



A SNAPSHOT OF THE CHINA CLEANTECH FINANCING ECOSYSTEM

ACMFN Flagship Report Series

BUILD. ACCELERATE. MAINSTREAM.



ABOUT THE REPORT

This report is part of the Asian Cleantech MSME Financing Network (ACMFN) project and was prepared by the project partner adelphi. The project is a four-year project co-financed by the European Union that aims to build and leverage a cleantech financing ecosystem to spark improved access to finance for Asian cleantech enterprises and enhance sustainable consumption and production patterns in Asia.

The objective of this report is to gain an insight into the current cleantech financing state in China, to identify cleantech financing challenges and opportunities and to showcase country-specific successes of the ACMFN project. The insights are useful for all stakeholders working on harnessing the power of financial markets to deliver environmental and societal goals, in particular project donors and financial institutions in China looking to understand the contours of a fast-growing cleantech financing ecosystem.



FOREWORD

China's ever-increasing energy and natural resources consumption is unprecedented in size and scope; and there is an increasing urgency for the innovative solution and new mechanisms to address the issue. Since it entered the 13th Five-Year-Plan period, the environmental concerns are now at the forefront of social and political discussions with an emphasis on clean technology and environmental remediation. The Chinese government has made clean technology expansion now a foundation of not only its economic development plans, but has also put it at the heart of its efforts to address pollution, energy shortages, and climate change.

The Chinese green startups are critical not only to the future of China's green economic development, but also in combating climate change issues. With the successful transfer of knowledge and appreciation of the concept of sustainability, they will develop and provide the technologies, business models, projects and services required to deploy and finance solutions on sustainable development at scale. However, the Chinese green startups, due to the lack of a sound supporting system, grow at a much lower speed compared to its increasingly-worsening environment, despite the country's call for entrepreneurship and innovation.

Starting from 2016, thanks to the support from EU's SWITCH-Asia Programme, CEESTA and IED were fortunate to work with our international partners on the ACMFN (Asian Cleantech MSMEs Financing Network) project through the Green Startups Platform. We believe in the power of business and entrepreneurship as an effective solution to environmental and social challenges. Therefore, the startups that the project supports are environmentally-focused enterprises that seek the triple-bottom line principle. In addition to financial returns, they clearly address a specific environmental issue and, in some cases, offer products and services that help under-served people progress out of poverty. Those with a focus on low-carbon and climate-compatible innovations will be prioritized.

The project comes at a right time. The stronger government support, the growing awareness and demand for a better-quality livelihood from the public as well as the booming new technologies and their increasing integration and application to green industries all paved the way for the sound development of the cleantech startups in China.

Now that four years have passed and we are glad to see the project not only enhanced the capacity of strong and investible green startups, but also improved the green ecosystem and the access to green-financing for them. In the future we hope to continue our support to generate more scalable green solution and business models together with our international partners.

Mr. Walter Ge
Managing Director, Green Startups

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LIST OF ABBREVIATIONS

ACMFN	Asian Cleantech MSME and Financing Network
ADB	Asian Development Bank
AVPN	Asian Venture Philanthropy Network
CEESTA	China Electronic Energy-Saving Technology Association
CP	Cleaner Production
CT	Clean Technology
CTFC	Climate Technology Finance Centre
ECSO	Energy Service Company
EMCA	Energy Management Companies Association
FYP	Five-Year Plan
ICBC	Industrial and Commercial Bank of China
IED	Institute of Environment and Development
IFC	International Finance Corporation
MSME	Micro, Small and Medium-Sized Enterprise
NDCs	Nationally Determined Contributions
NDRC	National Development and Reform Commission
P2P	peer-to-peer
SCP	Sustainable Consumption and Production
SDGs	Sustainable Development Goals
TREERI	TR Energy and Environment Research Institute



1. EXECUTIVE SUMMARY

This flagship report provides a country snapshot of the cleantech MSME financing situation in China. It highlights country-level project successes of the Asian Cleantech MSME Financing Network (ACMFN).

KEY FINDINGS

Recent achievements & trends

- The cleantech market in China is already well developed and bears a high growth potential. The role of MSMEs within the cleantech market however remains underrepresented.
- Key drivers for China's cleantech MSME market are governmental policies and the development of new technologies.
- Clean technologies are already widely available in China, but fall behind their potential due to a lack in cleantech awareness, limited knowledge about clean technologies and limited available funding for MSMEs.
- While all cleantech sectors are represented in China, energy efficiency and renewable energy are among the most popular cleantech sectors.

- ACMFN's MSME engagement approach has proven successful in supporting enterprises based on their needs.
- ACMFN added great value to the ecosystem by setting up the first impact investing fund in China exclusively investing in start-ups that address climate change.

Challenges

- Investment directed towards cleantech MSMEs is still very low compared to financial institution's total fund sizes.
- Financial institutions tend to invest in large-scale cleantech projects. A major challenge for Chinese MSMEs is to compete against such large cleantech projects.
- Cleantech MSMEs depend on equity financing as enterprises struggle to access loans specifically.
- There are only very limited impact-focused instruments geared towards cleantech MSMEs' needs on the Chinese market.
- There is a great need for support services for MSMEs to access finance, especially the combination of financial and non-financial support, as well as cleantech expertise. To date, the number of cleantech-focused intermediaries is limited.

A lot is already happening in the Chinese cleantech MSME financing market and large potentials exist which need to be tapped into to boost cleantech investments and contribute to green growth in China. ACMFN has been part of this journey in recent years, and project successes need to be leveraged to transform current challenges into opportunities.

ACMFN stakeholders jointly need to support cleantech MSMEs to maximise their impact potentials:

Financial institutions should

- Broaden their knowledge base about clean technologies and build up and manifest expertise in cleantech financing for example through dedicated cleantech finance departments
- Collaborate with advisory providers to develop targeted cleantech financing instruments

MSMEs should

- Expand their business capacities and demonstrate a sound model to financial institutions
- Shape the mindset shift across the ecosystem to boost demand for cleantech solutions

Intermediaries should

- Develop and offer specific financial literacy training and cleantech training to MSMEs
- Boost the ecosystem by innovative intermediary models such as targeted platforms

The initial ecosystem for cleantech MSMEs is built. Now, it is the task to accelerate and mainstream these actions to maximise cleantech MSMEs' contributions to China's sustainable development path.

1.1. Project Background

The Asian Cleantech MSME Financing Network (ACMFN) is a four-year project co-financed by the European Union that aims to build and leverage a cleantech financing ecosystem in China, India and Indonesia to spark improved access to finance for cleantech enterprises and enhance sustainable consumption and production patterns in Asia. ACMFN tackles the nexus of cleantech financing and the access of finance for micro, small and medium enterprises which particularly face challenges to access finance.

ACMFN works directly with both micro, small and medium-sized enterprises (MSMEs) and financial institutions within the three focus countries China, India and Indonesia connecting more than 600 stakeholders. Under ACMFN, capacity-building measures via workshops, advisory and training services for about 400 MSMEs to spark their knowledge and capacities to successfully raise capital. Around 200 financial institutions have been supported through technical assistance in order to strengthen their understanding of the economic and environmental benefits of clean technologies and sustainable consumption and production (SCP) overall. This included the development of new and targeted financial instruments. To strengthen the local ecosystems further, national forums for matchmaking processes between MSMEs and financial institutions have been carried out. Ultimately, the goal is to unlock the full potential of cleantech-focused MSMEs by increased capital through peer-learning, co-investing and matchmaking opportunities facilitated by ACMFN's platforms.

In China, ACMFN is hosted by the China Electronic Energy-saving Technology Association (CEESTA) in collaboration with the Institute of Environment and Development (IED), both located in Beijing. ACMFN China is driven by the Green Startups programme, an acceleration platform promoting the green economy. Green Startups was established in 2016 by IED as a pioneer acceler-

Major achievements of ACMFN in China since the project's beginning in 2015 include:



Creation of informal networking of national and local partners from different actors in the cleantech space



Successful capacity building workshops on cleaner production and clean technology with more than 50 representative from MSMEs to participate



3 matchmaking events with 50+ MSMEs as participants and 10+ investors, with successful business pitches to top-rank investors and potential follow-up on business negotiations



Nearly 200 cleantech MSMEs supported & tens of millions of RMB financing facilitated

ator platform for green innovation and entrepreneurship in China. Their focus is “accelerating” and “impact investing” into early stage startups to support the development of their business and overcome challenges faced by early stage ventures specifically. The ACMFN China consortium plays a major role in bridging the gap of cleantech financing and important targeted support services for cleantech MSMEs.



1.2. Methodology

The ACMFN Flagship Report China provides insights into the status quo of cleantech financing for MSMEs in China by highlighting the project’s successes, but also drawing up the path for urgently needed developments to foster cleantech beyond the project’s time scope. This report relies on the collection of quantitative and qualitative data obtained through in-depth interviews with key project stakeholders and experts within the Chinese

cleantech MSME context. The interviews covered a broad range of categories to map the Chinese cleantech MSME financing landscape in terms of stakeholder’s motivations for cleantech engagement, general opinions of the Chinese cleantech market trends and development, and to find out about available cleantech financing instruments. The interview outputs were analysed along with first-hand experiences gained throughout ACMFN activities both on national and local level. Secondary research was used to compliment the collected primary data.



(Cleantech) MSMEs:

Small or medium-sized enterprises which provide or apply clean technologies or produce clean products and services to serve the market.



Intermediaries:

Industry associations, international or national collaboration organization, incubators or enterprises providing technical or financial service support for cleantech MSMEs.



Financial Institutions:

Banks, venture capitals, or investors who provide funds for cleantech MSMEs.

ACMFN stakeholders can be categorised into three broad groups: **MSMEs, intermediaries and financial institutions.**

China applies a broad definition of MSMEs, including micro, small and medium-sized enterprises. The classification is based on number of employees, and assets of the enterprise, but differs for the various industry branches. For example, a company in the wholesale sector is labelled “medium” when it has fewer than 200 employees while in the manufacturing sector medium enterprises can have up to 2000 staff¹.



Exhibit 1: Stakeholder Mapping

For this report, **eight MSMEs, seven intermediaries, eight financial institutions** and one government agency were analysed in-depth and interviewed (Exhibit 1). These stakeholders were carefully selected to 1) include active ACMFN partner organisations, 2) reflect the ecosystem by including additional experts and key players not yet involved in the network and 3) to cover a variety of topics, organisation types and expertise within the stakeholder categories. The stakeholder selection reflects broad-based on-the-ground realities within the cleantech financing ecosystem in China.

Stakeholder Portfolio

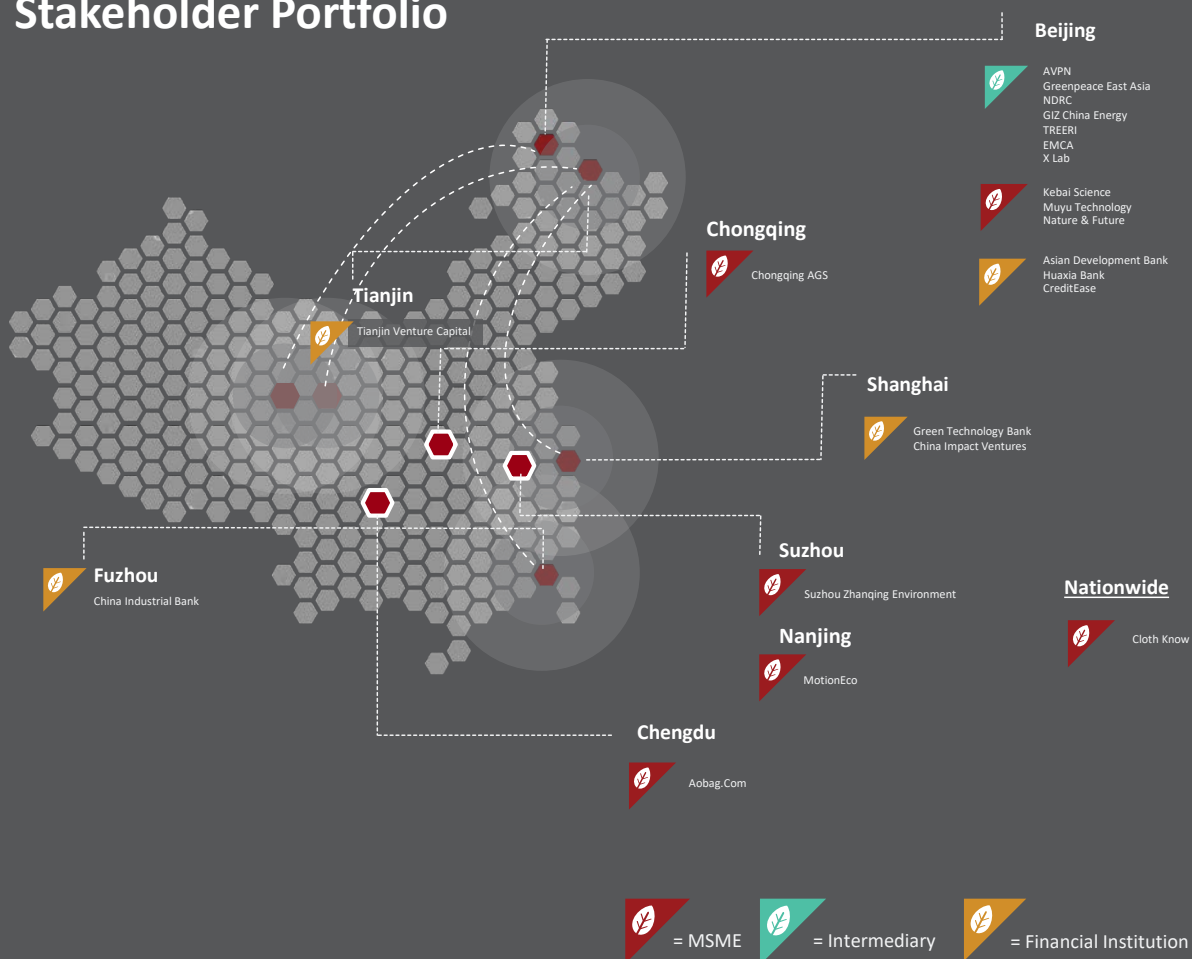


Exhibit 2: Stakeholder Portfolio

The stakeholder portfolio (Exhibit 2) shows that MSMEs and intermediaries are spread across the country based on the market focus, business settlements and available raw materials in the area. These can be clustered in four main focus hubs of ACMFN China: Beijing, the Pearl Delta, the Yangtze Delta and the Chengdu and Chongqing area. Each cluster is driving cleantech innovation. For example, the Pearl Delta is China’s “silicon delta” of high-tech industry, Beijing for example has the Zhongguancun Science and Technology Park and Tsinghua Science Park driving entrepreneurship, and Chengdu has also

transformed into an innovation center. In addition to the MSMEs featured in the report, ACMFN is supporting MSMEs based in almost all Chinese provinces and reaching up to Taiwan. Interviewed financial institutions are headquartered mainly in Beijing and especially banks have a network of local branches spanning across the country.

1.3 Country Zoom: China

In the light of the world's largest population with 1.4 billion people and immense growth in industrial production in the last decades, resulting in overcrowding cities and alarming environmental pressures especially with polluted air and water, it is an imperative that China's future economic growth needs to go in hand with a push for sustainable development and green and inclusive growth. China has the world's highest release of carbon emissions at 27% of global carbon dioxide emissions

which amounts to 7.0 tons per capita. In comparison, India with the third highest total amount of emissions has a per capita footprint of 1.4 tons. This highlights the global significance for China to lower CO₂ emissions, adapt and mitigate climate change, and contribute to environmental sustainability overall. Given China's strong economic relevance, China's success in achieving sustainable development will be central to the world's collective ambition of achieving the 2030 Sustainable Development Goals (SDGs).



In order to achieve this goal, a key driver is the transition to a green economy by enhancing cleantech businesses and innovation as a significant factor for China's economic development.

Cleantech refers to products, services and processes that reduce or eliminate negative ecological inputs, improve the productive and responsible use of natural resources and provide superior performance at lower cost.

Since MSMEs are major drivers of economies worldwide and the backbone of the Chinese economy, they bear a great potential to ensure that the green transition is mastered on each level of the economy. In 2015, 97.9% of all registered companies in China were MSMEs, and their assets combined were 62% of the total Chinese company revenue. As much as MSMEs have the potential to drive the application on cleantech, they offer an important innovation potential to develop disruptive clean technologies unlocking new sustainable methods and opening up

new market opportunities in China. In order to deliver this potential, cleantech MSMEs need to be supported by a conducive ecosystem that provides capacity building, technical support, as well as access to finance for implementing and developing clean technologies.

Cleantech Policy Context: Sustainable Development Commitments

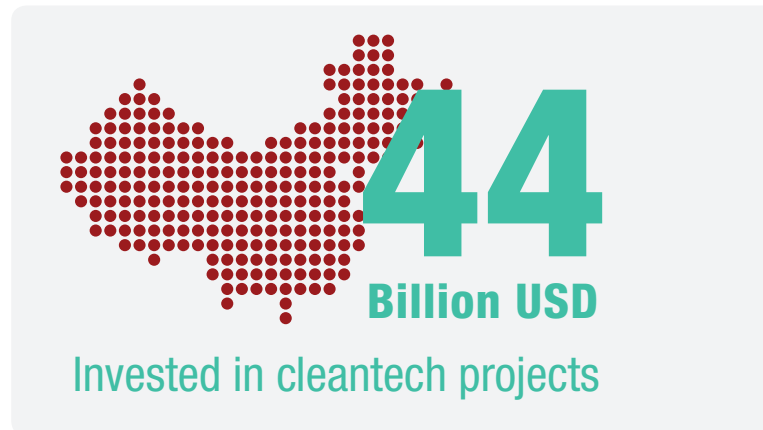
Policy and government regulations are key factors in driving the investment into cleantech and China's commitment is reflected in a range of ambitious policies and progressive goals. In line with China's Nationally Determined Contributions (NDCs) following the ratification of the Paris Agreement, the country aims to peak CO₂ emissions by 2030 the latest, decrease carbon intensity by 60-65%, decrease the rate of fossil fuels used as a primary energy consumption to 20% and increase the forest stock volume to around 4.5 billion m³ from 2005 levels all by 2030. At the national level, key policies driving the develop-

ment of the cleantech market are **China's 13th Five-Year Plan (FYP)** and the strategies The Belt & Road Initiative, Strategic Emerging Industries and Made in China 2025. The 13th FYP sets the tone for China's commitment to environmental protection with a clear objective to dominate the cleantech market. Specifically, China commits to (1) renewable energy to increase the use of non-fossil fuels and to increase the domestic production to ensure energy security, (2) energy efficiency to establish smart grids, support green buildings, and new-energy vehicles, and (3) ecological protection including water remediation, soil remediation and solid waste management. As part of the **Belt and Road Initiative**, an economic infrastructure programme to connect Asia, Africa and Europe with a land and marine trading network, China has set "ecological civilization" as a goal for its green development and low carbon economy. Another important strategy is the "**Made in China 2025**" strategy which aims to drive green manufacturing and alternative energy production and use. Recently at the national level, the sixth meeting of the Central Committee for Comprehensive Reform, held on 23 January 2019, reviewed and adopted the **Guidance on Building a Market-oriented Green Technological Innovation System**. The meeting emphasized that green technology innovation is an important driving force for green development and an important support for tackling pollution prevention and control, promoting ecological civilization and promoting high-quality development.

China's Cleantech Investment

Driven by strong policies, China has developed into the largest producer and consumer of cleantech globally with a total investment in cleantech of up to approximately USD 269 billion (1.9 trillion RMB) by 2016 overtaking the combined cleantech investment in Europe and the US.

In 2017, new cleantech investment projects of around USD 44 billion (312 billion RMB) have been launched focusing on renewable energy, energy efficiency and ecological protection. A specific focus area is the increase of non-fossil fuel 20% by 2030, investing in smart grid, and green building standard encouragement. Estimations suggest an immense growth potential of the cleantech sector to reach around USD 2.47 trillion (17.5 trillion RMB) by 2020. Further, it is estimated, that the investment needed to achieve the cleantech goals of the 13th FYP is USD 320 billion (2.2 trillion RMB). In 2019 however, China's investment in the clean energy sector slowed down by 39% which could result from a phase-out of government subsidies, a tight credit policy and the slowdown of the Chinese



economy overall having an impact the cleantech sector as well. With a volatile trading and economic situation, the outlook for the overall investment climate remains to be seen.

Investment into Cleantech MSMEs to Foster Green Growth

In 2017, MSMEs contributed roughly 60% to China's GDP, accounting for 80% of urban employment. Despite the significance of MSMEs for the economy, MSME investments are still low. Less than 24% of bank loans and less than 5% of short-term loans were accessible for MSMEs. However, the government is recognising the role of MSMEs in its thrive towards an innovation-based economy actively encouraging mass entrepreneurship and innovation benefitting cleantech MSMEs as well. For example, development policies and plans to govern MSMEs were developed to help access financing for MSMEs such as credit guarantees and insurance for MSME loan development and tax reliefs for green MSMEs.





Cleantech in Action

Cleantech financing is the provision of funding to an enterprise which either provides or applies clean technologies, in order to develop, implement or upgrade their current operating technologies. To provide effective support to MSMEs, ACMFN's engagement approach distinguishes these two different cleantech business models along the cleantech value chain, namely **Clean Technology** and **Cleaner Production** enterprises.

1.4 The ACMFN Cleantech Financing Universe in China

MSMEs are categorised according to their engagement in cleantech along the cleantech value chain. The first model is **Clean Technology (CT) enterprises**, the providers of clean technology who - as active innovators - dynamically create and commercially supply innovative clean technologies. Their cleantech products and services offer solutions for a transition into a low-carbon economy. In addition, **Cleaner Production (CP) enterprises** as passive innovators are characterized as the

cleantech users who apply or integrate clean technologies into their existing operating and production processes. Their engagement in cleantech is driven by increased cost- and resource-efficiency and environmentally friendly operating processes enabled through the application of cleantech. The enterprises assessed in this report are all CT enterprises, in line with the focus of ACMFN in China (Exhibit 3).

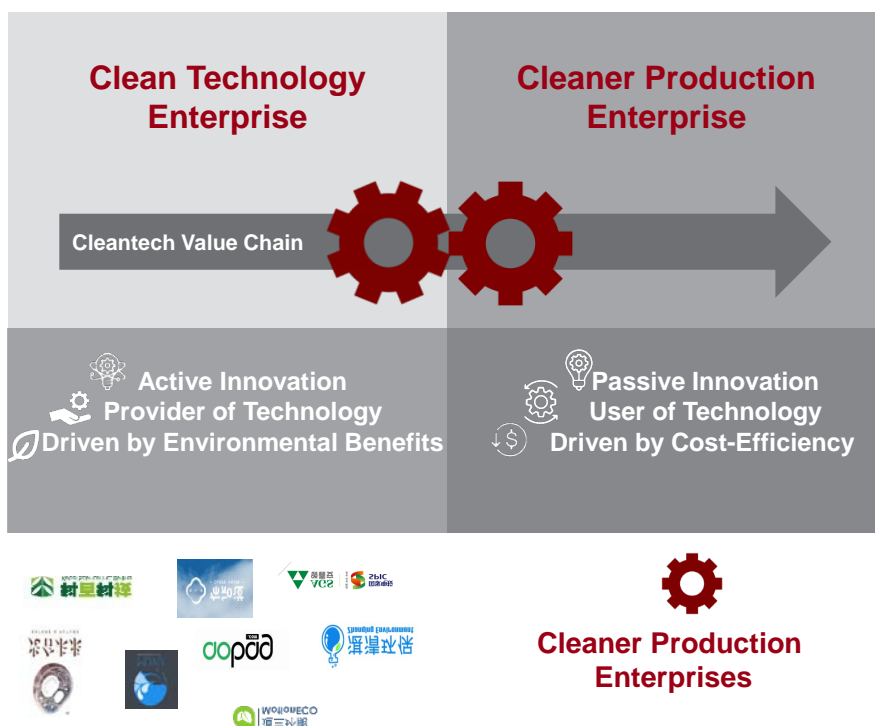


Exhibit 3: Strengthening Cleantech Value Chains

ACMFN recognises that in order to effectively support cleantech enterprises, it is important to consider the country-specific setup and develop an individual support approach for each project country. Therefore, ACMFN in China has focused on targeted support mechanisms through the Green Startups acceleration platform providing mentoring and tailor-made guidance in all business aspects, especially financial capacities, injecting the “green gene” into MSMEs to become frontrunners of the cleantech movement, as well as building a network for cleantech enterprises for effective knowledge transfer for CT enterprises and sharing of best practices. Cleantech MSMEs receive fundraising support by connecting with investors and financial institutions from the ACMFN network at pitching sessions.

In addition to acceleration support, ACMFN in China applies an equity approach through setting up the first impact investing fund that exclusively invests in green startups, the Green Leaf Fund. The Green Leaf Fund is building a co-investment platform that channels patient capital from selected private individual investors to cleantech MSMEs.

Thereby, ACMFN China recognises the specific needs for innovative patient capital investment within the ACMFN MSME cleantech universe and accordingly developed the impact fund

to effectively fill the gap within the universe establishing a legacy of ACMFN beyond the project's timespan.

Clean Technology Application Sectors in China

Clean technologies part of the ACMFN cleantech financing universe enable sustainable consumption and production patterns across industries and can be categorised in the main sectors: water and wastewater, land and air quality, waste and recycling, renewable energy and energy efficiency. Amongst the 200 cleantech enterprises that ACMFN engaged with since 2016, these five sectors are the most popular sectors providing a wide range of clean technologies across these sectors. The clean technologies are applied in multiple sectors driving a resource-efficient energy and water management, sustainable agriculture and the circular economy. Interviewed MSMEs represent the spectrum of popular clean tech applications (for a classification see Exhibit 4).



The agriculture sector is a difficult one. It took us some years to develop our products and services. The systems must be reliable.

Kebai Science, Clean Technology enterprise in Beijing



Exhibit 4: Classification of Clean Technology Application Sectors

ACMFN Cleantech Financing Ecosystem in China

In order to achieve the successful promotion of sustainable consumption and production practices by CT and CP enterprises and their effective financing, the ACMFN cleantech financing ecosystem in China is made up of a diverse range of contributing actors. A key driving actor in the Chinese cleantech financing ecosystem are the intermediaries including incubators, accelerators, research institutes and NGOs centered around Green Startups, an acceleration platform established under IED and CEESTA, building the focal point of ACMFN activities. Green Startups is actively engaging with other intermediaries and financial institutions such as banks and venture capital funds to join and actively participate within the ACMFN cleantech financing ecosystem and connect them with cleantech enterprises. Additionally to this driving force from within the ecosystem, China’s governmental and sub-governmental institutions provide a supportive policy framework via a top-down mechanism. One key actor involved is the National Development and Reform Commission (NDRC), interviewed for this report, playing an important role in establishing and disseminating the conducive cleantech financing ecosystem. For example, NDRC is involved in the Green Industry Catalogue 2019 which identifies and defines the scope of “green industry” and will effectively direct policy and investment to key green industries.

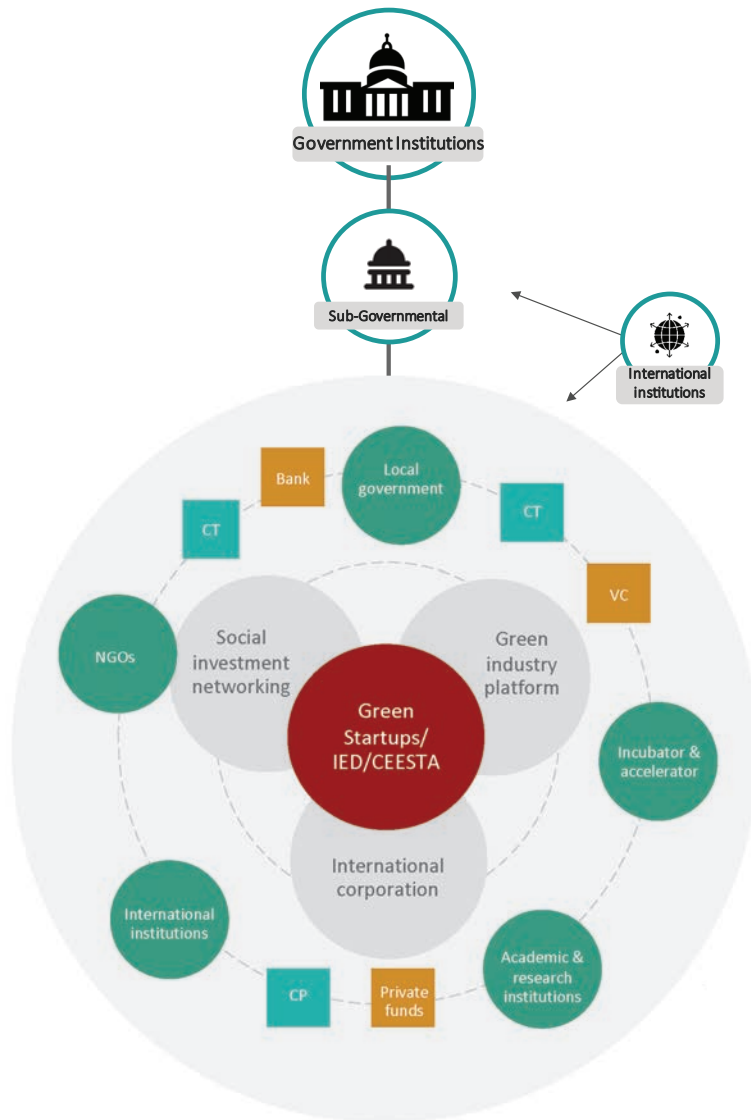


Exhibit 5: ACMFN Cleantech Financing Ecosystem in China



2. CLEANTECH MSME LANDSCAPE IN CHINA

Cleantech enterprises in the Chinese cleantech MSME landscape are active across different sectors and locations. ACMFN has selected eight cleantech enterprises to gather first-hand experiences and insights about cleantech engagement, potentials and challenges in accessing cleantech financing.

These eight enterprises are chosen to provide an accentuated impression covering multiple sectors, regions and development stages with long-standing enterprises operational for many years such as Kebai Science and very early-stage enterprises at the prototype phase MuYu Technology. Each enterprise offers an innovative clean technology building on disruptive technologies paired with innovative business models building on a reward-scheme (Aobag) for example. Thereby, interviewed enterprises provide cleantech solutions for a range of sectors including energy efficiency and renewable energy, land & air quality, water & wastewater and a third of the enterprises focuses on waste & recycling to provide circular economy solutions. While ACMFN generally supports both CT enterprises that provide clean technologies and CP enterprises that apply clean technologies in their business operations to green the full value chain, the support of ACMFN in China focuses on CT enterprises to unlock their full innovation potential to offer cleantech solutions to CP enterprises.



We provide a highly efficient water-saving cleaning technology, aiming to create more environmentally-friendly, more comfortable and healthier use of water for the people all over the world.

Muyu Technology, Clean Technology enterprise in Beijing



Our target is to reduce pesticide use by 80%.

Kebai Science, Clean Technology enterprise in Beijing

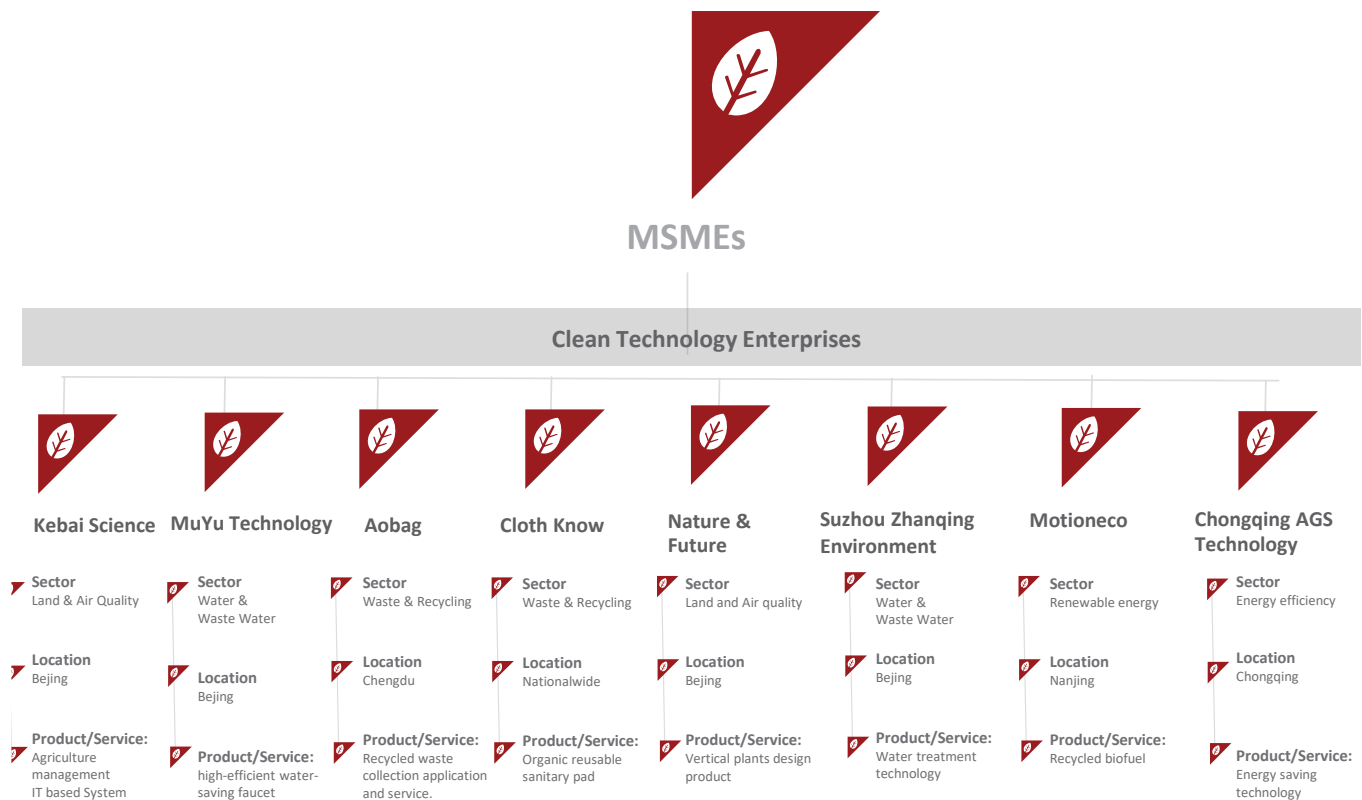


Exhibit 6: MSME Portfolio

2.1. Cleantech MSME Motivation

Cleantech MSMEs in China are driven by different motivations to develop and apply clean technologies. The main motivation for MSMEs' cleantech engagement is to turn environmental problems into business opportunities, in order to serve new markets with alternative products as business solutions.

The cleantech MSME landscape, in parallel to the Chinese overall startup scene taking the lead in developing digital technologies, is therefore strongly driven by an innovative spirit and digital focus.

Accordingly, the majority of interviewed enterprises mentioned that they can foresee new market opportunities driven by trends such as new technologies like Internet of Things (Kebai Science) or cloud solutions (Chongqing AGS) and trends in China which will lead to higher demand for clean and green quality products. Kebai Science for example highlights the trend that the willingness to pay higher prices for high quality food is growing amongst the urban population in recent years. The motivation to seize new market opportunities and respond to recent trends is paired with environmental considerations most importantly resource efficiency for example in terms of energy (Chongqing AGS) and water (Muyu Technology) or offering innovative waste management options to lift the low recycling levels of Chinese municipal waste (Aobag).

MSME's cleantech intensity (i.e. to what extent MSMEs develop or implement clean technologies in their business processes) varies between enterprises. Differentiating along the cleantech value chain, CP enterprises have a broad portfolio of cleantech initiatives which they can implement. CP enterprises typically base their choice of cleantech measures on factors such as available financing, individual preferences, the nature of their daily business, best practice examples from other enterprises and ultimately, the array of cleantech solutions available on the market. For CT enterprises, their cleantech intensity is naturally high as their core business is centered around clean technology. Still, their cleantech intensity varies in terms of the breadth of activities and impact on different cleantech sectors, the amount of cleantech products within the enterprise's portfolio and the magnitude of sustainability in the value chain and production process of the clean technology itself. For all ACMFN-interviewed enterprises the core business is to develop, produce and provide a clean technology. Thereby, some enterprises such as Aobag focus on one product, whereas other such as Kebai Science offer a comprehensive cleantech solution for agricultural production through multiple products for precision farming. The majority of enterprises generates a positive environmental impact cutting across several cleantech sectors. For example, MotionEco provides sustainable biofuel through recycling waste feedstocks, and oil leftovers tackling both waste management and renewable energies to enable sustainable mobility solutions. Similarly,

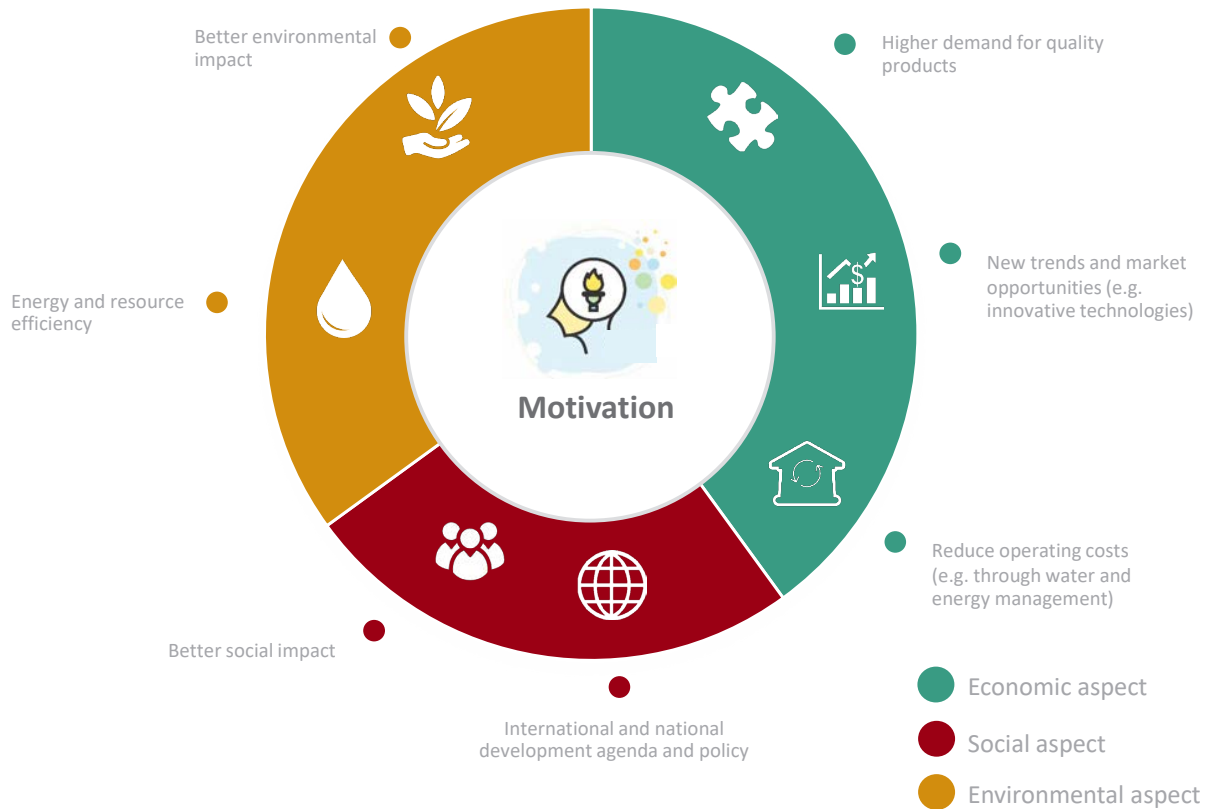


Exhibit 7: Motivation on Cleantech Financing Engagement

throughout all eight enterprises sustainable production measures are applied for production. For example, Cloth Know, providing re-usable sanitary pads pays close attention to source organic cotton only. Notably, ACMFN-enterprises thrive to offer systemic cleantech solutions and root the “green gene” deep into the enterprise’s DNA.

Based on ACMFN experience, there is a clear trend that MSMEs take up the cleantech movement and follow the boom of Chinese large-scale industrial cleantech projects.

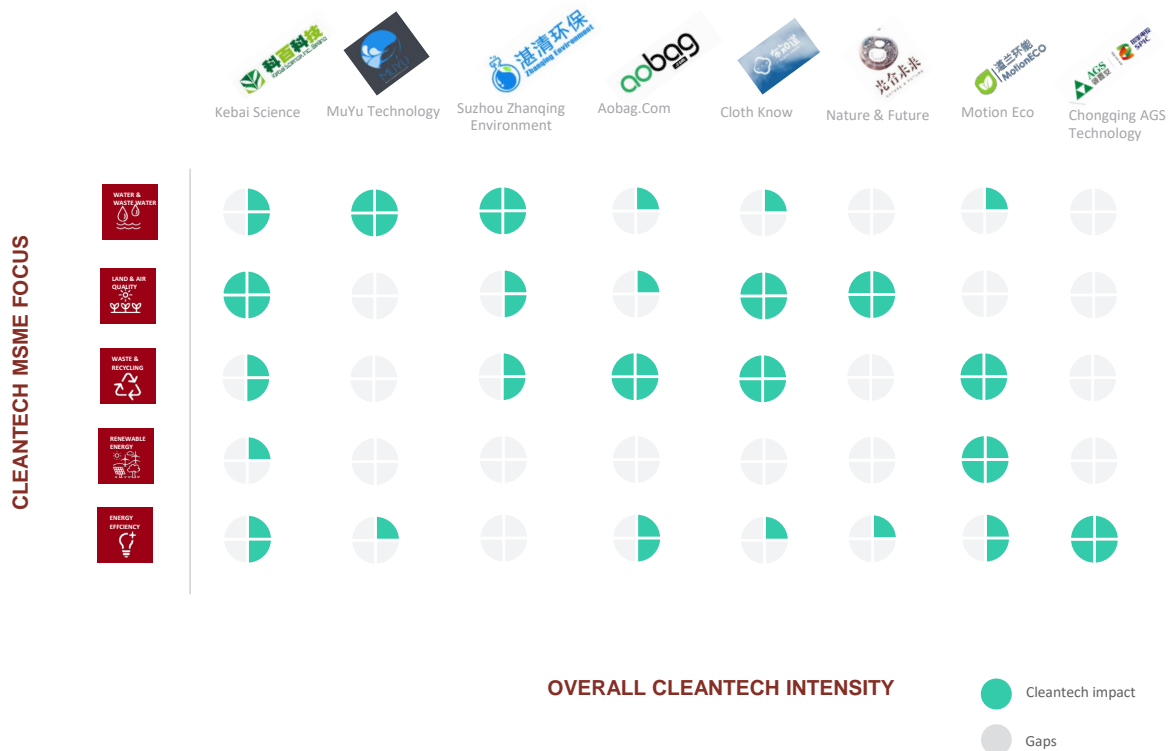


Exhibit 8: MSMEs’ cleantech intensity based on sector activity impact

2.2. Financing Cleantech: Cleantech MSME Models

Accessing finance tends to be difficult for CT and CP enterprises in different ways. Cleaner Production enterprises, who engage in cleantech to refine their existing business model, usually need to present a sound financial model and results to banks to showcase the profitability of the cleantech investment, comparable to any other investment undertaken by the enterprise. CP enterprises have the advantage of being able to start off with small self-financed cleantech initiatives such as energy optimisation or replacement of existing machinery or material. Since the business is not focused on the green sector, but has usually established itself within a conventional sector, cleantech investments can start small and gradually be increased based on available funds.

The challenge of accessing cleantech financing remains for CP enterprises due to financier's limited knowledge and trust in clean technologies.

Due to the enterprises' already established business model, they tend to have built up a financing relationship with a local bank which makes it easier for them access financing for cleantech investments. Sometimes, targeted financial instruments are available for cleantech investments such as green loans. ACMFN supports that process and eases the access to finance for CP enterprises by tackling it from the side of the banks and offering capacity building on cleantech and the development of supportive financial products.

On the side of CT enterprises, MSMEs face significant challenges accessing finance for their business and often need to find ways to self-finance their investments. Due to the low availability of financing instruments in the cleantech space, many CT enterprises that cannot self-finance their investments have to turn to conventional microloans which are usually not focused on environmental aspects and strictly profit-driven aspects.

This makes it difficult for CT enterprises to access these loans, as technology-based business models are often research and asset intensive. Especially compared to purely digital ventures, this requires a high upfront investment and leads to longer investment turnovers.

To address this challenge, the equity-based cleantech financing approach applied by **ACMFN China focuses on injecting patient capital in early-stage enterprises** through the Green Leaf Fund.

In addition to capacity building for financial institutions, ACMFN is providing direct support to cleantech MSMEs. Key support includes workshops and training session, one on one coaching, mentoring from experts, and matchmaking between MSMEs and financial institution to create more financial access opportunities to strengthen cleantech MSMEs. Many supported cleantech MSMEs have made significant progress and achieved positive impact through the program, which has allowed them to develop their new business model, upgrade their clean product, and successfully compete in the market. ACMFN facilitated the development of strong relationships which are to remain impactful beyond the project's timespan.



Patient capital for MSMEs by the impact fund Green Leaf Fund



Cleantech MSME capacity building



Financing advisory services



National matchmaking between MSMEs and financial institutions

Exhibit 9: ACMFN's Main Activities



I would like to thank ACMFN's mentors for their truthful advice. They re-visited us a few times even after the training session. Now, whenever I have issues in business, either operational or team building related, I am very open to share my worries and seek for their advice.

Suzhou Zhanjiang Environment, Clean Technology Enterprise in Beijing

2.3. Overview of Current Cleantech MSME Financing & Investment

MSME's access to cleantech financing is strongly dependent on their enterprise and investment stage. Financial institutions and investors offering MSME finance usually offer **instruments which are focused on one or more different MSME stages (seed, venture, growth, mature) and these preferences determine the ease or difficulty of accessing financing for MSMEs** with different investment needs.

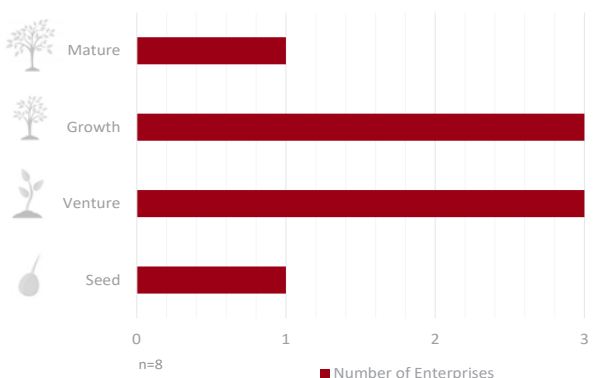


Exhibit 10: MSME's Investment Stages

ACMFN-interviewed MSMEs are mostly in the venture and growth stage and all enterprises have received cleantech funding to reach their enterprise development stage. Accessing cleantech financing, becomes easier when enterprises are already established with the major barrier to attract finance being the proof of concept. Instruments focusing on the seed stage are especially relevant because start-ups face severe difficulties financing cleantech investments in this stage. **Currently, seed-stage enterprises are largely dependent on limited grants to bridge this financing gap.** Grant financing focusing on green start-ups is also limited. An example for a common support mechanism for seed-stage enterprises in China are state-supported business incubators connected to universities. There,

early-stage enterprises such as MuYu Technology are provided with free premises to reduce their investment needs at the beginning of the venture. Due to these financing challenges, only few CT enterprises manage to pass the venture-stage and establish themselves successfully. Often, this requires a high amount of self-financing in the beginning and patience from the entrepreneur. In the case of Ke-bai Science for example, this patience paid off in 2018, when breakeven was reached ten years after the start of the business.

Once an enterprise is established and can demonstrate their sale readiness and a clear cash flow, financing tends to be easier. However, **establishing a sound business model and developing proposals which are presentable to banks and investors is one of the major challenges for start-ups in China.** Some cleantech entrepreneurs are technical experts for clean technology, with limited experiences and knowledge about business development.



Lack of capital is a typical block for those caught in the 'missing middle' with limited number of investors on early-stage green companies.

Green Startups

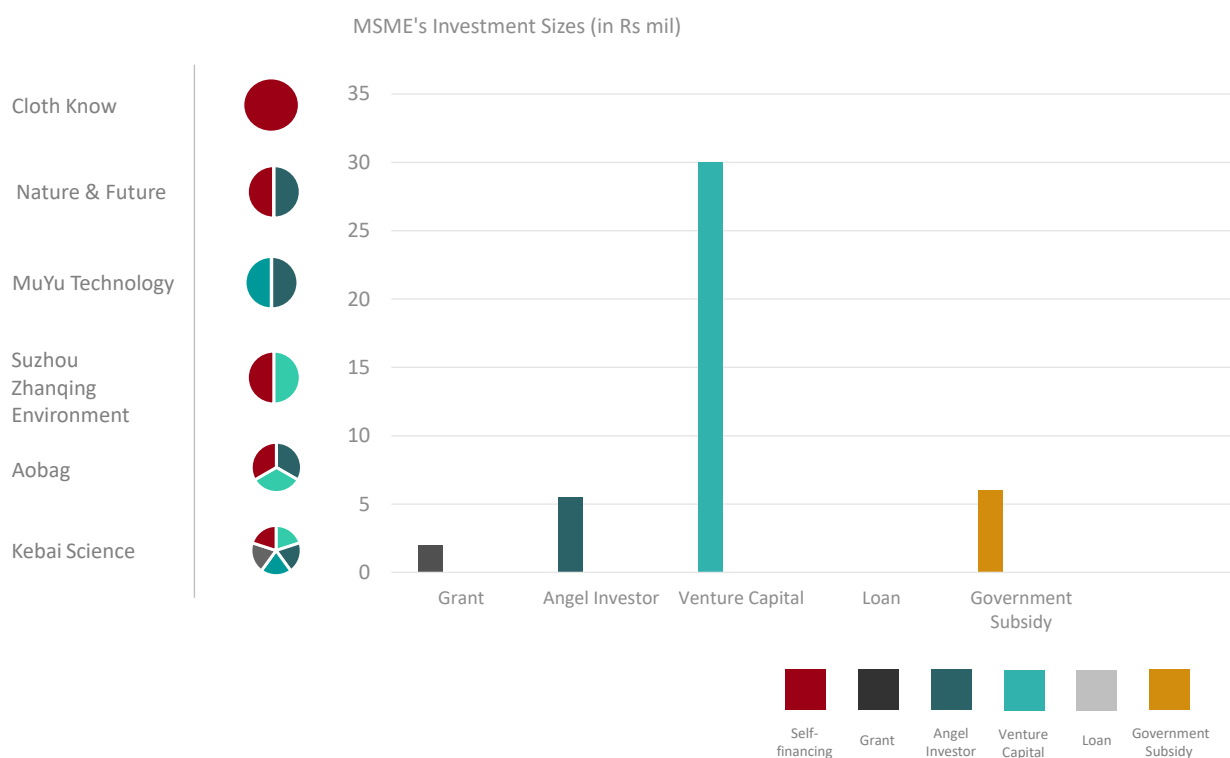


Exhibit 11: Cleantech MSMEs Investment Status

To finance their cleantech investments, MSMEs use a range of financing source including grants, loans, angel investors, venture capital, or self-financing. Some cleantech enterprises also benefit from government subsidies. The majority of enterprises included in this study have realised cleantech investments through their own means, i.e. through self-financing. Grants as one of the major funding instruments accessible for cleantech start-up mainly have a small volume of up to 2 million RMB (281,600 USD) for interviewed enterprises. Grants are therefore more suitable for enterprises in the seed stage to ignite their product prototype and business plan until they are ready to start selling their products and services. Competitions often reward the environmental impact more than traditional investor and accordingly, the majority of interviewed enterprises has joined competitions. Competition winners receive the prize money as grants mostly within the range of 50,000-100,000 USD (350,000 – 700,000 RMB). The most investment by interviewed enterprises was raised through equity, namely venture capital and angel investors. The highest investment was raised by Kebai Science, who have recently closed a Round A investment of 20 million RMB (2.81 million USD). In order to raise investment through venture capitalists, entrepreneurs have to be enduring. Interviewed enterprises disclosed that they often have to pitch to 30-40 VCs to be suc-

cessful with an investment. Investments by angel investors are typically smaller and targeted towards seed-stage enterprises. Angel investors are usually personally interested in the business, its impact or have a close connection with the business owner. **None of the interviewed enterprises have raised any debt financing yet and many have reported that this is a major difficulty for them. While many would prefer debt financing over equity, they have to fall back for equity financing.**

All in all, cleantech MSMEs in China still face significant challenges with regards to financing their cleantech products. Key stakeholders gave recommendations during ACM-FN interviews on how to address these challenges and foster innovation and application of clean technologies in China beyond the project's scope.



CHALLENGES FOR MSMEs

Access to finance for cleantech MSMEs remains difficult leading to relatively low adoption rates of clean technologies. A main barrier to attract financing for MSMEs is the competitiveness of (1) early-stage enterprises and (2) cleantech enterprises. Compared to established enterprises, early-stage ventures lack a proof of concept and investors are reluctant to invest into enterprises without a market feedback. There is an overflow of digital business model on the Chinese market, providing a difficult standpoint for cleantech enterprises. Compared to digital enterprises, clean technologies are resource intensive and returns require a longer time horizon to materialise. As the mindset of investors is still profit-rather than impact-driven, this is a major obstacle for cleantech enterprises. While MSMEs lack the track record and collateral requirements for traditional financial instruments, the amount of innovative financing is limited.



KEY RECOMMENDATIONS

Drive mindset change

Raising awareness and spreading the potential value and long term benefits of clean technologies will promote the positive benefits of cleantech investments. Though they may be more resource and asset-intensive than Internet startups, they reveal a steady and sustainable growth trajectory in the longterm.

ACMFN Recommendation: Developing business strategies and marketing for clean technologies in China

It is very important for financial institutions or investors to understand the nature of cleantech businesses in terms of their benefits and impact. The key strategy is to drive long-term financial access through improved return of investment for MSMEs to be able to access financing. In terms of marketing, the power of networking to encourage stakeholders to get information, see best practice showcasing and have a chance to learn more about the application of cleantech technologies is important, and developing a networking platform is one of the key marketing concerns that MSMEs need to make use of.





3. CLEANTECH FINANCING LANDSCAPE IN CHINA

The cleantech financing landscape in China includes many actors such as **public and private sector banks, bilateral institutions, international and national impact investors, venture capital funds, incubators** and other financial institutions, each of which have distinct motivations of engaging in cleantech financing and which offer different types of financing available to cleantech enterprises.

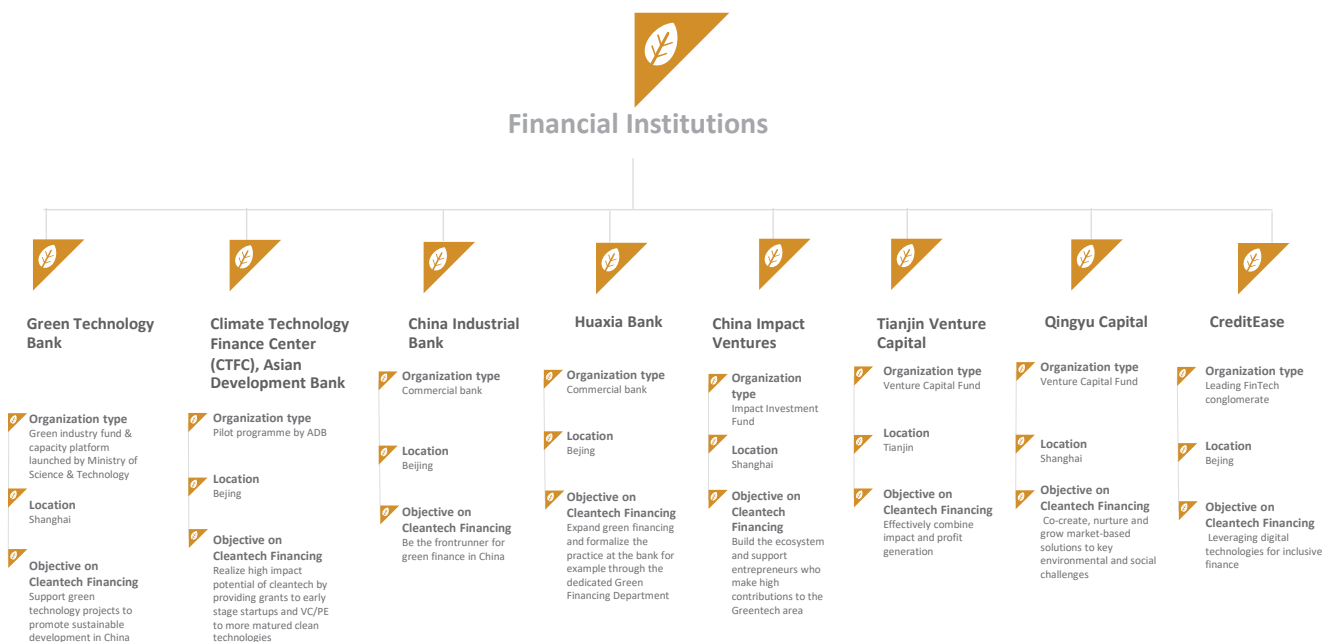


Exhibit 12: Financial Institution Portfolio

ACMFN has interviewed eight financial institutions which play a significant role in the Chinese cleantech MSME financing space. Interviewed institutions include the **Green Technology Bank, Asian Development Bank, China Industrial Bank, Huaxia Bank, China Impact Ventures, Tianjin Venture Capital, Credit Ease, and Qingyu Capital**. The Green Technology Bank is an organisation established by the Ministry of Science and Technology and the City of Shanghai to increase finance for green technology. It is administered by the Shanghai Science and Technology Exchange Centre and implemented together with multiple stakeholders such as ACCA21, the Administrative Center for China’s Agenda 21. Next to the establishment of a fund to support green projects, the Green Technology Bank serves as a technology hub and networking center to support knowledge transfer about green technologies. The Asian Development Bank is setting up the pilot programme of the Climate Technology Finance Centre (CTFC) to operate as venture capital investor and grant-giver paired with incubation support. China Industrial Bank and Huaxia Bank are commercial banks taking part in cleantech investment and broader green finance initiatives. China Impact Ventures, Tianjin Venture Capital and Qingyu Capital are important VCs supporting cleantech MSMEs in different stages. Credit Ease is a leading fintech conglomerate that focuses on financial inclu-

sion. All in all, these institutions represent the range of important actors in the cleantech MSME financing landscape with some financial institutions focusing on cleantech financing (including large-scale projects), some stemming from the MSME space and some integrating the two altogether.

Financial institutions are generally driven by economic aspects as they strive to maximise profits when it comes to investments including cleantech projects. Social and environmental motivations and its impacts are usually less considerations motivating financial institutions to engage in cleantech investment. ACMFN-interviewed institutions stated to have an interest in investing in cleantech enterprises with strong entrepreneurial investment opportunities and new market opportunities. Noting a gap between traditional investments and cleantech investments, investors are motivated to fill this gap. While some financial institutions follow the green movement as part of their portfolio, others focus exclusively on cleantech. For example, the Green Technology Bank was established with the core objective to promote financing of green technologies and Qingyu Capital is one of the limited amount of venture capitalists that focus only on environment and cleantech. Some financial institutions have niche interests based on new market opportunities linked to the cleantech sector.

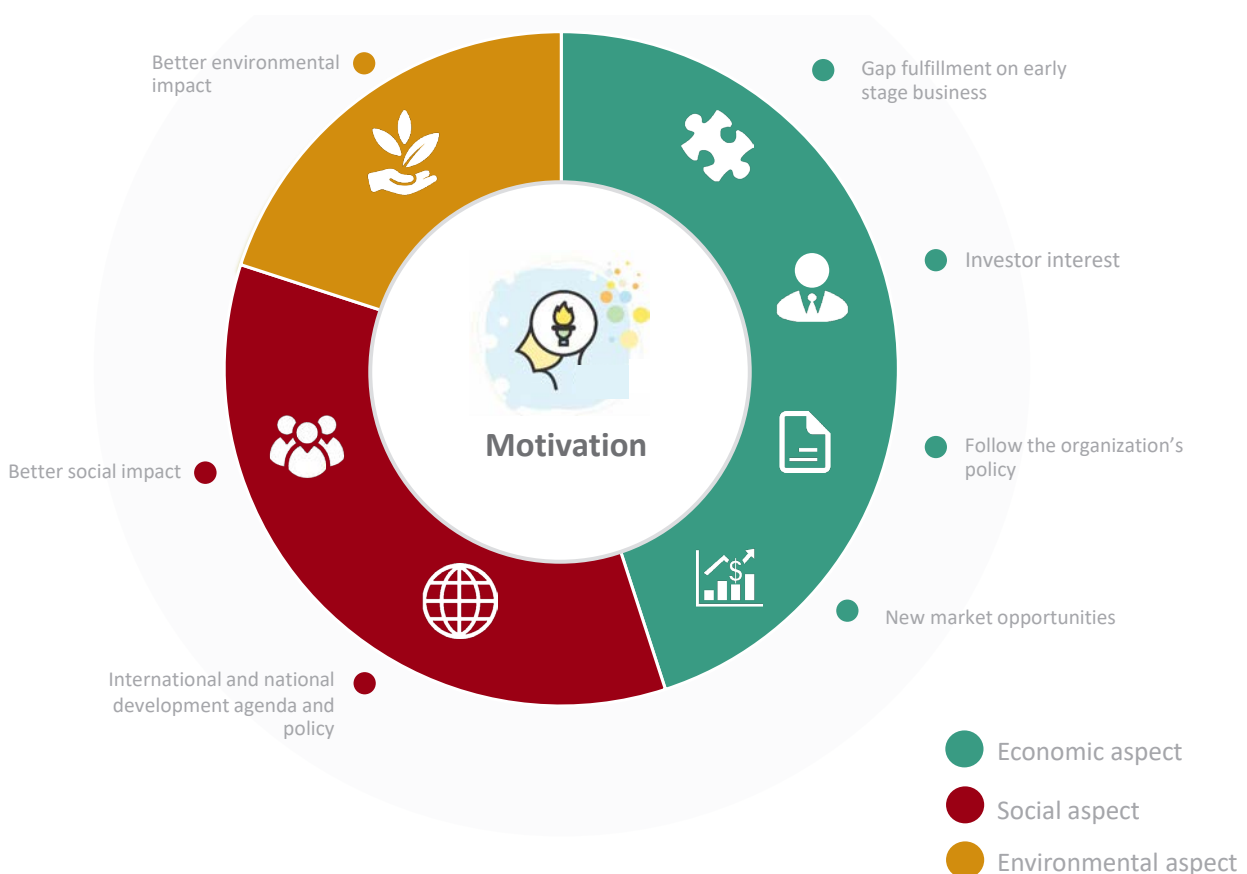


Exhibit 13: FI’s motivation on cleantech financing engagement

A strong motivation and driver expressed by the majority of interviewed financial institutions to engage in cleantech are national and international policies. The national environmental protection laws have led to boost throughout the green sector and channeling investments towards cleantech.

For Green Technology Bank, a key driver to engage in cleantech is to promote the SDGs along with national policies through integrated planning with the Administrative Centre for China's Agenda 21. Likewise, Tianjin Venture Capital consider international obligations as their driving cleantech motivation, while considering social benefits. However, most financial institutions which consider environmental and societal impact tend to equally focus on both aspects rather than one aspect alone.



Early-stage investments [is] lacking in China, [that is why we are] trying to fill the gap between entrepreneurs and the traditional capital market with low risk.

China Impact Ventures

3.1 Cleantech Financing Landscape

The Chinese cleantech financing landscape is characterised by many different players. The **Chinese banking landscape** is organised into different types of banking financial institutions – including the three **state policy banks** Agricultural Development Bank of China, the China Development Bank and Exim Bank of China, six **state-owned commercial banks** for example the Industrial and Commercial Bank of China (ICBC) and the Bank of China, and 12 **city commercial banks and joint-stock commercial banks** such as China Industrial Bank and **publicly traded commercial banks** like Huaxia Bank. Joint-stock commercial banks are known as innovators in terms of green finance and as such the China Industrial Bank was the first commercial bank in China to fully embrace green finance. As a pioneer, the **China Industrial Bank** established the first “green credit” product in China in collaboration with the International Finance Corporation (IFC) and is engaged into cleantech through China's green bond market. Next to China Industrial Bank, numerous banks like the ICBC and the Agricultural Bank of China are involved in the growing green bond market, which climbed up to a volume of USD 42.8 billion (303 billion RMB) in 2018 making it the second largest market glob-

ally. Currently, the most popular sector of China's green bond market is renewable energy, i.e. one of the cleantech sectors specifically. Other banks are also investing into green and cleantech finance. For example, **Huaxia Bank** provides MSMEs loans and cleantech financing for enterprises in collaboration with the World Bank (through a project on air pollution control) and a range of products for MSMEs to invest in renewable energy and energy efficiency. Moreover, Huaxia Bank has established a “Green Finance Department” that is dedicated to push cleantech financing, establish cleantech-related financing criteria and expand green finance capacities. However, no lending institutions have been established yet that focus explicitly on cleantech MSME investments.

China has a vibrant **venture capital** scene reaching a peak in 2018 with a total of USD 41.2 billion (292 billion RMB) invested. However, in line with the tech boom, investments concentrated on the broader technology sector, software technology, robotic and big data rather than cleantech sectors. Accordingly, many venture capital funds hold a broad portfolio and few focus explicitly on cleantech.

China Impact Venture is at the forefront of providing cleantech finance to MSMEs. Their aim is to grow market-based solutions to key environmental and social challenges by filling the gap in early-stage investments across clean energy, mobility and smart agriculture in China. With the development of ecosystem partners; multinational institutions, foundations, incubators, the academic sector and co-investors, China Impact Venture has reached cleantech investment of around 4 million USD (27 million RMB). Likewise, **Qingyu Capital** is a key player amongst cleantech-focused venture capital funds with focusing on the three sectors: environmental protection (pollution treatment, recycling, clean products), clean energy (renewable energy, electric vehicles, clean utilisation of fossil fuels), and efficiency management (energy production, transmission and use). **Tianjin Venture Capital** has a broader portfolio including mostly IT, media and technology enterprises, as well as pharmaceutical and environmental and energy enterprises with a cleantech share of approximately 20% of the portfolio.



A lot of companies are investing in cleantech, but only few have it [explicitly] in their portfolio. Out of 10,000 VC & PE companies, less than 100 have it in their portfolio.

Tianjin Venture Capital

Important players for the Chinese cleantech financing landscape are also international institutions shaping the ecosystem but also providing finance to cleantech MSMEs themselves such as the Asian Development Bank under their pilot programme CTFC to provide grants to early-stage cleantech enterprises and inject equity into more mature cleantech enterprises.



We believe that we can make bigger impact with less funds in this space, to help early-stage start-ups get through the first challenges.

*Climate Technology Finance Center (CTFC),
Pilot programme of Asian Development Bank*

The success of digital finance in China driven by major players such as Tencent and Alibaba does not halt with cleantech and MSME finance. The role of digital finance to include MSMEs in the financial system is growing immensely in China. CreditEase, growing from the first peer-to-peer (P2P) microlending platform into a fintech conglomerate is an important driver for financial inclusion of MSMEs and channelling cleantech investments not only to large-scale projects but also small-size cleantech providers. The innovative young minds working at CreditEase hold the potential to stir up the conventional banking sector and overtake risk-averse investors reluctant to invest in early-stage clean technology ventures due to their high risk potential.



Clean finance in China is usually big projects. Our approach is different.

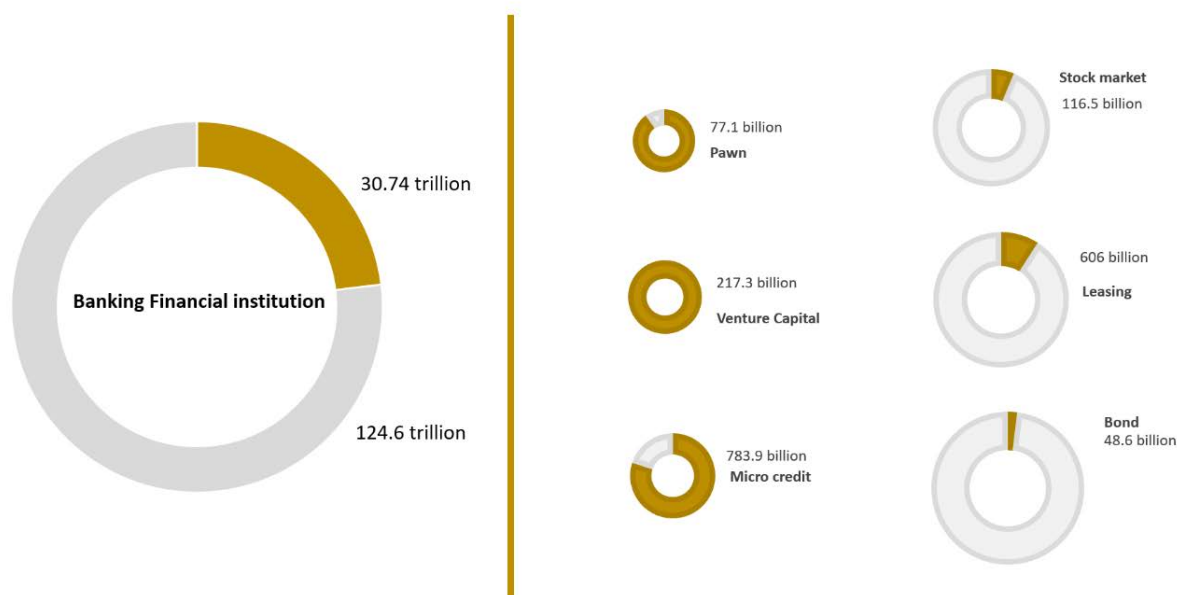
CreditEase

Next to financial institutions, the government is playing a supportive role for the cleantech financing landscape. The absence of a universal definition of “green” in green finance has led to hesitation by many financial institutions. ACMFN-interviewed financial institutions have confirmed that the lack of a clear definition is a barrier holding back the investment in green projects affecting clearly the investments in clean technologies. The government, through NDRC, has addressed this issue by developing and recently revising the “Green Industry Cata-

logue” which maps out the definition of green industries. Notably, this definition differs from European and international approaches to define green finance by including clean coal and large hydropower plants for example. An additional definition is offered by the central bank People’s Bank of China which is more aligned with European and international standards. Moreover, the government takes an active role in cleantech financing through the provision of state subsidies. For instance, in regard with energy service companies (ESCOs), which are typically small- or medium-sized enterprises providing services for energy retrofitting to energy-intensive companies, the government incentivises the “shared-savings” model. Moreover, the government initiatives supportive organisations such as the Green Technology Bank that recognise the need to combine financing and knowledge sharing about clean technologies.



3.2 Financial Instruments Snapshot



Overview of Financial Services to MSMEs in China / 2017/ RMB
based on Mintai Institute of Financing and Banking (2018)

Exhibit 14: Overview of Financial Services to MSMEs in China

MSMEs have been provided with various types of financial instruments and different volumes of funding. In 2017, according to Mintai Institute of Finance and Banking, MSMEs have received around 25% or 30.74 trillion RMB (4.3 trillion USD) of the total banking investment of 124.6 trillion RMB (17.54 trillion USD). There are six financial instruments available to MSMEs for investment purposes. The major volume of MSME investment is generated from micro credit at 783.9 billion RMB (110 billion USD), financial lease at 606 billion RMB (85 billion USD) and from Venture Capital at 217.3 billion RMB (30 billion USD) respectively. Although financial lease has the highest investment volume, the relative share of investment into MSMEs is less than 20% of the total leasing fund for all sectors. At the same time, most venture capital funds focus on investing into the MSME sector, similarly to micro credits. For stock market and bond investment, the volume directed towards the MSME sector reached up to 116.5 RMB (stock market), and 48.6 billion RMB (bonds) respectively.

Moving from general MSME investment towards specific cleantech investment, the dominant financial instruments offered by financiers in the space are venture capital, loans and bonds.

Cleantech MSMEs interviewed by ACMFN receive the majority of investment in the form of equity from venture capital funds

such as China Impact Venture, Tianjin Venture Capital and Qingyu Capital. Qingyu Capital has a total investment volume of around 3,000 million RMB (422 million USD) covering all MSME stages and cleantech sectors which achieve environmental impact. In comparison, China Impact Ventures has a smaller portfolio of enterprises with a total investment size of at 28.5 million RMB (4 million USD). Their focus is specific to early-stage enterprises and start-ups active in cleantech innovation for example. Venture capitalists analyse potential enterprises in-depth and undergo a due diligence process for each potential investee.



To analyse enterprises, we look at the following categories: 1) Technology, 2) Team, 3) Financing; i.e. if financing decision is based on the state / value of the company, if they are sustainable and if they portray confidence.

Tianjin Venture Capital

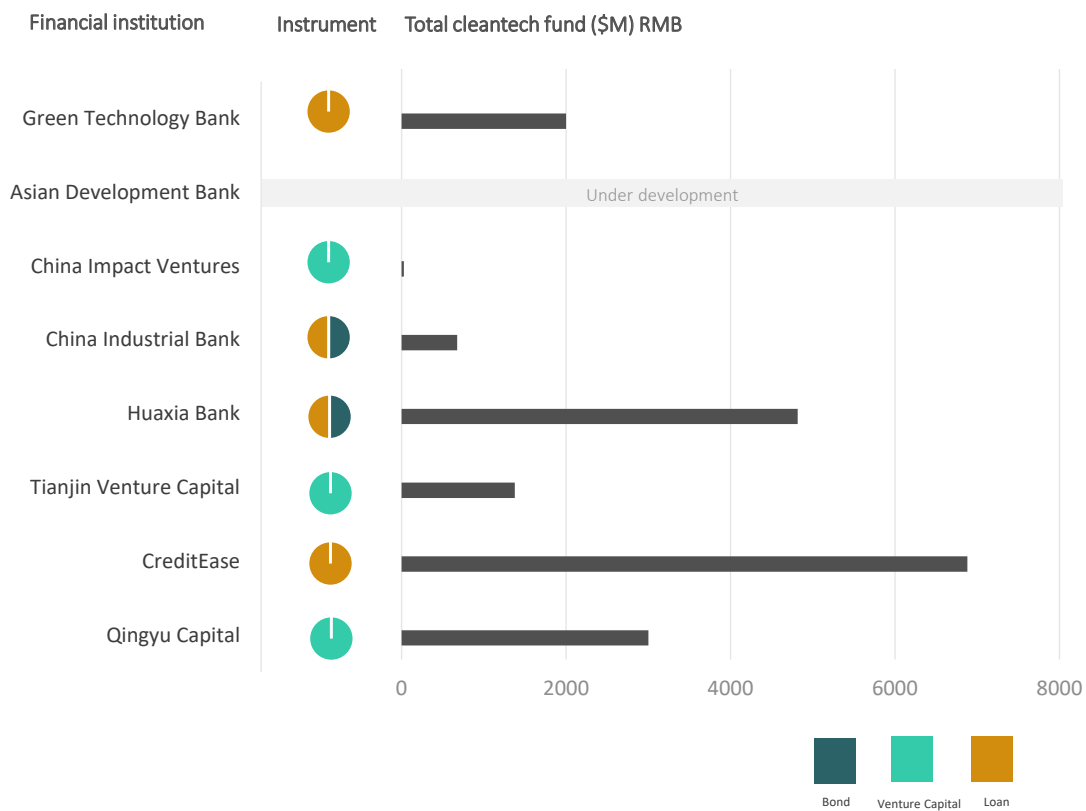


Exhibit 15: Financial Institution’s Cleantech Instruments

Commercial banking institutions such as Huaxia Bank and China Industrial Bank offer loans either for green investments or for MSMEs. Notably, there is no financial instrument in place that is targeted specifically towards cleantech MSMEs. Huaxia Bank provided 4,815 million RMB (677 million USD) so far via loans for green financing. With regards to cleantech, Huaxia emphasizes to invest in energy efficiency, renewable energy or air pollution reduction. They have set up clear investment criteria along with the World Bank’s qualification standard requiring in-depth information concerning focus region for enterprise implementation, specific proven benefits of energy efficiency, renewable energy or air pollution reduction regarding carbon emissions and energy saving and concrete emission evaluation from a third party. China Industrial Bank provides not only loans but offers the first financial green bond in China since 2016. CreditEase, representing China’s fintechs in this report has the highest investment volume of all interviewed institutions with 6,880 million RMB (968 million USD). However, their focus has been on cloud technology and big data investment. A new financing mechanism was established by the fund of the Green Technology Bank which serves as an intermediary directing funds towards mostly large-scale cleantech projects. At the

same time, multinational financial institutions such as Asian Development Bank acknowledge MSME’s financial access gap especially in early-stage access to financing. ADB’s program is currently in a development process aiming to provide direct funds to early-stage enterprises and venture capital for mature enterprises, which also benefits MSMEs in the cleantech sector.

Another example for financial instruments supported by the government is ESCO-financing which will be analysed in detail in the intermediary chapter.



There are a lot of financing mechanisms from the Central Government in place with the goal to introduce efficient technologies. We see that a lot in the green building sector [...]. Mechanisms sometimes work through subsidies, or paying less taxes for a certain period.”

3.3 Positioning Financial Institutions in Cleantech Financing Provision

Financial institutions interviewed by ACMFN have different investment focuses moving gradually from traditional investment towards integrating further specific aspects such as becoming a “cleantech financier” at the core. Investment focuses include: Traditional, MSME, impact, environmental, and cleantech financing. While most institutions are positioned as a cleantech financier, the differentiation at a granular level reveals the underlying intention to engage in cleantech financing.

The interviewed commercial banks do not actively focus on cleantech but rather on environmental financing, i.e. cleantech financing resulting rather as a “by-product” of their green finance lens. Notably, CreditEase is positioned rather as an MSME and impact investor as their cleantech engagement is more implicit at the current stage, bearing potential for scale-up.

Most venture capital funds are primarily focused on generating impact in the MSME sector while at the same time promoting a positive environmental impact through cleantech.

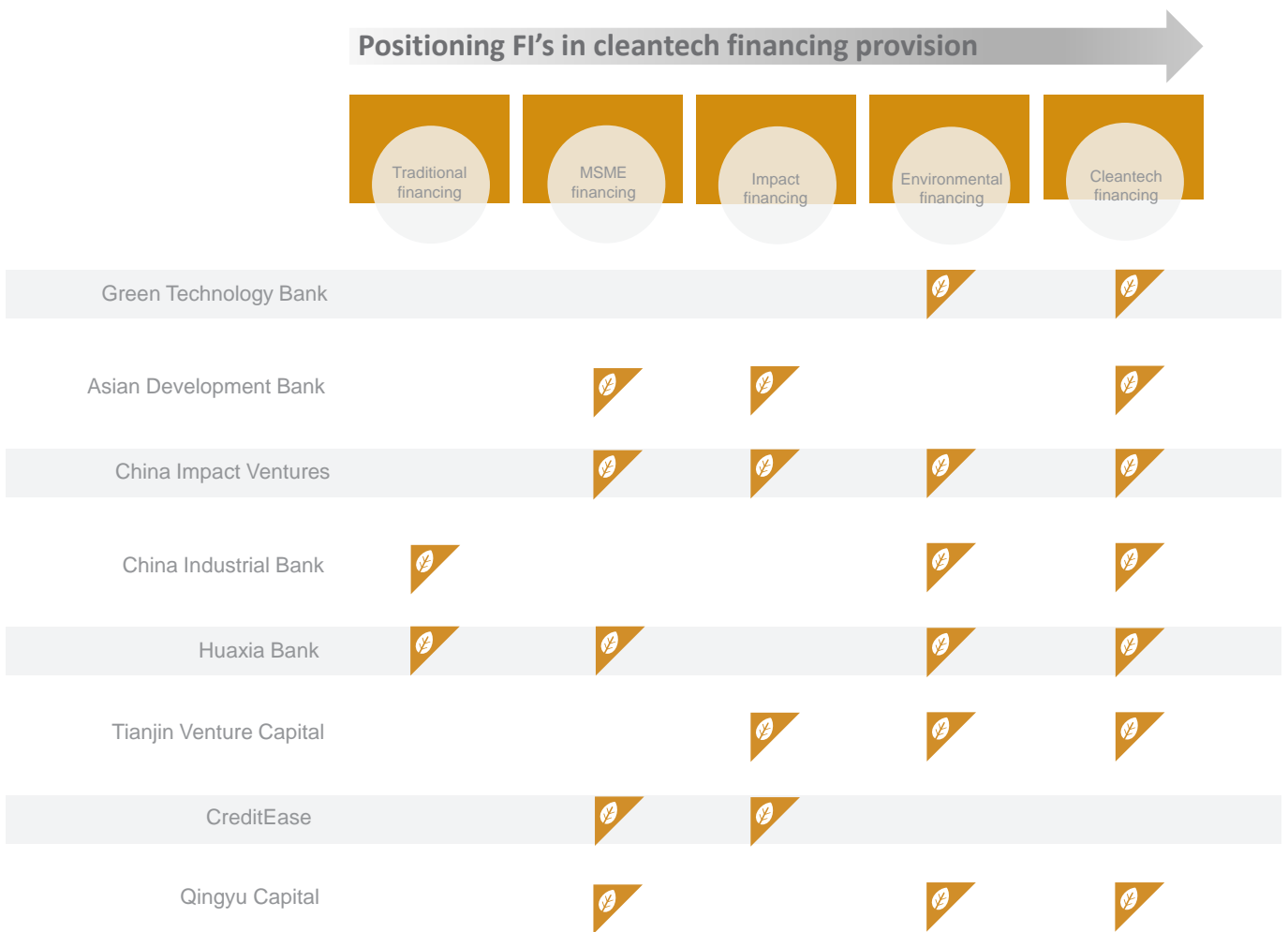


Exhibit 16: Positioning FIs in Cleantech Financing Provision

3.4 Accessing Cleantech Financing at Different Enterprise Stages

In order to measure the density of cleantech involvement, key considerations are whether the core business is related to cleantech, investment volumes and the number of instruments provided. According to interviewed ACMFN partners, Green Technology Bank, China Impact Ventures and Qingyu Capital have been considered to have the highest density in the cleantech sector. At the same time, there is still a capacity and structure gap in cleantech financing development in China. The involvement of Green Technology Bank, which offers projects on capacity building in the cleantech sector, is therefore fundamentally important. Although there are no direct investments into MSMEs through the project, cleantech MSMEs can benefit from these developments and projects. Financial institutions which offer direct financing for cleantech MSMEs are China Impact Ventures and Qingyu Capital, thereby offering cleantech enterprises more opportunities to access finance. Both venture capital providers complement each other by financing stages from early stage to venture. These two stages are considered as the most critical ones for start-up enterprises to survive and become established in the market. Therefore, this type of venture capital could help cleantech MSMEs significantly in terms of bridging the investment gap which cleantech MSMEs face.

Commercial banks also have high investment volumes and no restrictions with regards to cleantech MSMEs investment stage. Their evaluation and investment criteria approval are based on financial impact benefits and risk control, which may pose difficulties for cleantech MSME financing in the early-venture-stage. On the other hand, it is a positive sign for general cleantech investment growth since conventional investors, like commercial banks, could diversify their financial products to serve the new cleantech market. Currently, the capacity and financing readiness pushing cleantech MSME support forward are progressing.

Looking at the landscape of financial institutions involved in and relevant for cleantech MSMEs in China, significant challenges exist which reduce cleantech MSMEs' access to finance. ACMFN stakeholders with on-the-ground sector knowledge gave key recommendations during ACMFN interviews for financial institutions on how they can effectively address these challenges and boost the cleantech financing sector.



Exhibit 17: Financier Cleantech MSME Investment



CHALLENGES FOR FINANCIAL INSTITUTIONS

Despite the generally high cleantech awareness compared to other countries, investors focus rather on **quick returns, low risk and high growth investments**. Especially as early-stage enterprises bear a higher risk, investors are reluctant to invest such ventures. Instead, financiers prefer to **invest in large and often state-owned enterprises with more established technologies**. In addition to risk aversion, investors are held off by the proportionally larger transaction costs. Smaller ticket sizes still require lengthy due diligence and consulting processes and hence, large-scale projects tend to be more profitable. Financial institutions often **lack the tools to assess MSME's credit default risk** and the **technical knowledge for appraisal of clean technologies**. The competitiveness of cleantech MSMEs is further hampered by a longer time horizon for the investment to capitalise. Clean technologies are resource intensive and take a longer time than quick returns from digital ventures.

Overall, the financing of cleantech projects in the MSME sector is not yet a priority of financial institutions. Looking at the economic slowdown, the limited focus on MSMEs is not likely to change in the near future.



The risk is too high and investors don't understand the technology, so cleantech investment gets difficult.

Asian Development Bank



KEY RECOMMENDATIONS

Ensuring governmental support

An effective way to push financial institutions towards prioritising cleantech MSMEs is through governmental support. ACMFN stakeholders disclosed that a powerful way to drive change is local action on a province and city level.

ACMFN Recommendation: Capacitating the financial institutions

One approach to push for the mindset change within financial institutions to shift towards cleantech investments is to increase the cleantech capacities within financial institutions. With an increased understanding of clean technologies, the appraisal of clean technologies becomes more smooth and quicker reducing the transaction costs of cleantech MSME investments. The capacity building measures should be supported by frameworks and tools easing the process for financial institutions. Further, the establishment of cleantech financing expert groups within financial institutions like the “Green Finance Department” at Huaxia Bank ensures that newly acquired knowledge is absorbed and translated into daily operations.



The problem with green financing is that we can't accept a loss. There are no exceptions from the regulators to the banks whether you do green finance or not.

China Industrial Bank



4. CLEANTECH INTERMEDIARY LANDSCAPE IN CHINA

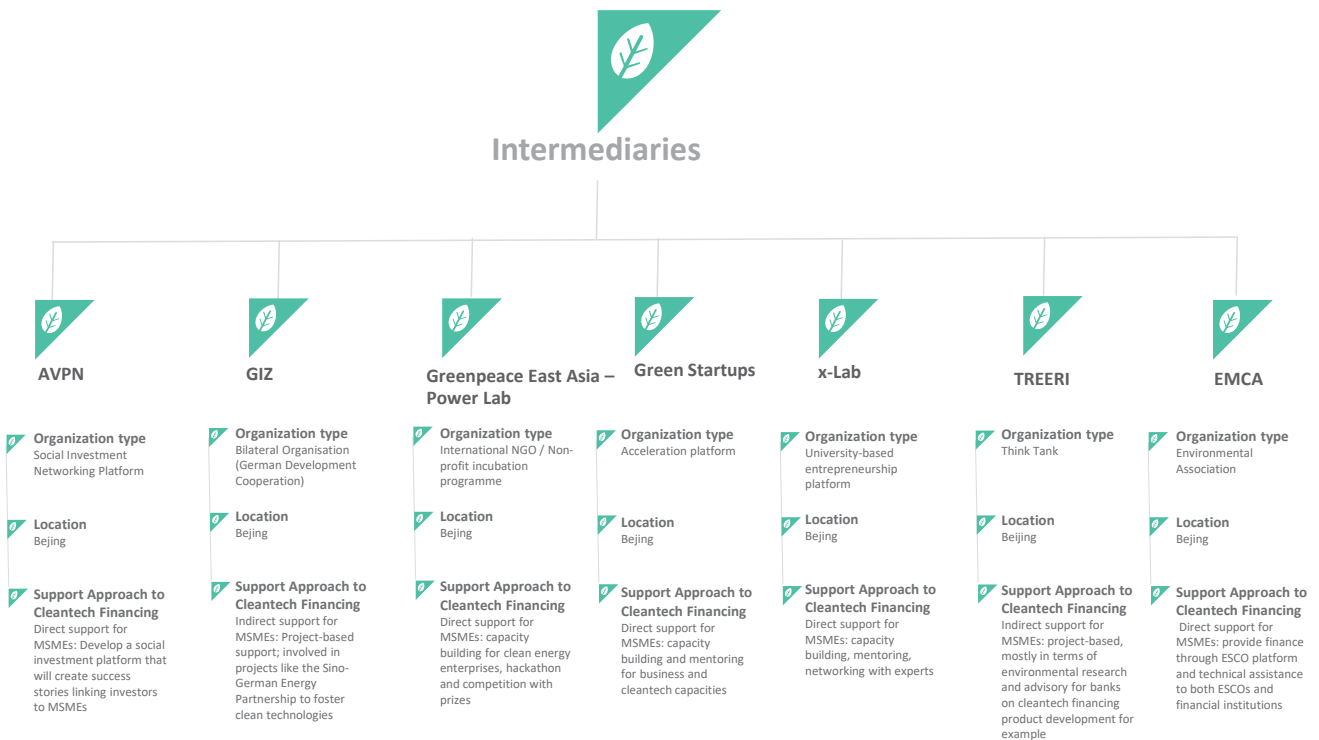


Exhibit 18: Intermediaries Portfolio

The landscape of Chinese cleantech intermediaries consists of international organisations and networks (such as GIZ and AVPN, the Asian Venture Philanthropy Network), incubators and accelerators (such as Green Startups, PowerLab by Greenpeace East Asia and Tsinghua University’s x-Lab), advisory providers (such as TREERI, the TR Energy and Environment Research Institute), as well as other governmental institutions and national associations (such as the China Energy Management Companies Association [EMCA]). All intermediaries pursue the joint-objective to establish a conducive environment for cleantech MSMEs either through directly supporting cleantech enterprises in the case of incubators for example or indirectly by providing a supportive policy framework like GIZ. To capture these different perspectives, ACMFN has selected seven intermediaries which play important roles in the Chinese cleantech MSMEs financing space for an in-depth interview.

4.1 Financing Cleantech: The Role of Intermediaries

The intermediary portfolio shows that different actors have different approaches to promote cleantech financing. Through their different activities within the cleantech space, intermediaries take up different roles to support Chinese cleantech MSMEs, such as developing business or cleantech capacity, developing dialogue & policy, supporting infrastructure, providing direct financing, facilitating deals, developing the cleantech community, research support and matching stakeholders. Intermediary organisations may take up a set of these roles through their different activities for cleantech MSMEs.

Looking at ACMFN-interviewed intermediaries in detail, their approach on MSME cleantech financing support varies. It becomes clear that the approach is closely tied to the type of or-

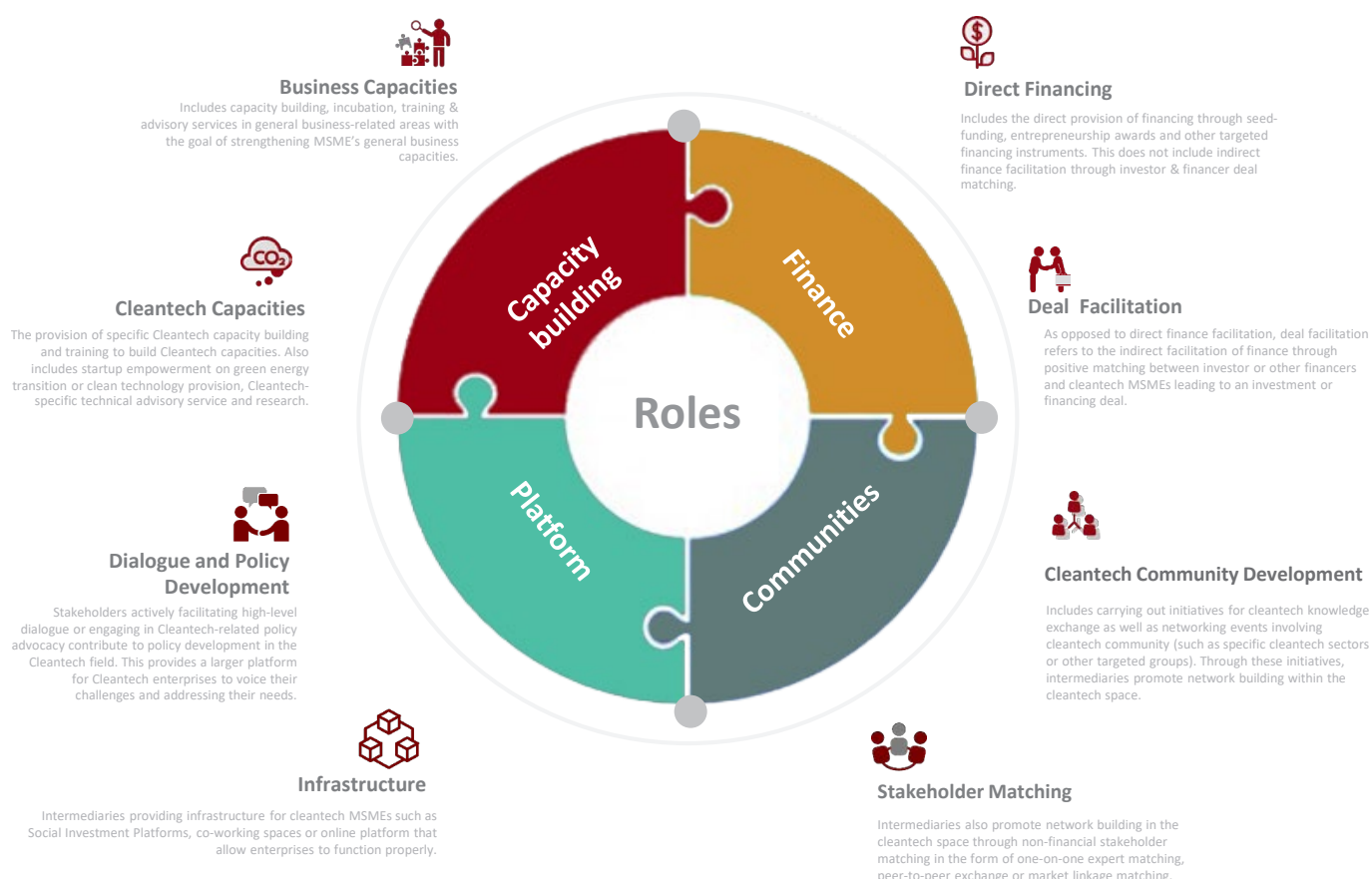


Exhibit 19: Roles of Intermediaries

ganisation. As such, incubators and accelerators including Green Startups, Power Lab by Greenpeace East Asia and Tsinghua x-Lab, but also the association EMCA focus on direct support for cleantech MSMEs through capacity building in terms of business skills and cleantech skills. International organisations and associations like GIZ and AVPN, as well as research institutes such as TREERI indirectly support cleantech MSMEs through dialogue and policy development, research and cleantech community building to enhance a supportive ecosystem for cleantech MSMEs to flourish. Thereby, the intermediaries tackle also challenges related to other actors such as policymakers or financial institutions. For example, TREERI provides advisory for financial institutions on the development of new financial instruments. It is noteworthy, that the local AC-MFN implementer Green Startups covers nearly all categories, even direct financing.



x-Lab provides capacity building and investor matchmaking for university students and aspiring entrepreneurs who are in a very early-stage idea development, in order to help them realize their projects and become entrepreneurs.

x-Lab



CEOs [of cleantech enterprises often] have a technology background. They know little about other things, so we implement capacity building trainings every month.

EMCA

APPROACH

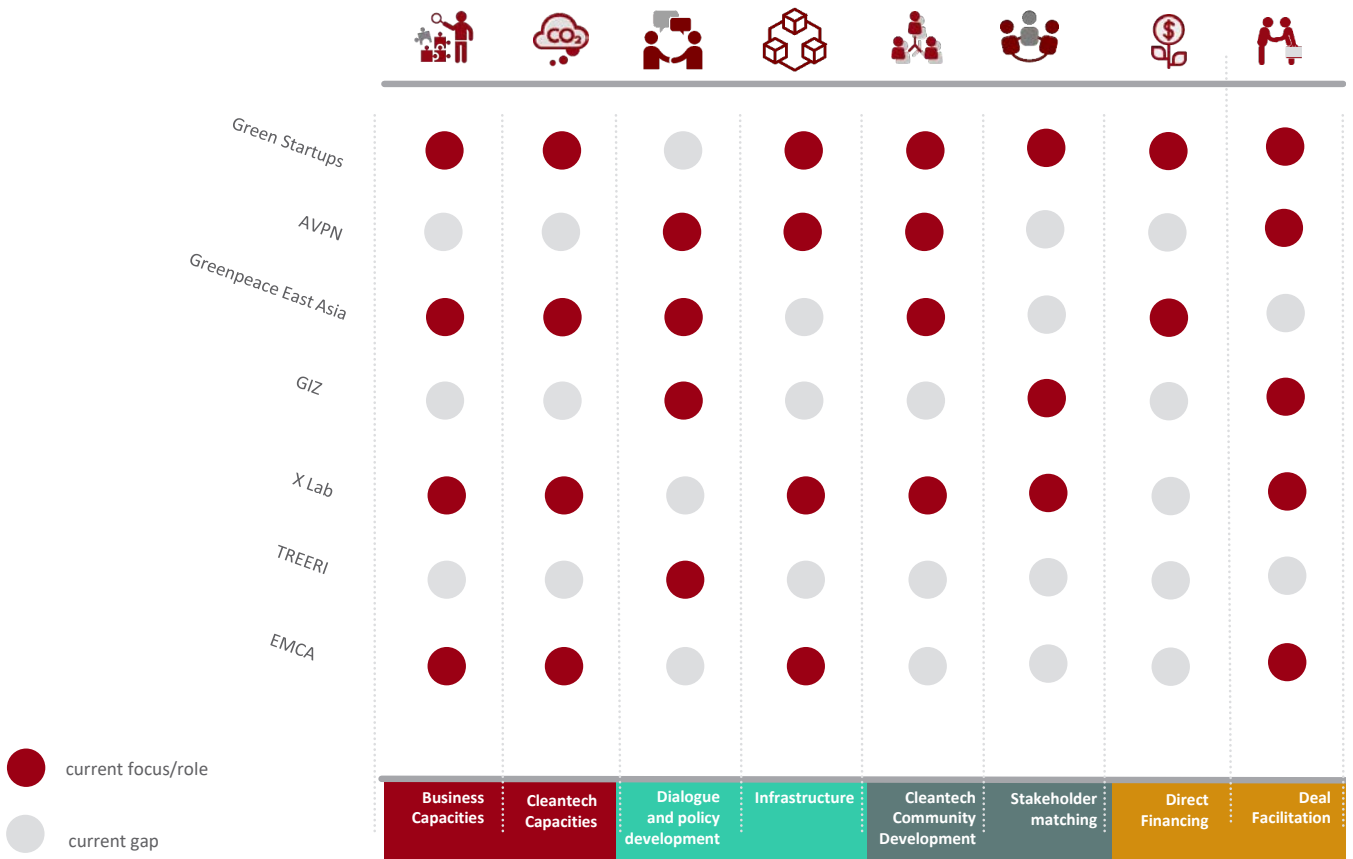


Exhibit 20: Intermediaries Role

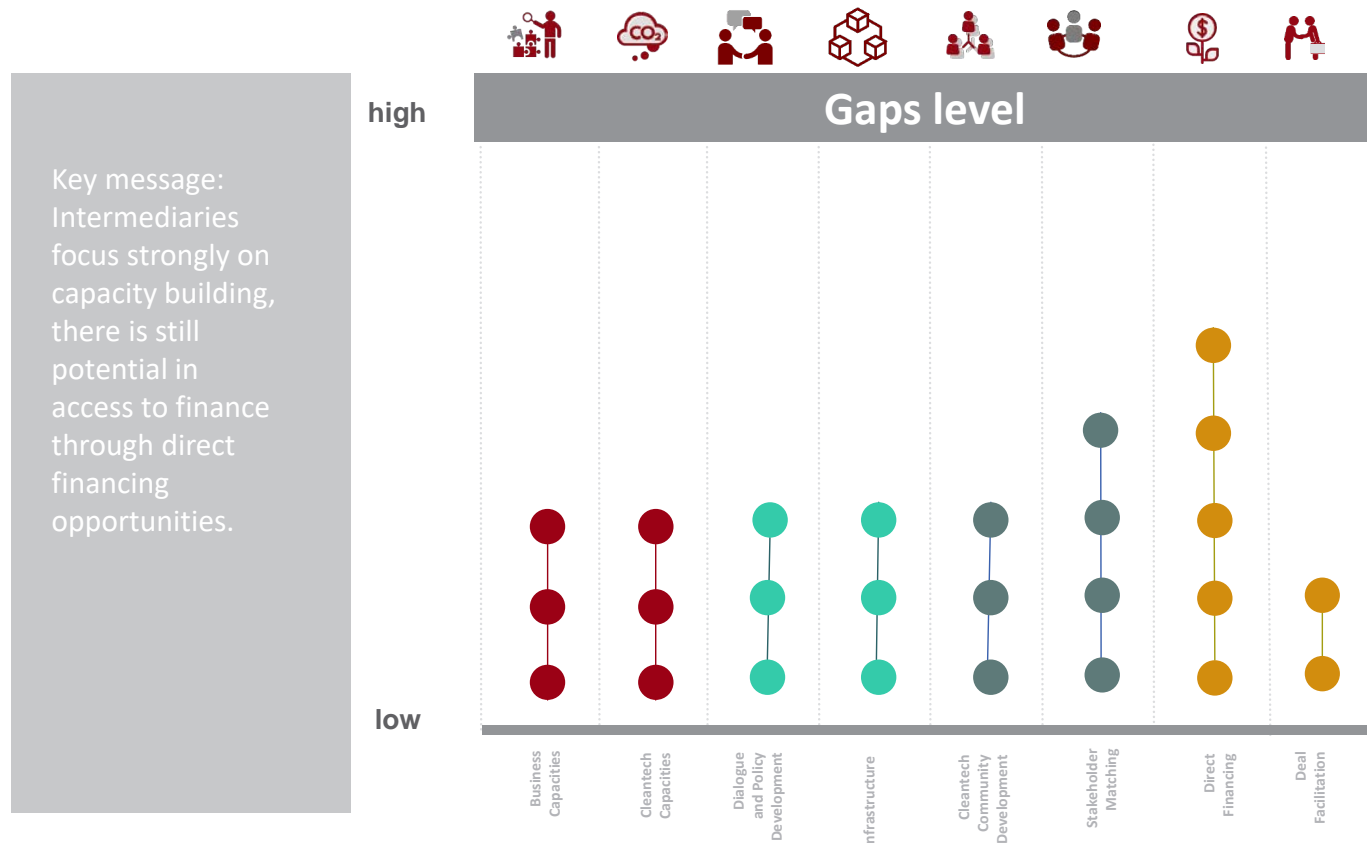


Exhibit 21: Intermediaries Gaps

The current intermediary landscape shows a balanced division of support gaps. This underlines the fact that the approach to cleantech MSME financing support can be divided into two domains: (1) intermediaries working directly with MSMEs and (2) intermediaries focusing on the ecosystem. Thereby, the shortcomings of one group are evened out by the other and vice versa. A significant gap can be seen in the direct support services for MSMEs to access finance. While deal facilitation is strong and pursued by the majority of intermediaries, the direct financing component falls short. Especially many incubators and association facilitate the connection between cleantech enterprises and financial institution, but have not established financing mechanisms affiliated with incubation.

A way forward to connect capacity building and direct financing is drawn up by Greenpeace, which integrates a competition into their incubation programme Power Lab providing seed-funding for at least a small part of enterprise’s operations.

Another opportunity is the co-investment fund by Green Start-ups. Moreover, the stakeholder matching is a gap within the intermediary landscape. This suggests that there is further potential for all actors to work closely together. Especially close

linkages between direct and indirect enterprise supporters are crucial to ensure an effective support for cleantech MSMEs to access finance. Greenpeace mentioned that entrepreneurs do not only require cleantech knowledge but also market knowledge. Accordingly, an interesting opportunity for matchmaking with stakeholders and networking events would be to increase exposure to market experts and potential clients.



All universities have their innovation center to encourage entrepreneurs, but there is a gap between what happens on the campus and what happens outside. People are deep into the technology side but don't know much about the market needs.

Power Lab, Greenpeace East Asia

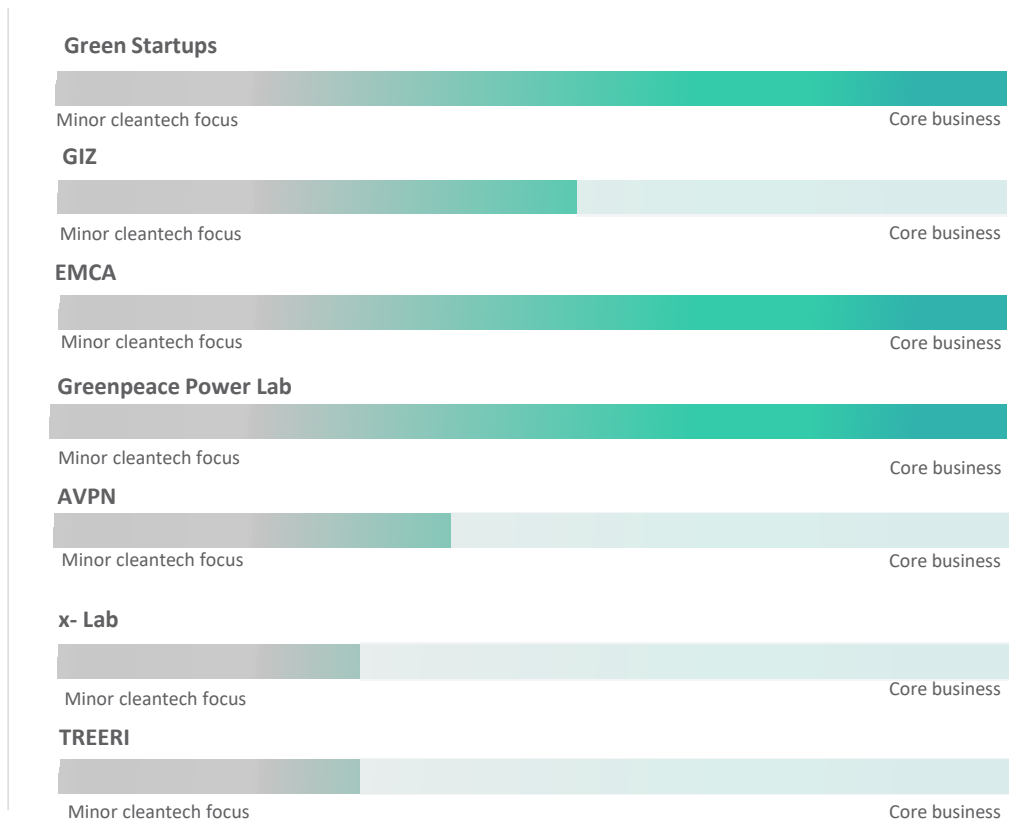


Exhibit 22: Intermediaries’ Focus Intensity on Cleantech Support

Despite the gaps in support areas such as direct financing provision and stakeholder matching, for most intermediaries, cleantech support plays a significant role within their service portfolio, though at a varying intensity. The intermediaries’ focus intensity on cleantech support is analysed by looking at the service portfolio, but also the strength of their influence in the cleantech space. Although not all intermediaries exclusively focus on cleantech support, some are still influential players in the cleantech ecosystem contributing to the development of cleantech MSMEs and particularly their access to finance.

For example, some intermediaries have a clear focus on cleantech as their core business. As such, Green Startups focuses on clean technologies across sectors. EMCA is active exclusively in the energy efficiency sector and Greenpeace’s Power Lab focuses on clean energy enterprises. Power lab’s focus on clean energy incubation is needs-driven. They analysed that a lot of commercial providers look at cleantech, but only 20% are for clean energy.



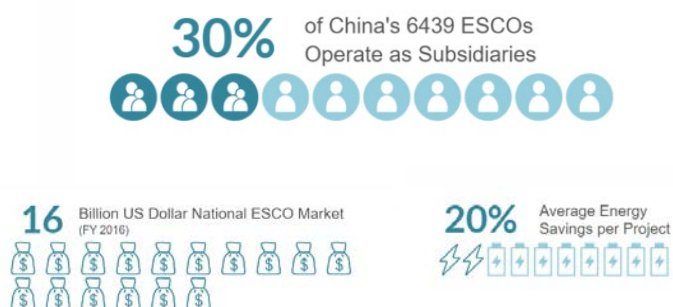
4.2. Financing Cleantech: Intermediary Models

Since financial institutions have been lagging behind in providing financing instruments suitable for cleantech MSMEs, alternative models promoted by intermediaries such as Energy Service Companies (ESCOs), academic institution likes Tsinghua University and the co-investment platform by Green Startups have become proven ways of providing access to cleantech financing. Three intermediary models, the ESCO model the TusPark cluster model by Tsinghua University and the co-investment fund by Green Startups are presented below to highlight alternative ways of raising access to finance for cleantech MSMEs.

Energy Service Company (ESCO) Model

SHOWCASING 

“ An ESCO is a company providing a broad range of energy solutions including the design and implementation of energy savings projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management ”



Key benefits of the model




-  Provides both technical and financial solutions for energy efficiency implementation
-  Finances or assists in arranging financing for energy solutions
-  Guarantees energy savings

Exhibit 23: ESCO Model At-a-Glance

ESCO Model

Energy Service Companies (ESCOs) have become popular financing vehicles across Asia, especially in China. An ESCO is a company providing a broad range of energy solutions including the design and implementation of energy savings projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management.

The newly formed Asia-Pacific ESCO Industry Alliance declared that an estimated 60% of the US\$ 26.8 billion global ESCO market is situated in Asia. Among Asian countries, China has the biggest ESCO market with a total size of US\$ 16 billion (2016 est.) with 6000 ESCOs in total, according to EMCA which is steering the ESCO market in China. **ESCOs are important actors in providing both technical and financial solutions for energy efficiency implementation.** The model provides many benefits to financing cleantech in the country. An energy performance contract undertaken by an ESCO could in-

clude guarantees of energy savings or the provision of the same level of energy service at a lower cost with its remuneration directly linked to the energy savings achieved. The ESCO can either finance or assist in arranging financing under a shared savings or guaranteed savings model. The ESCO model is a best practice example for a collaborative model than encourages the cleantech movement amongst energy efficiency MSMEs. As the interview partner EMCA points out: “Among ESCOs there is rather cooperation than competition for projects.”

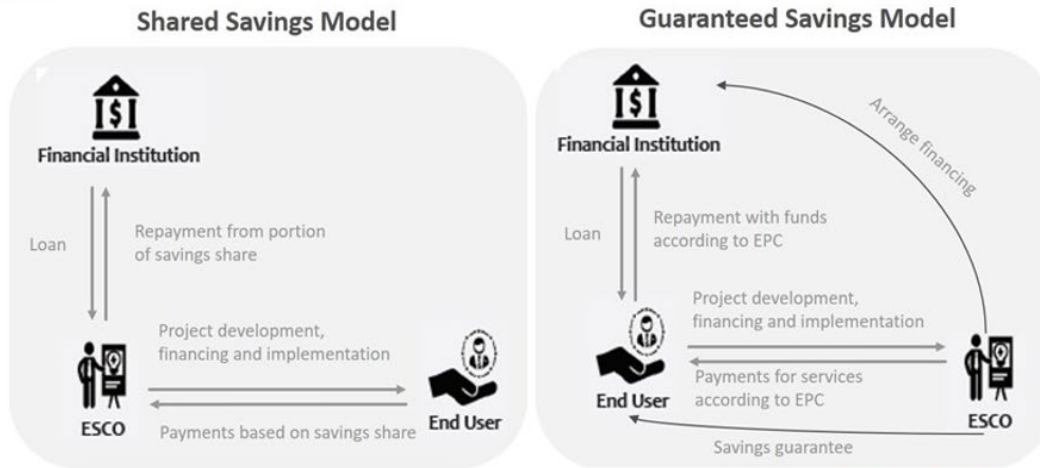


In energy saving, the obstacles are how to make money and how to get verification for energy saving.

Energy Service Company (ESCO) Model

SHOWCASING 

Approach



Source: The World Bank (2008). *Financing Energy Efficiency – Lessons from Brazil, China, India and Beyond*. <https://openknowledge.worldbank.org/handle/10986/6349>

Exhibit 24: ESCO Model Approach





“

TusPark is the key platform for organically extending the social function of Tsinghua University and transferring technological achievements in university. As a mission, it wishes to become “a stage of innovation & entrepreneurship, a way to opportunities & success and a bridge between technology and economy.”

”

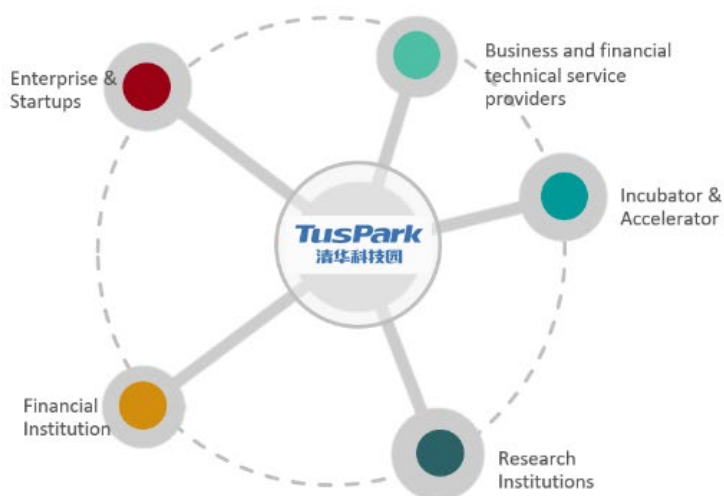


Exhibit 25: TusPark Cluster Model

TusPark Cluster Model

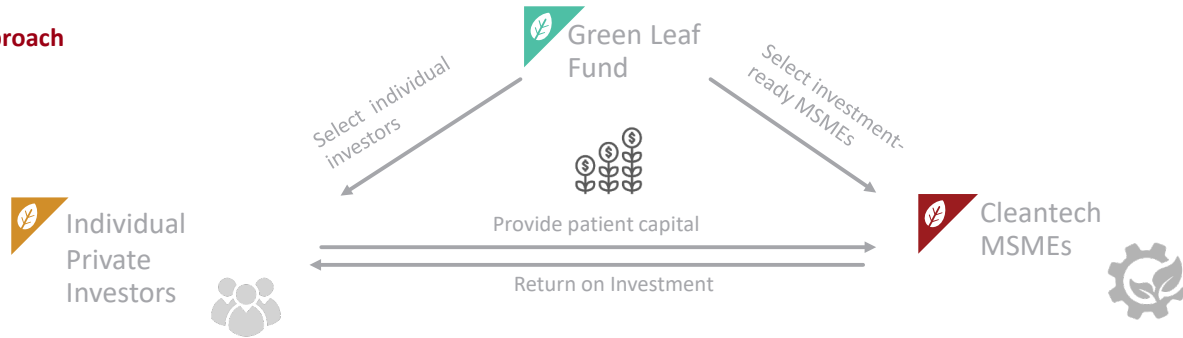
TusPark is a platform and innovation cluster which supports cleantech enterprises by integrate all stakeholders involved in cleantech enterprise development into the cluster and thereby generating an active cleantech MSME ecosystem. It aims to extend Tsinghua University's social impact and to transfer technological achievements by bridging technology and the economy. Inside a 770,000 m² building area in Zhongguancun National Innovation Demonstration Zone, TusPark gathers over 1,000 technological enterprises and both local and multinational R&D institutions as well as innovative startups, intermediaries, and representatives of financial institutions. The TusPark hub was

created to support innovative enterprises to access financing and their markets. TusPark also provides various services to help enterprises develop and grow strongly. They offer financial services, venture capital, talent service, training, policy advice, and other intermediary services to drive technological innovation and market expansion through the platform. The TusPark cluster is an example for an intermediary model which offers a complete innovation service portfolio in order to effectively support and incubate cleantech enterprises in the industry.

Impact Fund: Green Leaf Fund

SHOWCASING 

Approach



Key benefits of the model



Provides direct financing for investment-ready MSMEs



Long-term investment to allow environmental impact to unfold



Reduced risks for investors due to careful selection on MSMEs

"The environment is hard. Many investors want quick returns and growth. That is hard to achieve for a hardware company."

MuYu Technology, Clean Technology Enterprise in Beijing

Exhibit 26: Green Leaf Fund

Impact Fund: Green Leaf Fund

The Green Leaf Fund established by Green Startups under ACMFN is the first impact fund in China to exclusively invest in green startups. It addresses the need of the Chinese cleantech MSME ecosystem for patient capital for startups. As resource and asset-intensive enterprises, cleantech MSMEs require a high initial investment with a longer time horizon until returns materialise. With the Green Leaf Fund, Green Startups builds a co-investment platform that serves as an intermediary by gathering selected individual private investors, who are ready to provide patient capital for cleantech MSMEs and selected high-potential cleantech MSMEs. MSMEs have typically undergone the acceleration support by Green Startups to become investment-ready.

Green Startups therefore has accompanied the enterprises throughout the support phase and developed a deep understanding of the enterprise and especially their technology which can be leveraged to select high potential enterprises. The Green Leaf Fund then invest the "best breeds" selected from the accelerated startups and invite other investors to co-invest.

This in turn reduces the risks for investors and increases trust in the investment, building a trustworthy pipeline of investment-ready and promising enterprises. This approach highlights a best-practice example on how intermediaries can facilitate direct investment into MSMEs in a highly effective way.



CHALLENGES FOR INTERMEDIARIES

Cleantech-focused intermediation

While there are more than 8,000 incubators and accelerators, including co-creation and co-working spaces, active in China, only few focus on cleantech specifically. As cleantech MSMEs often lack business capacities, financial institutions often lack a technical understanding of clean technologies. Intermediaries need to connect the dots between the two camps which becomes difficult if intermediaries themselves lack an understanding about the specifics of cleantech business models.

Mindset lacking behind

Mindset and knowledge gaps of supporting actors such as the government and financial institutions towards cleantech businesses are a major challenge for intermediaries. While intermediaries are focusing on cleantech, they may struggle to find investors that focus on cleantech as well, as brought forward by x-Lab. This hinders the intermediaries' opportunities for deal facilitation and stakeholder matching, if financial institution's mindset is not yet ready for cleantech investments. At the same time, the cleantech MSME sector is struggling under the economic situation, making a mindset change even more difficult at the moment.



KEY RECOMMENDATIONS

Broad-based capacity building for enterprises and the financial sector and mindset change

To address these challenges, capacity building to close the existing gaps for both cleantech enterprises and supporting actors like the government and financial institutions is needed to develop knowledge exchange and platforms in order to leverage cleantech knowledge and business capacities. Intermediaries have the potential to assist startups in getting a better sense of market needs and in improving their business model. At the same time, knowledge exchange platforms would help to increase stakeholder's understanding of cleantech businesses and make knowledge available to a wider audience.

Extension of the cluster model

Investments into ecosystem building are crucial to create demand for cleantech products in China. To effectively continue to build the ecosystem, the creation and development of a partnership and sharing platform is important to assist stakeholders in understanding technologies and implementation procedures. An example for such an initiative is the TusPark cluster. This model should be extended to other locations in order to reach more local cleantech enterprises and stakeholders and promote the flow of information about clean technology products and services.

ACMFN Recommendation: Leverage the expertise of cleantech-focused intermediaries

Cleantech-focused intermediaries are needed to bridge the gap between the knowledge of MSMEs and financial institutions. As the middle-man between enterprises and investors, intermediaries are closely involved with both sides and their potential to connect the two sides needs to be emphasised stronger. Thereby, especially the cleantech expertise of cleantech-focused intermediaries needs to be leveraged to fill the gaps of technological understanding on the side of financial intermediaries. Innovative mechanisms such as the co-investment platform Green Leaf Fund need to be developed.



The sector is facing difficulties in supporting entrepreneurs due to the economic situation.

Greenpeace East Asia



The struggle is finding venture capital funds that focus on cleantech.

x-Lab



5. CLEANTECH FINANCING CHALLENGES, TRENDS & RECOMMENDATIONS

After zooming into the different landscapes of MSMEs, financial institutions and intermediaries, it is time for a resume: How cleantech financing ready is China? From the status quo in relation to current sector trends, future developments as well as recommendations are given to set the stage for continuous joint ambitions pushing for the development of cleantech MSMEs in China.

The financing readiness of the three ecosystem level (MSMEs, financial institutions, intermediaries) shows that many opportunities exist for the development of the Chinese cleantech sector.

- **MSMEs:** Clean technologies are widely available in China across all CT sectors. Notably, the CT sectors energy efficiency and renewable energy are particularly strong as they are in the focus of the government's interest. While innovative technical solutions are ready, the potential to reach scale of CT enterprises is lacking behind due to cleantech MSMEs' difficulties to mobilise funding. On the one hand, MSMEs are faced with high competition for early-stage funding from high-potential digital ventures which promise quick returns. On the other hand, cleantech enterprises compete with other cleantech projects, which are typically large-scale and thus more interesting for investors.
- **Financial institutions:** Cleantech financing is dominated by large-scale investments such large solar parks or wind farms for example. Targeted instruments for cleantech MSMEs however are lacking behind. This stems from a limited understanding of clean technologies and related investment requirements such as the need for patient capital based on longer time horizons and high capital needs for technology solutions. Financial institutions struggle with the financing needs of high-risk early ventures especially if they cannot present a cash flow record yet. A strong bias towards equity funding becomes apparent, as the vibrant venture capital scene in China opens up more opportunities for cleantech MSMEs than conventional banks making the access to debt financing even more difficult for CT enterprises.
- **Intermediaries:** There is a need to bridge the gap between knowledge gaps within enterprises in terms of

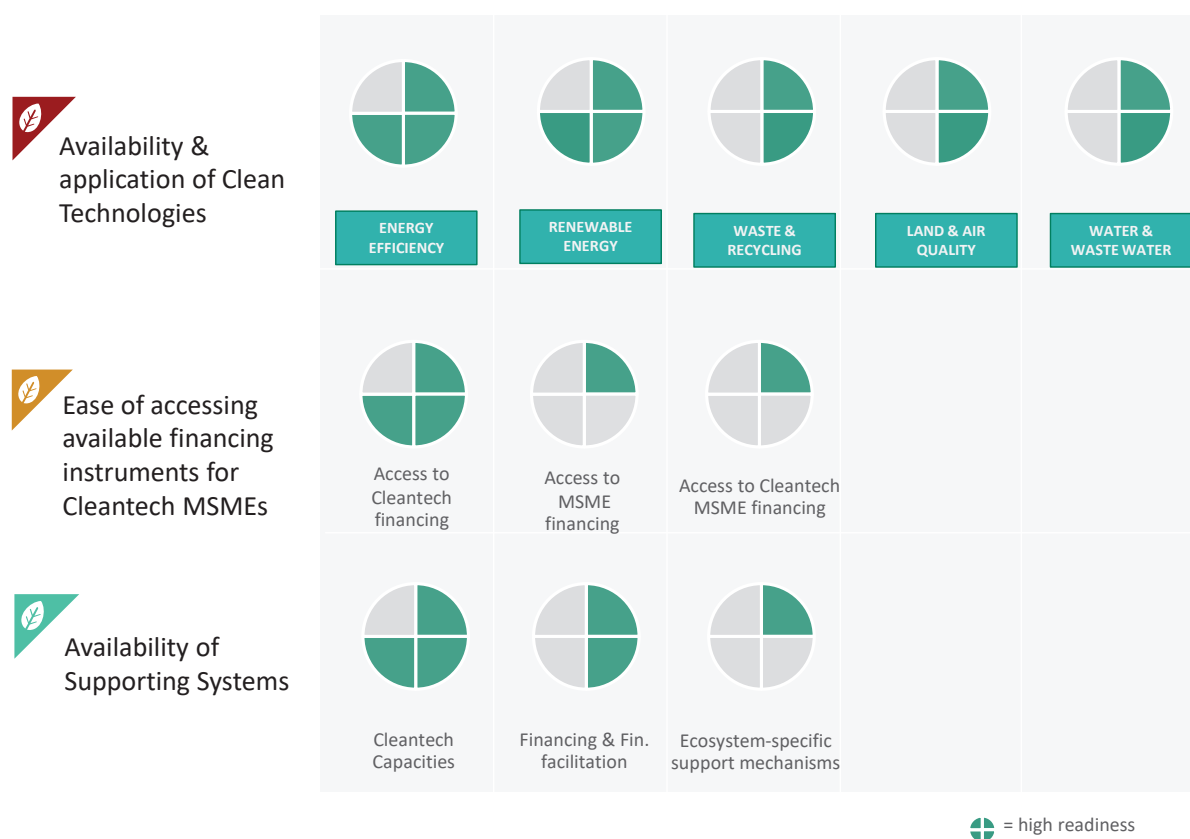


Exhibit 27: ACMFN China Cleantech Financing Readiness

business capacities and within financial institutions in terms of cleantech capacities. While opportunities to strengthen each business and cleantech capacities both directly with enterprises and within the broader ecosystem exist, there are few intermediaries which focus on both. Especially cleantech-focused intermediaries and their simultaneous expertise from both sides is needed however to bridge the gap between enterprises and financial institutions. Moreover, innovative intermediary models are needed to address ecosystem-specific challenges. Collaborative approaches such as the cluster model and investment platforms that recognize the specific needs of Chinese CT MSMEs for patient capital need to be scaled.



Investors are very impatient: the direction of start-ups is sometimes promising, and investors want to get into it, but start-ups may not have their first customers yet so investors are not sure whether to invest in them.

Greenpeace East Asia

5.1 Challenges in the Chinese cleantech MSME ecosystem

Cleantech enterprises in China still face structural challenges at the ecosystem level that hinder to reach scale and unlock their full potential for the transition to a low-carbon economy.



There is a lack of the supporting system for green startups despite the government's call for popular entrepreneurship and mass innovation.

Green Startups

An overarching challenge for the ecosystem is the **lack of awareness about cleantech and the mindset connected to MSMEs**. While the general awareness for cleantech in China is relatively high compared to other project countries, in relation to MSMEs, there is a lack of financial instruments and in a lack of demand for cleantech solutions

from consumers. According to an interview with AVPN, “Chinese mainstream investors are not yet ready for social investment [including cleantech], which is why cleantech enterprises have been focusing on accessing investment internationally”. Underpinning this statement, ACMFN-supported enterprise Ke-bai Science for example has started to sell abroad before selling in China. On the demand-side, in addition to limited cleantech awareness from consumers, the demand from enterprises to apply clean technologies and become a cleaner production enterprise is limited and benefits from CT application remain yet to be mainstreamed.



What matters are our buyers: if they care about environmental aspects and if they have the means to pay for it.

Muyu Technology, CT enterprise based in Beijing

The collaboration across the MSME cleantech community needs to be strengthened. The cleantech community and the startup community, which are both vibrant in itself, need to work more closely together and align the capacities both from an enterprise support and cleantech lense for all actors (MSMEs, intermediaries and financial institutions) by joint platforms and knowledge exchange formats. Importantly, the community needs to stress not only cross-actor collaboration but also collaboration between enterprises to strengthen cleantech value chains. Accordingly, CT providers and conventional enterprises need to be connected to encourage such enterprises to become cleaner production enterprises. **The definition of green or clean technology is still unclear and the concept often misinterpreted**, causing distrust in the sector as the definition of “green” is still a problem both internationally and in China. A clear and universal definition of green finance is needed to steer more funding towards cleantech MSMEs. Currently, this challenge is being addressed by the newly updated “Green Industry Catalogue 2019”. While the definition of green is becoming more clear, the role of MSMEs needs to be specified. **Insufficient skills and technical knowledge about clean technology restrain financiers in evaluating cleantech financing projects.** Moreover, MSMEs also have limited market or technical knowledge and skills which are necessary for scaling up their business. Ultimately, this considerably affects MSMEs access to finance.

While there is a wide range of supportive policies for cleantech in place and more recently a clear commitment for entrepreneurship support from the government, the intertwined role of cleantech MSMEs needs yet to be recognised at a large scale and be supported by targeted policies.

More government-supported innovative financing mechanisms for cleantech MSMEs are needed to bridge the gap between financing early-stage ventures and mature enterprises. Especially for cleaner production enterprises, incentives beyond ESCO-financing are needed to scale the application of cleantech.



The government tried approaches such as providing the guarantees to SMEs etc., but the finance tools are not enough.

NDRC

Meanwhile, cleantech MSMEs suffer from an investment bias towards large projects and state-owned enterprises. In term of market strategy driven cleantech business, the Chinese market is mainly oriented towards large-scale businesses. A lot of cleantech enterprises serve the market through solar farms, large-scale wind technology or alternative vehicles as large clean technology players. For cleantech MSMEs to be able to compete in the market, more business collaborations and partnerships between large corporations and cleantech MSMEs are needed to boost cleantech product development and application along these large businesses’ value chains.



In China, the whole economy is designed to support big companies.

GIZ

Current times are hard for green investments. While green finance received a lot of intentions these days, the economic slowdown of the Chinese economy from 10% growth to around 6.5% in 2019 over the decades impacts the investment climate including the availability of cleantech financing (Roach, 2019).

KEY CHALLENGES



Exhibit 28: Key Challenges for Cleantech Financing

5.2 Current Trends in Cleantech Financing

Despite existing challenges, ACMFN stakeholders have already made important contributions to the Chinese cleantech MSME ecosystem and the sector is slowly developing. Stakeholders with extensive experience in the field have shared their views on current trends and developments of the cleantech financing market in China with ACMFN and agreed that cleantech is evolving in China. While many positive trends were mentioned, some barriers to cleantech success were also pointed out:

Cleantech awareness is increasing and a mindset change is developing across the ecosystem. Amongst cleantech enterprises, the community is strengthening as pointed out by Cloth Know, an ACMFN-supported enterprise: "I am lucky to see there are many like-minded people gathering in the Green Startups Accelerator and doing practical actions to improve our living environment, while other people are complaining about pollution and doing nothing". On the level of consumers, interviewees recognise a growing willingness to pay for high quality,

green and organic good. Looking at the government, interest in cleantech is increasing and more and more mature guidelines resolve unclear understandings of green investments. Still, for medium-sized cleantech enterprises, more possibilities to access financing and grow are arising from green finance promotion of China's central bank and commercial banks which plan to increase MSME support through low interest rates as well.



The Government is putting a lot more mature guidelines in place, which makes it easier for green startups.

China Impact Ventures

In terms of financial institutions, **bank's understanding of the cleantech sector is increasing**. Their willingness to understand the business is increasing leading to requests for capacity building for example. Further, some banks like Huaxia Bank already have set up a green finance department to grow their expertise further. This is already leading to more targeted tools for risk management available such as guarantees and insurance easing the access to finance for MSMEs. **Technology development is catalysing the growth of the cleantech sector**. Being driven by innovative technologies, China is opening up to MSMEs which have before rather been of subordinate focus. An outstanding trend that has been a door-opener in clean technology development in China has been large injections of cleantech financing leading to progressive growth of renewable energy and energy efficiency technology businesses. Following national targets, the active involvement of many sectors to drive alternative energy technology such as solar, wind and hydro power, has increased resource availability for energy efficiency and renewable energy initiatives.



Technology can serve as a catalyst for change.

CreditEase

Cleantech investments are hampered by the increasingly volatile economic environment and CreditEase confirms that MSMEs are facing a tough situation since 2018. However, cleantech investors believe in an investment in cleantech enterprises, especially in times of an economic downturn.



In the long-term, strong technology companies can survive even with an economic downturn.

Tianjin Venture Capital

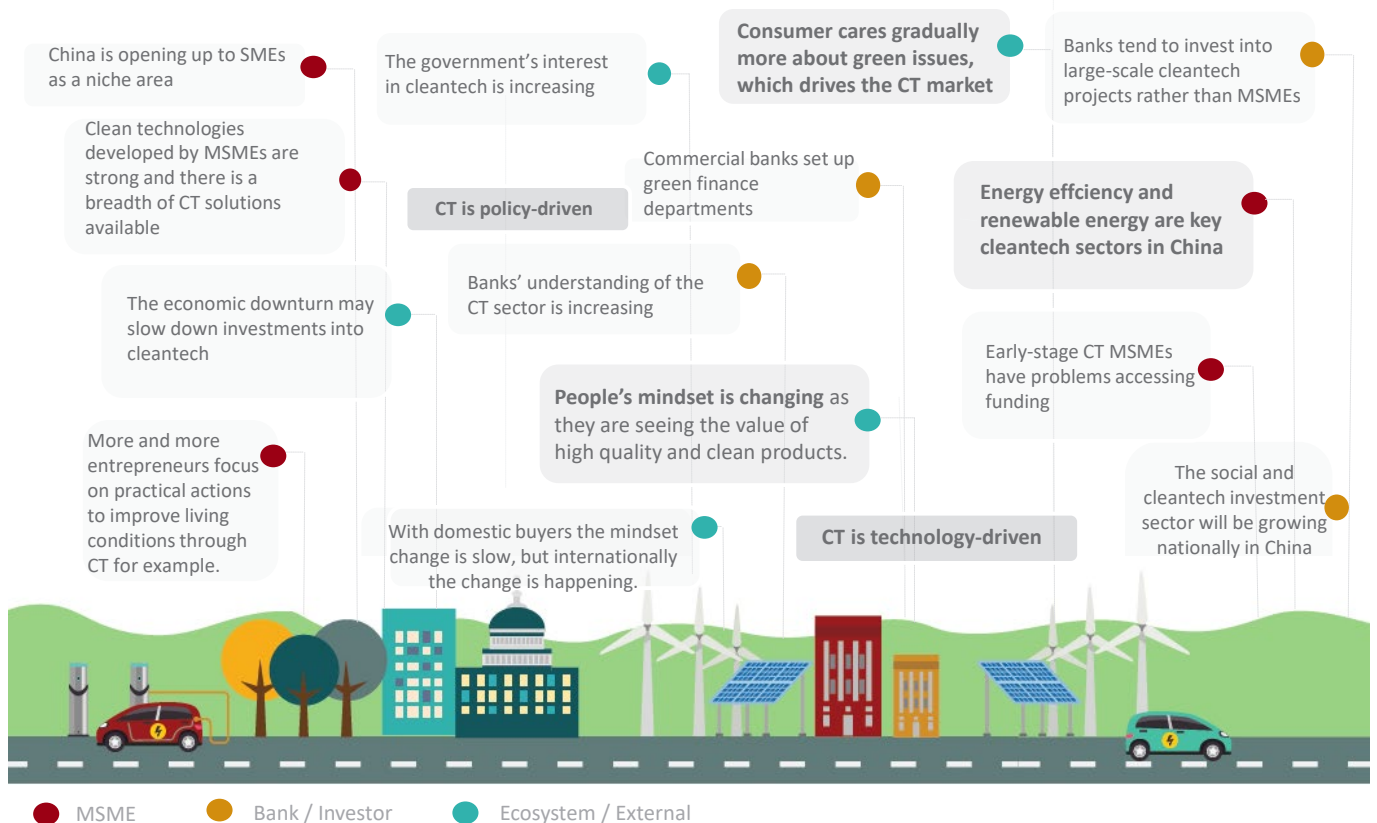


Exhibit 29: Cleantech Trends in China

5.3 Future Development of the Chinese Cleantech Sector

ACMFN stakeholders highlight a positive development of the cleantech sector and predict a growth at a medium pace. Though opportunities are expected to be more sporadic, investors agree that there is a high market potential in the long run.



There is a great market potential.

China Industrial Bank



Because of the environmental situation in China, there are opportunities for investment. It is unlikely however that the sector will grow fast; plus the government is difficult to predict, sometimes new policies are introduced.

Tianjin Venture Capital

Progressive action to support cleantech financing has been taken in all related sectors in the cleantech ecosystem. There are two main drivers for future development of the cleantech sector: 1) Government and 2) technologies.



Market is growing, mainly because policy is evolving and development of new technologies.

China Impact Ventures

Governmental policies, especially the environmental protection policies, have set a strong base for the development of the cleantech sector.

Experts agree that a push from the government is very effective in stimulating the cleantech market. Likewise, new technologies such as Internet of Things, blockchain and cloud solutions open up new opportunities in the cleantech sector, increasing the attractiveness of the sector. Looking at the diverse cleantech sectors, a sector which has grown very quickly in recent years is air quality. To address air pollution in China's mega cities, both large-scale projects, as well as individual consumers have invested in air quality technologies and products. ACMFN-interviewed organisations confirm that they have seen a major growth in this industry, which however has slowed down in 2019 as consumers had picked up new air control technologies quickly and the industry has become more and more saturated until today. For future years, experts estimate a large growth potential for water and waste treatment technologies. Likewise, renewable energy and energy efficiency as Chinese prime cleantech sectors continue to thrive. The quick take-up of electric vehicles in China is thereby driving the demand for renewable energy further both in terms of overall energy demand but especially for small-scale solutions for private households to charge their electric vehicles which is particularly promising for CT enterprises, as the energy-related cleantech markets is still dominated by larger industrial players rather than MSMEs.



Financial institutions start to see the business for them. Financing has already gotten better in the past and the banks want new products.

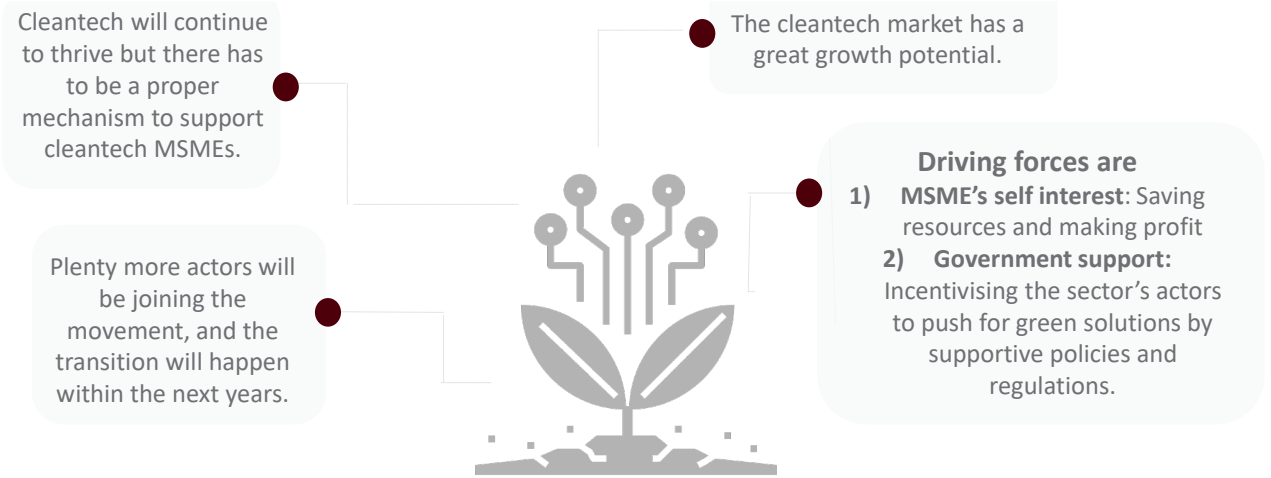
TREER

Investors emphasize a positive momentum for cleantech investments. Innovative financing mechanisms such as online platforms and more traditional instruments are being developed as institutions continue to expand their cleantech capacities. For the development of new financial instruments, blended finance can play a major role to pool public funds from development finance institutions with private funds from local banks for example.



China is on a good way.

Huaxia Bank



“ Many products in the green sector are doing pretty well, that's why the banks pay attention to the sector. This doesn't mean coming up with financing tools for SME financing is easy, the main problem is they don't have assets, but we are on the way. ”

NDRC

Exhibit 30: Future Development of the Chinese Cleantech Sector



5.4 The Way Forward: Addressing Ecosystem Challenges

ACMFN-stakeholders have come up with a set of solutions to tackle barriers at the different levels, relevant to all stakeholder groups. The following compilation reflects the opinions of numerous ACMFN-stakeholders and intends to be a selection of possible solutions to the challenges identified in earlier chapters.



Exhibit 31: Solutions Catalogue

The next Chapter identifies concrete actions to be taken by the different stakeholder groups to lower the barrier of accessing cleantech financing for Chinese MSMEs and to spark innovation and application in the Chinese cleantech sector.

6. OUTLOOK AND ROADMAP

In the light of China's growing energy needs and environmental and societal challenges such as the persisting pollution, water contamination and waste challenges, the country faces the task of leveraging its clean technology potential to produce cleaner energy and to consume resources more efficiently. The clean energy market represents a huge opportunity to transform China into a resilient, green nation that can support a growing population in a sustainable manner while providing returns for investors.

MSMEs are one of the major contributors to the transition towards a low carbon economy in China, not just as a source of clean energy innovations but also as its end users.

Current flows of cleantech MSME finance into the key sectors energy efficiency, renewable energy, waste & recycling, land &

air quality and water & wastewater, remain insufficient to capitalise on this opportunity.

To realise the large market potential of Chinese cleantech MSMEs, active support from all stakeholders in the cleantech ecosystem, especially public and private financiers and intermediary organisations, is necessary to boost stakeholder's cleantech "readiness" in China. Joint interventions are required to help enterprises overcome major barriers and provide an enabling environment to become pioneers of change.

At the country level, stakeholders should come together to develop a long-term, coherent strategy around cleantech financing. In addition, a combination of concrete next steps by financiers, intermediaries and MSMEs is needed to foster cleantech innovation and application, and to scale up the cleantech investment environment



MSMEs

Enhance enterprise's financials and establish a sound business model

Cleantech enterprises and conventional enterprises wishing to apply cleantech need to approach local and regional banks to demonstrate their financing needs along with the potentials of their investments. Sound business models will help to convince investors about the profitability of investments despite early-stages of the enterprises.

Shape cleantech mindset within the ecosystem

By developing innovative cleantech solutions to societal and environmental challenges, cleantech enterprises can convincingly build up demand for cleantech products.



INTERMEDIARIES

Develop and offer financial literacy training and cleantech training

Advisory provider can encourage MSMEs to develop a sound business model and demonstrate demand for cleantech financing instruments to local and regional banks by strengthening their financial literacy through training and capacity building. This way, MSME's demand for cleantech financing and financial institution's investment interests can be streamlined. At the same time, intermediaries' cleantech expertise transfers both to MSMEs and financial institutions.

Accelerate innovative intermediary models

Based on the identified ecosystem-specific support gaps, more innovative intermediary models are needed that recognise specific needs. This can include cleantech events, networks, clusters, and platforms (such as Green Startups co-investment platform).



FINANCIAL INSTITUTIONS

Broaden knowledge base about clean technologies and resource saving potentials

Due to the large cleantech investment potential and financing needs, financial institutions should actively broaden their knowledge base on cleantech market potentials in relation to financing options and opportunities.

Collaborate with advisory providers to develop cleantech financing instruments

In order to address the gap of accessing cleantech financing, investors have the task to seek advisory expertise with regards to developing suitable credit lines and other instruments that combine impact- and profit-considerations.



REFERENCES

1. OECD. (2016). Financing SMEs and Entrepreneurs 2016. An OECD Scoreboard. Retrieved from https://read.oecd-ilibrary.org/industry-and-services/financing-smes-and-entrepreneurs-2016_fin_sme_ent-2016-en#page1
2. South China Morning Post. (2015). How China's Pearl River Delta went from the world's factory floor to a hi-tech hub. Retrieved from <https://www.scmp.com/comment/insight-opinion/article/1864553/how-chinas-pearl-river-delta-went-worlds-factory-floor-hi>
3. PR Newswire. (2018). Chengdu Becoming an Innovation Center of China. Retrieved from <https://www.prnewswire.com/news-releases/chengdu-becoming-an-innovation-center-of-china-300748158.html>
4. Global Carbon Project (2019). Global Carbon Atlas. Retrieved from <http://www.globalcarbonatlas.org/en/CO2-emissions>
5. Ibid.
6. ECOVIS Beijing (2017). Small and Medium Enterprises (SMEs) In China. Retrieved from <https://ecovis-beijing.com/smes-china/>
7. Climate Action Tracker. (2019). Current Policy Projections. Retrieved from <https://climateactiontracker.org/countries/china/pledges-and-targets/>
8. Ibid.
9. PwC. (2017). China Cleantech Market Opportunities. Retrieved from <https://www.pwccn.com/en/energy-utilities-mining/chinese-cleantech-market-opportunities-2017.pdf>
10. Kuang, Y. (2018). China's Clean Tech Commitment. Asia Pacific Foundation of Canada. Retrieve from <https://www.asiapacific.ca/blog/chinas-clean-tech-commitment>
11. PwC. (2017). China Cleantech Market Opportunities. Retrieved from <https://www.pwccn.com/en/energy-utilities-mining/chinese-cleantech-market-opportunities-2017.pdf>
12. Temple, J. (2019). China has slashed clean energy funding by 39%, leading a global decline. MIT Technology Review. Retrieved from <https://www.technologyreview.com/f/613938/clean-energy-investments-are-plummeting-bloomberg-bnef/>
13. AVPN (2017). Social Investment Landscape in China. Retrieved from <https://avpn.asia/markets/china/>
14. Climate Bonds Initiative (2018). China Green Bond Market 2018. Retrieved from <https://www.climatebonds.net/resources/reports/china-green-bond-market-2018>
15. Green Finance Task Force (2015) Establishing China's Green Financial System. Summary Report of the Green Finance Task Force. People's Bank of China. United Nations Environment Programme. Retrieved from <https://www.unepfi.org/news/establishing-chinas-green-financial-system-report-of-the-green-finance-task-force/>
16. Bloomberg (2019). China's Venture Capital Boom Shows Signs of Turning Into a Bust. Retrieved from <https://www.bloomberg.com/news/articles/2019-07-09/china-s-venture-capital-boom-shows-signs-of-turning-into-a-bust>
17. Mintai Institute of Finance and Banking. (2018). China MSME Finance Report 2018. Retrieved from <http://www.smefinanceforum.org/sites/default/files/blogs/China%20MSME%20Finance%20Report%202018.pdf>
18. Ibid.
19. United Nations Environment Programme & DBS. (2017), Green Finance Opportunities in ASEAN. Retrieved from https://www.dbs.com/iwov-resources/images/sustainability/img/Green_Finance_Opportunities_in_ASEAN.pdf
20. Tusholdings. (n.d.). Tus Park. Retrieved from <http://en.tusholdings.com/index.php/584f892103b>

REFERENCES FOR THE EXHIBIT GRAPHICS

- Cleantech Group (2017). Based on Yema Financial. Retrieved from. <https://www.cleantech.com/chinas-growing-cleantech-ecosystem-and-venture-investments/>
- Green Impact. (2012). Impact Report on Green SMEs in China. Information Center of Ministry of Industry and Information Technology, China. Retrieved from http://www.ied.cn/sites/default/files/Impact%20Report%20on%20Green%20SMEs%20in%20China_English%20version.pdf
- Institute for Environment and Development. (n.d). New Ventures China Program. Retrieved from <http://www.ied.cn/en/node/155>
- Mars, (2017). Entering China's Emerging Cleantech Markets: An opportunity for Ontario startups. Retrieved from https://www.marsdd.com/wp-content/uploads/2017/06/Entering-China%E2%80%99s-Emerging-Cleantech-Markets_An-opportunity-for-Ontario-startups_June2017.pdf
- The World Bank (2019). Poverty & Equity Data Portal. Retrieved from. <http://povertydata.worldbank.org/poverty/country/CHN>
- The World Bank.(2019). China. Retrieved from. <https://data.worldbank.org/country/china>
- UN Environment (2019). Beat Air Pollution.Retrieved from : <https://www.unenvironment.org/interactive/beat-air-pollution/>
- United Nations Environment Programme. (2017). The emissions gap report 2017; a un environment synthesis report. Retrieved from <https://www.unepfi.org/wordpress/wp-content/uploads/2017/10/Emissions-Gap-Report-2017.pdf>
- UNFCCC. (2015). Enhanced actions on climate change:china' s intended nationally determined contributions. Retrieved from <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China%27s%20First%20NDC%20Submission.pdf>
- United Nations. (2016). Sustainable development goals knowledge platform. Executive Summary of China's Actions on the Implementation of the 2030 Agenda for Sustainable Development. Retrieved from <https://sustainabledevelopment.un.org/memberstates/china>



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