization, and storage (CCUS) technologies, Borui Energy's solution eliminates dependence on geological constraints such as salt caverns or man-made chambers, significantly enhancing deployment flexibility.

Est. Year	Location	TRL
2022	Changsha, Hunan	8

Latest Funding Year	Funding Stage	Funding Amount
2023	Angel	Tens of millions of RMB

SDGs

Carbon and Energy Management

China's energy transition is navigating a delicate balance among three critical priorities: energy security, economic viability, and environmental sustainability - often reffered as the "trilemma". Smart energy management systems powered by AI and big data are emerging powerful tools to address this challenge, by enhancing energy efficiency while accelerating the transition toward a greener and lower-carbon future.

At the national level, a series of policies has been introduced to promote the digitalization and intelligent deployment of energy and carbon management technologies. As a result, a growing number of ventures are adopting smart energy management systems to enhance operational efficiency through more granular energy control and accurate carbon tracking, ultimately helping to reduce both emissions and costs.

Shanghai Good Enegy Low Carbon Technology Co., Ltd.

Introduction

GOOD ENERGY specializes in delivering full-lifecycle products and green low-carbon technology services for behind-the-meter power systems in buildings and campuses. Its offerings span multiple stages—from energy diagnostics and planning to investment, construction, and intelligent operations and maintenance.

In 2023, GOOD ENERGY successfully completed the low-carbon retrofit project for the Shanghai Fulei Library. Based on the library's spatial conditions, operational needs, and daily energy consumption patterns, the project implemented a comprehensive solution that included enhancing building energy system performance, maximizing green electricity supply and consumption, and integrating generation, grid, load, and storage. As a result, the library achieved approximately 88% on-site solar power utilization and around 67% annual green electricity substitution.

Shanghai Fulei Library has since become the world's first library to earn LEED Zero Carbon certification and was recognized with the "2023 Global Zero Carbon City Innovation Model Award" by the United Nations Industrial Development Organization (UNIDO).

Est. Year	Location	TRL
2014	Shanghai	9

Funding Status:

No public funding information available

SDGs

7 AFFORDABLE AND CLEAN ENERGY; 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 11 SUSTAINABLE CITIES AND COMMUNITIES; 13 CLIMATE ACTION

Low-Carbon Materials

Low-carbon materials refer to environmentally friendly materials that generate low or even zero carbon emissions throughout their life cycle, typically produced through cleaner manufacturing processes[4]. In the context of China's dual carbon goals, the development of low-carbon materials represents a critical pathway toward achieving carbon neutrality. For example, in the construction sector, carbon emissions from buildings and housing accounted for 38.2% of China's total emissions in 2021, with 42% of that figure stemming from the production and transportation of construction materials (see Figure 12). This data highlights the immense potential of green and low-carbon materials in emissions reduction and underscores their importance as an effective lever for advancing industrial green transformation.

According to two batches of the *Green and Low-Carbon Advanced Technology Demonstration Projects* issued by the National Development and Reform Commission (NDRC), the category of low-carbon materials includes new energy materials, hydrogen-related materials, bio-based materials, carbon capture and utilization (CCU) materials, environmentally friendly materials, energy-efficient building materials, and specialty functional materials.

This report focuses on innovation in two key areas: bio-based materials with strong potential to replace petroleum-based products, and low-carbon building materials that can support the decarbonization of the construction sector.

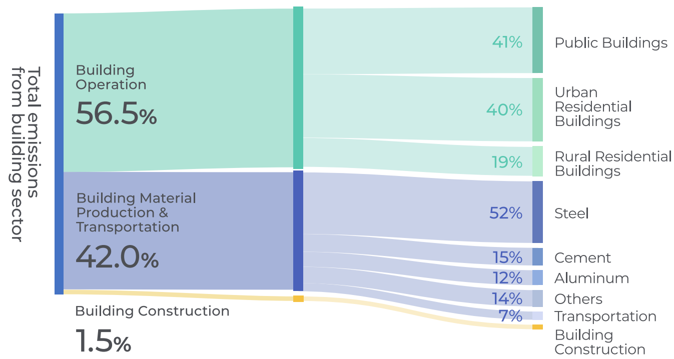


Figure 12: Total Carbon Emissions and Sectoral Share of the Building and Construction Industries in China, 2022[5]

Shanghai Geopoly New Materials Co., Ltd.

#Low-carbon Building Materials

Introduction

GeoPoly is an innovative venture focused on geopolymer-based low-carbon material production and advanced solid/hazardous waste treatment services.

The venture utilizes silica-alumina-rich industrial waste or minerals to produce geopolymer cementitious materials, which exhibit corrosion resistance, high-temperature tolerance, and superior bonding properties, serving as a sustainable alternative to traditional cement in road base layers, prefabricated components, and soil stabilization. Compared to conventional cement, GeoPoly's geopolymer production eliminates carbonate raw materials and high-temperature sintering processes, reducing carbon emissions by 80%, while achieving 20%-30% cost savings.

Est. Year	Location	TRL
2013	Shanghai	8

Latest Funding Year	Funding Stage	Funding Amount
2024	Series A+	Approximately 100 million RMB

SDGs

经海纬象®
GWALRUS BIOMATERIALS

Shanghai Gwalrus Biomaterials Co., Ltd.

#Bio-based Material

Introduction

GWALRUS is a high-tech venture with cutting-edge capabilities in synthetic biology and bio-based materials R&D. Leveraging next-generation synthetic biology, the venture is building "super cell factories" focused on the production and recycling of polylactic acid (PLA), as well as the development of key intermediates such as lactide. GWALRUS has established a vertically integrated value chain—spanning biomass to lactic acid, lactide, PLA, PLA-based products, and closed-loop rPLA recycling back to lactide—effectively filling a critical gap between PLA and intermediate production in China.

The venture's proprietary gypsum-free lactic acid fermentation process has overcome a key bottleneck in chemical recycling of regenerated PLA (rPLA), enabling high-quality, non-degraded circular reuse of PLA. This process uses non-food biomass such as straw and food waste as feedstock, reducing food-based raw material consumption by approximately 80% and lowering costs by over 50%. As a result, the overall cost becomes comparable to petroleum-based plastics, significantly accelerating the industrial-scale adoption of PLA.

Est. Year	Location	TRL
2020	Shanghai	9

Latest Funding Year	Funding Stage	Funding Amount
2022	Series A	Undisclosed

SDGs

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

Artificial Intelligence (AI)+ Material Synthesis

The “AI+ Materials” approach is a key direction in the integration of AI and industrial applications. It can significantly shorten the R&D cycles and optimize synthesis pathways for low-carbon materials. In China, the market for AI-driven materials science reached RMB 700 million in 2020 and to RMB 2.6 billion in 2024[6].

In 2024, to “fully leverage the role of big data and artificial intelligence in supporting the advanced materials industry,” the Ministry of Industry and Information Technology (MIIT), the Ministry of Finance, and the National Data Administration jointly issued the *Master Plan for the Construction of the National Advanced Materials Data Center*. The plan explicitly calls for “accelerating breakthroughs in advanced materials through deep integration of materials science and data technologies.” Driven by both growing market demand and national policies, the AI + Materials market is projected to grow by an additional 42.31% in 2025, signaling its vast potential to shape the future of sustainable materials innovation[6].

深度原理 Deep Principle

Hangzhou Deep Principle Technology Co., Ltd.

Introduction

Deep Principle is a technology venture leveraging AI, quantum chemistry, and high-throughput experimentation to accelerate chemical material R&D, addressing traditional industry pain points such as prolonged development cycles, high costs, and low success rates.

Its "AI+ Industrial Closed-Loop" model enables customized material design tailored to client-specific molecular structures, predictive catalyst formulation, and reaction pathway optimization. The platform accelerates catalyst performance evaluation, reaction condition tuning, and reverse material screening, achieving 1,000x faster material screening, reducing reaction transition state search time from over 10 hours to 0.4 seconds, cutting high-throughput computational errors for metal-organic complexes to one-sixth of traditional methods, and slashing experimental costs by over 50%.

Est. Year	Location	TRL
2024	Hangzhou, Zhejiang	8

Latest Funding Year	Funding Stage	Funding Amount
2025	Series Pre-A	Approximately 100 million RMB

SDGs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
13 CLIMATE ACTION
17 PARTNERSHIPS FOR THE GOALS

DeepVerse

DeepVerse Technology (Shanghai) Co., Ltd.

Introduction

DeepVerse is a data-driven materials informatics and engineering venture dedicated to addressing challenges of prolonged R&D cycles, high costs, and low controllability in industries such as new energy, batteries, chemical formulations, and semiconductors.

In the EV power battery sector, its MatCopilot platform tackles complexities in electrolyte formulation development by extracting critical data from extensive scientific literature, conducting performance evaluation, forward simulation experiments, and reverse optimization. The platform identifies optimal solutions with minimal sample input, achieving performance enhancement over 2%, cost reduction to 83%-87% of baseline, therefore accelerating market competitiveness for battery manufacturers. Currently, DeepVerse serves industry leaders including Honeywell and Envision AESC.

Est. Year	Location	TRL
2021	Shanghai	9

Latest Funding Year	Funding Stage	Funding Amount
2024	Angel	Undisclosed

SDGs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
13 CLIMATE ACTION
17 PARTNERSHIPS FOR THE GOALS

Carbon Capture, Utilization, and Storage (CCUS)

Carbon Capture, Utilization, and Storage (CCUS) is widely considered a critical technology for achieving carbon neutrality. Projections indicate that China's demand for carbon emissions reductions via CCUS will surge dramatically—from approximately 14-31 million tonnes per year by 2025, to 2.11 to 2.53 billion tonnes per year by 2060. However, China's current carbon capture capacity accounts for only 0.17% of the level needed to meet the carbon neutrality goal, indicating an urgent need to scale up CCUS deployment across major industrial and power sectors, as well as emerging technologies such as Bioenergy with Carbon Capture and Storage (BECCS) and Direct Air Capture (DAC).[7]

Currently, most CCUS demonstration projects in China rely on CO_2 Enhanced Oil Recovery (CO_2-EOR) and other geological utilization techniques, which enable simultaneous CO_2 sequestration and improve fossil fuel recovery. Given China's ongoing reliance on coal, this approach remains both environmentally beneficial and economically viable in the short to medium term.

In parallel, chemical and biological utilization of CO_2—by converting it into value-added products—offers a promising pathway to offset the high costs of CCUS and to scale up applications with long-term economic potential. DAC extracts CO_2 directly from the atmosphere, offering greater deployment flexibility compared to point-source carbon capture. Meanwhile, BECCS converts plant-absorbed CO_2 (stored as biomass) through combustion or chemical synthesis, then captures the emitted CO_2 to achieve negative emissions.

Both DAC and BECCS are regarded as critical pathways toward future zero-carbon or negative-emission goals. However, challenges such as high energy demand and costs must be addressed to enable large-scale adoption.

Orca Energy Development Co., Ltd.

#Carbon Dioxide Removal #Direct Air Capture

Introduction

Orca Energy is a leading Chinese venture in the commercialization of direct air capture (DAC) technology, dedicated to delivering low-energy negative carbon solutions for efficient removal of historical carbon stock. The venture's proprietary solid organic amine adsorbents achieve high CO_2 adsorption capacity and exceptional cycle stability even under ultra-low atmospheric CO_2 concentrations. Integrated with its self-developed steam-assisted temperature/pressure swing adsorption system, Orca Energy further reduces energy consumption and costs for CO_2 capture.

Orca Energy has slashed CO_2 capture costs to about 50% of industry averages, achieving cost-effective, distributed, and scalable CO_2 capture solutions.

Est. Year	Location	TRL
2022	Beijing	8

Funding Status:

No public funding information available

SDGs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

13 CLIMATE ACTION

Nanjing Gasgene Biochemical Technology Co., Ltd.

#Carbon Capture and Utilization (CCU)

Introduction

GasGene is an innovative venture leveraging synthetic biology to enable high-value utilization of industrial waste gases. By engineering proprietary gas-fermenting Clostridium strains, the venture transforms industrial CO and CO_2 emissions into green alcohols, bulk chemicals, and feed proteins.

GasGene has overcome key technical barriers in Clostridium gene editing, becoming the only venture in China currently mastering this technology. Using its self-developed genetic tools, the venture has created a portfolio of specialized strains capable of synthesizing more than 30 types of acids, alcohols, and esters, enabling the green production of traditionally petroleum-based bulk chemicals. This significantly reduces both carbon emissions and raw material costs in chemical manufacturing.

Moreover, GasGene's technology offers a sustainable alternative to bio-based chemicals derived from food crops, contributing to the alleviation of food security pressures.

Est. Year	Location	TRL
2023	Nanjing, Jiangsu	8

Latest Funding Year	Funding Stage	Funding Amount
2025	Series Pre-A+	Undisclosed

SDGs

Environmental Governance and Climate Adaptation

Natural ecosystems, such as lakes, rivers, and oceans, serve as critical pillars of climate resilience. By regulating hydrological cycles and sustaining biodiversity, these systems function as natural buffers against extreme weather events. As such, they are indispensable to both ecological integrity and human well-being, making them key assets in climate change adaptation strategies.

Despite ongoing progress, China's water environment still faces multiple challenges, including eutrophication and widespread agricultural non-point source pollution, which continue to undermine aquatic biodiversity, threaten water security, and compromise the overall resilience of freshwater and marine ecosystems.

Improving water environment governance can enhance the climate resilience of water ecosystems. This includes efforts to restore aquatic biodiversity, enhance the self-recovery capacity of water bodies, and reduce the vulnerability of water resources to climate change. To achieve these goals, accelerating water governance and ecological restoration by leveraging new technologies and innovative approaches has become a central focus in building more resilient water ecosystems.

新水环保

Wuhan Xinshui Environmental Protection Technology Co., Ltd.

Aquatic Environment

Introduction

Xinshui is a technology venture specializing in aquatic ecosystem restoration. To address issues like cyanobacterial blooms and algal toxin contamination, the venture pioneered a nano-targeted cyanobacteria control technology based on bioenzymes. Utilizing toxin-degrading enzymes, the system precisely identifies harmful algal species and catalyzes the breakdown of cyanotoxins into harmless small molecules, achieving eco-friendly algal control and water quality enhancement with higher efficiency than traditional methods.

In multiple regional demonstration projects, this technology has significantly improved aquatic biodiversity and enhanced ecological resilience, while reducing carbon emissions by 50%-70% during treatment. Post-treatment water bodies exhibit carbon sequestration capacity of 2.5 tons/hectare, twice that of forests, delivering substantial decarbonization benefits. Currently, Xinshui is developing the " Xinshui Academy" education platform to promote advanced water pollution control technologies in rural areas, with the Wuhan Qingyun Village demonstration project driving rural revitalization.

Est. Year	Location	TRL
2022	Wuhan, Hubei	9

Funding Status:

No public funding information available

SDGs

02 CIRCULAR ECONOMY

The circular economy represents a fundamental shift from the traditional linear growth model to a regenerative model based on a "resource–product–recycled resource" cycle. Guided by the principles of reduce, reuse, and recycle (3Rs), it aims to improve resource efficiency, minimize pollution from production and consumption, and transform waste into valuable inputs through sustainable, closed-loop processes [8][9].

China has elevated the development of a circular economy to a national strategic priority. According to the ***14th Five-Year Plan for Circular Economy Development***, the total output value of China's resource recycling industry is expected to reach 5 trillion RMB by 2025 [10]. By 2023, the market size of China's recycled resource utilization sector had already reached nearly 1.6 trillion RMB[11].

Impact Hub Shanghai views the circular economy not only as a standalone concept, but also as a strategic enabler of net-zero transition, sustainable consumption, and inclusive innovation. To avoid redundancy with other chapters, this chapter focuses specifically on solutions for four key waste streams: plastics, batteries, buildings, and agriculture. Topics such as source reduction, material substitution, and circular design are addressed in the corresponding thematic chapters of this report.

Closed-loop Plastic Recycling

In 2022, global plastic production reached about 400 million tonnes, with over 90% derived from fossil-based feedstocks. However, less than 9% of plastic waste was actually recycled worldwide [12]. In China, the plastic recycling rate stands at approximately 30%, with the majority of recycled plastics being PET, PE, and PP, according to the *2024 In-Depth Industry Report on Comprehensive Utilization of Waste Plastics in China*[13].

There are three primary technological pathways for plastic waste recycling and resource recovery: physical recycling, chemical recycling, and enzymatic degradation. Physical recycling is the most established method and is mainly suitable for clean and single-type plastic waste. However, it still faces challenges such as secondary pollution, material degradation, and difficulty achieving high-value reuse. Chemical recycling can process low-value, mixed, or contaminated plastics and enables closed-loop recycling of near-virgin material quality. Despite its potential, this pathway requires further innovation to reduce costs, lower energy consumption, and improve the performance of recycled outputs. Enzymatic degradation is an emerging green solution that offers promising advantages in terms of cost-efficiency, product quality, and scalability, although it remains in the early stages of commercial development.

Beyond technological innovation, addressing systemic barriers, such as fragmented recycling infrastructure, is essential to enable effective plastic recycling. In response, some innovative ventures are actively exploring closed-loop value chains of "collection–sorting–reprocessing" to promote high-value reuse and more sustainable plastic lifecycle management.

源天生物

Yuantian Biotech (Tianjin) Co., Ltd.

#Bio-recycling

Introduction

Yuantian Biotech specializes in enzymatic recycling technology for PET plastics. The venture's high-efficiency PET-degrading enzyme capable of depolymerizing various waste PET materials—such as polyester textiles and beverage bottles—into monomers under ambient temperature and pressure, overcoming molecular-level recycling bottlenecks. The resulting monomers can be repolymerized into recycled PET (rPET), which has been tested and verified for use in downstream applications such as food-grade packaging and textile fibers.

In November 2024, Yuantian Bio successfully produced upcycled PET bottles from waste textiles, achieving closed-loop PET recycling to prevent material downgrading, thereby advancing green transitions in the textile and packaging industries. The same year, the venture commissioned a 300-ton enzymatic hydrolysis production line, projected to process 30,000 tons of textile waste annually.

Est. Year	Location	TRL
2022	Tianjin	9

Latest Funding Year	Funding Stage	Funding Amount
2024	Series Pre-A	Undisclosed

SDGs

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

TOPCENTRAL

Ningbo Topcentral New Material Co., Ltd.

#Chemical Recycling #Physical Recycling #Integrated Recycling Solutions

Introduction

As a technology-driven venture, Topcentral specializes in R&D and production of low-carbon renewable plastics and modified plastics. Technologically, Topcentral collaborates with universities and industrial partners to develop novel eco-friendly additives. It pioneered breakthrough closed-loop recycling technologies for circular materials, including the Same-Quality Recycling for waste polycarbonate (PC). These innovations address critical industry challenges such as severe water pollution in plastic processing and inferior performance of recycled materials. By overcoming technical barriers to large-scale industrialization of recycled PC, the venture reduces China's dependence on imported engineering plastics.

Est. Year	Location	TRL
2019	Ningbo, Zhejiang	9

Funding Status:

No public funding information available

SDGs

12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION

In supply chain development, Topcentral advances a closed-loop recycling system encompassing "waste collection - post-consumer recycled (PCR) feedstock - modified recycled material circulation". It has established a digital intelligent innovation platform covering "collection-transportation-recycling-upcycling", empowering the industry with smart solutions to enhance fossil-based waste valorization. Currently, the venture operates a complete value chain in marine plastic recycling - from ocean cleanup to end-product applications. Its "Ocean Partner" environmental capsule project, recognized as one of the 2023 Zhejiang Provincial "Zero-Waste City" Best Practice Cases, delivers comprehensive solutions to reduce marine plastic pollution.

TaiChu

TaiChu Technology (Zhejiang) Co., Ltd.

#Integrated Recycling Solutions

Introduction

TaiChu is a comprehensive solution provider in precision upstream recycling systems for post-consumer plastics. By deploying intelligent sorting technologies, the venture drives industry transformation from manual bulk processing to automated, standardized operations, addressing critical pain points including high labor costs, suboptimal sorting accuracy, and scalability challenges in food-grade recycled material production.

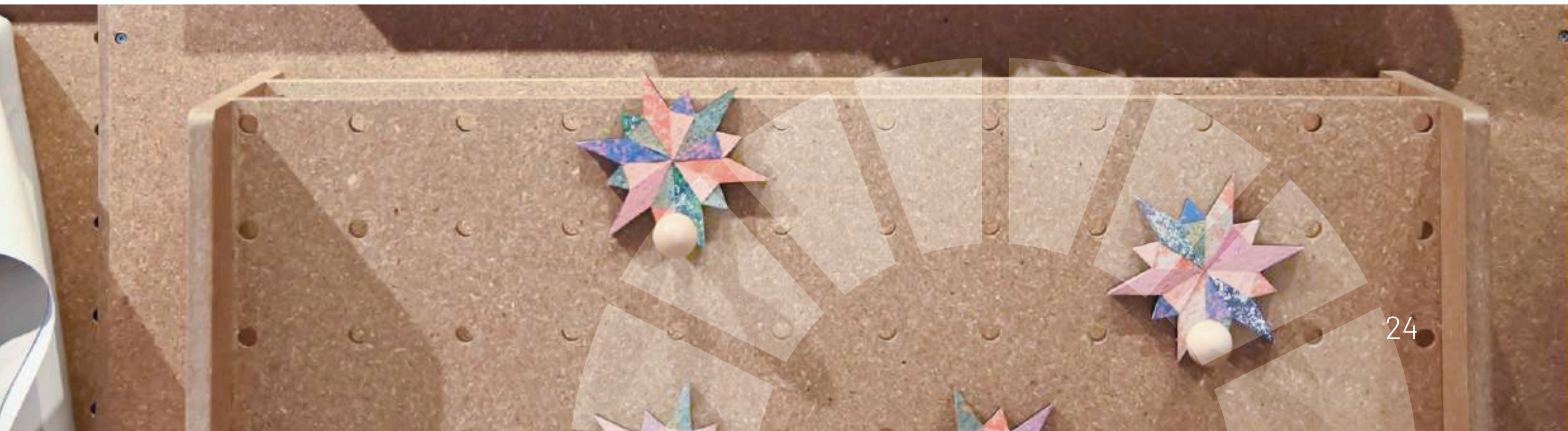
In precision sorting solutions, the venture's AI-powered vision systems achieve 4A/5A-grade material classification by identifying plastic bottle brands, colors, polymer types, and contaminants with 99.5% accuracy. Its Kirin T-Series optical sorters enhance bale value by 5-10% through brand-specific and color-sorted output streams. In intelligent recycling networks, TaiChu empowers small-to-medium baling stations with digital tools, establishing a managed urban plastic waste collection network that ensures traceable feedstock quality for closed-loop recycling.

Est. Year	Location	TRL
2021	Hangzhou, Zhejiang	9

Latest Funding Year	Funding Stage	Funding Amount
2021	Angel	Undisclosed

SDGs

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



Battery Recycling

Amid the ongoing energy transition, China's new energy vehicle (NEV) market has grown rapidly since 2016, driving a steady increase in power battery installations. These batteries typically have a lifespan of 5 to 8 years, which means a growing number are now reaching the end of their useful life. According to the China Electronics Energy Saving Technology Association, the total volume of end-of-life power batteries in China is projected to reach 820,000 tons by 2025, and exceed 4 million tons annually from 2028[14]. Without sufficient recycling capacity and a well-established collection and processing system, these retired batteries could generate massive volumes of solid waste, leading to serious environmental issues such as heavy metal contamination, dust emissions, and water pollution.

There are two primary pathways for recycling end-of-life power batteries: second-life applications and materials recovery. Second-life use—such as redeploying used batteries in less demanding energy storage systems—faces ongoing challenges, including high testing costs and safety risks stemming from inconsistent battery cell performance. Materials recovery is viewed as more promising in the near term due to its strategic role in resource security and its potential to boost industrial growth. However, scaling this pathway requires overcoming systemic barriers such as fragmented recycling infrastructure and weak coordination across the supply chain.

From the technical standpoint, the two main recycling methods are pyrometallurgy and hydrometallurgy. Pyrometallurgy involves high-temperature processes to recover metals and is suited to large-scale battery waste, but struggles to recover certain critical metals and generates hazardous emissions. Hydrometallurgy, which extracts metals using chemical solutions, offers higher recovery rates and better metal purity, but it also raises concerns about the treatment of organic wastewater. An emerging approach is bioleaching, which uses microorganisms to extract metals. While environmentally friendly and potentially low-cost, bioleaching is still in the laboratory stage and not yet ready for commercial deployment.

BOTREE

Suzhou Botree Recycling Technology Co., Ltd.

#Battery Recycling Technology

Est. Year	Location	TRL
2020	Suzhou, Jiangsu	9

Latest Funding Year	Funding Stage	Funding Amount
2025	Series B	Nearly 100 million RMB

SDGs

7 AFFORDABLE AND CLEAN ENERGY

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Introduction

Botree is a leading venture specializing in battery recycling and critical metal resource recovery, with a focus on new energy power battery recycling. The venture has developed an ultra-short hydrometallurgical process that directly converts high-nickel battery materials into battery-grade nickel-cobalt solutions. This innovation shortens the traditional process flow, reduces production costs by 50%, and cuts energy consumption by over 10% compared to conventional methods.

The technology also achieves near-zero wastewater discharge, resolving the persistent challenge of organic wastewater treatment in traditional hydrometallurgical processes. Currently, Botree Cycling achieves >99% comprehensive recovery rates for nickel and cobalt and 90-95% lithium recovery rates through its multi-component LFP recycling technology, far exceeding industry averages.

North Star Advanced Recycling Technology (Qingdao) Co., Ltd.

#Battery Recycling Technology #Integrated Recycling Solutions

Introduction

North Star Recycling specializes in the low-carbon green recycling of emerging industrial waste, including decommissioned lithium-ion batteries, photovoltaic modules, wind turbine components, and fuel cells. The venture provides recycling system development and low-carbon technical solutions to enhance recycling efficiency and safety. Its proprietary fully dry physical crushing and sorting process enables low-cost, high-efficiency battery recycling with near-zero emissions.

To address challenges such as incomplete recycling networks and low digitalization in the supply chain, North Star Recycling actively explores digital solutions. In 2025, the venture partnered with Siemens to develop a smart recycling system for decommissioned EV batteries, integrating data collection, network management, logistics tracking, process monitoring, and data-driven decision support. This system improves recycling efficiency and transparency while enabling full lifecycle management of retired batteries.

Est. Year	Location	TRL
2020	Qingdao, Shandong	9

Latest Funding Year	Funding Stage	Funding Amount
2023	Series Pre-A+	Tens of millions of RMB

SDGs

7 AFFORDABLE AND CLEAN ENERGY
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Construction and Demolition Waste Recycling

China produces over **3 billion tonnes** of construction and demolition waste each year—mostly from building, demolition, and renovation projects. This accounts for **30% to 40%** of all the country's solid waste, making it the largest single waste stream nationwide[15]. While China's construction waste recycling rate reached around 50% during its 13th Five-Year Plan, some developed countries have already achieved recycling rates exceeding **90%**, setting a high bar in terms of **waste reduction, reuse, and recycling** [16].

However, there are still several challenges: collection systems remain fragmented, smart sorting technology is still in its early stages, and overall recycling rates remain low. These gaps hinder the development of a robust circular economy in the construction sector.

Recycling construction and demolition waste is key to China's pursuit of Zero-Waste Cities and its boarder sustainability agenda. Moving forward, efforts should focus on more efficient upstream collection, improved sorting technologies, and building a reliable supply chain for high-quality recycled construction materials.

万宸环境 VANCEN ENVIRONMENT

Vancen Environment Technology Co., Ltd.

#Intelligent Sorting

Introduction

VANCEN is dedicated to resolving urban solid waste challenges, including construction waste, renovation waste, and bulky waste, addressing land occupation, heavy metal pollution, and resource inefficiency. The venture employs high-efficiency crushing and precision screening technology combined with AI-powered dynamic sorting systems to process waste into aggregates of varying particle sizes, achieving 98% aggregate purity, 100% hazard-free treatment, and >90% resource utilization. Its proprietary 3F-CR decarbonization technology further enables low-carbon production of recycled aggregates.

To date, VANCEN has deployed 80+ projects nationwide, including the Beijing Olympic Winter Games Construction and Decoration (C&D) Waste Recycling Line and the Chongqing C&D Waste Recycling Base.

Est. Year	Location	TRL
2018	Suzhou, Jiangsu	9

Funding Status:

No public funding information available

SDGs

11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION

Shanghai in2orbits Technology Co., Ltd.

#Integrated Recycling Solutions #Waste Lifecycle Management

Introduction

in2orbits is a comprehensive venture specializing in waste management for the construction and consumer sectors. The venture delivers low-carbon waste management solutions and high-performance sustainable recycled materials, covering the full chain from waste collection & sorting, dismantling & transportation, material regeneration, to carbon footprint monitoring. It addresses industry pain points such as high landfill rates in commercial spaces, high-carbon emissions from traditional building materials, and low resource circularity, accelerating sustainable transitions for businesses. The venture's dual-chain system integrates carbon tracking and material lifecycle management, enabling simultaneous carbon footprint traceability and resource circularity.

In 2025, in2orbits became a tier-1 authorized distributor of Saint-Gobain, producing high-quality gypsum board products and providing closed-loop solutions for decommissioned gypsum board recycling.

Est. Year	Location	TRL
2021	Shanghai	8

Funding Status:

No public funding information available

SDGs

11 SUSTAINABLE CITIES AND COMMUNITIES, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 13 CLIMATE ACTION, 17 PARTNERSHIPS FOR THE GOALS

Beijing SpaceDicon Technology Co., Ltd.

SpaceDicon 北京空间智筑技术有限公司 SpaceDicon Technologies Company

#3D Printing Technology

Introduction

SpaceDicon is a high-tech venture specializing in construction 3D printing, addressing challenges of high pollution and carbon emissions in traditional building materials and solid waste recycling. The venture develops eco-friendly 3D printing materials using recycled solid waste, such as slag, tailings, and construction waste, significantly enhancing recycling rates while reducing material carbon emissions by 30-40%.

Its self-developed construction 3D printing robots integrate crawler chassis and vision systems, enabling mobility, precision positioning, and efficient construction with enhanced accuracy. In 2022, SpaceDicon contributed to landmark projects including Beijing Olympics Winter Games and Xiongan New Area municipal landscapes.

Est. Year	Location	TRL
2021	Beijing	9

Funding Status:

No public funding information available

SDGs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE, 11 SUSTAINABLE CITIES AND COMMUNITIES, 13 CLIMATE ACTION

Agricultural and Food Waste Recycling

A sustainable, low-carbon transition of the agri-food system is critical to safeguarding China's food security and advancing long-term development goals. Central to this transition is the effective utilization of agricultural and food waste—both key drivers to sustainable farming practices and advancing the rural revitalization.

China's agricultural waste primarily includes crop residues, livestock and poultry manure, and discarded plastic film. Each year, the country generates around 900 million tons of straw, over 3 billion tons of manure, and consumes more than 1.45 million tons of agricultural plastic[17][18]. Without proper treatment, these waste streams can significantly contribute to agricultural pollution.

In recent years, China has made notable strides in developing eco-circular agriculture. The nationwide utilization rates for crop straw and livestock manure have reached 88% and 79% respectively[17][18]. However, unlocking higher-value applications remains a key challenge and opportunity for the sector's next stage of growth.

Beyond agricultural residues, the food waste management is an essential component in the agri-food system transition. By 2025, China's annual volume of food waste is projected to reach between 150 and 170 million tonnes—a nearly 47% increase from 2019 levels[19]. Since the State Council issued guidelines in 2010 to address "gutter oil" and improve food waste management, there has been growing emphasis on safe and resource-efficient solutions. The *14th Five-Year Plan for Urban Household Waste Sorting and Treatment* explicitly promotes the adoption of technologies for converting food waste into soil amendments, bio-protein, and other value-added byproducts[20].

Despite notable progress, challenges remain. For both agricultural and food waste, further innovation is needed in core technologies, such as low-cost preprocessing, clean and efficient conversion, and high-value product development. Operational bottlenecks, such as difficulties in on-site utilization and local processing, highlighting the need for new technical solutions and scalable business models to support broader circular transition across the agri-food value chain.

Shengshen (Jiangsu) Biological Environment Technology Co., Ltd.

#Bioconversion #Food Waste Valorization

Est. Year	Location	TRL
2020	Nanjing, Jiangsu	9

Latest Funding Year	Funding Stage	Funding Amount
2021	Angel	Undisclosed

SDGs

Introduction

Shengshen Bio specializes in organic waste treatment via black soldier fly (BSF) bioconversion, providing innovative solutions to address low hazard-free treatment rates, poor resource utilization, and high costs in traditional food waste management. The venture's third-generation BSF breeding technology resolves critical issues such as cross-contamination and pest/disease control. By deploying microbial composite agents, it prevents waste spoilage and odor, while efficiently converting organic waste into odorless organic fertilizer and protein/lipid-rich animal feed additives.

Shengshen Bio's integrated solution spans the full lifecycle of organic waste management—from collection to bioconversion—achieving a daily processing capacity of 100 tons and significantly enhancing resource utilization rates.

XING NONG FU 星农夫生态科技

Hainan Xing Nong Fu Ecological Technology Co., Ltd.

#Bioconversion #Safe Treatment and Resource Recovery of Livestock and Poultry Manure

Introduction

Est. Year	Location	TRL
2015	Haikou, Hainan	9

Latest Funding Year	Funding Stage	Funding Amount
2019	Angel	Millions of RMB

SDGs: 1 No Poverty, 2 Zero Hunger, 12 Responsible Consumption and Production

Xing Nong Fu is an innovative social venture dedicated to sustainable soil ecology, specializing in earthworm biotechnology to address environmental challenges such as agricultural organic waste pollution, soil degradation, and salinization. The venture's vermicompost soil amendment technology reduces saline-alkali land remediation time from 3 years to 7 days at 10% of traditional costs.

Xing Nong Fu is also a pioneer in introducing a model that integrates "agroforest economy + ecological recycling + soil remediation," utilizing idle rubber plantation land in Hainan to raise earthworms. This model creates a closed-loop system of "waste treatment – earthworm casting production – soil improvement – contract farming," effectively improving both farmers' incomes and soil fertility. To date, Xing Nong Fu has established three earthworm farming bases in Hainan, capable of processing 400 tonnes of agricultural organic waste per month and restoring approximately 200 mu (around 13 hectares) of farmland monthly.

甡物科技 ZENCE OBJECT TECHNOLOGY

Zence Object Technology (Shenzhen) Co., Ltd.

#Crop Valorization

Introduction

Est. Year	Location	TRL
2021	Shenzhen, Guangdong	9

Latest Funding Year	Funding Stage	Funding Amount
2023	Seed	2.5 million USD

SDGs: 11 Sustainable Cities and Communities, 12 Responsible Consumption and Production

ZENCE is an innovative venture converting bio-based waste into sustainable materials, addressing challenges of agricultural organic waste pollution, resource inefficiency, and non-degradable plastics. The venture's three core technologies — tea fiber molding, tea-based composite processing, and tea-origin polymerization — efficiently transform tea residues, wheat straw, and other agricultural waste into fully biodegradable tea-fiber plastics and composite boards for applications including eco-packaging, reusable tableware, and biodegradable bags.

ZENCE's 'Tea-Plastic' achieves approximately 40% cost reduction compared to bio-based PHA materials, approaching the price of conventional plastics. Through waste recycling, material modification, and smart manufacturing, the venture has built a green closed-loop production system.

Partnering with leading brands, ZENCE has converted over 10,000 tons of agricultural waste into biodegradable tea-fiber materials, reducing carbon emissions by 10,000+ tons.

03 SUSTAINABLE CONSUMPTION AND SUPPLY CHAINS

Sustainability is emerging as a pivotal trend in the consumer sector, driven by both policy mandates and market dynamics. Governments are implementing increasingly stringent mandates on businesses regarding low-carbon transition, resource efficiency, and environmental accountability. Meanwhile, consumers—particularly younger generations such as Gen Z—are placing greater emphasis on product environmental footprints and corporate social responsibility.

According to *Spend Z: A Global Report* **published by NielsenIQ, GFK and World Data Lab, Gen Z consumers show a strong preference for sustainable brands, with a willingness to pay a 10% premium for environmentally responsible products[21]. Consequently, consumer-facing ventures are actively adopting technological and business model innovations to meet their expectations. These sustainability-driven efforts are no longer just about compliance—they are increasingly seen as strategic investments that deliver long-term competitive advantages in a rapidly evolving marketplace.**

Impact Hub Shanghai has been deeply engaged in the field of sustainability for many years, with sustainable consumption as one of our core focus areas. In 2022 and 2024, we released the reports *Sustainable Transformation Pathways and Innovation Opportunities in the Consumer Sector (2022)* **and** *2024 Sustainable Consumption – Food & Beverage Industry Insights*, **respectively, providing timely insights into innovative technologies and business models shaping the consumer industry.**

Building on this experience, this report explores sustainable consumption and supply chain innovation across six critical stages: raw materials, production processes, packaging, products, logistics, and sales. The analysis is rooted in real-world innovations from key consumer industries, including agriculture, food service, and textiles, and identifies innovative solutions such as big data, artificial intelligence, and synthetic biology. By focusing on both upstream sustainability (e.g., sourcing and manufacturing) and downstream impact (e.g., product use and disposal), this collection aims to surface holistic strategies for building more sustainable and resilient consumer ecosystems.

Bio-based Ingredient

As public awareness of sustainable consumption continues to rise, consumers are showing significantly greater interest in and acceptance of environmentally friendly products, driving a shift in how consumer ventures select raw materials. Compared to traditional petroleum-based and chemically synthesized inputs, bio-based materials and ingredients—offering lower environmental impacts and improving cost competitiveness—are increasingly becoming a key enabler of green supply chain transformation. Replacing conventional materials with bio-based alternatives to foster upstream sustainability has now become a strategic priority for many consumer brands seeking future growth.

According to estimates, five sectors account for approximately 82% of total demand for bio-based materials and ingredients: packaging (bio-based plastics); food and beverage (alternative proteins, rare natural compounds, microbial oils, bio-based food additives, and functional ingredients); textiles (bio-fibers and dyes); agriculture and forestry (bio-organic fertilizers and bio-based mulch films); and coatings (bio-based paints and finishes)[22].

Huilai Biotechnology (Shenzhen) Co., Ltd. (BloomGem)

#Bio-based Dyes

Introduction

Est. Year	Location	TRL
2022	Shenzhen, Guangdong	9

Latest Funding Year	Funding Stage	Funding Amount
2023	Series A	Undisclosed

SDGs: 9 Industry, Innovation and Infrastructure; 12 Responsible Consumption and Production

BloomGem is an innovative venture committed to revolutionizing the textile industry through bio-based dyeing technologies, addressing the high energy consumption, pollution, and health risks inherent in traditional chemical dyes. The venture has independently developed and mastered core plant-derived and microbial dyeing technologies, characterized by controllable microbial pigment production cycles and highly stable dyeing processes. These advancements eliminate harmful emissions such as heavy metals while significantly reducing water and chemical usage.

BloomGem's patented indigo pre-reduction agents enable room-temperature dye fixation, replacing energy-intensive high-temperature steaming and achieving substantial energy savings. Additionally, the application of pigment-producing Streptomyces strains simplifies the dyeing process while maintaining high color fastness and overcoming the industry challenge of photodegradation in microbial dyes.

To tackle bottlenecks like unstable dyeing performance and low production efficiency in bio-dyeing, BloomGem offers integrated solutions through systematic process optimization and industrial chain training, accelerating the commercialization of bio-dyeing technologies. The venture's innovations align with global sustainability standards, driving eco-friendly practices across the textile sector.

Mojia Biotech (Guang An) Co., Ltd.

#Biological Formulations #AI+ Synthetic Biology

Introduction

Est. Year	Location	TRL
2018	Guangan, Sichuan	9

Latest Funding Year	Funding Stage	Funding Amount
2022	Series B	80 million USD

SDGs: 9 Industry, Innovation and Infrastructure; 12 Responsible Consumption and Production; 17 Partnerships for the Goals

MojiaBio is a product-driven innovator leveraging synthetic biology to enable green bio-manufacturing, targeting product innovation, cost reduction, and efficiency gains in packaging, textiles, and food additives. Its proprietary OrthBio™ and C1+Bio™ platforms convert low-cost non-food renewable feedstocks into bio-based molecules, overcoming high capital intensity and lengthy cycles in traditional bio-manufacturing. The venture's commercialized products include the Viridimin series vitamin B5, which replaces energy-intensive high-temperature/pressure processes with bioconversion to slash waste emissions, and the Aliphane series bio-polymers, derived from bio-based PDI instead of petroleum-based HDI, reducing supply chain carbon footprint for coatings and adhesives.

MojiaBio collaborates with Singapore's Agency for Science, Technology and Research (A*STAR) to develop the Sustainable Biomanufacturing Technology Platform (SBTP), utilizing methanol and glycol to produce cost-competitive high-value bio-molecules.

Biocreatech (Shenzhen) Co., Ltd.

#Biological Formulations #AI+ Synthetic Biology

Introduction

Biocreatech is an AI-driven synthetic biology venture specializing in protein precision design and protein molecular machine development, advancing sustainable innovation across agriculture, pharmaceuticals, and cosmetics. Its integrated synthetic biology platform combines AI algorithms, automated high-throughput screening, and high-efficiency gene editing to enable rapid protein engineering, boosting biosynthetic efficiency.

In agriculture, Biocreatech's biodegradable bio-surfactants offer strong wetting, penetration, adhesion, and synergistic effects, addressing low efficacy and resistance issues in conventional pesticides while reducing environmental impact. In pharmaceuticals, the venture pioneers full biosynthesis of 7-ADCA — a key cephalosporin intermediate—replacing high-pollution chemical synthesis while cutting production costs.

With 3,000 m² R&D and ton-scale pilot facilities in Shenzhen and Tianjin, Biocreatech has scaled multiple product lines and partners with global cosmetics and chemical leaders to deploy AI-driven bio-manufacturing solutions.

Est. Year	Location	TRL
2021	Shenzhen, Guangdong	9

Latest Funding Year	Funding Stage	Funding Amount
2024	Series A	Tens of millions of RMB

SDGs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
17 PARTNERSHIPS FOR THE GOALS

Alternative Proteins

According to research by the UNEP, alternative proteins not only reduce greenhouse gas emissions but also alleviate land degradation, deforestation, water and soil pollution, and biodiversity loss. As such, they represent a critical solution for ensuring food security while mitigating the environmental impacts of conventional animal agriculture.

In China, alternative proteins are gaining strategic traction. The *2024 Guidelines on Practicing the "Diversified Food Supply System" Concept*, issued by the General Office of the State Council, explicitly calls for sourcing protein from plants, animals, and microorganisms[23]. Alternative proteins, aligned with this national strategy, are emerging as a high-potential sector poised for rapid innovation and adoption across the Chinese market.

Currently, mainstream alternative proteins fall into four categories: plant-based, fermentation-derived, insect-based, and cell-cultivated proteins.

Plant-based proteins, the most mature category, have decades of commercial use (e.g., soy protein). However, next-generation development requires advances in raw material optimization, processing technologies, protein functionality, and cost-effective scalability.

Fermentation-derived proteins offer significantly higher calorie-to-protein conversion efficiency than animal agriculture, drastically reducing the use of water, feedstock, and land. Precision fermentation further enhances protein traits, accelerating R&D and production efficiency.

Insect-based proteins provide a complete amino acid profile and require minimal land and water for farming, offering both environmental and economic benefits through lower emissions and circular feedstock cycles.

Cell-cultivated proteins, cultivated directly from animal cells without livestock rearing or slaughter, promise major resource savings and ethical advantages. Yet high costs remain a barrier to commercialization, demanding breakthroughs in bioprocessing and cost-reduction technologies.

Shanghai Changing Biological Technology Co., Ltd.

#Fermented Proteins

Introduction

Changing Bio is a high-tech venture focused on precision fermentation-derived synthetic proteins and biomass-fermented microbial proteins, driving R&D and industrialization to disrupt traditional animal agriculture. Its fermentation-based protein production eliminates livestock farming, shortening the cycle for premium milk protein synthesis from 1 year to 3-5 days while enabling flexible supply-demand alignment, thereby reducing land use and carbon emissions significantly compared to dairy farming.

The venture's engineered chassis cells and modular endogenous genetic element libraries accelerate novel protein development, achieving batch-to-batch consistency through standardized processes. In 2024, Changing Bio's Kluyv protein became China's first edible synthetic protein product approved for the US market, pioneering international market access for China's fermentation protein industry.

Est. Year	Location	TRL
2017	Shanghai	9

Latest Funding Year	Funding Stage	Funding Amount
2023	Series A+	Tens of millions of RMB

SDGs

2 ZERO HUNGER
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION

Shanghai Shiwei Biotechnology Co., Ltd. (CellX)

#Cultivated Proteins

Introduction

CellX is a frontier synthetic biology venture advancing cell-cultured meat R&D and commercialization. By producing meat directly from animal cell cultivation — eliminating industrial livestock farming and slaughter — it replicates the taste and nutrition of conventional meat while addressing critical issues like resource overconsumption, high carbon emissions, animal diseases, and ethical concerns.

To address the industry-wide challenge of high production costs in cultivated meat, CellX successfully established China's first pilot facility for cultivated meat at the kiloliter-ton scale "Fuxi" in 2023. This breakthrough brought the cost of cultivated meat in China down to the hundred-yuan level, with plans to further reduce it to a mass-market price point within the next decade. In addition, CellX is advancing full-process development across multiple types of meat, laying a solid foundation for the scaled production and commercial rollout of cultivated meat.

Est. Year	Location	TRL
2021	Shanghai	8

Latest Funding Year	Funding Stage	Funding Amount
2023	Series A+	Tens of millions of RMB

SDGs

2 ZERO HUNGER
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION

Inspro Science Limited

#Insect Protein

Introduction

INSPRO is an innovative social venture leveraging insect-based bioconversion technology to transform organic waste into high-value protein feed and organic fertilizers. Integrating motion control, AI-driven environmental regulation, and industrial IoT, the venture's modular insect protein bioconversion system cultivates black soldier fly (BSF) larvae in fully controlled environment cabins, achieving 12x higher productivity and over 70% land use reduction compared to traditional insect farming. The system prevents secondary pollution while boosting organic waste valorization efficiency and providing stable protein sources for animal feed.

INSPRO's technology significantly reduces carbon emissions in waste-to-feed conversion processes, with digital twin-enabled carbon traceability. So far, its demonstration plant processes 20 tons/day of organic waste. In December 2023, INSPRO partnered with Cuiping District, Yibin City to deploy its technology for distillery waste recycling in China's leading liquor production hub. The project aims to process 1,000 tons/day of distillery waste and produce tens of thousands of tons of fresh BSF larvae per year.

Est. Year	Location	TRL
2021	Shenzhen, Guangdong	9

Latest Funding Year	Funding Stage	Funding Amount
2025	Series A+	Undisclosed

SDGs

2 ZERO HUNGER
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION

Sustainable Packaging

With rising concerns over single-use waste, sustainable packaging has become a global priority. Governments worldwide have implemented policies to promote the transition to sustainable packaging. In response, both multinational corporations and domestic ventures are treating sustainable packaging as a strategic priority for future development.

Global consumer brand leaders, such as Coca-Cola, P&G, Nestlé, PepsiCo, and Unilever, have established clear sustainable packaging targets, committing to achieve 75%-100% recyclable, compostable, or reusable packaging materials between 2025 and 2030.

In China, leading e-commerce and logistics players like JD.com, Meituan, and SF Express are actively building green packaging and logistics systems. Beyond reducing packaging materials, they are increasingly focusing on developing and scaling up reusable packaging solutions.

We believe that sustainable packaging strategies should follow the 3R hierarchy: 1) reduction (including material substitution), 2) reuse, and 3) recycling to minimize environmental impact.

Currently, the solutions with the highest potential include: reusable packaging systems, bio-based material packaging, and mono-material recyclable packaging. Among these three strategies, recent innovations have shown the most traction in reuse systems, bio-based material substitution, and improved recyclability through mono-material design. By prioritizing design for circularity, closed-loop systems, and next-generation materials, sustainable packaging innovation plays a vital role in reducing environmental impacts and reshaping consumption patterns.

灰度环保 HUIDU ENVIRONMENTAL

Huidu Environmental Technology (Shanghai) Co., Ltd.

#Reusable Packaging

Introduction

Huidu Environmental is a technology venture providing eco-circular packaging solutions and green logistics systems, focusing on reusable packaging innovation and supply chain optimization to overcome traditional packaging's limitations in recycling networks and operational scalability. Its self-developed ZerOBox reusable container features waterproofing, heat resistance, compression resistance, and shock absorption, requiring no glue or tape for sealing, enabling 100% recyclability and zero wastewater/gas emissions during production. Compared to corrugated boxes (2-5 cycles), ZerOBox has a 7-8 month lifespan with 50+ reuse cycles, reducing significant supply chain costs.

Integrated with RFID tags, Huidu Environmental also enables real-time tracking of package location, destination, and cycle counts, facilitating digital lifecycle management. The venture has partnered with Anta, MUJI, UNIQLO, Mengniu and others, deploying more than 8 million containers with over 200 million cycles, achieving 160,000+ metric tons of carbon reduction.

Est. Year	Location	TRL
2017	Shanghai	9

Latest Funding Year	Funding Stage	Funding Amount
2021	Series B	Undisclosed

SDGs

9, 11, 12, 13, 17

Yongkang Zhilu Technology Co., Ltd.

#Reusable Packaging

Introduction

Zhilu is an innovative venture focused on the R&D, production, and closed-loop recycling of reusable logistics packaging containers, providing systemic green packaging solutions to address industry pain points such as inefficient recycling, high storage/transport costs, and material waste. Co-developed with Tongji University, its zero-tape reusable box features a tamper-proof lock without adhesive, food-grade materials, lightweight design, water/mold resistance, and durability. The production process generates zero toxic gas, wastewater, and solid waste emissions, ensuring eco-friendly manufacturing. Furthermore, the box achieves 100+ reuse cycles, reducing per-use costs by 30% compared to traditional cardboard, and its foldable design has significant savings in storage space, enhancing logistics turnover efficiency. Integrated RFID technology, Zhilu also enables real-time tracking and supply chain transparency.

Est. Year	Location	TRL
2019	Jinhua, Zhejiang	9

Funding Status:
No public funding information available

SDGs: 9, 11, 12, 13, 17

In 2025, Zhilu's 'Tape-free Stackable Recycling Boxes' won the Green Design International Award at the World Green Design Organization Summit. So far, the venture has collaborated with multiple leading logistics and express delivery ventures, such as JD Logistics, China Post, ZTO Express, and Cainiao, with 360,000+ units deployed nationwide.

Nanjing Sage Advanced Materials Technology Co., Ltd.

#Bio-based Material

Introduction

SAGE is a technology venture dedicated to the R&D, production, and sales of bio-based materials, providing eco-friendly, high-performance solutions for food, pharmaceutical, and other industries. Its bio-based high-barrier film, with nanocellulose as the core material, achieves oxygen transmission rate (OTR) lower than 0.005 cc/m²·day, three orders of magnitude lower than traditional PET films, resolving the poor barrier performance and high costs of conventional flexible packaging. The product extends food shelf life by >30% and reduces preservative usage by >60%, enhancing safety and commercial viability. SAGE has commissioned China's first 10-ton/day nanocellulose production line and a 100-million m²/year bio-based high-barrier film line, achieving full vertical integration from raw materials to end products.

Est. Year	Location	TRL
2019	Nanjing, Jiangsu	9

Latest Funding Year	Funding Stage	Funding Amount
2025	Series A+	Tens of millions of RMB

SDGs: 9, 12

青昀新材 KINGWILLS Advanced Materials

Kingwills Advanced Materials Co., Ltd.

#Mono-material Solution

Introduction

Kingwills is a technology innovator specializing in flash-spun ultramaterials, achieving breakthroughs in fiber structure control and solvent recovery through full-chain innovation in formulas, processes, and equipment. The venture has established five internal circular systems for waste, solvent, heat, water, and green energy, enabling comprehensive energy recovery and circular utilization. In waste recycling, its proprietary product Kunlun™ Hypak™, made from 100% high-density polyethylene (HDPE), represents a landmark advancement in material science in China. The material is fully recyclable, and enables clean delamination in packaging applications without residue.

Kingwills's flash-spun ultramaterials combine properties of non-woven fabrics, specialty paper, and films, offering water/dust resistance, breathability, high strength-to-weight ratio, and tear/bacterial resistance. These materials are used in 100+ applications across medical packaging, building insulation, safety gear, and industrial innovation. The venture operates China's first flash-spun ultramaterial production line with 15,000-ton annual capacity, enabling mass production of this sustainable materials.

Est. Year	Location	TRL
2021	Nantong, Jiangsu	9

Latest Funding Year	Funding Stage	Funding Amount
2023	Series B	Over 100 million RMB

SDGs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 11 SUSTAINABLE CITIES AND COMMUNITIES; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 17 PARTNERSHIPS FOR THE GOALS

Source Reduction

According to UNEP statistics (2022), approximately 19% of food was wasted across the retail, food service, and household sectors. Producing this wasted food consumes nearly 30% of global agricultural land [24]. Beyond food waste, industrial and domestic waste—including discarded textiles—reflects massive resource depletion, exacerbating the overconsumption of land and water resources.

Research by the Global Footprint Network (GFN) reveals that humanity is currently consuming natural resources at 1.75 times the Earth's regeneration capacity, posing a severe threat to global sustainability and demanding urgent systemic change[25].

Reducing waste at source requires systemic waste reduction strategies across product lifecycles—including design, production to sales—which are critical for sustainable resource management:

- Design: Eco-friendly materials and minimalist structural design can significantly reduce raw material waste.
- Production: Digitalized and intelligent manufacturing can enhance product precision and operational efficiency. These innovations can help optimize production planning, minimize material inefficiencies and reduce waste generated by overproduction or fluctuating demand.
- Sales: Innovative marketing strategies, such as offering near-expiry food products, can steer consumers toward sustainable choices .

Dongshi Sunflower (Beijing) Information Technology Co., Ltd.

#Near-expiry Food

Introduction

Dongshi Sunflower is a social innovation venture tackling food waste through its core product "Food Magic Bag', which establishes a low-carbon circular ecosystem between merchants and consumers via a 'surplus food mystery boxes + smart management platform' model. The venture connects users and businesses via a mini-program, offering food-saving solutions for retail sectors like hotels and bakeries. Users can reserve or purchase near-expiration yet quality-assured surplus food online or in-store. In dining scenarios, its “Food Hour” initiative allows customers to purchase unsold premium dishes at discounted prices one hour before closing, reducing food waste at the source.

Currently, Food Magic Bag has operated in numerous Chinese cities, partnering with 15,000+ brands including Paris Baguette and WITHWHEAT, diverting 8,200+ tons of food waste and reducing 21,000+ tons of GHG emissions.

Est. Year	Location	TRL
2019	Beijing	Not Applicable

Funding Status:

No public funding information available

SDGs

12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
17 PARTNERSHIPS FOR THE GOALS

Sustainable Agriculture

Climate change is exerting growing impacts on China's agricultural systems. Over the past 50 years, the severity and frequency of agricultural disasters caused by droughts, floods, and extreme heat have increased significantly. Higher temperatures have also led to earlier outbreaks of pests and diseases, exacerbating production risks [26]. Research by the Chinese Academy of Agricultural Sciences indicates that under global warming scenarios of 1.5°C and 2°C, China's wheat production could decline significantly—by 5.1% and 4.7% respectively [27]. These challenges coincide with rising demands from population growth and dietary upgrades, posing a serious threat to national agricultural systems.

To ensure food security, enable a sustainable agri-food system, and improve crop quality and resilience, agricultural sustainability has become imperative. The *14th Five-Year Plan for Advancing Agricultural and Rural Modernization* (2022) explicitly prioritizes developing agricultural technologies, with focus on bio-breeding, smart agriculture, and agricultural machinery, alongside initiatives to reduce pesticide and fertilizer use as part of rural ecological civilization construction [28]. The subsequent *Guidelines on Key Rural Revitalization Work in 2023* further reinforced this direction by calling for the "comprehensive implementation of major bio-breeding projects" [29].

Looking ahead, we believe that the intergration of technologies like big data and AI can significantly enhance sustainable agricultural management.These tools can enhance monitoring and disaster prevention, thereby improving climate resilience and the efficiency of farming systems.

Simultaneously, intelligent breeding technologies will accelerate the development of superior crop varieties with enhanced drought tolerance, pest resistance, and other adaptive traits, representing a major future trend. Additionally, bio-based organic fertilizers produced through biotechnology can replace chemical alternatives, offering considerable potential to reduce agricultural GHG emissions, mitigate environmental pollution, and improve crop quality.

BioBin Data Sciences Co., Ltd.

#Bio-breeding

Introduction

BioBin pioneers AI-driven smart breeding, revolutionizing traditional methods plagued by high costs, long cycles, and low efficiency. Its large AI model platform—the first in agricultural breeding—aggregates and updates global research data, literature, and phenotypic traits to predict optimal crop varieties. By analyzing genotypes and simulating field performance, the platform reduces reliance on field trials, slashing breeding cycles from 6-8 years to 1-2 years at 50% lower costs.

Est. Year	Location	TRL
2018	Changsha, Hunan	9

Latest Funding Year	Funding Stage	Funding Amount
2022	Series Pre-A	Tens of millions of RMB

SDGs

Beijing Green Nitrogen Biotechnology Co., Ltd.

#Bio-organic Fertilizer

Introduction

NBio is an innovator in synthetic bio-nitrogen fixation technology, driving agricultural decarbonization by enhancing nitrogen use efficiency. Its Pseudomonas stutzeri strains exhibit high nitrogen fixation rates, salt-alkali tolerance, and plant growth promotion. To overcome the suppression of nitrogenase activity under chemical fertilizer application, NBio developed ammonium-tolerant nitrogen secretion technology, maintaining high nitrogen fixation efficiency even with chemical fertilizer inputs.

The venture's Directed Micro-Ecology (DME) microbial incubator integrates high-throughput screening, synthetic biology, and machine learning to autonomously optimize microbial strains and growth strategies, significantly reducing production costs while scaling high-viability biofertilizers.

Est. Year	Location	TRL
2022	Beijing	9

Latest Funding Year	Funding Stage	Funding Amount
2022	Seed	Tens of millions of RMB

SDGs

Beijing ICAN Technology Co., Ltd.

#Intelligent Agriculture

Introduction

ICAN Tech is a high-tech venture specializing in smart farming decision-making systems, addressing challenges such as excessive fertilizer/pesticide use, low resource efficiency, and limited technical service coverage. Leveraging remote sensing, AI prediction, and mobile internet technologies, the venture developed the Plant-Soil-Atmosphere Continuum Model and the ICAN Big Data Platform. These tools monitor real-time environmental variables (light, temperature, rainfall, soil conditions) and predict crop-specific water/nutrient demands, pest/disease risks, and yield potential, enabling data-driven decisions to boost crop quality and productivity.

Currently, ICAN Tech serves 30,000+ farms across 10+ Chinese regions, achieving 5-15% yield increases while reducing fertilizer use to 80-90% compared to traditional farming.

Est. Year	Location	TRL
2016	Beijing	9

Latest Funding Year	Funding Stage	Funding Amount
2024	Series B	Undisclosed

SDGs

04 INCLUSIVE INNOVATION

Technological innovation plays a vital role in driving economic growth. However, without deliberate attention to inclusivity and equity, it also carries the risk of exacerbating social inequalities and widening income gaps. Inclusive innovation addresses these challenges by focusing on the needs of underserved and low-income communities, providing sustainable, accessible, high-quality, and affordable products and services.

Today, a growing number of business models are embedding inclusive principles at their core. These models aim to generate measurable social impact that not only fuels economic progress but also expands opportunities to improve quality of life, particularly for those often left behind. In doing so, they are making meaningful contributions to the achievement of the SDGs[30].

Impact Hub Shanghai has long championed inclusive innovation in technology and business models, with a particular focus on three areas: women impact entrepreneurship, rural revitalization, and disability innovation. We aim to identify, distill, and share successful cases and replicable practices from outstanding innovators. In this report, we highlight eight exemplary cases of inclusive innovation ventures, with the hope of providing insights and inspiration for practitioners across the field.

Women Impact Entrepreneurship

Research shows that ventures led by women often outperform on ESG metrics and tend to place a stronger emphasis on innovation[31]. Female entrepreneurs are pioneering innovative solutions that create jobs, improve local livelihoods, and address critical community needs in areas such as health and education. In doing so, they are shaping the global economy in profound ways[32]. Supporting women entrepreneurs not only helps narrow the gender gap but also generates widespread social benefits.

Despite their contributions, women founders continue to face systemic gender bias, most notably in accessing funding. According to PitchBook, in 2024, ventures with at least one female founder accounted for only 19.9% of total venture capital deal value, while startups founded solely by women received just 1.9%[33]. Systemic support for women enterpreneurs remains limited, and barriers continue to be a major challenge.

Impact Hub global network is committed to empowering women entrepreneurs in the sustainability sector by providing access to resources, knowledge, and networks. According to the *Impact Report 2023–2024* published by Impact Hub, 75% of ventures supported across the network have at least one female leader[34]. In this section, we focus on startups founded or led by women that are tackling social challenges, highlighting how their innovative business models are driving inclusive development.

Shenzhen Tide Culture & Technology Co., Ltd.

Introduction

TIDE is a social venture dedicated to addressing sustainable livelihood challenges for rural women and people with disabilities through technological innovation and ESG practices. In response to the scarcity of employment opportunities for left-behind rural women, single mothers, and people with disabilities, the venture has built a platform that connects rural women with ventures seeking to fulfill corporate social responsibility (CSR). By providing intangible cultural heritage (ICH) handicraft skills training to rural women and customized handmade gift solutions for businesses, TIDE empowers disadvantaged groups to access equitable and flexible employment and income opportunities.

To date, the venture's services have reached dozens of rural communities, supporting nearly 100 rural production teams and enabling over 20,000 rural women to achieve flexible employment. This initiative has increased their average annual income by more than 3,000 RMB, injecting sustainable momentum into rural revitalization and inclusive development.

Est. Year	Location	TRL
2022	Shenzhen, Guangdong	Not Applicable

Funding Status:

No public funding information available

SDGs

Yakma Handmade Natural Cosmetics Co., Ltd.

Introduction

YAKMA, based in Tianzhu Tibetan Autonomous County, Gansu, tackles gender inequality and unemployment among Tibetan women through yak milk soap production. In response to entrenched gender roles—where women are often forced to leave home for low-skilled jobs or stay behind burdened with unpaid domestic labor, YAKMA champions women's economic independence and empowerment by offering flexible, home-based employment opportunities. The venture has established local workshops that use yak milk and incorporate Tibetan cultural elements to create natural, handmade soaps. These workshops help women balance work and family life, reduce the issue of left-behind children, and promote broader shifts in gender norms across the region.

Est. Year	Location	TRL
2016	Wuwei, Gansu	Not Applicable

Funding Status:

No public funding information available

SDGs

动物公民 ANIMAL CITIZEN

Guangzhou Zhongmu Kuikui Cultural Communication Co., Ltd.

Introduction

ZMKK is an innovative social venture dedicated to animal protection. By combining technology with creative advocacy, the venture seeks to steer business toward social good, raise public awareness about wildlife conservation, and support rural women's livelihoods. ZMKK has developed the "China Life" animal-tracking bracelet, which integrates GPS data from animals being monitored for conservation and research purposes. By scanning a QR code, users can follow the movements of the specific animal they are symbolically protecting, creating a unique, cross-distance bond between people and wildlife.

The bracelets are handcrafted by rural women using upcycled materials such as discarded posters, magazines, and brochures — reducing waste while enabling women in rural areas to earn income and gain independence. For every bracelet sold, 30% of the gross profit is allocated to support animal protection projects and the development or procurement of tracking technologies, creating a positive cycle where consumption directly contributes to conservation.

Est. Year	Location	TRL
2020	Guangzhou, Guangdong	Not Applicable

Funding Status:

No public funding information available

SDGs

Rural Revitalization

In January 2025, China released the *Rural Revitalization Plan (2024–2027)*, outlining priorities to deepen the integration of rural industries and boost farmers' incomes[35].

Despite these policy efforts, challenges remain. Many rural industrial clusters are still underdeveloped—characterized by small and fragmented ventures with limited value-added processing, inconsistent product quality, and weak brand competitiveness. On the income side, farmers face difficulties such as low agricultural prices, limited employment opportunities, and a lack of diverse income sources[36].

Innovative ventures have the potential to bridge these gaps by bringing capital, technology, and talent into rural areas through market-oriented approaches. Their involvement can unlock new momentum for rural sustainability—leveraging digital and smart solutions to modernize agricultural production, expand e-commerce channels, and create meaningful income opportunities for farming communities.

Chengdu Dayi Fuping Microcredit Co., Ltd.

Introduction

Est. Year	Location	TRL
2012	Chengdu, Sichuan	Not Applicable

Funding Status:

No public funding information available

SDGs

1 NO POVERTY; 10 REDUCED INEQUALITIES

Fuping is a rural-focused inclusive finance institution that addresses the financing challenges faced by farmers, small rural businesses, and individual entrepreneurs—groups often underserved by traditional financial systems. By channeling capital into projects such as agriculture, animal husbandry, and rural tourism, the venture supports income-generating activities in county-level areas.

Fuping has developed an innovative "localized services + ecosystem collaboration" model. On one hand, it has established a dense service network in hilly regions of Dayi County, reaching 10% of the population across 11 townships. On the other hand, it has formed a support alliance with eight social organizations, providing in-home visits to 118 households and direct assistance to 54 families in need.

In partnership with Bosch China and the Leping Foundation, Fuping co-launched the "Stakeholder-driven & Inclusive Community for Rural Revitalization Project", which has so far incubated 12 local guides and organized over 350 community-benefit tourism activities, generating nearly 200,000 RMB in local consumption through rural homestays and product sales. Through years of practice, the institution has disbursed over 400 million RMB in loans, directly supporting more than 3,000 micro and small ventures and over 5,000 rural households, gradually establishing a sustainable service model for rural revitalization.

Disability Innovation

Persons with disabilities account for approximately 15% of the global population[37]. In China, over 85 million people live with disabilities[38]. The 2030 Agenda for Sustainable Development identifies disability inclusion as a fundamental pillar of social inclusion and essential condition for achieving sustainable development[39]. In recent years, China has implemented a series of measures to improve access to employment, education, social security, and rehabilitation services for persons with disabilities, resulting in notable progress across these areas.

However, significant disparities remain. Gaps in education levels and access to social protection persist between urban and rural areas and across regions. Employment opportunities for persons with disabilities remain limited in both quantity and quality, and accessibility infrastructure in communities and workplaces remains insufficiently developed[40]. Meanwhile, the rapid development of digital technologies has introduced new challenges, particularly for individuals with hearing or visual impairments, who often face barriers to accessing digital services and online platforms.

We believe that innovative technologies and business models grounded in the real needs of persons with disabilities can empower them to live more fulfilling and independent lives. In 2025, Impact Hub Shanghai launched the Disability Innovation Accelerator to support disability-led ventures and early-stage startups focused on accessibility. The program is designed to enhance participants' fundraising capacities and help build a more inclusive entrepreneurial ecosystem. Since its launch, the initiative has received nearly 100 applications, with 18 ventures selected for the inaugural cohort. Looking forward, we remain committed to supporting entrepreneurs in this space, continuing to identify the core needs of persons with disabilities and deliver targeted, impactful solutions that promote inclusion and equity.

HINICHIJOU Food & Beverage Management (Shanghai) Co., Ltd.

#Social Inclusion

Introduction

Give & Take Coffee is a social venture dedicated to empowering people with disabilities through employment support and social integration, addressing systemic challenges such as employment barriers, limited career development, and social marginalization caused by societal biases and restricted job opportunities. The venture has established an inclusive employment ecosystem spanning from coffee plantations in Yunnan to roasting workshops and retail stores in Shanghai, actively hiring individuals with visual, hearing, and physical impairments. In partnership with government agencies and disability federations, it provides tailored vocational training to dismantle traditional employment barriers, fostering economic independence and social value reclamation.

Est. Year	Location	TRL
2020	Shanghai	Not Applicable

Latest Funding Year	Funding Stage	Funding Amount
2022	Series A	Undisclosed

SDGs

8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES

Give & Take Coffee has fully integrated accessible facilities across its outlets. For instance, workstation countertops utilize textured surfaces with distinct materials to assist visually impaired baristas in spatial orientation, while custom-designed coffee machines feature tactile buttons with haptic feedback , enhancing operational safety and efficiency. As of 2025, Give & Take Coffee operates 14 stores nationwide, with over 90% of employees being people with disabilities, and has provided vocational training to nearly 10,000 individuals with disabilities.

Sichuan 123 Yuan Meng Technology Co., Ltd.

#Social Inclusion

Introduction

Yuan Meng is a social venture focused on empowering people with disabilities through barrier-free tourism and inclusive employment. It developed China's first digital platform for accessible travel, mapping barrier-free routes and driving infrastructure upgrades at numerous scenarios. The venture provides free vocational training and advises employers on disability-inclusive hiring policies, achieving a 60% job retention rate among placed workers. Its initiatives have enabled 3,000+ individuals with disabilities to secure jobs or start businesses, while facilitating 200,000+ accessible trips, promoting accessibility renovations in over 100 tourist attractions, continuously advancing the creation of a more inclusive social environment.

Est. Year	Location	TRL
2017	Chengdu, Sichuan	Not Applicable

Funding Status:

No public funding information available

SDGs

8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES

Shanghai Tianyu Smart Elderly Care Service Co., Ltd.

#Age-friendly

Introduction

Tianyu specializes in addressing supervision and service challenges in home-based elderly care through digitalization and intelligent technologies. To overcome traditional shortcomings like product-centric approaches, inadequate service coverage, and high reliance on manual labor, the venture leverages AI algorithms and big data analytics to deliver tech-integrated service solutions. Its intelligent systems enable active care for seniors, including those who are elderly, functionally impaired, or living alone, with real-time risk monitoring and multi-level alerts.

Integrated with Tianyu Internet Hospital, the platform extends from non-medical home care to comprehensive medical-elderly care operations, offering chronic disease management and telemedicine services. Currently, Tianyu operates in 23 provinces/municipalities, serving millions of seniors.

Est. Year	Location	TRL
2019	Shanghai	9

Latest Funding Year	Funding Stage	Funding Amount
2023	Series B	Tens of millions of Dollars

SDGs

3 GOOD HEALTH AND WELL-BEING; 10 REDUCED INEQUALITIES; 11 SUSTAINABLE CITIES AND COMMUNITIES

Shenzhen Naowunao Network Technology Co., Ltd.

#Age-friendly #Assistive Technology

Introduction

Braingine is an innovative technology venture focused on digital therapeutics for brain health and cognitive intervention technologies. It aims to provide scientific and efficient solutions for brain health management in the context of an aging society. By integrating cognitive training with non-invasive neuromodulation technology, the venture drives the digitalization and personalization of brain health services.

Relying on cutting-edge technologies such as artificial intelligence (AI), virtual reality (VR), and neuroscience, Braingine has developed a digital therapy system that includes “Cognitive Assessment & Training System”, “VR Intelligent Rehabilitation System” and “Eye-Tracking Cognitive Rehabilitation System”. These systems enhance patient engagement through gamified and interactive approaches, while comprehensively evaluating and restoring cognitive functions. Currently, Braingine has implemented cognitive screening programs in multiple communities, offering tailored interventions and services based on individuals' cognitive risk levels. Data shows that low-to-moderate risk populations achieved an average improvement of 16% in overall cognitive function after training.

Est. Year	Location	TRL
2022	Shenzhen, Guangdong	8

Latest Funding Year	Funding Stage	Funding Amount
2023	Angel	nearly 10 million RMB

SDGs

3 GOOD HEALTH AND WELL-BEING; 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 10 REDUCED INEQUALITIES

APPENDIX

Appendix I : 2024 Asia Climate Pioneers 100 Selected Ventures List

Category	Subcategory	Venture Name
Transition to Net Zero	Clean Energy and Storage	Microquanta
Transition to Net Zero	Clean Energy and Storage	Hyran
Transition to Net Zero	Clean Energy and Storage	H2 Green Steel
Transition to Net Zero	Clean Energy and Storage	Passive Edge
Transition to Net Zero	Clean Energy and Storage	Factorial Energy
Transition to Net Zero	Clean Energy and Storage	ROSI Solar
Transition to Net Zero	Energy Saving & Efficiency	Zhong Jing Gu
Transition to Net Zero	Energy Saving & Efficiency	Yo-I
Transition to Net Zero	Energy Saving & Efficiency	Enjoyelec
Transition to Net Zero	Electrification	Coolbrook
Transition to Net Zero	Electrification	Blocpower
Transition to Net Zero	CCUS	LanzaTech
Transition to Net Zero	CCUS	Kunsheng Biodegradable New Material
Transition to Net Zero	CCUS	Clean CO2
Circular Economy	Circular Design	Deartree
Circular Economy	Circular Design	Cellugy
Circular Economy	Circular Design	Floyd
Circular Economy	Plastic Recycling	Comy
Circular Economy	Plastic Recycling	Polystyvert
Circular Economy	Plastic Recycling	JEPLAN
Circular Economy	Bettery Recycling	Jinsheng New Energy
Circular Economy	Bettery Recycling	Li-Cycle
Circular Economy	Waste Valorization	Vegatex
Circular Economy	Waste Valorization	Cruz Foam
Circular Economy	Recycling System Development	Turtledove
Circular Economy	Recycling System Development	SMARTSORT
Sustainable Consumption and Supply Chains	Sustainable Branding	SAFONE
Sustainable Consumption and Supply Chains	Sustainable Branding	Organic Earth
Sustainable Consumption and Supply Chains	Sustainable Branding	MTG - MIND THE GAP
Sustainable Consumption and Supply Chains	Material Substitution	MycoWorks
Sustainable Consumption and Supply Chains	Material Substitution	Notpla
Sustainable Consumption and Supply Chains	Material Substitution	JIPURE
Sustainable Consumption and Supply Chains	Material Substitution	Bluepha
Sustainable Consumption and Supply Chains	Material Substitution	GsynBioT

Appendix I : 2024 Asia Climate Pioneers 100 Selected Ventures List

Category	Subcategory	Venture Name
Sustainable Consumption and Supply Chains	Lightweight & Paper-Based Packaging	Paboco
Sustainable Consumption and Supply Chains	Lightweight & Paper-Based Packaging	Boxtalk Media
Sustainable Consumption and Supply Chains	Reusable Packaging	Oysterable
Sustainable Consumption and Supply Chains	Reusable Packaging	CLUBZERø
Sustainable Consumption and Supply Chains	Digital Transformation	BlackLake
Sustainable Consumption and Supply Chains	Digital Transformation	TERRAQUANTA
Sustainable Consumption and Supply Chains	Digital Transformation	VeChain
Inclusive Innovation	Women’s Empowerment	reach52
Inclusive Innovation	Accessibility	Voibook
Inclusive Innovation	Accessibility	VictoriaLand Beauty
Inclusive Innovation	Accessibility	Finger Dance
Inclusive Innovation	Blockchain-Enabled Solutions	HuoChain
Inclusive Innovation	Rural Revitalization	Vinetree
Inclusive Innovation	Rural Revitalization	Shan Pin Gong She
Inclusive Innovation	Rural Revitalization	Roslin
Inclusive Innovation	Rural Revitalization	SHOKAY

Appendix II : 2022 Impact 50 Selected Ventures List

Category	Venture Name
Energy Transition	SunGreenH2
Energy Transition	Xurya
Energy Transition	Greenjoules
Energy Transition	Connexx Systems
Energy Transition	Emulsion Flow Technologies
Energy Transition	Enecoat Technologies
Energy Transition	Sunman
Energy Transition	Qingdian Photovoltaic Technology
Energy Transition	Northern Electric Power (NEP)
Energy Transition	Legend Energy
Energy Transition	FIRMLI
Energy Transition	ZD Power
Energy Transition	Ju'an Energy Storage
Energy Transition	Renshine Solar
Energy Transition	EQuota
Energy Transition	Teplore
Energy Transition	VppTech
Energy Transition	WeView Energy Storage Technology
Energy Transition	SPF Hydrogen Energy
Energy Transition	Xi’an 1908 New Energy Technology
Energy Transition	enjoyelec Tech
Industrial Decarbonization	SepPure Technologies
Industrial Decarbonization	RWDC Industries
Industrial Decarbonization	iPEACE223
Industrial Decarbonization	Sentra.World
Industrial Decarbonization	Powered Carbon
Industrial Decarbonization	PolyX Material
Industrial Decarbonization	Zhongke Huizhi
Industrial Decarbonization	Greenore
Industrial Decarbonization	Yuanchu Technology
Industrial Decarbonization	Doctor Scrap
Industrial Decarbonization	Carbonstop
Industrial Decarbonization	Carbon Energy
Industrial Decarbonization	Bluepha
Industrial Decarbonization	PhaBuilder
Industrial Decarbonization	CellUranics

Appendix II : 2022 Impact 50 Selected Ventures List

Category	Venture Name
Industrial Decarbonization	Feynman Dynamics
Industrial Decarbonization	Oxsyns
Industrial Decarbonization	Zhongke Guosheng (GS Biotech)
Industrial Decarbonization	Hymater
Industrial Decarbonization	Yo-I
Industrial Decarbonization	DaMaoNiu
Industrial Decarbonization	Re-mall Environmental Protection
Industrial Decarbonization	Demeter Bio-Tech
Industrial Decarbonization	Ecoinno
Industrial Decarbonization	SMARTSORT
Industrial Decarbonization	Passive Edge Tech
Low-carbon Buildings	Ampotech
Low-carbon Buildings	EnergyX
Low-carbon Buildings	Clean CO2
Low-carbon Buildings	Unisolar
Low-carbon Buildings	Onesight Technology
Low-carbon Buildings	i2Cool
Low-carbon Buildings	Beike Yunhong
Transport Decarbonization	Green Li-ion
Transport Decarbonization	Swap Energy
Transport Decarbonization	NABLA Mobility
Transport Decarbonization	PJP Eye
Transport Decarbonization	Battery Smart
Transport Decarbonization	Jaran Hydrogen
Transport Decarbonization	Jiecheng New Energy
Transport Decarbonization	Daotong
Transport Decarbonization	Legend New Energy Technology
Transport Decarbonization	Green Energy Cellulose Materials (GECM)
Transport Decarbonization	Enpower Greentech
Transport Decarbonization	Talent New Energy
Transport Decarbonization	Circue
Transport Decarbonization	Flance
Transport Decarbonization	TCab Tech
Transport Decarbonization	Tanovus
Transport Decarbonization	LynkVertx
Transport Decarbonization	GRST

Appendix II : 2022 Impact 50 Selected Ventures List

Category	Venture Name
Agrifood System Reform	Fermenstation
Agrifood System Reform	Jala Tech
Agrifood System Reform	TurtleTree
Agrifood System Reform	AtoANI
Agrifood System Reform	SynMetabio
Agrifood System Reform	Wastely
Agrifood System Reform	Peelsphere
Agrifood System Reform	Enwise
Agrifood System Reform	Kangfen Ecolution
Agrifood System Reform	Jimi Bio
Agrifood System Reform	4D Bios
Agrifood System Reform	Avant Meats
Nature Conservation	Biome Inc.
Nature Conservation	Arkadiah
Nature Conservation	TerraQuanta
Nature Conservation	Linhe Climate Technology
Nature Conservation	DeCarbon Tech
Climate Adaptation	EF Polymer
Climate Adaptation	Komunidad
Climate Adaptation	Ac-Planta
Climate Adaptation	Richhold
Climate Adaptation	HurRain NanoTech
Climate Adaptation	Molbreeding
Climate Finance	Climate Alpha
Climate Finance	Sustainacraft
Climate Finance	iFarmer
Climate Finance	Neufin
Climate Finance	Lingshu.Net

EXPLANATION AND ACKNOWLEDGEMENTS

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The authors of the report are SHAO Yuwei, LU Xinyi and LI Mingyan.

Lyu Xiujuan, SUN Jingge, GUO Ruiling, JIANG Puzhen, XU Minghan, ZHENG Yimeng, WANG Li, YANG Wandong, ZHU Mengyi and HUANG Yitong from Impact Hub Shanghai provided support and advice for this report.

We would like to thanks LANG Shan and LI Xiaodie from Impact Hub Shanghai for the production and design of the report.

We would also like to thank ZHANG Minqi, Intern of Impact Hub Shanghai, for her support for the report.

An Introduction to Organization

About Impact Hub Shanghai

Impact Hub has been a catalyst for entrepreneurial action and collaboration since 2005. It is a locally rooted, globally connected network driving environmental and societal change in 120+ locations across 67+ countries. Every Impact Hub is established and operated by a local team, allowing them to reach deep into local markets and communities, while linking global innovation resources to create global impact in addressing the Sustainable Development Goals (SDGs) set by the United Nations.

In 2017, Impact Hub Shanghai broke ground. We take the lead to build sustainable innovation ecosystems in China and around the world through innovation consulting, startup support, impact communication, impact investment, and ecosystem research. In 2022, we became a certified B-Corporation.

About Makeable

Makeable is an action research platform focused on sustainable innovation, developed by Impact Hub Shanghai in 2020. It aims to empower the sustainable innovation ecosystem through research, knowledge dissemination and industrial capacity-building, accelerating the realization of the SDGs through innovation.

About 1.5DO Climate Innovation Lab

The 1.5DO Climate Innovation Lab, initiated in 2022, provides systemic solutions to address challenges arising from climate change. Through industry research, technological application and implementation, industrial innovation, data platforms and international dissemination, the lab builds a domestic climate innovation ecosystem, enables the development of climate innovation technologies, and promotes the transformation of key emitting industries and regions, ultimately contributing to the achievement of China's dual carbon target and the global 1.5 degree climate vision.

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The information and descriptions of the 50 ventures in this report are sourced from public information, including the ventures' official websites and authoritative news sources. The information and data date to the date of publication: May 30, 2025. The business cases in this report are listed in no particular order. Impact Hub Shanghai holds intellectual property rights for all diagrams contained in this report. Please clearly indicate the source if you wish to use the data and charts in this report. This report arises from research based on information publicly available for a limited time. Suggestions, comments, and questions about this report are welcomed and can be directed to *yuwei.shao@impacthub.net*.

Given limitations in accessing the information, Impact Hub Shanghai does not guarantee the timeliness, accuracy, and completeness of the information contained in the report.

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IMPACT 50

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