ACMFN
Asian Cleantech MSME Financing Network

A SNAPSHOT OF THE INDIAN CLEANTECH FINANCING ECOSYSTEM

ACMFN Flagship Report Series

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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 eco-system 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 India, to identify cleantech financing challenges and opportunities and to showcase country-specific successes of the ACM-FN 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 India looking to understand the contours of a fast-growing cleantech financing ecosystem.

FOREWORD

The Confederation of Indian Industry (CII) with sustainability at its core works closely with the Indian industry in equipping the stakeholders to gain a competitive advantage.

A step towards this direction was partnering with the European Union (EU) and launching the Asian Cleantech MSME Financing Network (ACMFN) program, which has evoked excellent responses from the stakeholders.

As part of this initiative, CII has been working with the over 10 MSME units part of the supply chain of an Original Equipment Manufacturer (OEM) based in Pune; 70 in Chandigarh, Jalandhar and Ludhiana and over 70 MSME units through Industry Association at Tiruppur. CII has identified more than 300 opportunities for improvement in these facilities.

As part of this engagement, CII could facilitate to introduce some of the latest and emerging resource conservation measures, energy management measures, and clean technologies at their facilities, while minimizing their overall operational costs.

Under the ACMFN project, CII has launched the following:

- Development of India's first online platform - PACT (Platform for Accelerating Clean Technologies): This online platform pools the latest clean technologies encompassing technologies from renewable energy, energy efficiency, waste management, water management and IoT solutions with more than 30 products listed on the platform and more than 100+ products in the pipeline. This platform facilitates faster adoption and access to technologies and global stakeholders.
- Clean Tech Expo: Three-day event, where new and innovative start-ups had B2B interactions with over 150 organizations representing various sectors of the Indian industry. A total of 45 clean tech companies have participated and showcased their innovative solutions to the industry.

Further, CII is partnering with various financial institutions viz. PFIs and NBFCs to facilitate access to finance and other supporting mechanisms for faster and effective project implementation. So far, more than 2 million euros were facilitated through self and bank finance. As part of this project, CII could facilitate in bringing in new cleantech concepts & technologies and offered new networking and partnership opportunities to the stakeholders.

Going green is a continuous journey and through vibrant and progressive partnerships, clean tech efforts and pursuits can be further accelerated, resulting in higher impact creation at the national and global stage.

Mr P V Kiran Ananth
Senior Project Manager (ACMFN – India)

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LIST OF ABBREVIATIONS

ACMFN	Asian Cleantech MSME and Financing Network
CII	Confederation of Indian Industries
CII-GBC	CII-Green Business Centre
CP	Cleaner Production
CSP	Corporate Social Responsibility
CT	Clean Technology
EE	Energy Efficiency
EESL	Energy Efficiency Services Unlimited
ESCO	Energy Service Company
ESG	Environmental and Social Governance
ESUS	Early Stage Units
EU	European Union
FI	Financial Institution
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Fund
GHG	Greenhouse Gas
GreenCo	Green Companies Certification Scheme
HNI	High Net-Worth Individual
IDBI	International Development Bank of India
IDFI	International Development Financial Institution
IFC	International Finance Corporation
INDC	Intended Nationally Determined Contributions
JV	Joint Venture
MSME	Micro, Small and Medium-Sized Enterprise
NAPCC	National Action Plan on Climate Change
NBFC	Non-Banking Financial Company
OEM	Original Equipment Manufacturer
PACT	Platform for Accelerating Clean Technologies
RE	Renewable Energy
SAG	Shree Ashtavinayak Glass
SDGs	Sustainable Development Goals
SIDBI	Small Industries Development Bank of India
SMILE	SIDBI Make in India Loan for Enterprises
SUS	Scheme for Start-ups
TEA	Tiruppur Exporter's Association
VC	Venture Capital

1. EXECUTIVE SUMMARY

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

KEY FINDINGS

Recent achievements & trends

- Huge opportunities exist given India's US$ 103 billion cleantech MSME market potential.
- ACMFN's MSME engagement approach has proven successful in supporting enterprises based on their needs.
- The ACMFN cluster model has proven successful in promoting the development of the existing cleantech community in India.
- Blended finance has been one of the most useful financing instruments for cleantech MSMEs.
- Clean technologies are already widely available in India, but cleantech adoption rates are still low due to a lack in cleantech awareness, limited knowledge about clean technologies and limited available funding.
- Energy efficiency initiatives are among the most popular cleantech measures as cost-benefits can be achieved at minimum investment costs.
- ACMFN added great value to the ecosystem by starting to provide a knowledge and technology exchange platform for cleantech MSMEs.

Challenges

- Investment directed towards cleantech MSMEs is still very low compared to financial institution's total fund sizes.
- Financial institutions tend to invest in cleantech projects with large scaling potential. A major challenge for Indian cleantech MSMEs is to boost their business model's scalability.
- Cleantech MSMEs heavily depend on self-financing and conventional microloans because targeted funding instrument are limited.
- There are only very limited impact-focused instruments geared towards cleantech MSMEs' needs on the Indian market.
- There is a great need for support services for MSMEs to access finance, especially the combination of financial and non-financial support.

A lot is already happening in the Indian cleantech MSME financing market and large potentials exist which need to be tapped into to boost cleantech investments and contribute to green growth in India. 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 resource saving potentials
- Collaborate with advisory providers to develop cleantech financing instruments

MSMEs should

- Demonstrate increased demand for cleantech financing products to financial institutions
- Create demand for green measures from other enterprises

Intermediaries should

- Develop and offer specific financial literacy training to cleantech MSMEs
- Accelerate established matchmaking events and platforms

The task is now to take these actions to scale to maximise cleantech MSMEs' contributions to India'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 Asian cleantech enterprises and enhance sustainable consumption and production patterns in Asia.

ACMFN carries out capacity-building measures for more than 400 Micro, Small and Medium-sized Enterprises (MSMEs) in the three target countries via workshops, advisory and training services in order to provide enterprises with the knowledge necessary for raising capital for cleantech, as well as via national forums for matchmaking processes between MSMEs and financial institutions. The project also provides technical assistance to financial institutions in order to strengthen understanding of the economic and environmental benefits of cleaner production and green technologies. Ultimately, the goal is the expansion of MSMEs lending portfolio benefiting of peer-learning, co-investing and matchmaking opportunities.

In India, ACMFN is hosted by the Confederation of Indian Industry (CII), an industry led & managed non-governmental association with 66 offices in India and a wide network of 208,000 direct and indirect membership organisations and enterprises. The CII Godrej Green Business Centre (CII-GBC) in Hyderabad works towards making India a global leader in green businesses and specifically deals with improving the cleantech ecosystem in India, bridging the gap of cleantech financing and providing important targeted support services for cleantech MSMEs.

Through its activities and networks, CII continuously develops and improves its services for Indian MSMEs to leverage cleantech investments and contribute to green business development in India.

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

- **Finance facilitation of over US$ 614,000 through local and regional banks, greenloans and ESCO model financing**
- **Adoption and promotion of Green Company Certification Scheme (GreenCo) among 51 MSMEs**
- **Establishment of an Online-Platform for Accelerating Clean Technologies (PACT)**
- **Successful adoption of Cluster-model in Pune, Mumbai, Punjab and Tiruppur**
- **Three-day Cleantech Expo in 2018, with 800+ participants involving 15+ sectors**
- **Creation of an informal network of 50 cleantech MSMEs serving as a business promotion platform**

1.2. Methodology

The approach adopted in this report focuses on analyses of in-depth interviews carried out with important project partners and key stakeholders in the Indian cleantech MSME context. The interviews covered a broad range of categories to map the Indian cleantech MSME financing landscape in terms of stakeholder's motivations for cleantech engagement, general opinions of the Indian cleantech market trends and development, and to find out about available cleantech financing instruments. The information from these interviews is complimented with first-hand experiences gained through ACMFN activities at country-level as well as additional desk research.

ACMFN stakeholders can be categorised into three broad groups: **MSMEs, intermediaries and financial institutions (FI)**. In India, MSMEs are classified based on capital investment made. Micro enterprises have made capital investment of approx. US$ 1,500-36,500 (Rs 1-25 lakhs), small enterprises approx. US$ 36,500-730,000 (Rs 25 lakhs to 5 crores), and medium enterprises approx. US$ 730,000-1.5 million (Rs 5-10 crores). This means, an enterprise is considered an MSME when approx. US$ 1,500-1.5 million (Rs 1 lakh to 10 crores) of capital investment has been made. Intermediaries are organisations or associations involved in promoting access to cleantech financing for MSMEs in India, and financial institutions include banks, venture capital firms (VCs) and other investors.

FIGURE 1: Stakeholders involved for the report

For this report, **ten MSMEs, seven intermediaries and seven financial institutions** were interviewed and analysed in depth (see Figure 1). These stakeholders were carefully selected to a) include the most important ACMFN partners, and b) to cover a wide range of topics within the stakeholder categories. The stakeholder selection reflects broad-based on-the-ground realities within the cleantech financing ecosystem in India.

The stakeholder portfolio shows that MSMEs and intermediaries are located across the country (see Figure 2). MSMEs are usually settled in regions relevant to their sector, such as Tiruppur in the case of the textile sector. MSMEs active in different sectors were selected for this report to cover sector-specific differences and similarities. Interviewed financial institutions are all headquartered in Mumbai, the financial hub for cleantech financing. Banks have local branches in other parts of the country.

Building on visual documentation, this report provides best practice case studies, stocktaking of existing financing products and cleantech projects, as well as current trends and developments for cleantech financing in India. Based on project evidence, challenges and recommendations at the level of MSMEs, financial institutions and intermediaries are identified to guide the way forward towards successful cleantech financing ecosystem improvements.

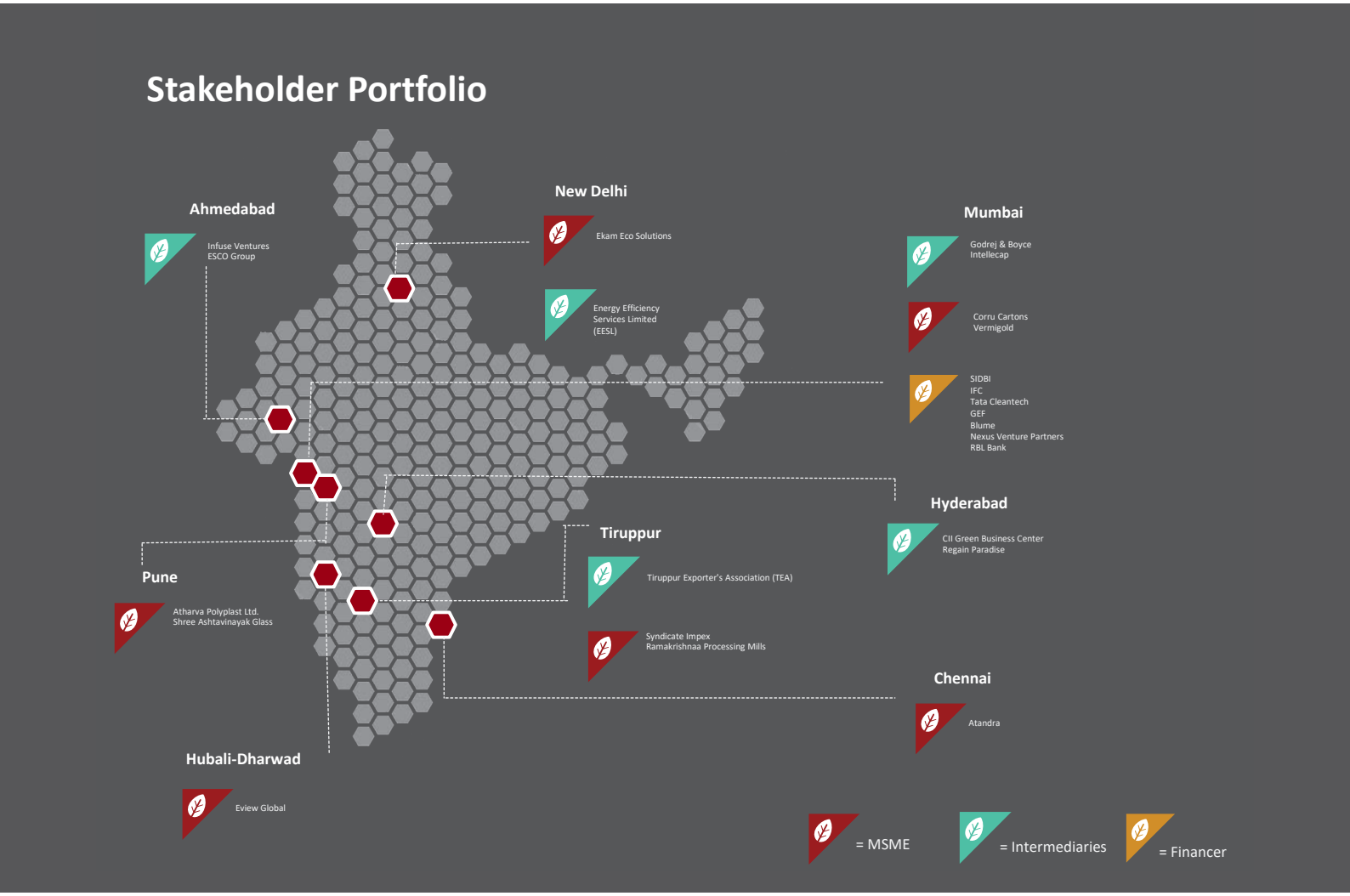
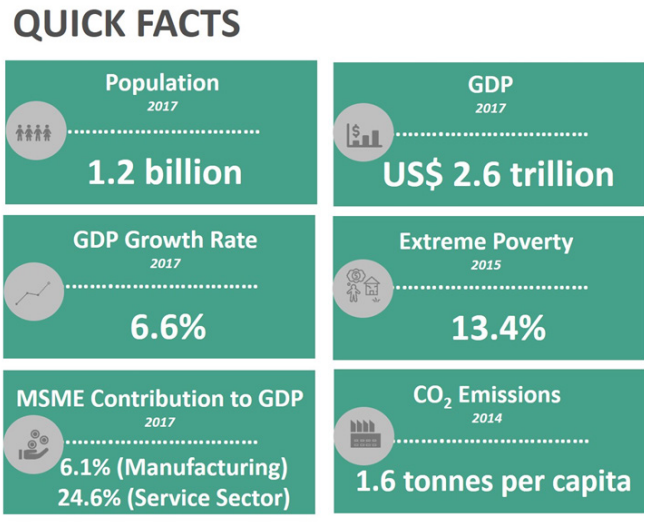


FIGURE 2: Stakeholder Portfolio

1.3. Country Zoom: India



In the light of India's population growth, overcrowding of cities, inadequate infrastructure, and polluted air and water, India's future economic growth needs to go in hand with a push for sustainable development and green and inclusive growth. In 2017, India accounted for 3% of total cumulative emissions[1]. This increases its global relevance to lower CO_2 emissions, adapting and mitigating climate change, and contributing to environmental sustainability. Given India's strong economic performance and its extremely low human development indicators such as high poverty rates, India's success in achieving sustainable development will be central to the world's collective ambition of achieving the 2030 Sustainable Development Goals (SDGs).

MSMEs can make a significant contribution to green and inclusive growth by applying clean technologies. Since MSMEs are major drivers of economies worldwide and the backbone of the Indian economy, there is great potential to be tapped into for

clean technology investments. A central challenge for cleantech companies particularly in Asian countries remains access to finance for clean technology investments. MSMEs as important implementors of clean technology applications need to be supported through capacity building, technical support, as well as access to finance for implementing clean technology initiatives.

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.

Cleantech Policy Context: Sustainable Development Commitments

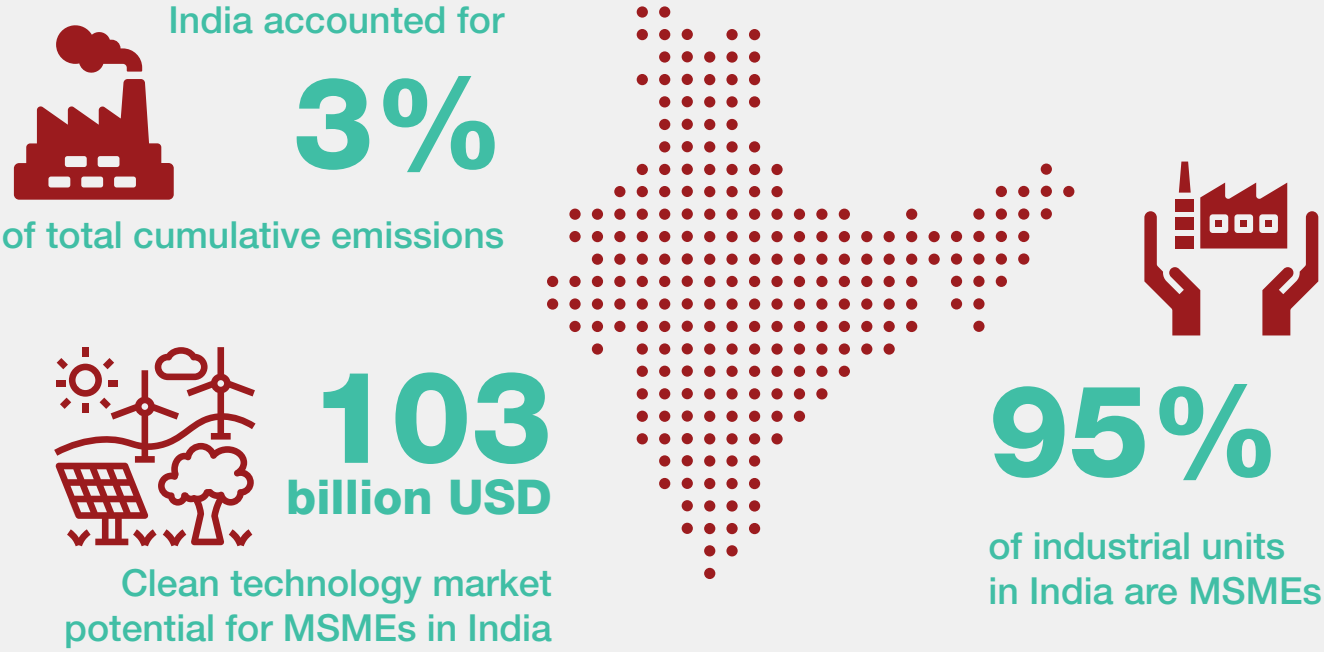
India has a wide environmental policy framework with over 200 laws relating to environmental protection, controlling industrial pollution and managing and handling different types of wastes. India's National Action Plan on Climate Change (NAPCC) released in 2008 targets eight national missions in the areas of **solar energy, energy efficiency (EE), sustainable habitat, water, the Himalayan ecosystem, afforestation, sustainable agriculture and a research** fund for strategic knowledge for climate change[2].

In 2015, India announced its Intended Nationally Determined Contribution (INDC) that sets an ambitious new target to increase share of non-fossil-based power capacity from current 30% to 40% by 2030 with the help of international support. It also commits to reducing the emission intensity of its Gross Domestic Product (GDP) by 33-35% by 2030 and to create an additional carbon sink of 2.5-3 billion tonnes of CO_2 through additional tree cover[3]. For its renewable energy sector, the government seeks to significantly expand renewable energy capacity to 175GW by 2022[4].

Cleantech MSMEs Investments to Foster Green Growth

Many of the provisions in these policies that concern the private sector are applicable to MSMEs. The MSME sector in India accounts for almost half of industrial output and 40% of exports. There are approximately 46 million MSMEs, employing about 106 million people[5]. This number accounts to about **8% of the total Indian population**. Only 6% of the MSME sector is formally registered – the remaining 94% are unregistered enterprises[6]. MSMEs using outdated technologies or poor management practices are known to contribute 70% of the industrial pollution in India[7].

Despite the country's ambitious environmental goals, India needs significant energy to support its economic growth plans and to meet increasing demands for access to electricity, water and food, among other development objectives[8]. Clean energy innovation can play an important role in maintaining ecological balance, securing energy access, and increasing economic growth and development, while also avoiding increasing emissions. To realise these objectives, there is considerable demand for increased cleantech financing supply from financial institutions.



Cleantech MSME Market Potential

India's total cleantech market size accounted for $US 44 billion in 2014, and there's still plenty of room for improvement. For example, in 2017, India scored far below the mean for all cleantech innovation metrics in the Global Cleantech Innovation Index. India's performance can be attributed to a drop in the number of cleantech-specific venture capital funds targeting the country, alongside a drop in the count of cleantech cluster organisations. These are compounded by a significant relative drop in India's cleantech R&D budget.

> **India's total cleantech market size accounted for US$ 44 billion in 2014, and there's still plenty of room for improvement.**

The clean technology market potential for MSMEs in India is estimated to be $US 103 billion[9]. However, huge problems persist in bringing both worlds together. Lack of financial literacy and transparency are major issues on the demand side which hamper further commitments by financial institutions. Financiers themselves lack awareness, technical capabilities as well as tailored financial products and co-investment opportunities to meet the increasing demand for cleantech financing.

1.4. The ACMFN Cleantech Financing Universe in India

Cleantech in Action

Cleantech financing is the provision of funding to an enterprise which either provides or uses clean technologies, in order to develop, implement or upgrade these technologies. To provide adequate support to these MSMEs, ACMFN has adopted an engagement approach which takes into account these two different cleantech business models, namely **Clean Technology and Cleaner Production enterprises**. In cleantech value chains, the providers of clean technologies are considered Clean Technology (CT) enterprises because they are actively engaged in the innovation of clean technologies. The users are considered Cleaner Production (CP) enterprises because they integrate clean technologies into existing production processes. Both models are characterised by different motivations of engaging in cleantech. CT enterprises as active innovators of clean technologies strive to provide environmental benefits through their products and services. CP enterprises as passive innovators are mainly driven by cost-efficiency of the applied technology. Both enterprise models have different support needs. Figure 4 categorises the ten MSMEs which were interviewed for this report into CT and CP enterprises.

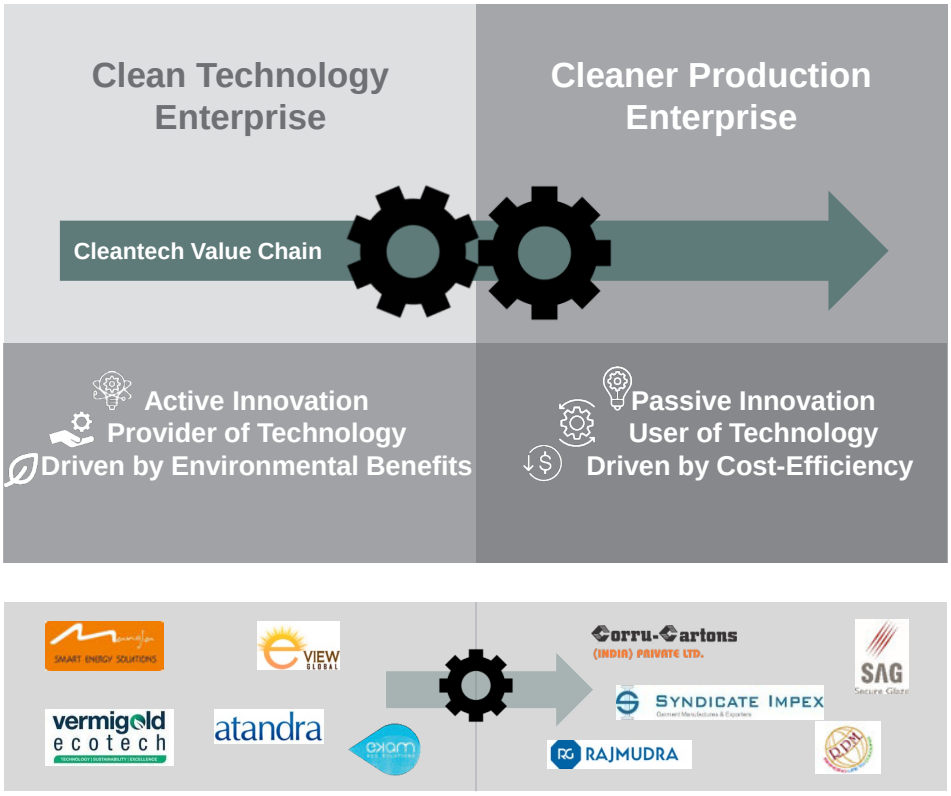


FIGURE 4: Strengthening Cleantech Value Chains

To effectively support cleantech MSMEs, ACMFN has focused on providing a physical and online platform for networking purposes, sharing of best practices and effective knowledge transfer for CT enterprises. CP enterprises have been supported through local industry associations – each forming a cluster for MSME engagement - which take over the role of connecting stakeholders, bridging financing gaps for clean technology investments and capacity building provision.

Clean Technology Application Sectors in India

Clean technologies applied in the ACMFN cleantech financing universe can be categorised in the main sectors: Energy efficiency, renewable energy (RE), waste & recycling, land & air quality and water & wastewater. Both CT and CP enterprises apply a wide range of clean technologies across these different sectors. Textile & garment production is one of the most prominent industry for cleantech applications. Other sectors covered by the assessed MSMEs include carton, glass and electronic appliances production and processing (for an overview see Figure 5).

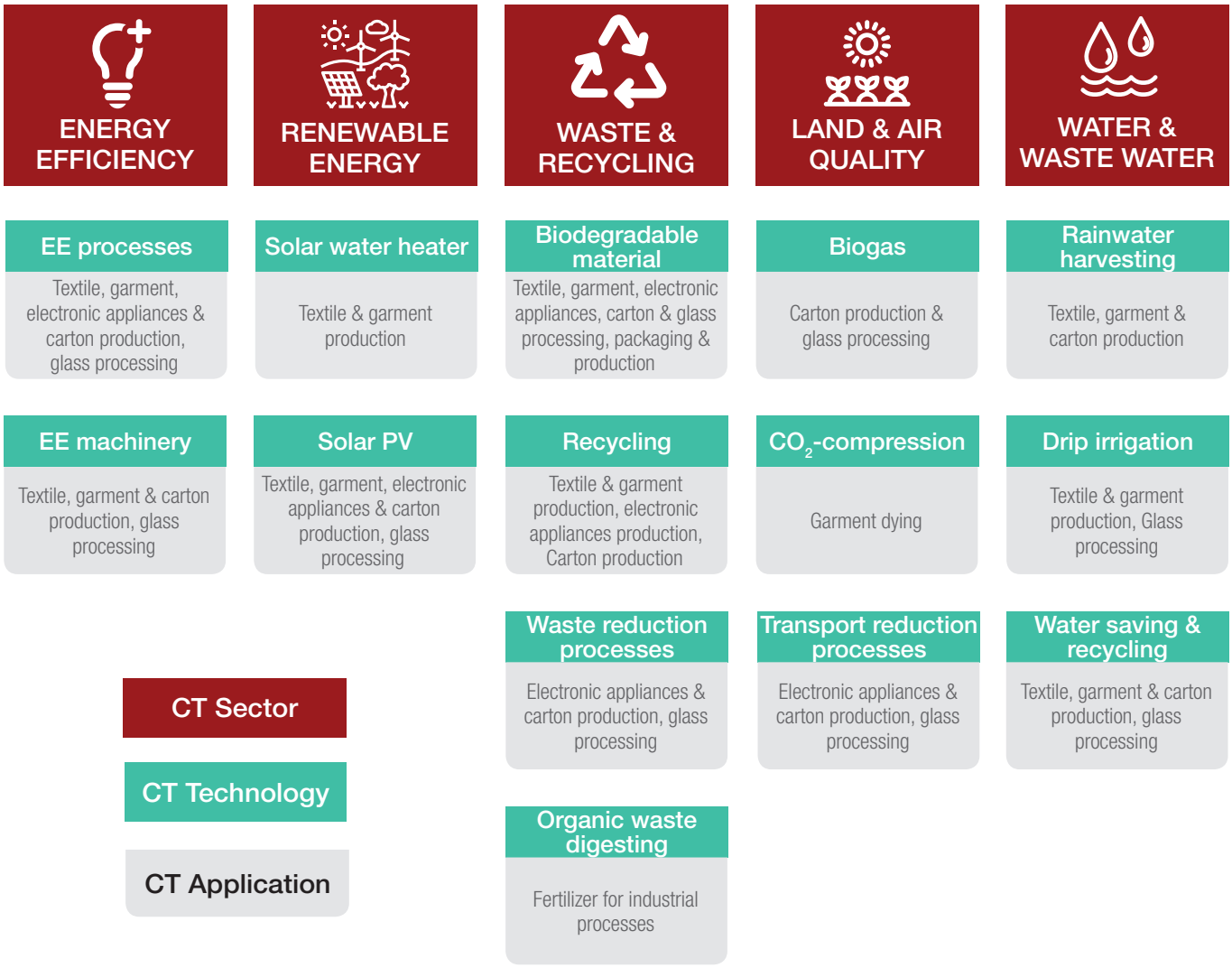


FIGURE 5: Cleantech Providers and Technologies in India

ACMFN Cleantech Financing Ecosystem in India

In the ACMFN Cleantech financing ecosystem in India, many different actors contribute to the promotion of Clean Technology and Cleaner Production enterprises.

CII as the national focal point and ACMFN project host is a main actor involved in the coordination and promotion of different initiatives such as the local industry association clusters. These clusters are important in India's efforts to promote green and inclusive businesses. Among the most important clusters are the Original Equipment Manufacturer (OEM) clusters in Pune and Punjab, and the Tiruppur Exporter's Association (TEA) cluster in Tiruppur.

CII also works with other important actors such as advisory providers (e.g. Regain Paradise or Intellecap) and many national, regional and local incubators & accelerators. The public sector influences the ecosystem through regulations and policies as an overarching actor.

These different ecosystem actors partly cooperate with each other, and they also work directly with both cleantech enterprises as well as financial institutions to promote cleantech application.

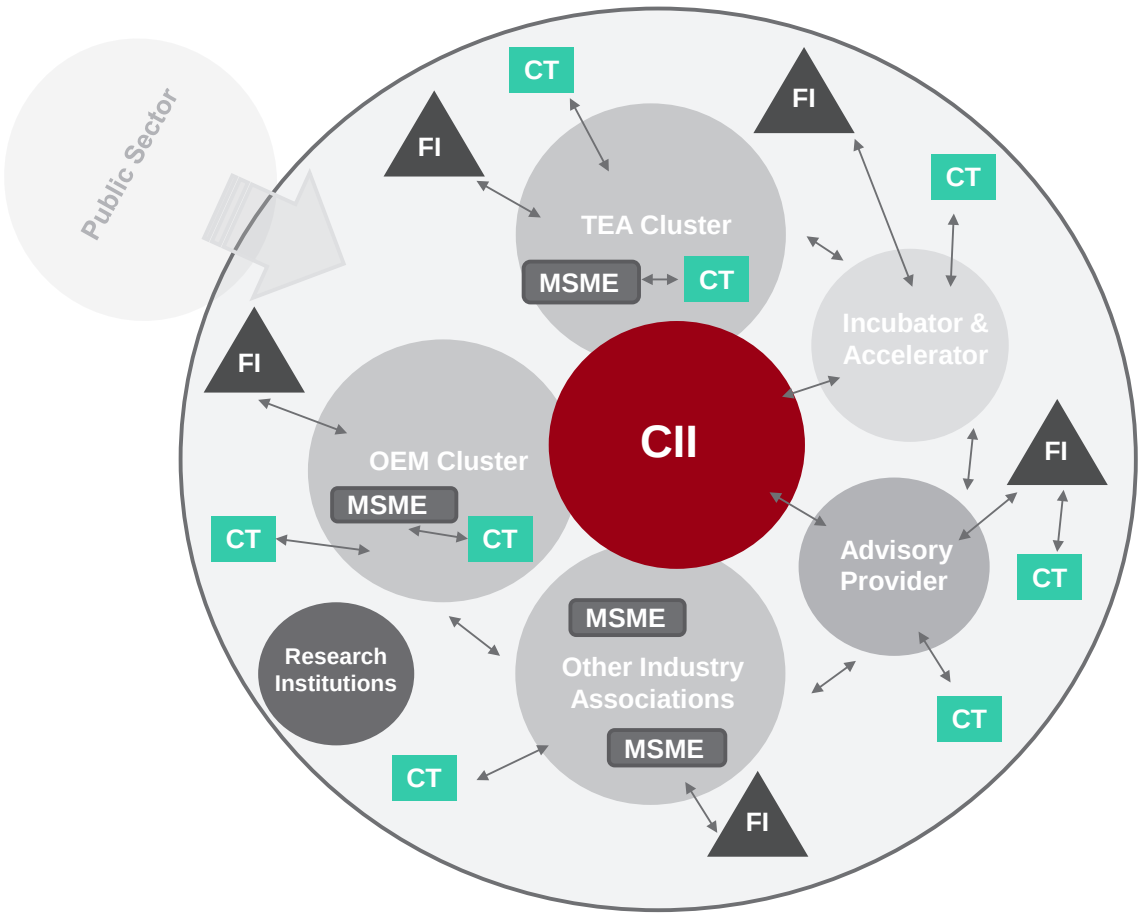


FIGURE 6: Bigger Picture of MSME ecosystem: Cleantech Financing Universe Actors in India

2. CLEANTECH MSME LANDSCAPE IN INDIA

Cleantech MSMEs in India are driven by different motivations to develop and apply clean technologies. CT enterprises are usually driven by environmental benefits which their technologies provide, and CP enterprises are largely cost- and buyer-driven as their primary interest is to save production costs.

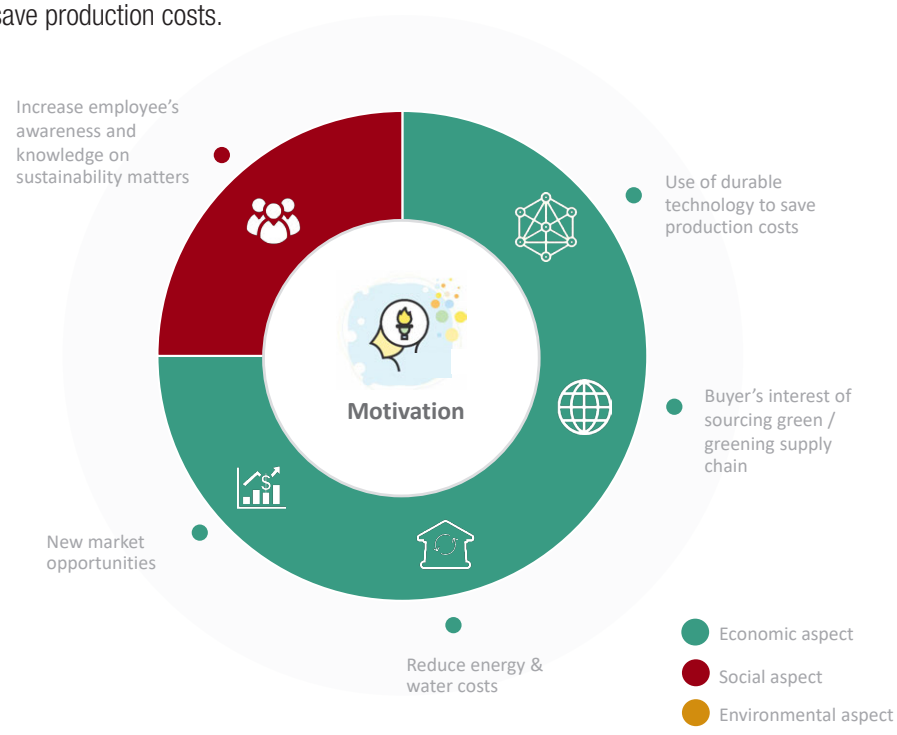


FIGURE 7: Cleaner Production MSMEs' motivation on cleantech engagement

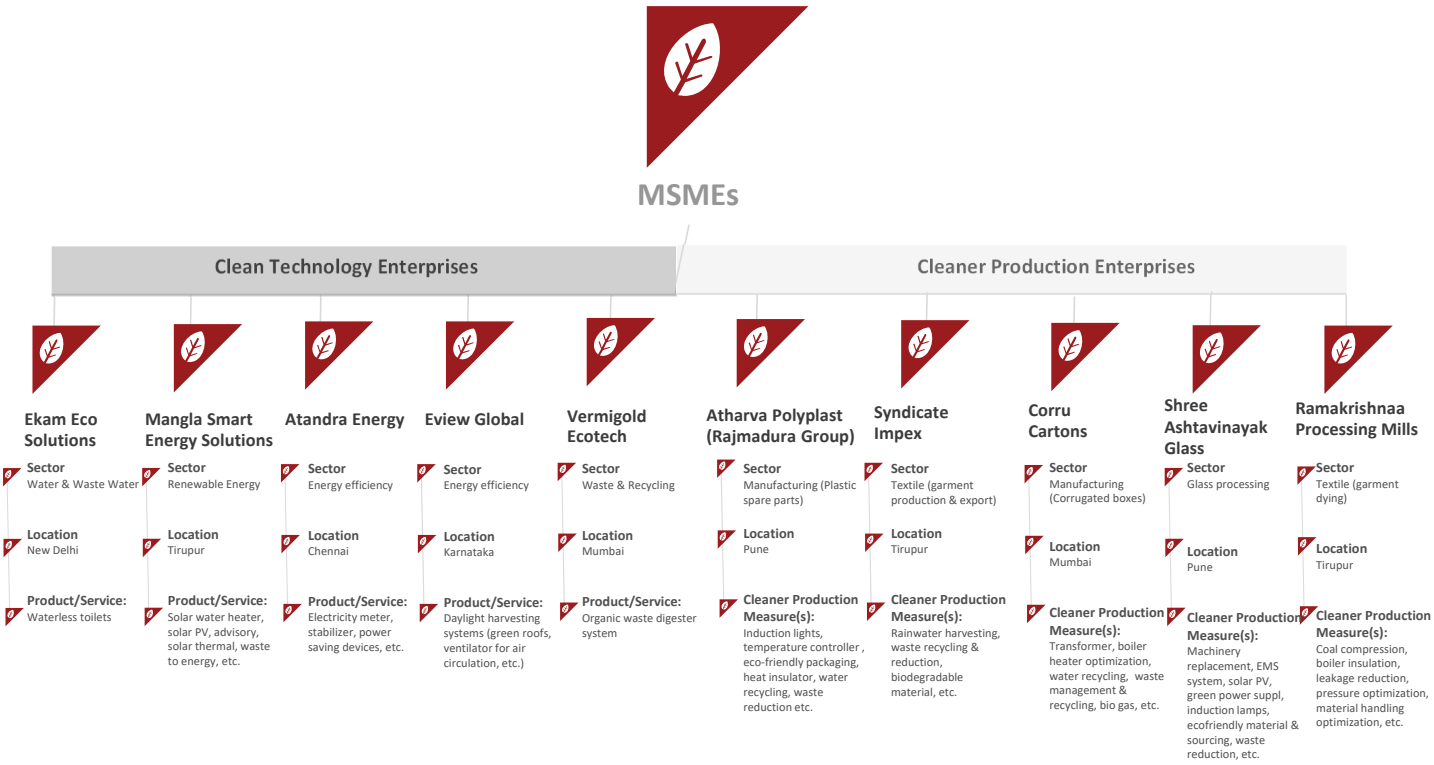


FIGURE 8: MSME Portfolio

> ***Our Green Mission has strengthened our profile because we do something for the environment. When we talk about what our business does, we can go further and talk about our impact, that creates a good image.***

Atharva Polyplast Ltd., Cleaner Production enterprise in Pune

Some of the analysed CP enterprises (20% in total) also specifically stated that they apply clean technologies when they are faced with pressure from the buyer side, obligating them to produce in a greener way. Since most interviewed CP enterprises are suppliers of Godrej & Boyce, a manufacturing company which obligates their suppliers to become GreenCo-certified, it is likely that many other CP enterprises have started to engage in cleantech due to pressure from the buyer's side.

> ***The best way to get MSMEs to join [Cleaner Production] is through their buyer, the paying company who they are affiliated with***

Shree Ashtavinayak Glass, Cleaner Production enterprise in Pune

2.1. Cleantech MSME Landscape

CT and CP enterprises in the Indian cleantech MSME landscape are active across different sectors and geographic locations. ACMFN has assessed five CT enterprises and five CP enterprises to gather first-hand experiences and information about cleantech engagement, potentials and challenges in accessing cleantech financing.

Indian MSME's produce and apply cleantech in the sectors waste & recycling, land & air quality, water & wastewater, renewable energy and energy efficiency. Half of all interviewed enterprises are active in three of these sectors. In total, 80% of the analysed enterprises are active in three or more sectors. Two of the CP enterprises in this study (Corru Cartons and Shree Ashtavinayak Glass/SAG) are even active in all sectors.

While CT enterprises' sector activity is determined by the nature of their clean technology product(s) or service(s), CP enterprises have a broader portfolio of options for clean technology initiatives which they can implement. Ultimately, CP enterprises base their choice of cleantech measures on factors such as available financing, individual preferences, the nature of their daily business, and best practice examples from other enterprises. Sectors which are less popular for cleantech applications are renewable energy and water & wastewater. In the renewable energy sector, initial technology investment costs for CP enterprises are higher than energy efficiency measures or other small initiatives related to waste and water.

ACMFN-assessed CP enterprises are most active in energy efficiency and waste & recycling initiatives which reduce energy costs and waste generation and save resources through waste recycling. The reason why energy efficiency initiatives are among the most popular ones is that investment costs in this area start at a very low amount and cost-benefits can be achieved at minimum costs.

MSME's cleantech intensity (i.e. to what extent MSMEs develop or implement clean technologies in their business processes) varies between enterprises. Some CP enterprises strive to go completely green in their production processes, while others have only started applying clean technologies. CT enterprises differ in the number of clean products they offer on the market and the sectors they engage in. Some have only one or two products on the market; others offer a comprehensive portfolio by continuously developing new cleantech products and services.

Based on the ACMFN experience, Indian cleantech enterprises are gradually taking up the green movement as they have seen successes and continue to look for new ways to innovate and enhance cleantech production and application.

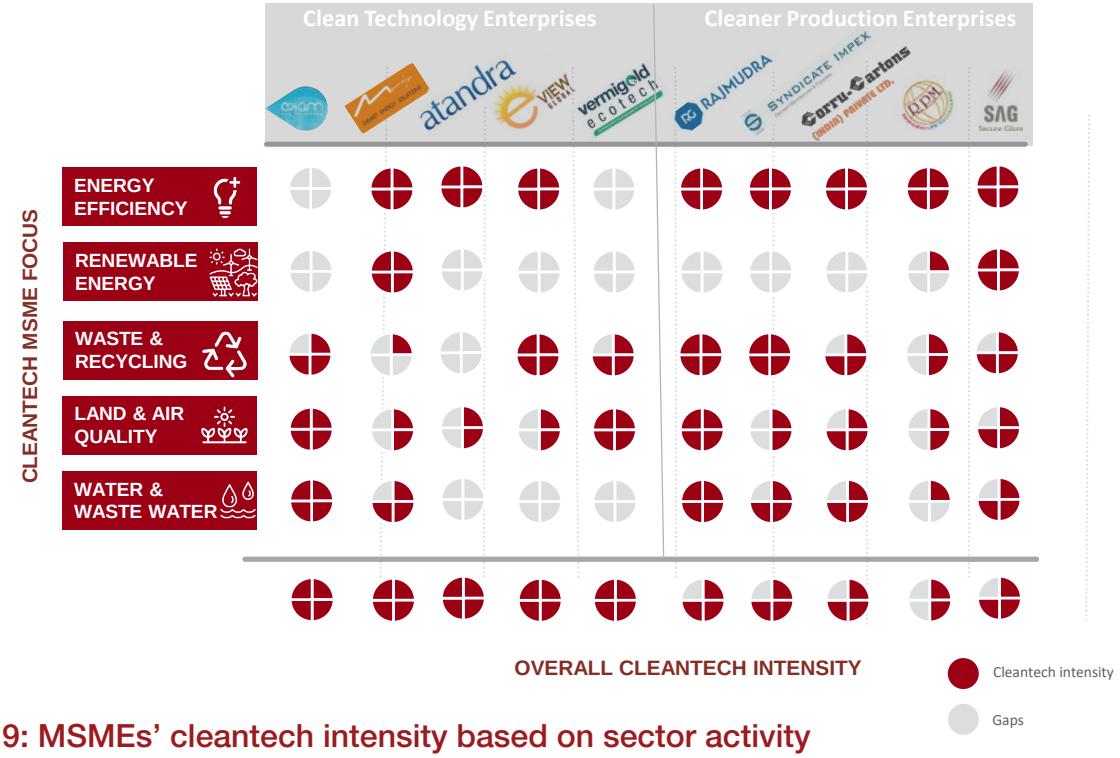


FIGURE 9: MSMEs' cleantech intensity based on sector activity

2.2. Financing Cleantech: Cleantech MSME Models

Accessing finance tends to be difficult for CT and CP enterprises in different ways, which is why ACMFN has adopted an engagement approach based on these different cleantech MSME models. In ACMFN's efforts to improve the financing ecosystem of cleantech MSMEs in India, different financing needs and barriers of these two MSME models are considered to effectively support them.

Clean Technology MSMEs

Many CT enterprises 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 consider strictly profit-driven aspects. This makes it difficult for CT enterprises to access these loans. This is exacerbated by the fact that bankers often have limited knowledge about technologies, which reduces the financing opportunities of CT enterprises.

Mangla Smart Energy is a best practice model of CT enterprises which have successfully scaled and is now able to finance its own cleantech investments. **The company is part of a group which revolves capital among member companies to finance investments.** The company also shares profits with high net-worth individuals (HNI) who invest in the company. This strategy of revolving capital among companies and involving HNI in their investments has proven successful and can be used as a best practice example for cleantech financing by other CT enterprises.

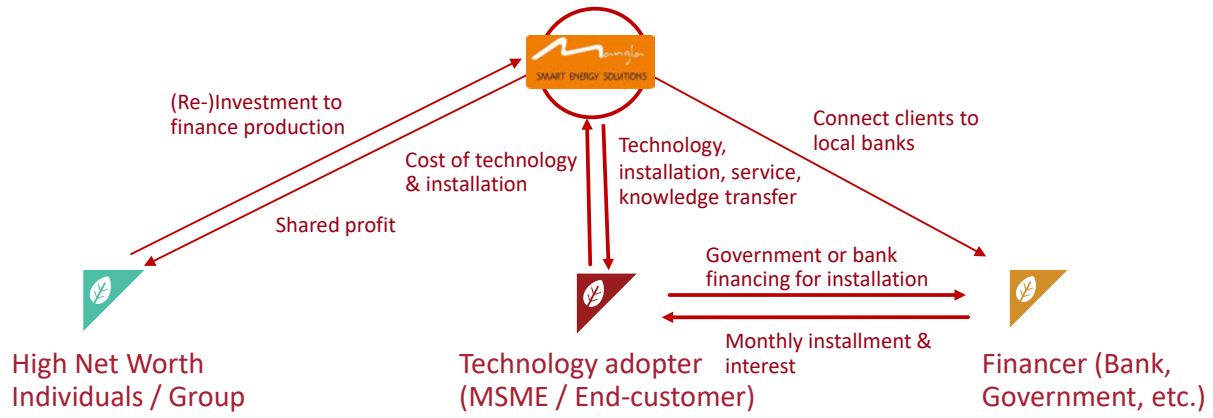


FIGURE 10: Clean Technology Model - Mangla Smart Energy Solutions

Cleaner Production MSMEs

In order for CP enterprises to access financing, the technology innovators usually need to present a sound financial model and results to banks to increase the credibility and profitability of the technology investment. **This means that the scalability of CT enterprises ultimately affects CP enterprise's access to finance** as well. Cleaner Production 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 financiers limited knowledge and trust in clean technologies. Due to enterprises already established business model, **they tend to have built up a financing relationship with a local bank which makes it easier for them to access financing for cleantech investments.** Many of the ACMFN-interviewed CP enterprises stressed that financing is possible for them through already established good relations with local banks which finance their clean investments.

SAG's Cleaner Production model shows how the company makes use of its good relationship with a local bank to finance CP measures. SAG is also one of Godrej & Boyce's supplier, which initially pushed SAG towards cleantech application, while Godrej's demand and history in the sector increases technology credibility with SAG's financier (see Figure 11).

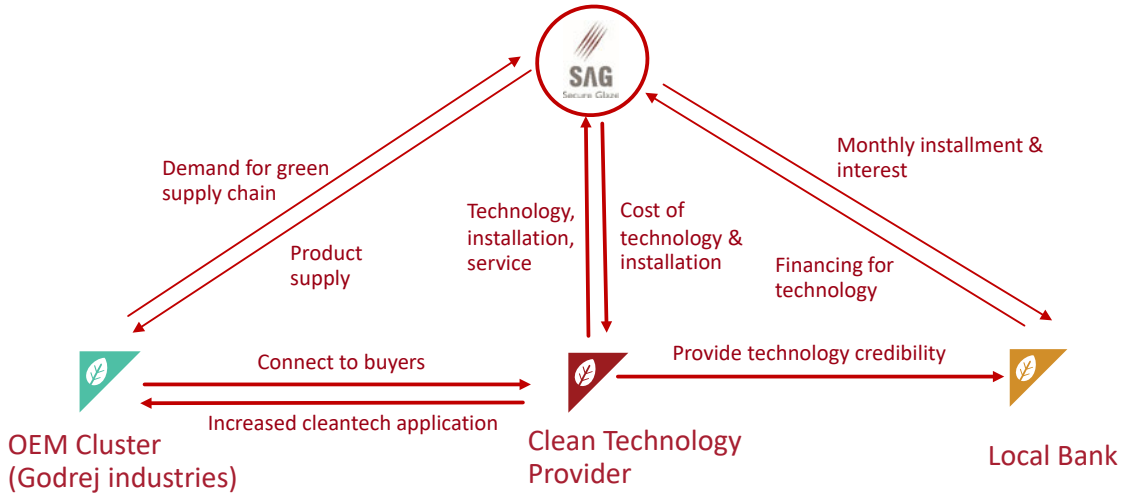


FIGURE 11: Clean Production Model - Shree Ashtavinayak Glass

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, mature, growth) and these preferences determine the ease or difficulty of accessing financing for MSME's with different investment needs.

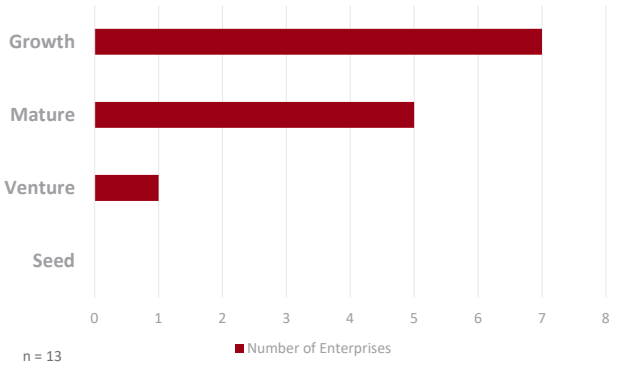


FIGURE 12: MSME's Investment Stage

ACMFN-interviewed MSME's are mostly in the growth stage. All of these enterprises have passed the seed stage and received cleantech funding in the past. In order to access cleantech financing, enterprises need to be established because early-stage funding is scarce in India. 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 in India. Due to these challenges, only few CT enterprises manage to pass the seed-stage and establish themselves successfully.

Once an enterprise is established and can demonstrate a clear cashflow, financing tends to be easier. However, **establishing a sound business model which is presentable to banks is one of the major challenges for start-ups in India** .

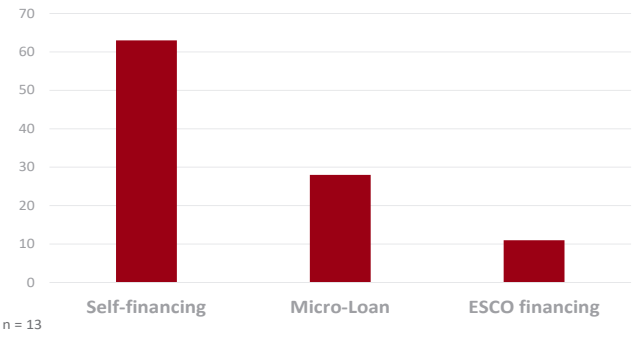


FIGURE 13: MSME's Investment Sizes (in Rs mil)

To finance their cleantech investments, MSMEs use not only grants and microloans as financing sources but also angel investors, venture capital, equity capital or self-financing. The majority of enterprises included in this study have realised cleantech investments through their own means, i.e. through self-financing. Figure 13 shows that ACMFN-interviewed **enterprises have invested a total of approx. US$ 910,000 (Rs 6.3 crores) through self-financing**, approx. US$ 405,000 (Rs 2.8 crores) through microloans and approx. 160,000 (Rs 1.1 crores) were financed through an Energy Ser-

vice Company (ESCO)[1]. MSMEs involved in the ACMFN cluster in Pune and Tiruppur have invested between approx. US$ 150-300,000 (Rs 8 lakhs-2 crores) each. It is likely that these MSMEs were able to self-finance their cleantech investments because they have already reached the growth stage.

1 Please refer to Section 4.2 for a definition and explanation of ESCO

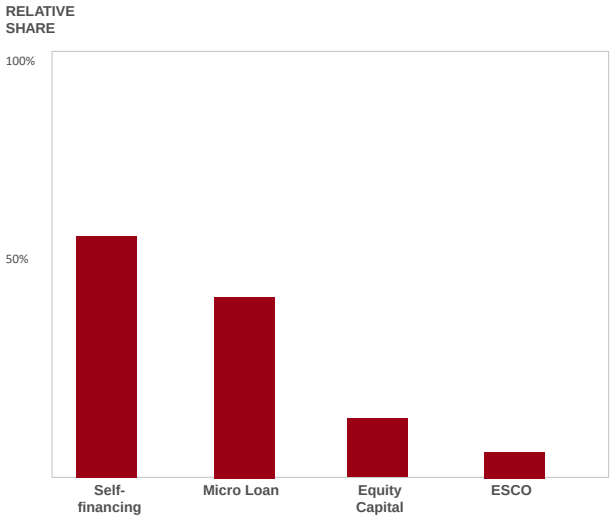


FIGURE 14: Cleantech MSME Focus

Apart from self-financing, microloans and venture capital are other common forms of investments into cleantech MSMEs (see Figure 14). MSMEs still largely depend on conventional microloans provided by banks and other financial institutions. These microloans tend to be easy to access through local banks which MSME already have a close relationship with, but they do not consider environmental or social impact.

VCs focused on cleantech or MSME financing is a possible financing instruments as well, although among the ACMFN-assessed MSMEs, VC tends to be a less-frequent financing instrument. Especially bigger cleantech projects are often financed through VC, none of which were part of this study.

Other financial institutions still struggle to evaluate and understand the complexity of cleantech investments.

All in all, cleantech MSMEs in India still face significant challenges with regards to financing their cleantech products and initiatives. Key stakeholders gave concrete recommendations during ACMFN interviews on how to address these challenges and foster innovation and application of clean technologies in India.

CHALLENGES FOR MSMEs

Due to barriers in accessing finance, **cleantech adoption rates are low** and as a result, the number of entrepreneurs in the cleantech field is limited in India. Some ACMFN stakeholders such as Nexus Venture Partners have even witnessed a brain drain in entrepreneurship. The promotion of cleantech among entrepreneurs is crucial in the Indian context where MSMEs count with 15% more energy savings potential than large companies. However, MSMEs as well as financers significantly **lack knowledge about clean technologies** and their applications. While energy efficiency measures are popular among cleantech MSMEs, cleantech adoption in other sectors is lacking behind. Given persisting developmental challenges in India, such as huge waste and GHG emission problems, boosting cleantech adoption rates across sectors is important for India's green growth path.

KEY RECOMMENDATIONS

Raising awareness & educating on clean technologies

Raising awareness and spreading word of mouth on resource saving potential of cleantech initiatives will promote the positive benefits of cleantech investments and potentially stimulate their implementation. Cleantech MSMEs have an important task in bringing technology education to consumers and other MSMEs. These cleantech MSMEs can contribute to raising awareness by doing site visits and attending events to explain their technologies and educate on the quality, material and benefits of technologies.

Promoting renewable energy adoption through MSMEs with large exposure

Due to the current low adoption rate of adopting renewable energy technologies, stakeholders suggest that RE can be promoted through businesses with wide (or global) exposure to highlight best practice examples and raise awareness about the positive benefits of renewable energy.

ACMFN Recommendation: Developing and marketing clean technologies in India

There is currently a large need to develop and market clean technologies in India. MSMEs have the task to continue developing clean solutions to India's social and environmental challenges and to effectively market these technologies. Leveraging clean technology innovation and marketing these innovations will encourage the flow of information, best practice showcasing and the application of these technologies.

> ***In India, there is a lack of young great entrepreneurs in the cleantech field. Most have moved away.***

Nexus Venture Partners

3. CLEANTECH FINANCING LANDSCAPE IN INDIA

The cleantech financing landscape in India includes many actors such as **public and private sector banks, bilateral institutions, international and national impact investors, venture capital funds, incubators, accelerators** 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.

ACMFN has interviewed seven financial institutions which play a significant role in the Indian cleantech MSME financing space. Interviewed institutions include the **Small Industries Development Bank (SIDBI) Venture Capital, Blume Ventures, Global Environmental Fund (GEF), Nexus Venture Partners, Tata Cleantech, RBL Bank and the International Finance Corporation (IFC)**. SIDBI is the most relevant financial institution for MSMEs in India. Blume Ventures and Nexus Venture Partners are important VCs for start-ups and cleantech projects. Tata Cleantech and RBL Bank are the equivalent private sector banks with a mandate for cleantech and MSMEs. GEF is an important global alternative asset manager which invests in clean energy projects globally. IFC is an important international development financial institution (IDFI) providing funds for the global low carbon transition. All in all, these institutions cover a range of different financing options relevant to MSMEs and cleantech financing in India.

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 are usually less relevant. ACMFN-interviewed institutions stated to have an interest in investing in cleantech enterprises with strong entrepreneurial investment opportunities. Furthermore, already existing cleantech enterprises with a proven cashflow and large scaling opportunities have better chances at receiving financing with these institutions. Other financiers such as GEF and Blume Ventures engage in cleantech because they have an interest in financing meaningful investments and contributing to the SDGs and national goals of reducing greenhouse gas (GHG) emissions. Financial institutions which consider environmental and societal impact tend to equally focus on both aspects rather than one aspect alone (Figure 15).

> ***It is not true that investing into ESG[10] lowers your return. Incorporating ESG aspects actually increases your investment value.***
>
> *Global Environmental Fund*

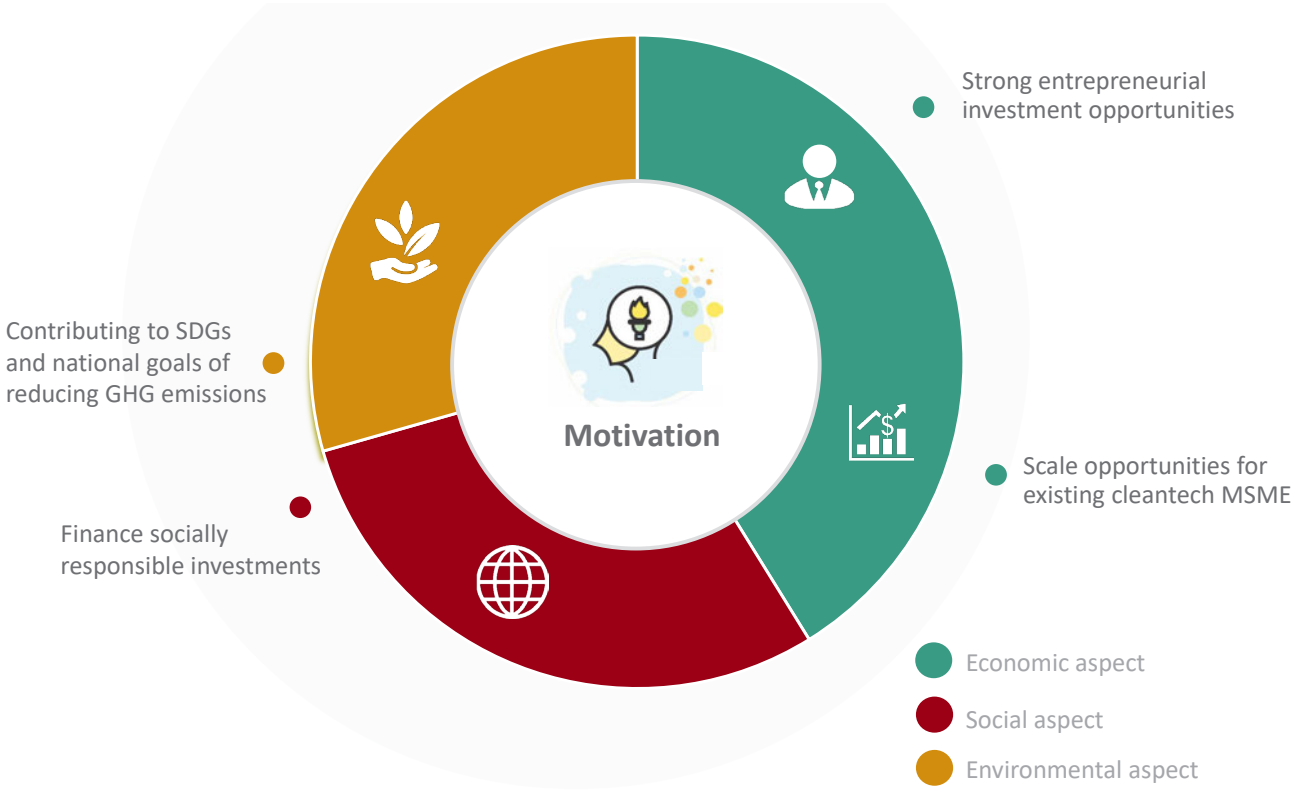


FIGURE 15: FI's motivation on cleantech financing engagement

3.1. Cleantech Financing Landscape

The Indian cleantech financing landscape is characterised by many different players. As one important player and the **principal financial institution for MSMEs in India** and, **SIDBI** has been at the forefront of providing cleantech finance to MSMEs. With support from bilateral institutions such as the German development bank KfW, the Japan International Cooperation Agency JICA and the French development bank AFD, SIDBI has introduced several credit lines for energy efficiency and cleaner production. Financing for many of these projects has moved beyond the support provided by international development finance organisations and is now part of SIDBI's mainstream business. In an interview with ACMFN SIDBI stressed that there are many opportunities for cleantech MSME investments, which is why the institution is very keen on supporting cleantech MSMEs.

India is also a destination for **international impact investors**. Several investors have invested in green and inclusive businesses in India, particularly in the area of clean energy and water access for disadvantaged parts of the population9.

The Indian banking system is organised into public sector banks, private sector banks, foreign banks, co-operative banks and regional rural banks. There are 27 **public sector banks** providing the majority of financing services to MSMEs. Currently, **only five banks have specific energy efficiency financing products**, and none has loans for cleaner production measures. ***Canara Bank*** is one of the most relevant public sector banks providing start-up financing. Other important public sector banks such as ***State Bank of India, Bank of Baroda*** and the ***Industrial Bank of India (IDBI)*** have funded renewable energy projects in the wind and solar sectors as have **private sector banks** such as ***Yes Bank*** and ***Axis Bank***. Another private sector green investment bank which informed this report is ***Tata Cleantech***. Tata Cleantech explained in an ACMFN interview that they have so far funded mostly large-scale grid-connected projects set up by independent power producers.

Usually, banks provide recourse loans for renewable energy projects based on existing relationships with customers, which makes it difficult for first-time MSME promoters to access finance. A notable exception is 's funding for small early stage companies that provide solar-based technology solutions.

Although India has a vibrant venture capital and start-up scene, most of Indian venture capital has been targeting sectors such as information technology, consumer internet services and

e-commerce. There are only three **venture capital funds** – ***INFUSE, Global Environment Fund*** (not to be confused with the Global Environment Facility) and ***Green India Venture Fund*** – which focus solely on the green technology sector. As a global partnership, GEF's targets for instance relate to the SDGs, which is why cleantech investments are of relevance for the institution. In an ACMFN interview the organisation highlighted that they are not an impact investor, but investments focus on enterprises with global exposure and a financially viable business model. Other VCs supporting green investments include Blume Venture, an important seed-funding provider, and Nexus Venture Partners. Similar to GEF, Blume Venture put forward in an ACMFN-interview that they are not impact investors, but they believe in meaningful investments. Nexus has similar investment preferences than GEF and stressed in an ACMFN-interview that they do not have a cleantech or MSME focus, but rather focus on strong entrepreneurial opportunities. So far, Nexus has financed four big cleantech projects.

> ***In the cleantech space, companies generally struggle to scale. That's why we rather focus on large investments that have the potential to compete in the global market.***

Nexus Venture Partners

> ***We invest in fundamental viable business which also have an ESG focus, we are not impact investors. The market fails to understand that these business models are financially sound.***

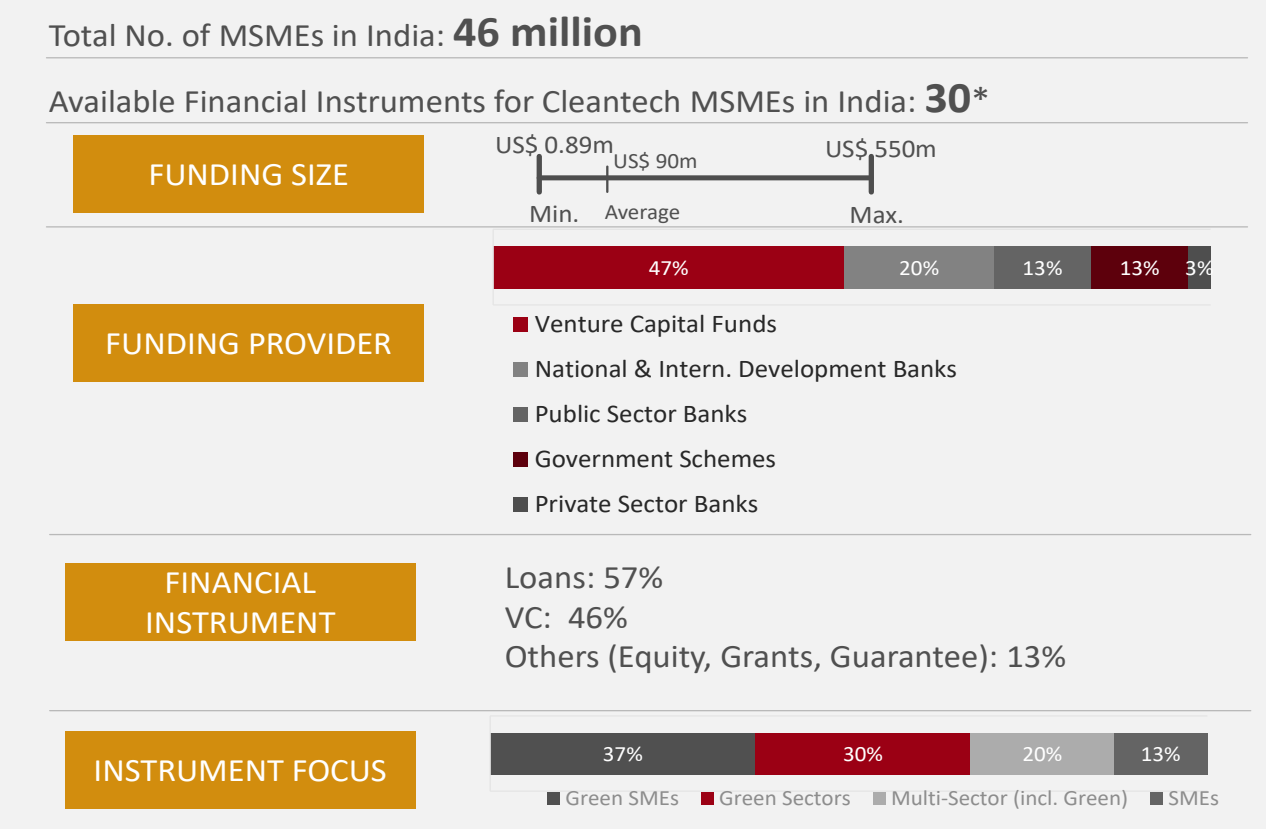
Global Environmental Fund

Another group of potential financiers for cleantech financing are incubators and accelerators. However, cleantech funding available through Indian incubators is too small to develop green technology products and services, which discourages innovation in green technologies.[11] At the same time, incubators and accelerators provide important non-financial services to cleantech MSMEs, which is why they have been included as intermediaries in this report rather than as financial institutions.

> **ACMFN interviews with key financial players in the Indian cleantech investment space revealed altogether that players with a focus on or an interest in green investments still only finance strong entrepreneurial opportunities with financially sound business models, which tend to be bigger projects or projects with large scaling potential. Cleantech MSMEs that cannot demonstrate large scaling potential, or which do not have large exposure, have very limited financing options across different categories.**

Following the global trend, blended finance is increasingly characterising the Indian cleantech financing landscape and merging and connecting the efforts of key financial institutions. In blended finance, development capital (from public sources like government aid or development banks) is used to decrease the risk of SDG-related investments (including cleantech) to attract commercial capital from private investors who would otherwise not have participated. It therefore "blends" capital with a development mandate with capital which is not development-related, making cleantech investments more "investable"[12]. The credit lines established by SIDBI and development financiers such as KfW or IFC, with on-lending from Indian private banks for cleantech investments are a prime example of blended finance in action.

3.2. Financial Instruments



*Number based on research conducted by ACMFN in 2018

FIGURE 16: Financial Instruments Snapshot

In India, a total of 30 financial instruments are available to Indian cleantech enterprises in 2018 (Figure 16)[13]. This number includes instruments targeting either MSMEs, green MSMEs, green sectors or multi-sector-investments including green sectors.

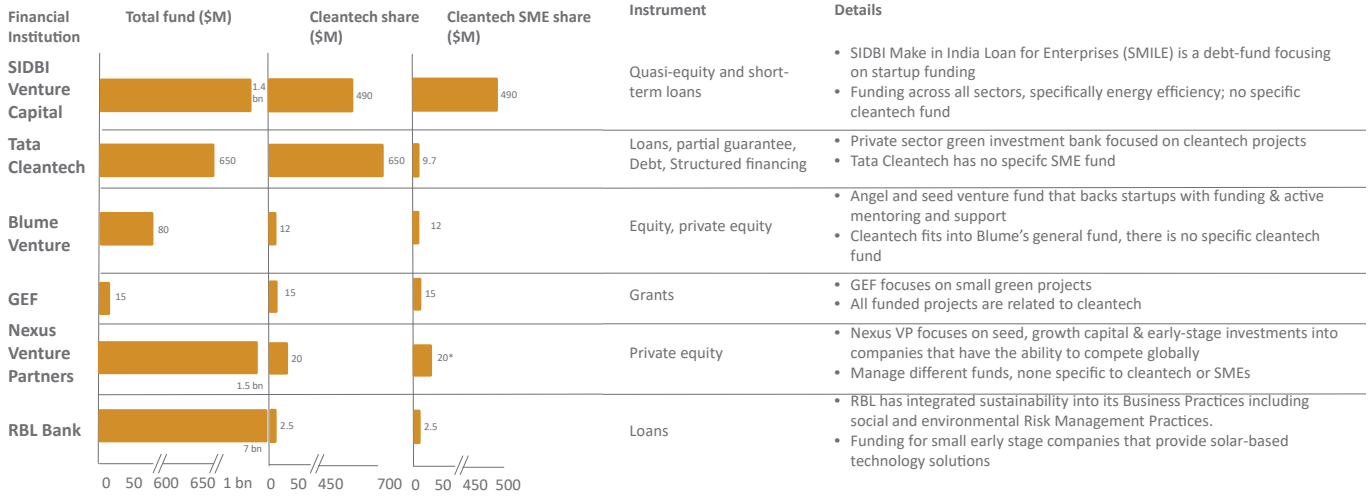
One of the most relevant funds for cleantech MSMEs in India is the **SIDBI Make in India Loan for Enterprises (SMILE) scheme** which provides broad-based financing for MSMEs active in one of 25 target sectors including renewable energy. Under the Word Bank financed **MSME Growth Innovation and Inclusive Finance Project**, SIDBI currently provides the highest amount of cleantech MSME funding with a total of US$ 550 mil. This project is a prime example for blended finance, as no other financial instrument in India provides a higher amount of funding available to cleantech MSMEs. Other important blended finance instruments relevant for cleantech MSMEs are the Government of India's **Credit Guarantee Fund Trust Scheme** providing collateral-free loans through SIDBI and other lending institutions, and IDBI's **Credit Guarantee Fund for SMEs.** Canara Bank's **Scheme for Start-ups (SUS) and Early Stage Units (ESUS)** is another financing instrument provided by the public sector. One of the most important Series A investors and Venture Capital Funds for MSMEs is **Venture East Fund Advisors**.

There are other financial institutions such as Tata Cleantech that invest more into cleantech than SIDBI among those included in the interview series. Tata Cleantech for instance has a total fund size of US$ 650 million However, only approximately US$ 10 million go towards MSMEs, which decreases their relevance for small cleantech enterprises.

> **Financial institutions invest approximately US$ 2.5-15 million into cleantech MSMEs. Most institutions do not have a specific financial instrument focusing on cleantech or MSMEs. Cleantech rather fits into their general portfolio and becomes interesting once the investment opportunity is profitable**

Nexus Venture Partners for instance does not focus on cleantech, but generally on **scalable business opportunities**, which in some cases has been in the cleantech space. Nexus has invested in four cleantech projects so far. Blume Ventures as an angel- and seed-investor also has no specific cleantech MSME fund, but cleantech belongs to their general portfolio. On the other hand, GEF is focused on relatively small environmental projects, which promises great funding opportunities for cleantech MSMEs. However, the GEF fund size is quite small with US$ 15 million. Specific MSME funds tend to not have a cleantech focus and hence do not take into account impact considerations. **A noteworthy credit line relevant for cleantech MSMEs is RBL Bank's fund for small early-stage companies that provide solar-based technology solutions**. This instrument is particularly relevant for micro-investment into agricultural activities. Figure 18 gives an overview of selected financial instruments, including fund sizes, investment shares into cleantech and shares of cleantech MSME financing.

Apart from financing from SIDBI and Tata Cleantech, ***investment directed towards cleantech in general is still very low compared to total fund sizes***. Investments into cleantech MSMEs are even lower. This means that there is a gap in the provision of specific credit lines and other instruments targeting cleantech MSMEs.



*Data entry based on institution's share of Cleantech investment; share of Cleantech SME investment may be lower.

FIGURE 17: Cleantech share of overall fund size

IFC Providing Blended Finance for Cleantech Enterprises

As an IDFI, IFC serves as an example for a global fund providing blended finance in India. IFC has successfully mobilised billions of dollars due to its "private sector-focused" way of engaging with investors, having raised US$ 10 billion across 13 funds in developing countries[14]. IFC highlighted in an interview with ACMFN that in their mandate to fund the low carbon transition globally, they remain interested in financing energy transition areas such as distributed power, mini-grids, and transportation. Focused on equity investment, IFC acts as a general VC fund, which invests on average US$ 3-20 million per customer. As a second stage VC, IFC provides capital for start-ups pass the seed stage that have conducted initial market analysis and business plans in place, looking to begin marketing and advertising the product and acquiring customers. For cleantech MSMEs in India, this is an interesting financing option. IFC has also invested in the specialised cleantech VC fund Infuse Ventures in the past, which is not specific to cleantech anymore. IFC has so far provided important cleantech financing to several Indian companies in the areas of rural renewable energy, biomass waste to energy plants and independent power provision . IFC is also a Joint Venture (JV) partner of Tata Cleantech[15].

IFC focuses on second stage VC investment to fund the low carbon transition globally, including India.

Financial institutions interviewed by ACMFN have different investment foci moving gradually from a traditional investment towards integrating further specific aspects such as becoming a "cleantech financer" at the core: Traditional, MSME, impact, environmental, and cleantech financing. Traditional and MSME financing is more prominent - in some cases also environmental and cleantech financing. **Impact-financing is usually not part of the portfolio of financial institutions** (see Figure 18). Some institutions do not take environmental aspects into considerations at all. This becomes problematic for MSMEs with impact-focused business models, as this focus may diminish profits and investment into their model hence becomes uninteresting for financiers. Currently, there are only **very limited impact-focused instruments geared towards cleantech MSMEs characteristics and needs** on the Indian market.

Accessing Cleantech Financing at Different Enterprise Stages

Considering investment volumes and the number of instruments provided, **SIDBI Venture Capital is most involved in cleantech MSME financing in all enterprise stages** due to the large size of available funds and instruments.

Tata Cleantech is an interesting option for MSMEs in different enterprise stages due to their large fund size as well. However, **enterprises need to have a clear cashflow or scalable business model with large investment opportunities** in order to receive financing.

> *If you can make sure that the model is scalable, one can identify a large set of opportunities, and accessing funding will be easier.*
>
> *Tata Cleantech*

As opposed to many other financial institutions, Blume Ventures focuses on start-ups and early-stage ventures, but with a relatively small investment volume into cleantech MSMEs. Blume also offers **mentoring support together with its funding, which is of great benefit** in the development of enterprises.

Similarly, GEF invests in seed- and early-stage projects, also with a small investment volume.

Nexus Venture Partners finances enterprises in different stages, however, they focus on highly scalable businesses.

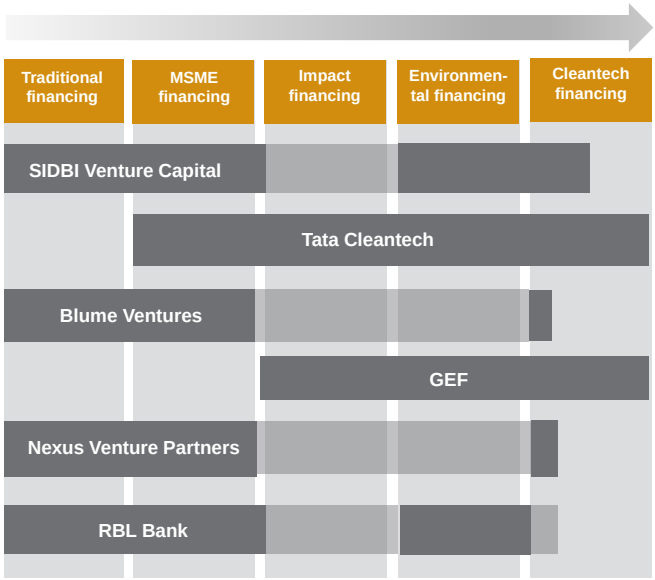


FIGURE 18: Positioning FIs in cleantech financing provision

RBL bank has started to fill the MSME financing gap by offering a targeted financing instrument, but with a relatively small fund size.

> **One of the major challenges for ACMFN partners has been deficiencies in enterprise's scalability, making funding difficult.**

FIGURE 19: FI's involvement in cleantech MSME investment

Looking at the landscape of financial institutions involved in and relevant for cleantech MSMEs in India, 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.

CHALLENGES FOR FINANCIAL INSTITUTIONS

In addition to the generally low **cleantech awareness**, investors focus rather on **quick returns, low risk and high growth investments** without including impact considerations. **Currently, only five banks have specific energy efficiency financing products,** making cleantech financing difficult for MSMEs. Especially public sector banks need to increase their share of blended finance for cleantech investments. Deficiencies also exist with regards to the existence of flexible financial instruments offering focused financing with impact considerations. In addition, **not enough focused funding opportunities** for scaling clean technologies are on the market. Private sector banks should focus on this aspect particularly as one of the major reasons for enterprise's funding denials is that their business models are not scalable, and funder's perceive investment prospects as low.

In some cases, market opportunities to invest in and scale cleantech companies are also limited due to **government-controlled spaces**. These are caused by government incentives such as subsidies in the cleantech space, which impact market and consumer behaviour. Changing policies and regulations also pose **investment risks** for financial institutions in the cleantech space.

KEY RECOMMENDATIONS

Developing creative hybrid instruments

Financial institutions play an important role in pushing the cleantech movement in India. Recommendations from cleantech financers include the development of creative hybrid instruments, which could for instance be equity-raised instruments starting off as debt preference. The evaluation of impact should be considered in instruments to make them suitable for MSMEs with environmental and social impact.

Developing smaller targeted funds

Niche-level funds which tend to be smaller and targeted are more flexible in developing solutions, according to ACMFN stakeholders. Additionally, impact-driven funds are useful instruments geared towards the benefits and needs of cleantech SMEs. The development of credit lines which will reduce cleantech MSME's financing barriers are important steps to take.

Creating a bigger institutional fund

Other financial institutions recommend the creation of a bigger institutional fund which has less restrictions than conventional funds and guarantees broader coverage of financing options for cleantech MSMEs nationwide. This could also be an important mechanism addressing the prevalent financing challenge in the cleantech MSME space.

ACMFN Recommendation: Developing financial models with Non-Banking Financial Companies (NBFC)

While the financial sector is still lacking behind in providing finance for cleantech MSMEs, NBFCs offer an opportunity for faster finance mobilisation. CII recommends developing financing models with NBFC focussing on low collateral, faster lending and lower interest rates. The ACMFN cluster model has also been successful in mobilising finance and promoting innovative tripartite financing agreements between suppliers, MSMEs and OEM/Industry associations. There remains a need to develop more financing models for clean technology implementation through such models.

4. CLEANTECH INTERMEDIARY LANDSCAPE IN INDIA

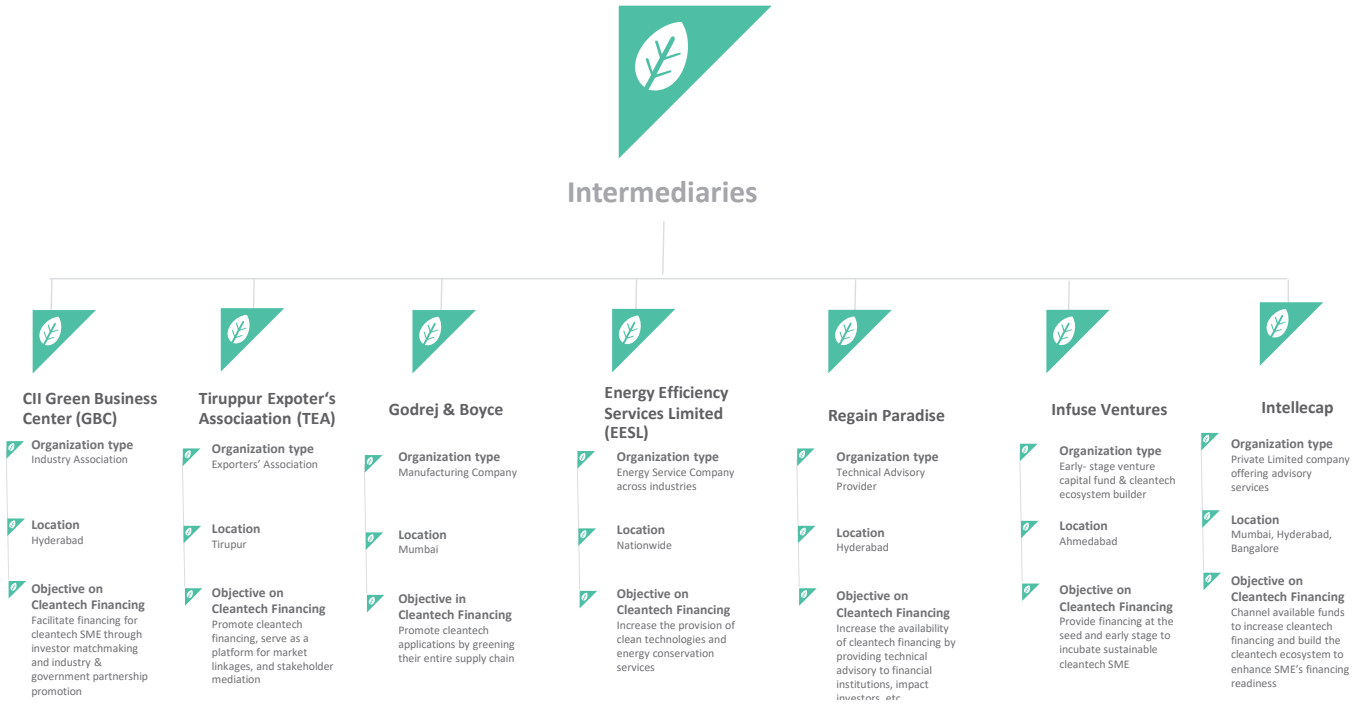


FIGURE 20: Intermediaries Portfolio

4.1. Cleantech Intermediary Landscape

The Indian cleantech intermediary landscape consists of industry associations (such as Tiruppur Exporter's Association), incubators and accelerators, advisory provider (such as Regain Paradise or Intellecap), as well as other organizations, companies and models which offer services or programmes promoting cleantech MSME financing (such as Godrej & Boyce, Infuse Ventures and Energy Efficiency Services Unlimited/EESL). ACMFN has selected seven intermediaries which play important roles in the Indian cleantech MSME financing space for an in-depth interview:

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

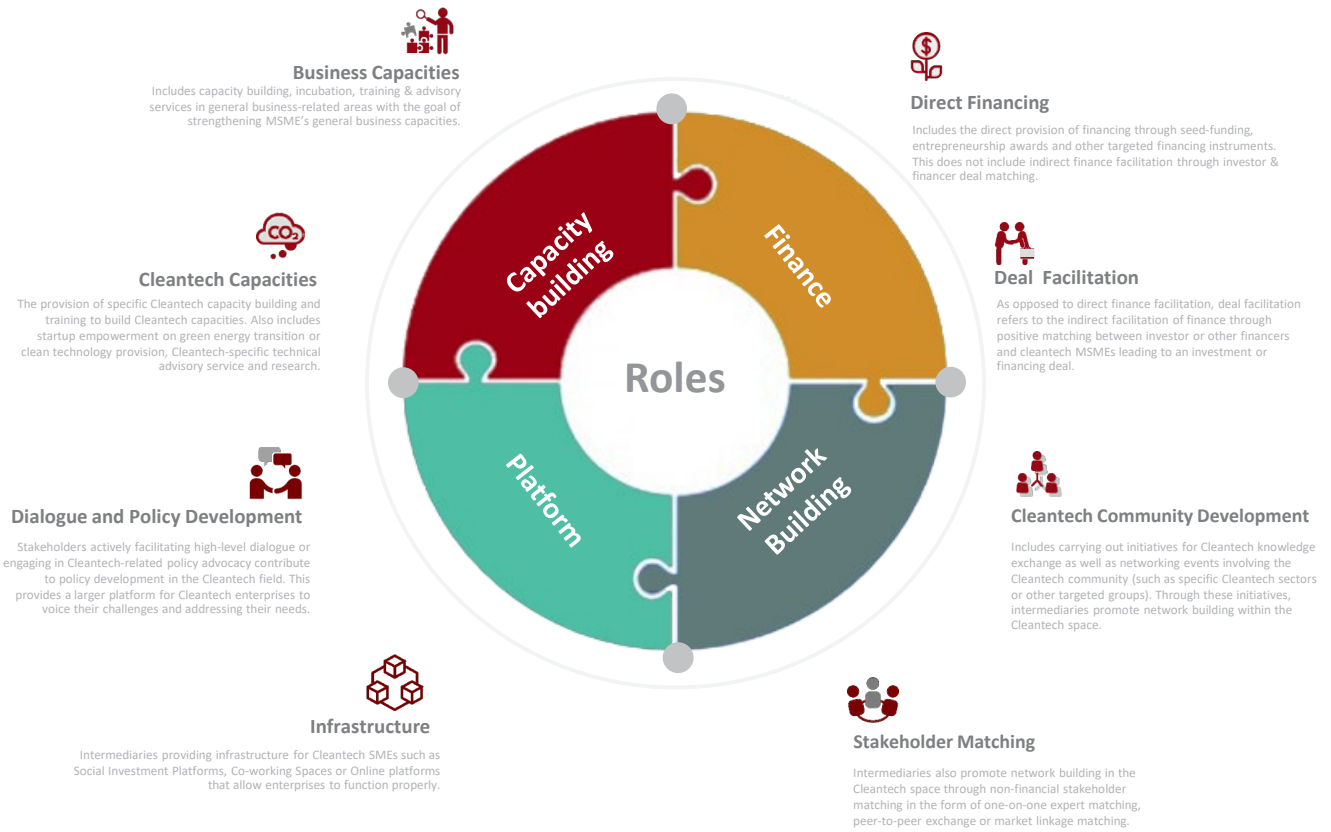


FIGURE 21: Roles of Intermediaries

Currently, intermediaries focus their approach on business capacity development, infrastructure development and network building. It is noteworthy that the local ACMFN host **CII covers all categories except direct financing provision.**

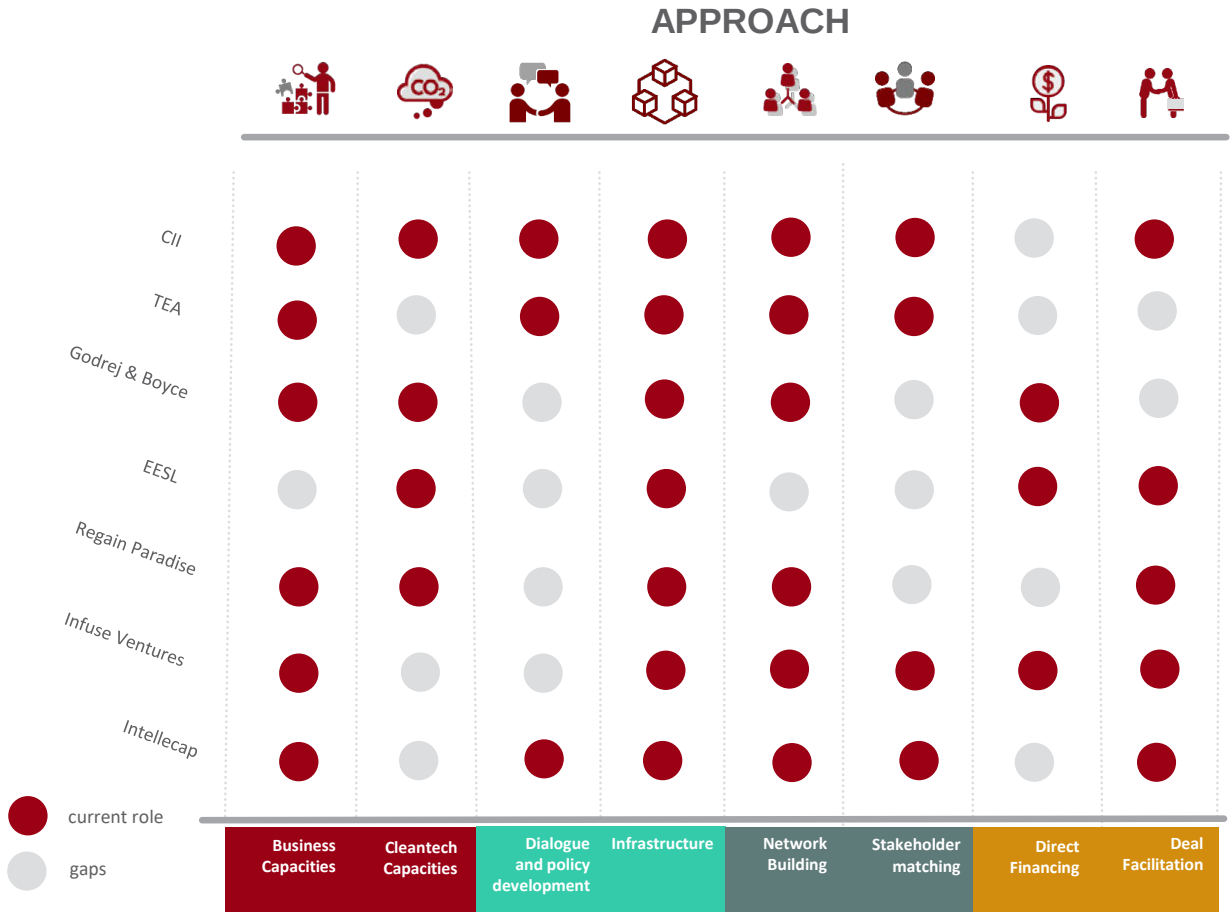


FIGURE 22: Intermediaries Role

Currently, the intermediary **landscape lacks support services for MSMEs to access finance**, especially the combination of financial and non-financial support. Besides access to finance for any type of company wanting to invest in cleantech measures, **MSME support is also limited with regards to developing and marketing clean technologies in India**.

Significant gaps also exist in the area of dialogue and policy development, **cleantech capacity building and stakeholder matching**. ACMFN interviews confirm that among the biggest challenges in the Indian cleantech MSME ecosystem is the limited knowledge about clean technologies and the lack of a knowledge exchange platform for cleantech MSMEs . Knowledge is limited especially among MSMEs and financial institutions. Since energy has been heavily subsidised and the law enforcement for environmental protection is relatively poor in India, MSMEs lack incentives to invest in cleantech measures. Consequently, they do not generate demand for cleantech financing products. **Due to the limited demand for financing products, financial institutions do not only lack knowledge about clean technologies, but also knowledge about risk assessment tools for green investments**. Both factors significantly hinder the development of cleantech financing tools[16].

> **Among the biggest challenges in the Indian cleantech MSME ecosystem is the limited knowledge about clean technologies and the lack of a knowledge exchange platform for cleantech MSMEs.**

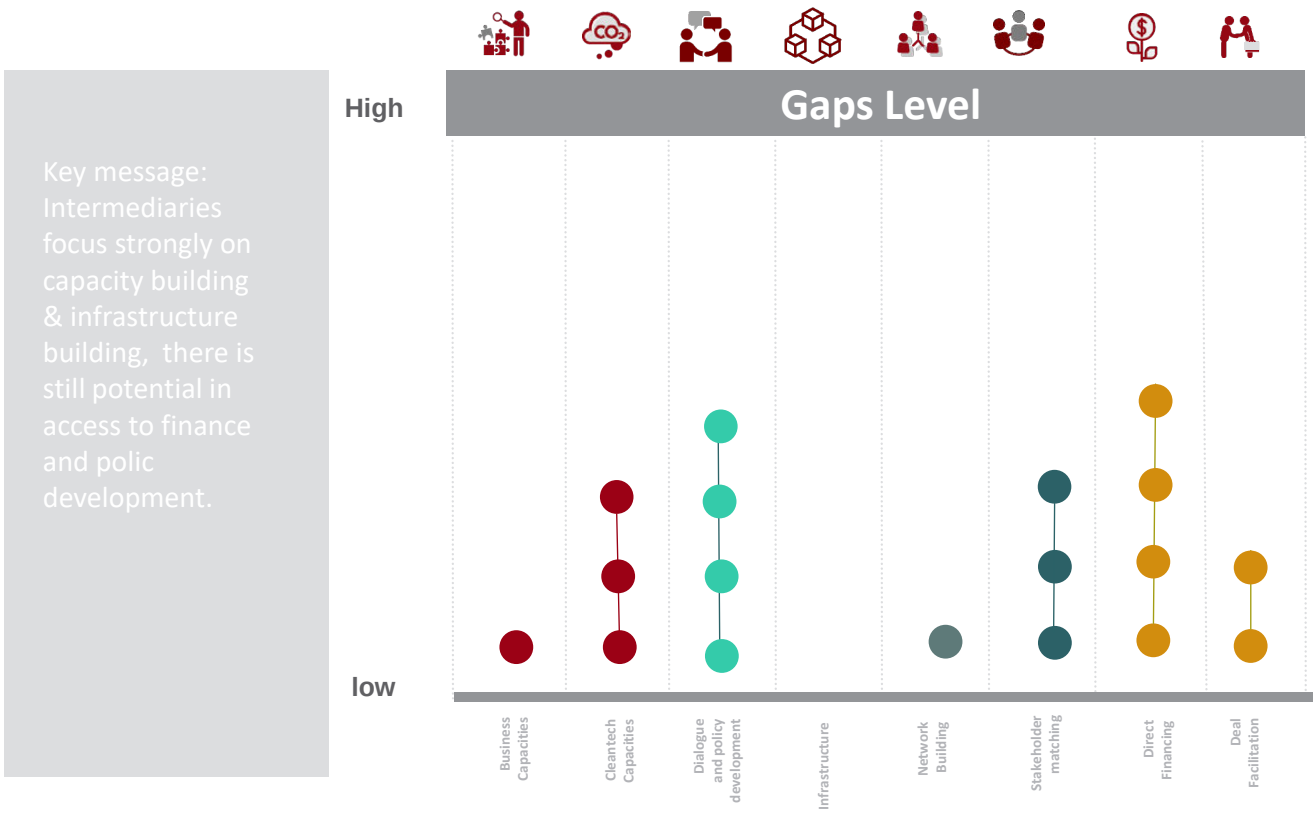


FIGURE 23: Intermediaries Gaps

Despite the gaps in support areas such as direct financing provision or dialogue and policy development, for most intermediaries, cleantech support plays a significant role within their service portfolio because their core business revolves around promoting Indian cleantech MSMEs.

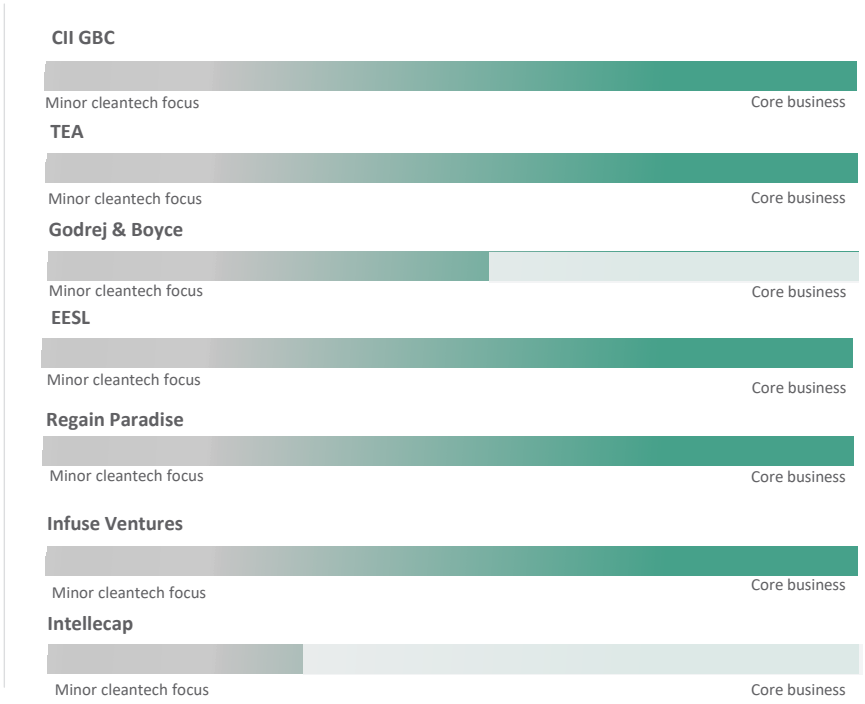


FIGURE 24: Intermediaries' focus intensity on cleantech support

Figure 26 takes into consideration not only the intermediaries' service portfolio, but also the strength of their influence in the cleantech financing space to identify the importance of different players in the Indian cleantech space. Although not all intermediaries focus on cleantech support, some are still important players in the cleantech MSME ecosystem because they significantly contribute to the development of cleantech MSMEs, in particular with regards to facilitating access to finance.

For example, Godrej & Boyce have shown significant progress and success in promoting cleantech among their supplier MSMEs, yet their 15-months support programme for MSMEs is only a small part of their business activities. Currently, their supplier base consists of 250 MSMEs and more than 80 have been supported so far through their programme. According to the company, 50% of suppliers are already green. Although the company's business activity does not focus on cleantech per se, Godrej & Boyce is driven by a green vision, making an exemplary contribution to the Indian cleantech MSME landscape because they show how demand from the buyer's side can effectively motivate conventional MSMEs to start their green path. Since the beginning of ACMFN activities, Godrej & Boyce have supported an additional ten MSMEs through their programme.

> ***Our goal is to ultimately green our entire supply chain.***
>
> *Godrej & Boyce Ltd.*

As another important intermediary, CII has been working closely with Godrej & Boyce and other OEMs to support them in propagating the concept of clean technology in their supply chain and members respectively. CII has supported Godrej & Boyce in forming clusters to enable structured knowledge and technology transfer to the MSMEs. Under the ACMFN initiative, CII has also organised several workshops and meetings to matchmake local financial institutions (debt) with these MSMEs to enable finance facilitation for implementing clean technologies. In addition to the OEMs, CII has actively worked with local industry association (specifically TEA) to organise several knowledge & technology transfer initiatives and finance facilitation for association members. For TEA, CII has also signed a Memorandum of Understanding to develop a green roadmap, a first of its kind green charter to garner voluntary commitment from the member MSMEs to reduce their environmental footprint while maximising their profits.

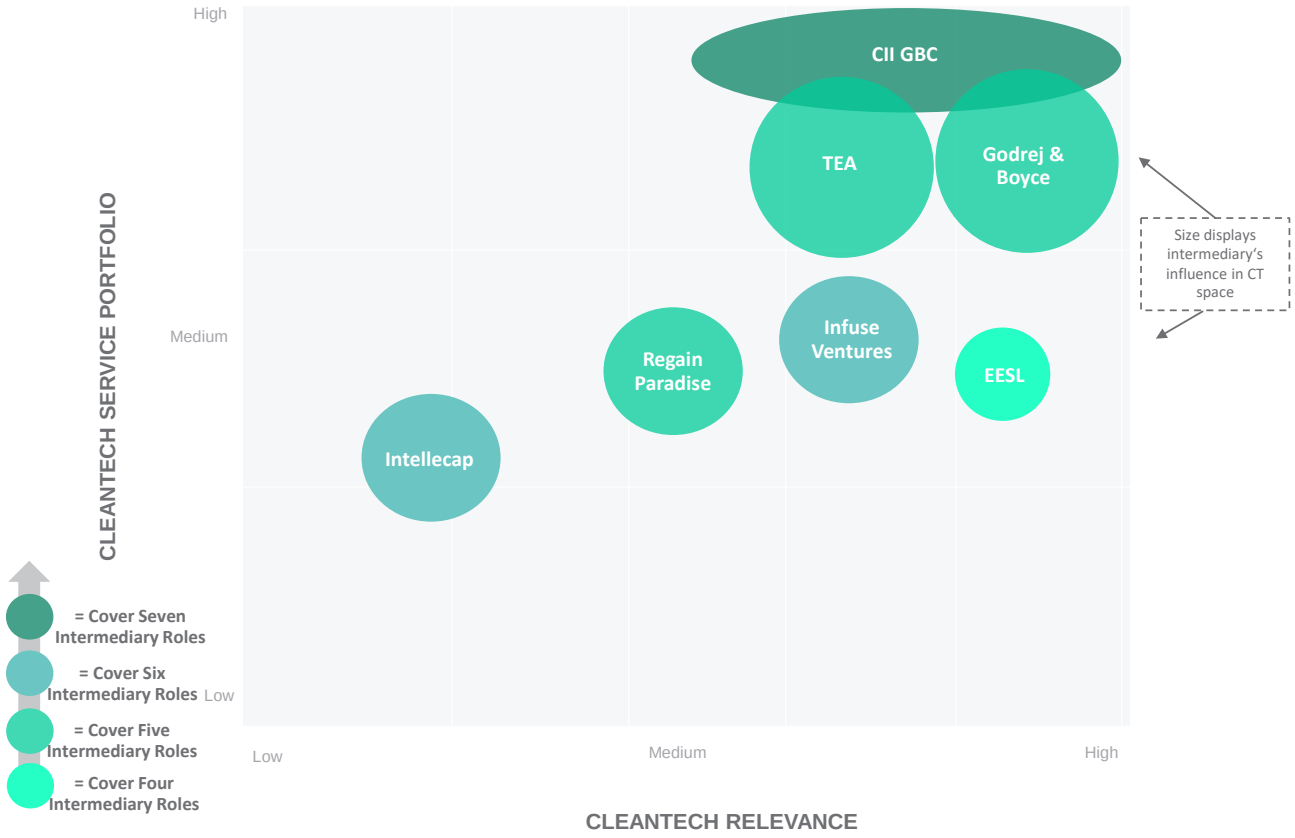


FIGURE 25: Intermediaries' relevance in the Cleantech space

4.2. Financing Cleantech: Intermediary Models

Since financial institutions have been lacking behind in providing financing instruments suitable for cleantech MSMEs, alternative models promoted by intermediaries such as Energy Service Companies (ESCOs) or CII have become proven ways of providing access to cleantech financing. Two intermediary models, the ESCO model and the ACMFN cluster model applied by CII, are presented below to highlight alternative way of raising financing for cleantech MSMEs.

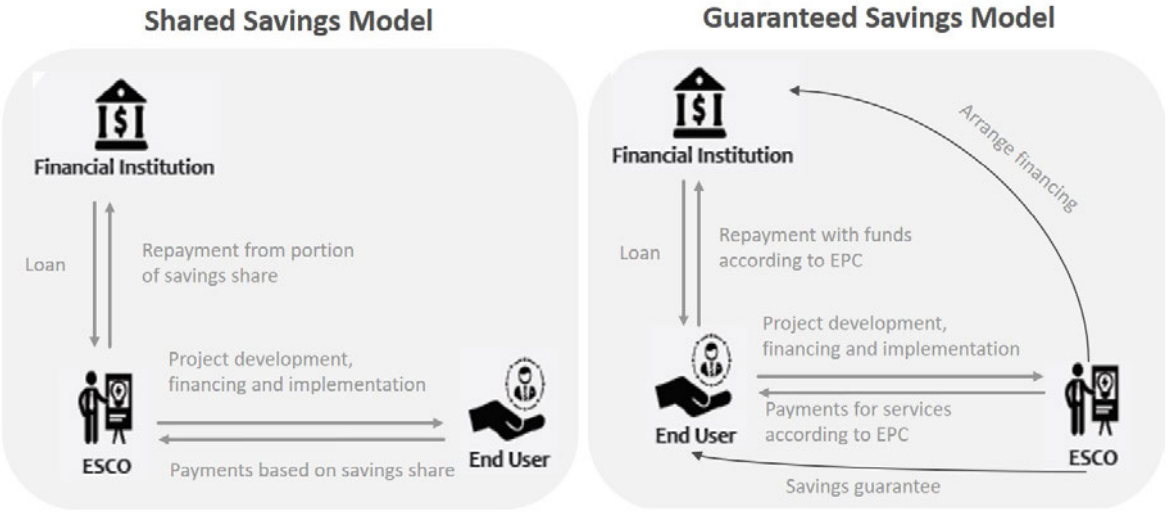
ESCO Model

FIGURE 26: ESCO Model At-a-Glance

ESCOs have become popular financing vehicles across Asia, including India. 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[17]. **In India, the ESCO market size had exceeded US$ 140 million by 2015**. Among Asian countries, China currently has the biggest ESCO market with a total size of US$ 16 billion (2016 est.). **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 include 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[18].

Approach



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

FIGURE 27: ESCO Model Approach

ACMFN Cluster Model

ACMFN's local partner CII has adopted the industry association cluster approach to engage with MSMEs and promote the application of clean technologies among CP MSMEs. Major drivers of the model are local industry associations, such as OEMs and TEA. Industry associations build the ecosystem for interactions among MSMEs by taking up connection points with MSMEs. The associations' main roles include fostering the involvement and interaction with all stakeholders including supplier / ESCOs, MSMEs and financial institutions. Ultimately, the cluster model focuses on expanding the work and clean production network inside the cluster while promoting the concept across India through other clusters.

So far, experiences with the cluster model have been very positive as capacity building of more than 300 vendors on green practices was conducted through workshops and in persona meetings. Also, technology supplier matchmaking and finance facilitation was successfully done. Through the cluster model, a total of US$ 614,000 was facilitated with financing from banks such as SIDBI or City Union Bank, as well as through green loans and ESCO model financing. Through OEM, successful clusters have been established in Pune and Punjab. An important driver of these clusters is the OEM Godrej & Boyce Ltd., a manufacturing company striving to create a shift towards greening their supply chain by enabling these MSME suppliers to adopt GreenCo-certification. Godrej & Boyce's supply chain stretches across both Pune and Mumbai, which is why the Pune cluster has been extended to Mumbai. Due to the company's size, influence, and engagement in promoting cleantech application among MSMEs, it is an important intermediary in the ACMFN cleantech financing space. In addition, TEA has successfully established the Tiruppur cluster. CII strives to replicate the model to other areas in the future.

> *We welcome all people that are ready for sustainability. The GreenCo-certification needs to make some changes in the society.*

Syndicate Impex, Cleaner Production enterprise in Tiruppur.

Recent TEA cluster successes in Tiruppur include an investment of approx. US$ 290,000 (Rs 2 crores) into clean production measures applied by five companies in total. So far, four companies have implemented their projects, one is still under implementation. Total savings amount to approx. US$ 12,000 (Rs 850,000) through the implemented initiatives.

Within the OEM clusters, eight companies have successfully engaged in clean production initiatives. In total, these companies are investing almost US$ 1.2 million (Rs 8.2 crores) in clean production, achieving significant emission savings.

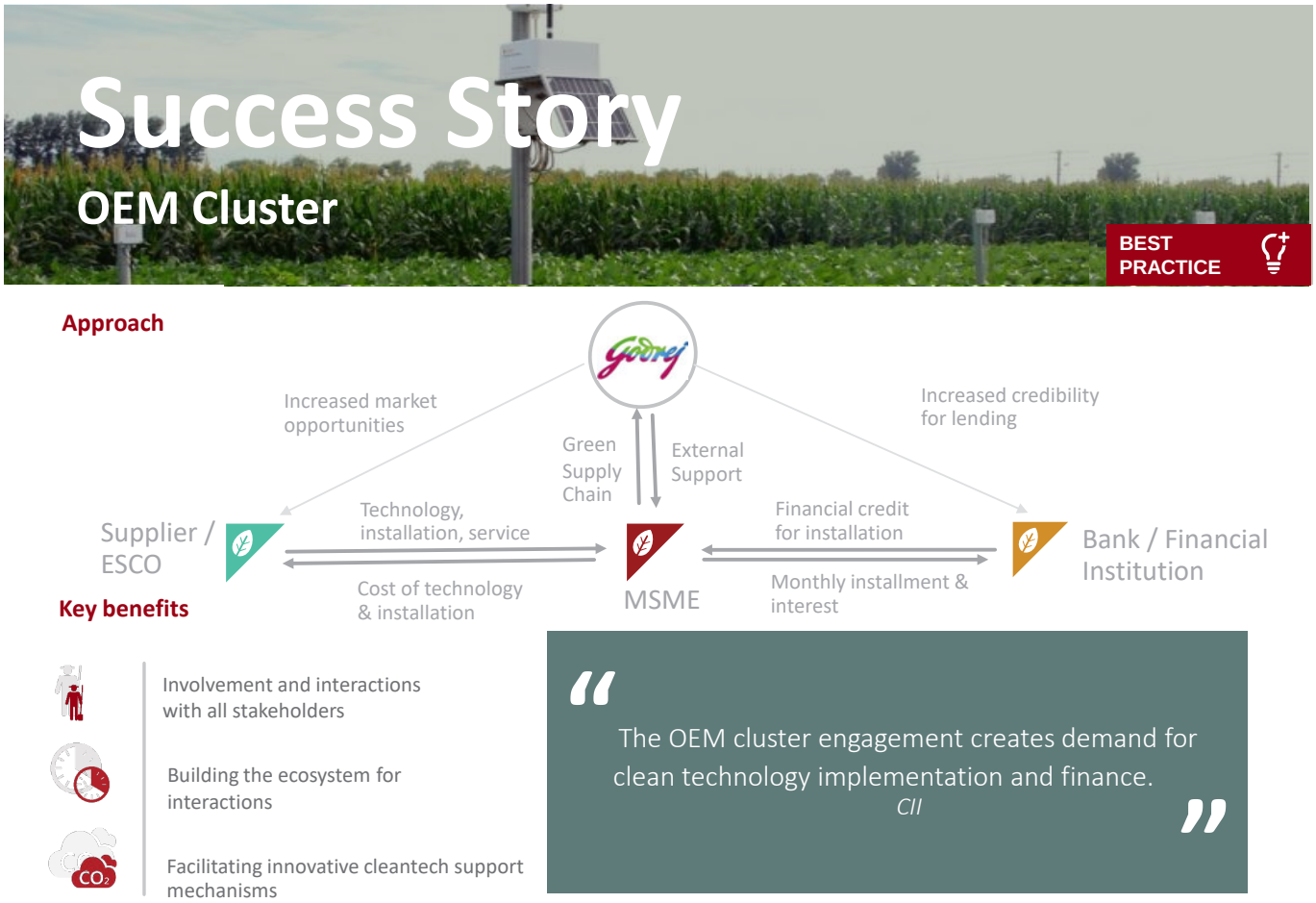


FIGURE 28: OEM Cluster Success Story

These models show that different intermediaries have come up with innovative instruments to address the challenge of accessing cleantech finance in India.

All in all, intermediary support gaps and other challenges in the intermediary landscape, which are needed to boost cleantech MSMEs innovation capacity, are also relevant and need to be addressed. In ACMFN interviews, stakeholders recommended future actions to leverage potentials in the intermediary landscape.

CHALLENGES FOR INTERMEDIARIES

Restrained knowledge exchange is one of the major challenges which cleantech start-ups face. What is needed from the intermediary side is a national cleantech knowledge exchange platform. Currently, **only eight cleantech-focused incubators and accelerators are active in India**. The provision of such an exchange platform has been a focus of ACMFN local partner CII, and the development of the online platform is of great significance for Indian cleantech start-ups. In addition to a lack of knowledge, capacity limitations also exist within enterprises which **limit enterprise's ability to scale**. This significantly hinders their investment opportunities, as outlined above. Capacity building initiatives providing targeted skills to enterprises to increase their ability to scale is essential to increase these enterprise's access to finance.

> ***Once we streamline the supply chain and the mentality, then we can break the prices.***
>
> *Syndicate Impex, Cleaner Production enterprise in Tiruppur.*

KEY RECOMMENDATIONS

Introducing compulsory green certification

In ACMFN interviews, stakeholders agreed that in order to develop the clean technology market in India, more demand for clean production needs to come from the buyer side. Godrej & Boyce as an intermediary buyer has been actively pushing the green movement in India and is a good best practice example of how buyers can boost cleantech adoption in India. The Godrej team, among other stakeholders, suggests that other buyers start introducing compulsory green certificates from their suppliers. This will push the implementation of clean technologies in India. As part of the ACMFN cluster in Tiruppur, TEA is planning to introduce a voluntary initiative of setting sustainability targets and commitments for SMEs across sectors. So far, no association has come up with this initiative and TEA is already working on partnerships for the technical facilitation. In ACMFN interviews, stakeholders pointed out, however, that if initiatives continue to be voluntary, implementation will continue to grow slowly as the mindset of enterprises is changing at a slow pace.

Creation of a knowledge sharing platform

Investments into ecosystem building are crucial to create demand for cleantech products in India. To effectively continue to build the ecosystem, the creation and development of a knowledge sharing platform is important to assist stakeholders in understanding technologies and implementation procedures. CII has taken an important step by creating the online platform PACT. The development of PACT as well as further initiatives by other stakeholders are required to promote the flow of information about clean technology products and services.

Establishing impact-focused cooperatives

Cooperatives are important for MSMEs as they can increase their market power and access to markets, while offering other important business services. ACMFN stakeholders are of the opinion that cooperatives with an interest in creating impact will strengthen the substance base of cleantech MSMEs. Once these cooperatives are established, they can be taken to another level, accelerating their influence in the market. The ACMFN clusters are an example of a similar model specifically for cleantech SMEs. Extending existing clusters and establishing new geographical clusters can be an effective tool to boost cleantech MSME activity in India.

Developing adequate labels for cleantech SMEs

When it comes to labelling cleantech initiatives, some enterprises use Environmental and Social Governance (ESG) labelling or other impact-focused labels. Stakeholders have highlighted that this form of impact labelling should not exclusively focus on impact because most businesses are conventional businesses and not impact-focused businesses. While impact-focused labels are important forms of streamlining quality assurance for consumers and buyers and serve as a great marketing tool for enterprises, intermediary organisations could develop a label highlighting conventional businesses sustainability efforts while not labelling them as entirely green businesses. This may combat potential implications and conflicts brought about by impact-labelling.

ACMFN Recommendation: Setting up a national portal of all clean technologies in India

Through CII's work on the ground implementing ACMFN activities, experience has shown that a key aspect related to clean technology development and application is access to information about already available technologies. It would therefore be highly effective to set up a large concentrated portal of all clean technologies on offer in the country, which provides this information for cleantech suppliers and adopters.

5. CURRENT CLEANTECH FINANCING TRENDS, CHALLENGES & RECOMMENDATIONS

After having looked at the level of MSMEs, financial institutions and intermediaries in depth, it is time for a resume: How cleantech financing ready is India? 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 India.

The financing readiness of the three stakeholder groups (MSMEs, financial institutions, intermediaries) shows that **many opportunities exist** for the development of the Indian cleantech sector.

- ***MSMEs:*** Clean technologies are widely available in India. However, cleantech application rates across different sectors are currently still low due to financial limitations of MSMEs and the lack of financing instruments available. Energy efficiency is among the most popular sectors, while initiatives in other sectors still lack behind. Especially renewable energy technologies require larger investment sums, which MSMEs can only stem once they have a significant size and investment capital available.
- ***Intermediaries:*** The need for clean technologies is higher than ever in India, as the industry realises the need to reduce their environmental footprint while maximizing their profits, which can be achieved by faster adoption of these clean technologies On the intermediary side, the lack of a national platform for cleantech knowledge exchange is a major barrier to cleantech adoption. Other crucial support gaps on the intermediary side exist in facilitating cleantech capacities and offering support to access finance.
- ***Financial institutions:*** The difficulty of accessing funding for cleantech MSMEs remains high, leaving much room for improvements and the development of suitable financial instruments. Investment sums into bigger cleantech projects is widely available, but targeted instruments for cleantech MSMEs are very limited.

FIGURE 29: ACMFN India Cleantech Financing Readiness

CII has taken an important step by creating an online platform for cleantech knowledge and technology exchange called PACT (Platform for Accelerating Clean Technologies). PACT links Indian cleantech MSMEs nationwide with each other and to potential markets (www.pact-india.com). The goal of the platform is to pool all the clean technologies in the country on one platform and to enable market transformation by accelerating clean technology adoption.

Cleantech financing has become available and much easier to access for big feasible projects in recent years, and small projects can only access funding if their models have large scaling opportunities. Especially private sector banks tend to invest in bigger projects, while public institutions tend to provide funding for smaller companies[19]. The Green Climate Fund (GCF), which invests only in large climate-related projects, had an important role to play in this development, as GCF's investment sum has been growing in the past and therefore many large cleantech projects could be financed.

Scaling cleantech businesses has been difficult because some enterprises cannot demonstrate a clear incremental cash flow in their models, which makes funding difficult. Investors tend to be hesitant to invest in these businesses, which limits innovation in the sector. The challenge and task of the industry remains to bring these businesses to a mature state or even a global scale.

> ***Accessing funding is a lot easier for bigger projects across sectors. For cleantech MSMEs, it is more challenging.***
>
> *Tata Cleantech*

Currently, cleantech investments are still seen as Corporate Social Responsibility (CSR) initiatives meant to boost the enterprise's marketing and promotion strategy rather than a strategy that provides economic, environmental and social benefits to the enterprise and society.

MSME's **primary motivation for cleantech adoption is currently driven by consumer- and buyer's-demand**. Best practice examples like Godrej's green supplier model are among the reasons why MSMEs get involved in cleantech and Godrej provides the cleantech market with a push. At the same time, there is still **no proper implementation mechanism** in place. Since MSME's motivations are rather extrinsic than intrinsic and funding is generally an issue for most enterprises,

the speed in which technologies are adopted differs from case to case, but generally **tends to be slow**.

Generally, older generation MSMEs still tend to me more hesitant towards applying cleantech. In some areas such as the Tiruppur area, **many MSMEs have already implemented small green initiatives** such as switching to LED-lamps or optimising their power savings through funding of local banks, but they have not gone entirely green.

> ***To find time for cleantech initiatives is a challenge itself. Most MSMEs mainly care about their normal production and have no time to consider cleantech. Some realize they can save some money; in our case we saved a lot of energy.***

Atharva Polyplast Ltd., Cleaner Production enterprise in Pune

Cleantech promotion and the **flow of information currently happens informally**, mainly through word of mouth. CII's newly established PACT platform **has been an important step in providing a promotion and networking platform** which is being used by over 40 cleantech MSMEs so far. PACT serves CP enterprises to access new and innovative clean technologies and also CT enterprises to have an increased market reach out. Especially at the top level, a knowledge exchange platform is crucial to exchange experiences, spread best practice examples and promote the sector.

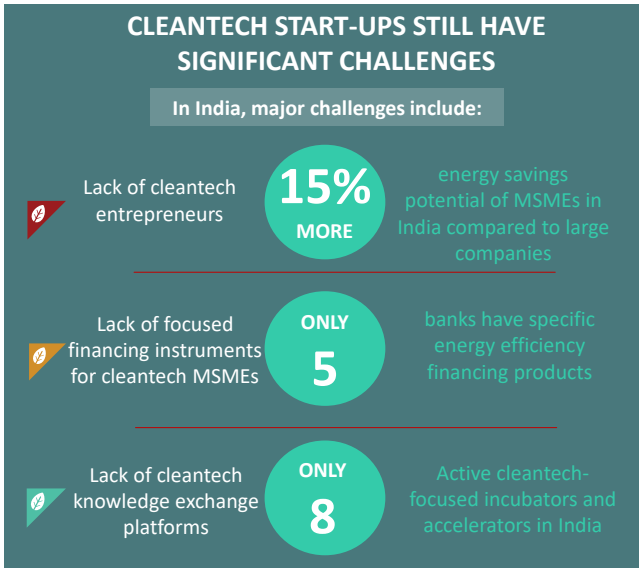


FIGURE 30: Key Challenges per Actor

Challenges in the Indian cleantech MSME ecosystem

Cleantech enterprises in India still face significant challenges and barriers on different levels. **Major challenges include market concerns due to a lack of demand for clean products, cleantech knowledge and expertise gaps, high profit investment preferences from donors, capacity limitations to scale cleantech business models, government incentives diminishing market opportunities for cleantech enterprises, and a lack of cleantech awareness. The lack of cleantech awareness about the importance and economic viability of environmental and social impact** is another major challenge among MSMEs (buyer and supplier), financial institutions, consumers, and society on a whole. This challenge is directly related to a **lack of demand for clean products and services** which causes market concerns for cleantech supplier.

> ***One of the biggest challenges is changing MSMEs mindset - In the first phase they don't understand the importance, until they realize that they can only benefit and gain new customers. Then they start to invest themselves.***

Godrej & Boyce Ltd.

FIGURE 31: Key Challenges in the Indian Cleantech Ecosystem

Current Trends in Cleantech Financing

Despite existing challenges, ACMFN stakeholders have already made important contributions to the Indian cleantech MSME market 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 India with ACMFN and agreed that **cleantech is evolving in India**. While many positive trends were mentioned, some barriers to cleantech success were also pointed out:

Cleantech awareness and the mindset of not seeing cleantech as a solely social initiative is slowly changing, especially among younger generations, as benefits of cost-optimisation and profits are becoming easier to grasp through **newly accessible information about technologies**. Furthermore, consumers are gradually driving cleantech adoption as **green issues are more and more important** to them.

The strain of resources available for energy efficiency and renewable energy initiatives is also growing as economies are maturing. To fill the gap of unavailable funding for smaller enterprises, targeted funds which are at a niche level and more flexible in developing solutions for small enterprises are needed. Some impact-focused funds are already existent, and according to Blume Ventures, the number will be growing. This is a significant trend because integrating renewable energy and clean technologies into business practices is becoming more and more important as renewable **energy issues are becoming economic realities** for businesses.

> ***Smaller, targeted funds which are at a niche level are more flexible in developing solutions, the bigger funds don't care. There are already impact funds, and there will be more in the sector.***

Blume Ventures

Since 2008-09, the e-commerce movement has led to shifts in supply chains, whereby the **consumption space has seen growth**. On the supplier side, opportunities of manufacturing clean technologies have been expanding and many enterprises have started focusing on clean technology measures.

> ***In 5-10 years, cleantech will emerge, it can be done, but there has to be a proper mechanism.***

Atharva Polyplast Ltd., Cleaner Production enterprise in Pune

Trends in the cleantech ecosystem show that there is much room for improvements and actions to stimulate the sector.

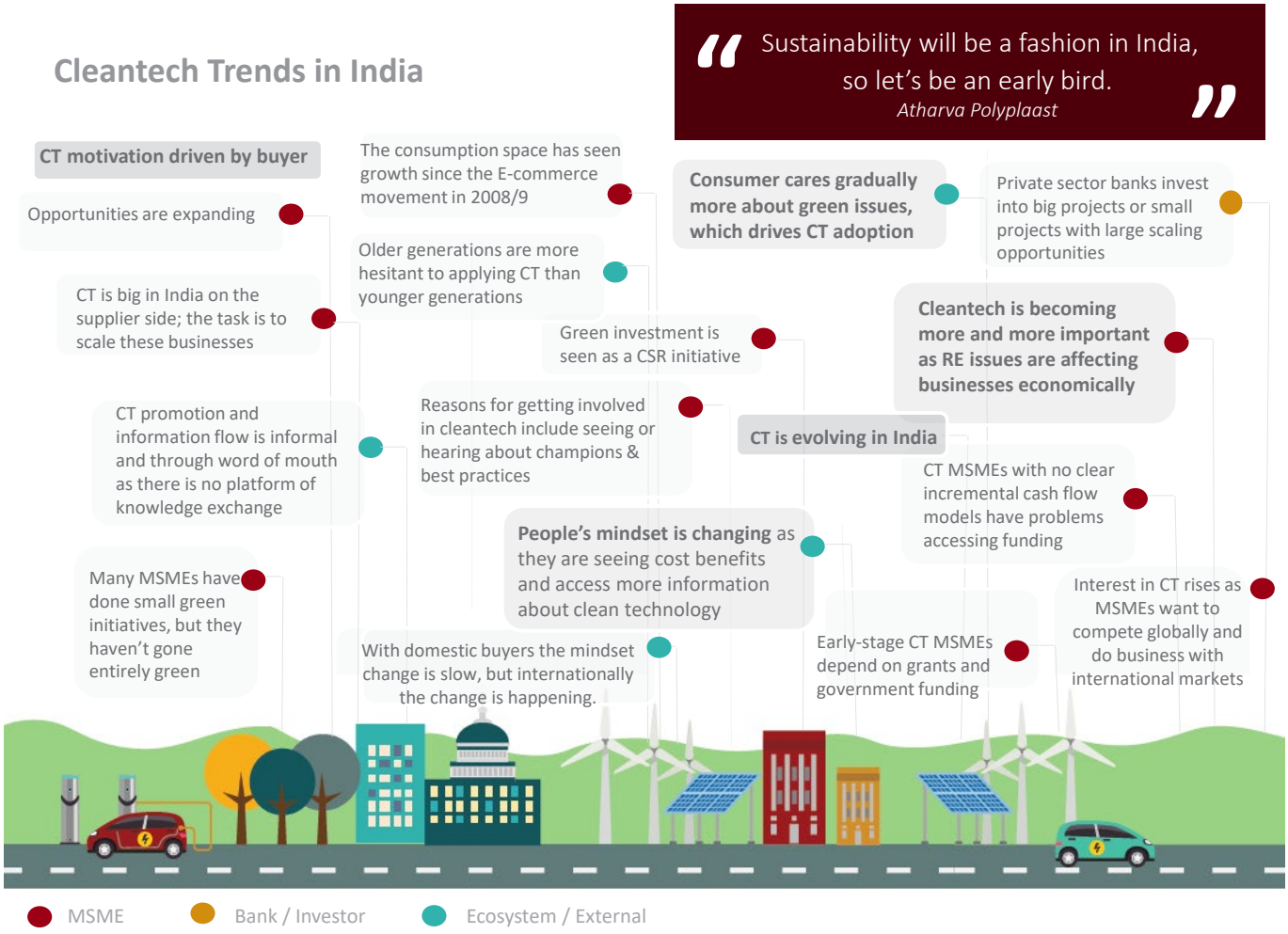


FIGURE 32: Cleantech Trends in India

Future Development of the Indian Cleantech Sector

ACMFN stakeholders highlight that the number of enterprises interested in cleantech and environmental and social impact is rising and that plenty more will be joining in the next years.

Many MSMEs are already interested in green energy and on a domestic level, people's mentality is changing as households and employees want to adopt clean technologies at home to save electricity costs and contribute to environmental sustainability. Consumer's and buyer's interest in sourcing green is rising. **The *green transition* is expected to happen very fast in the next years**. Driving forces in this transition is MSME's self-interest, whereby they see that they can save resources using green energy and that they can profit from their savings. Another driving force is globalisation, part of which is that stakeholders bring back the message of clean technologies from overseas, which is spread locally and slowly changes the mindset of MSMEs and consumers. **Among domestic buyers, the mindset change is happening slowly; internationally it is happening faster**. Many MSMEs also wish to expand business to new markets such as European markets, and in order to do business with these countries, factors such as sustainability, increased quality, green certification, etc. play a vital role. In order to be able to compete globally, MSME's interest in cleantech rises.

> ***In 5-10 years, MSME's investments into Cleantech will increase to close to 50%, if it goes well, all of them will adapt.***
>
> *Ramakrishnaa Processing Mills, Cleaner Production enterprise in Tiruppur*

ACMFN stakeholders believe that in the next 5-10 years, cleantech will emerge, but that a proper mechanism and improved methodology needs to be put in place. Others believe that there is a whole ecosystem of different funds and instruments already in place, and that cleantech in India is in a good state and can only grow from the current state. According to Blume Ventures, the three fundamental areas that will change the way India does well over the next 50 years is connected to financial technology, health technology, education and agriculture.

> The three fundamental areas that will change the way India does well over the next 50 years is connected to financial technology, health technology, education and agriculture.
>
> *Blume Ventures*

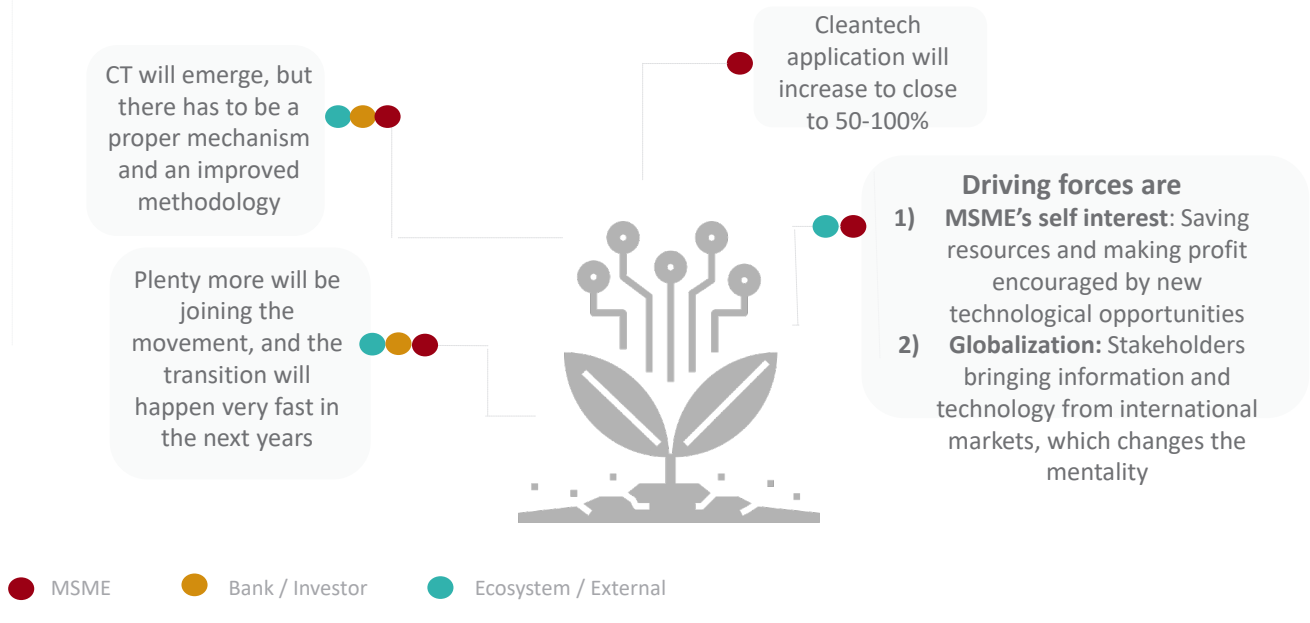


FIGURE 33: Future Development of the Indian Cleantech Sector

Through its project activities and engagement in the sector, ACMFN has contributed to these developments in the past years. In its first years of activities, ACMFN facilitated almost US$ 185,000 of financing for cleantech MSMEs through financial institutions. In 2018, its third year of activity, over US$ 350,000 of financing was facilitated, most of which was bank financing; a minor part was facilitated self-financing. Up to today, ACMFN continues to support almost 20 cleantech MSMEs, 8 achieved GreenCo-certification and 20 clean technologies were implemented through ACMFNs activities. ACMFN has evidently taken up an important role of promoting cleantech technology development and adoption in India and effectively supports these MSMEs in accessing finance.

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.

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

> ***Cleantech is still evolving in India, it's going to strengthen with time.***
>
> *Tata Cleantech*

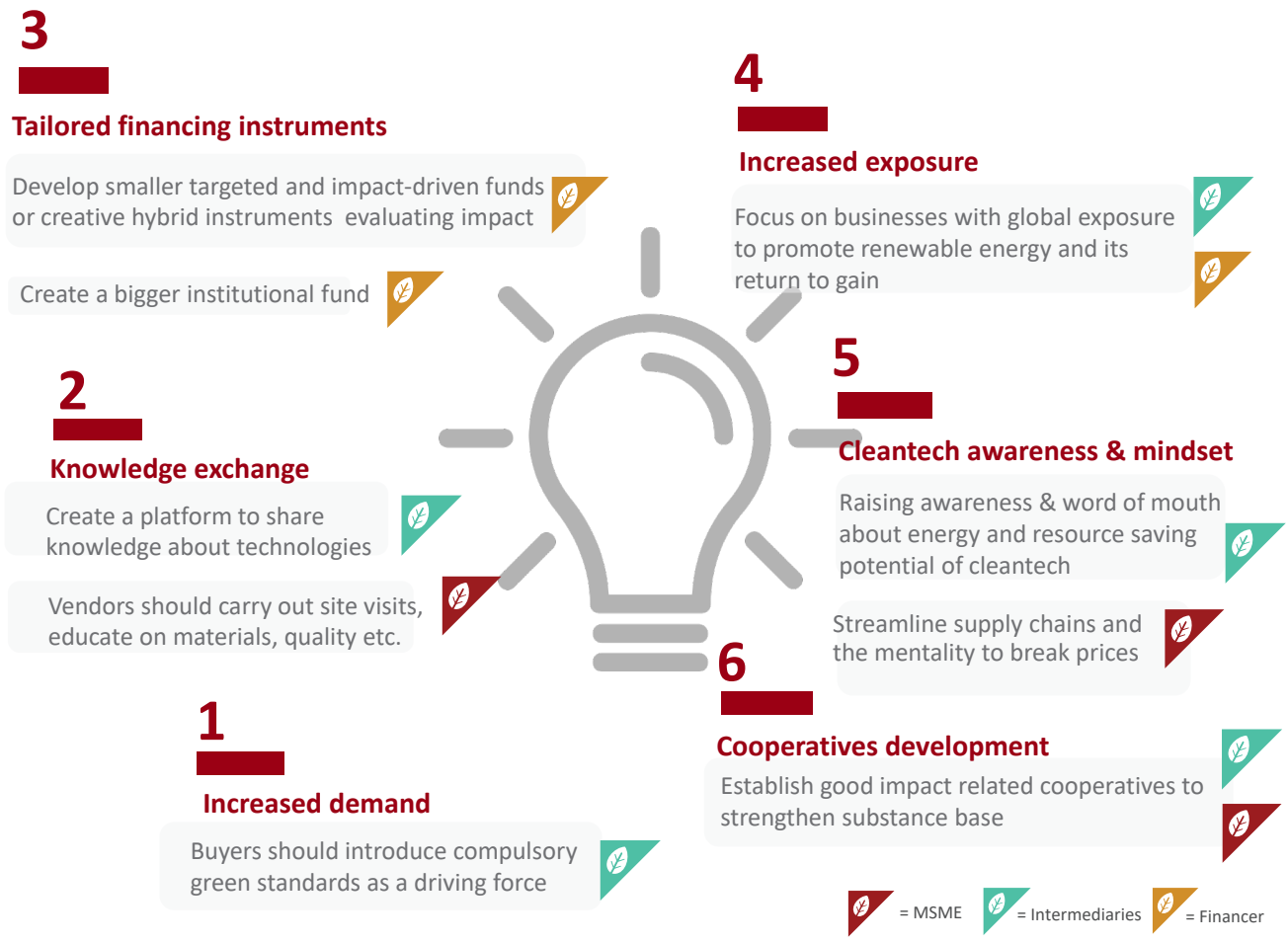


FIGURE 34: Solutions Catalogue

6. OUTLOOK AND ROADMAP

In the light of India's growing energy needs and environmental and societal challenges such as the big persisting waste challenge, 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 India 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 India, 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 Indian cleantech MSMEs, active support from all stakeholders in the cleantech ecosystem, especially public and private financers and intermediary organisations, is necessary to boost stakeholder's cleantech "readiness" in India. 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 financers, intermediaries and MSMEs is needed to foster clean energy innovation and application, and to scale up the clean energy investment environment:

MSMEs

Demonstrate increased demand for cleantech financing products to financial institutions

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. Demonstrated demand will push financial institutions to develop suitable financing instruments.

Create demand for green measures from other enterprises

Cleantech buyers have great influencing power in making sustainability concerns a criterion for the choice of suppliers they engage with. Following Godrej's best practice example, it will boost cleantech adoption rates among MSMEs if buyers start demanding green initiatives from their suppliers.

INTERMEDIARIES

Develop and offer specific financial literacy 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.

Accelerate established matchmaking events and platforms

Based on the identified knowledge gaps and challenges, intermediaries involved in established cleantech events, networks and platforms (such as CII's PACT platform), should offer specific networking options and cleantech capacity building to strengthen cleantech knowledge for MSMEs and financial institutions.

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.

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