



Facility for Low Carbon Technology Deployment



Financial Due-diligence and Fund-raising Support for Facility for Low Carbon Technology Deployment in India

Prepared By



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This report is part of the United Nations Industrial Development Organization (UNIDO), Bureau of Energy Efficiency (BEE), Government of India and Global Environment Facility (GEF) funded project “Facility for Low Carbon Technology Deployment” (FLCTD).

The findings are based on assessment and due diligence carried out by Intellectap in 2019 and 2020 with FLCTD 2018 Winners. The information provided is based on financial figures provided by the winners and the business and market conditions in calendar year 2020.

PREFACE

The main objective of the “Facility for Low Carbon Technology Deployment” (FLCTD) is to facilitate deployment and scaling up of low-carbon technologies in India that can address technology gaps in mitigating climate change and promote the use of clean energy applications in selected sectors. The main function of the ‘Facility*’ is to identify high-impact challenges that if solved have potential for large-scale carbon emission reductions. The project aims to locate and link the critical connections between the stakeholders – those who are aware of the high-impact challenge and those with the technical expertise to provide solutions – to solve problems identified by experts.

FLCTD project conducts annual innovation challenges to solicit applications from innovative technologies under three technology verticals, namely: Waste Heat Recovery, Space Conditioning and, Pump and Motor Systems. Winners of the innovation challenge are selected through a rigorous screening process by an expert panel. Each winner receives:

- Grant award up to USD 50,000 for winning technology demonstration at multiple locations.
- Performance verification to establish the efficacy of innovative technology in field working conditions.
- Recognition from Bureau of Energy Efficiency and UNIDO.

The grant award enables the deployment and validation of the innovations at field locations; typically, industries/firms willing for pilot demonstration where the technology is periodically monitored, and performance validated. The technology verification process is expected to validate the efficacy of innovation and will lend credibility to the innovation for replication.

To achieve these objectives, the project has built a Technology Verification process for all FLCTD grant winning innovations, in consultation with the implementation partner, the Confederation of Indian Industry - Sohrabji Godrej Green Business Centre, Hyderabad (hereinafter CII-SGGBC).

Further, the FLCTD project envisages that certain winning innovations identified, as mentioned above, are commercially available. This requires conducting financial due-diligence and carry out business mentoring of select winners of FLCTD innovation challenge, and identify the needs to make them investment ready, provide linkages with at least 3 financial institutions offering debt and equity finance to clean technology-based start-ups.

**The BEE, the PMU-UNIDO and the Expert Panel is referred to as “The Facility” henceforth.*

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LIST OF ABBREVIATIONS

AEEE	Alliance for an Energy Efficient Economy
BEE	Bureau of Energy Efficiency
CAGR	Compound Annual Growth Rate
CII	Confederation of Indian Industry
CO ₂	Carbon dioxide
Cr	Crores
DC	Direct Current
FERMI	Financial Comprehension, Evaluation, Readiness Support, Market Assessment and Informational Pitch
FLCTD	The Facility for Low Carbon Technology Deployment
FPO	Food Producer Organization
GEF	Global Environment Facility
GHG	Greenhouse Gas
GWP	Global Warming Potential
HP	Horse Power
HVAC	Heating, Ventilation and Air-conditioning
INR	Indian Rupees
INVEST	Inclination, Negation of Risk, Verification, Enterprise Readiness, Setting the Value, and Timeliness
IOT	Internet of Things
IPR	Intellectual Property Rights
IRR	Internal Rate of Return
KUSUM	Kisan Urja Suraksha evam Utthan Mahabhiyan
LCET	Low Carbon Emission Technologies
M&V	Measurement and Verification
MNRE	Ministry of New and Renewable Energy
MT	Metric Tonnes
NA	Not Applicable
NBFC	Non-Banking Financial Corporations
NDDB	National Dairy Development Board
NPV	Net-Present Value
PAYG	Pay As You Go
PCM	Phase Change Materials
R&D	Research and Development
SGD	Sustainable Development Goals
SKU	Stock Keeping Units
SME	Small and Medium Enterprises
SPA	Specialty Polymeric Additives
SWOT	Strength, Weakness, Opportunity, Threat
TERI	The Energy Resources Institute

TESSOL	Thermal Energy Service Solutions Private Limited
TOE	Tonne of Oil Equivalent
UNIDO	United Nations Industrial Development Organization
USD	United States Dollar
USPTO	United States Patent and Trademark Office
WHR	Waste Heat Recovery
YoY	Year on Year

INTRODUCTION

CONTEXT

Clean energy is at the forefront of the global agenda for achieving sustainable development goals. Technology contributes a very important role in endorsing sustainability across various sectors, including clean energy and industrial development. Globally, countries face challenges in obtaining, adapting and effectively using technologies for sustainable development. Many countries also suffer from severe energy poverty due to inadequate generation capacity, limited electrification, low power consumption, unreliable services and high energy costs. The impact of these persistent energy challenges falls disproportionately on the productive sector which is dominated by small and medium-sized enterprises (SMEs). Low-carbon low-emission technologies (LCETs) can help reduce greenhouse gas emissions, promote access to energy and enhance productive energy use. The adaptation and implementation of clean energy technologies can benefit small businesses, and create more jobs and new entrepreneurial opportunities, especially in rural areas where electricity infrastructure is not sufficiently developed.

In 2013, the United Nations Industrial Development Organization (UNIDO) initiated a collaborative program to provide potential technology to address three key global challenges; namely energy poverty, job creation and climate change. In India, UNIDO initiated a program called The Facility for Low Carbon Technology Deployment (FLCTD). This five-year program has been jointly implemented by the UNIDO and the Bureau of Energy Efficiency (BEE) and is been supported by the Global Environment Facility (GEF). It aims to promote innovation of low-carbon technologies and its deployment in industrial and other related sectors of Indian economy. The program selects enterprises (13 were selected in 2018) as part of the annual “**Innovation Challenge**” competition to identify innovative low carbon technologies and solutions that will improve efficient end-use of energy. These enterprises, through their innovative solutions help to reduce greenhouse gas emissions effectively over a period of time.

In 2018, the Innovation Challenge selected enterprises across three primary segments in the clean energy technology spectrum:

- Waste heat recovery (WHR): WHR technology innovations across all industrial sectors that lead to reduction in energy wastage in process or utilities.
- Space conditioning: This includes innovations for space conditioning, refrigeration and cold-chains. The innovations that lead to energy savings in air-conditioning for built environments without compromising on the user comfort and functionality of the space. The technologies that result in energy savings in refrigeration technologies for

domestic/ commercial/ industrial applications; and end-to-end cold-chain solutions for storage and transport to preserve and extend the shelf-life of perishable products.

- Pumps and pumping stations: This includes electric pumps, especially off-grid (renewable energy based) pumps. Industrial pumps find application in industries, buildings, and municipalities. Agricultural pumps demonstrate energy savings comprising of water intake system including valves, pipes, pumps, water delivery system.

The list of parameters considered for selection of enterprises include: nature of the innovation, key issues or problem solved, replication potential, GHG emission reduction, claimed energy savings, pay-back period and internal rate of return (IRR), state of technology and status of intellectual property rights (IPRs), among others.

To sustain the innovations and further scale the selected enterprises, there is a need for various kinds of capital (such as grant, soft debt, impact equity, commercial equity, and affordable debt) during different stages of operation across the enterprise's overall lifecycle. For instance, product developers typically require medium term operating capital for various interventions. This includes research and development, sales, marketing, distribution, inventory procurement, leasing and purchase of assets/ equipment, etc. There are many incubators/accelerators/challenge funds providing financial and technical assistance to clean energy enterprises to scale operations in India. However, these enterprises often face challenges in operationalisation of businesses due to lack of affordable/required capital post initial support from the accelerators, challenge fund, among others. Additionally, investors with mandates on clean energy investments are unable to access information on innovative enterprises due to limited market reach/information. There is a need to bridge this gap by partnering with players with expertise in raising capital for early stage innovative enterprises through its vast investment network and demonstrated experience in growing and managing innovative enterprises. Such ecosystem partners understand the need of the sector not just from a financial perspective, but also from a business and technology perspective.

In this context, UNIDO mandated Intellectap to provide support to five enterprises on key aspects including (i) design and implementation of a framework for financial due diligence; (ii) identification of critical financial gaps across these enterprises; (iii) investment readiness support (including guidance to develop business and marketing plans, and networking with investors and industry); and (iv) preparation of a roadmap to facilitate private sector investments in terms of debt, equity, or grants as per the need of each of these enterprises.

OBJECTIVE AND SCOPE OF WORK

The overarching objective of this assignment is to reduce investment risk for target enterprises through comprehensive due-diligence and market support to improve investment readiness.

This consists of a **FERMI** (i.e. financial comprehension, evaluation, readiness support, market assessment and informational pitch) approach for the enterprises, and **INVEST** (i.e. inclination, negation of risk, verification, enterprise readiness, setting the value, and timeliness) approach for the investors.

Figure 1: FERMI approach for enterprises

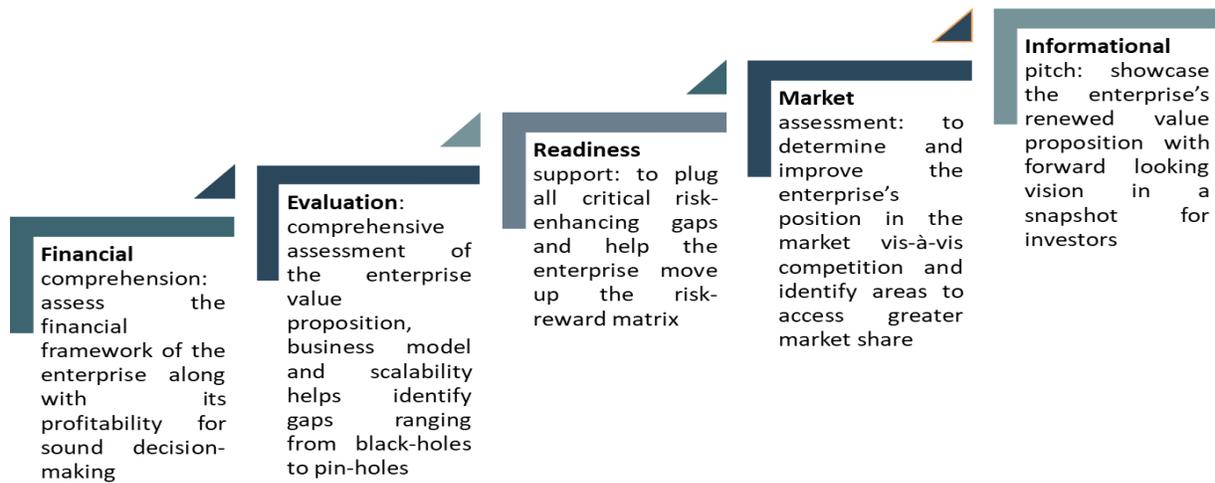
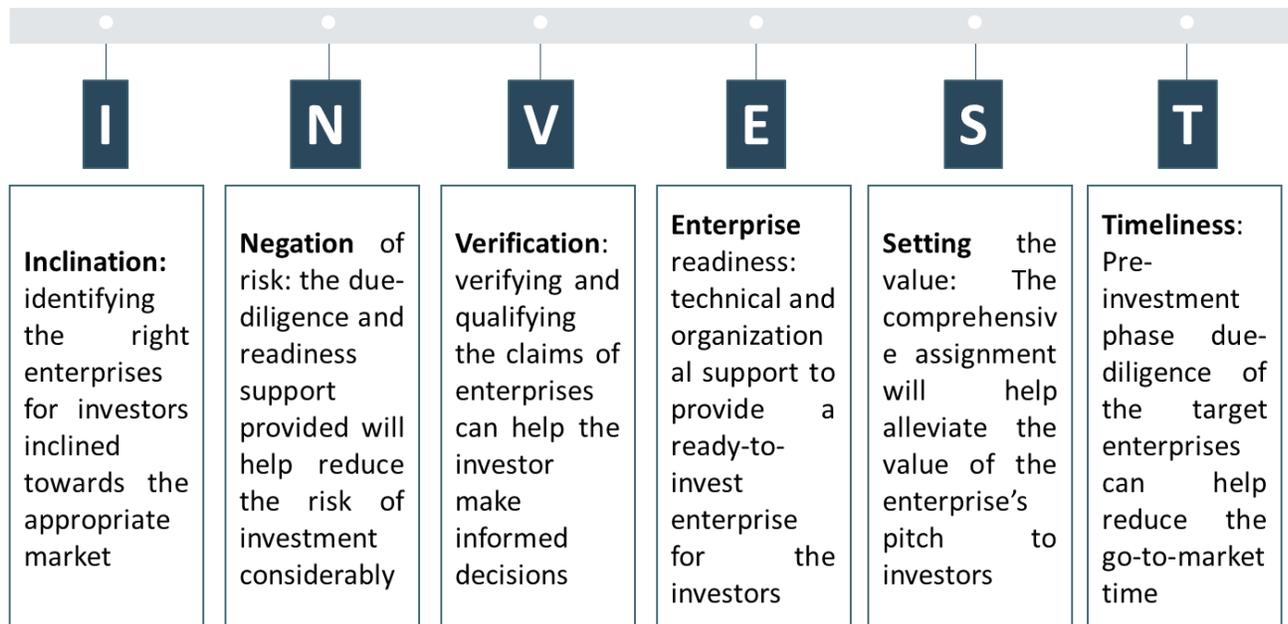


Figure 2: INVEST approach for investors



The overall scope of work involved the following key activities -

Develop a framework for financial due diligence: This included development of an enterprise evaluation framework that comprises of four major aspects; (a) technical, (b) business model, (c) scalability and (d) investability.

Provide investment readiness support: This included conducting due diligence on each selected enterprise; providing a platform/facility to receive and archive feedback from the investors on the evolving financing needs and available support for the clean-tech sector; developing a shared central repository for all stakeholders, a platform to inform the market about the new clean-tech business models, gather feedback, and demonstrate/showcase innovations; and preparing a report on the critical financing gaps across enterprises.

Conduct a market and enterprise need assessment: This comprised of assessing the overall market to understand the financial viability of the enterprise amidst competition; and analysing the data/information required financial due diligence (including information on enterprise performance, financial status, corporate and organizational data, intellectual property and technology, and product, sales, marketing and manufacturing activities).

Prepare investment collateral: This involved analysing key data/information to design a persuasive case for investment in the enterprises; refining the existing business plan/financial model of the enterprises and supporting them prepare presentations to approach prospective investors; and providing strategic support to enterprise management teams on giving an investment pitch to investors and compiled an information kit for investors

Develop a roadmap for raising capital: This included identifying at least three potential financial institutions/ investor firms for each funding type (i.e. equity and debt) to support the enterprises; and facilitating investment showcases with potential investors post financial due-diligence, for selected enterprises.

METHODOLOGY

Intellectap adopted a robust methodology for providing technical assistance to enterprises to improve their investment readiness. The methodology followed a framework that comprised of multi-level analysis across the lifecycle of the enterprise. A market-level landscape analysis was carried out to understand the alignment of the services and products provided by the enterprise with the market needs and competition. A deep-dive into the enterprise-level due diligence and analysis was undertaken that included concept and product analysis along with a comprehensive analysis of the operational model of the enterprise. This was followed by an evaluation of the risk management framework to minimize the market risks for the investors. This multi-level analysis was conducted based on information and data collected during various rounds of primary meetings with the enterprises, interactions with market stakeholders, and financial reports of the enterprises.

MULTI-LEVEL ANALYSIS

Enterprise analysis: Intellectap performed an in-depth analysis of all the target enterprises to understand the basic framework of the organization. This helped the team to determine the right financial approach and identify the investors aligned to the enterprise. The analysis provided insight into the core workings, directors, and the shareholding pattern (including aspects on types, distribution and quantity of shares etc.) of the enterprise. The team also conducted a study on the cash and credit situation of the enterprise and examined the source of any existing funds within the business.

Concept or product analysis: Intellectap profiled the enterprise's offerings in the market to understand its position and fitment. The analysis considered the core hypothesis or concept around which the enterprise has positioned itself. This was coupled with the assumptions that underpin the hypothesis. This was instrumental for early stage ventures who are still in the proof-of-concept stage. The team then assessed the kind of services or products offered by the enterprises, by developing a framework around the quality of offerings, limitations around it and the challenges the enterprise may face while scaling the portfolio. This became the basis for the market sizing and competitor analysis.

Market sizing and competitor analysis: Intellectap undertook a robust exercise to determine the market size along with the share of the target enterprise and the competitor landscape. This was further enhanced with the understanding of any definitive characteristics of the market that could provide considerable opportunities or threats to the business. The analysis was divided into two primary parts:

- **Market sizing:** Intellecip used appropriate assumptions to determine the size within the sphere of the sector that the enterprise strictly operates in. For instance, the enterprise could be a part of the global product but functioning in a local setup, which would significantly reduce its sphere of influence within the global market.
- **Competitor landscape:** This is highly dependent upon the findings of the market sizing exercise. For providing the appropriate landscape of the competition within the right segments, Intellecip understood the enterprises' unique selling propositions and used it to benchmark against the suitable competitors to assess its relative strengths and weaknesses. This has helped to identify the gaps in the enterprises' portfolio and operations while also highlighting the opportunities.

Operating model analysis: This analysis considered the structure of the target enterprises to create a top-level view of the design of the enterprise through several lenses. These range from customers to supply channels, and locations to the processes, vendors along with technology, governance and organizations. The primary aim of this segment of the analysis was to understand how the business is structured, identify the challenges that may hinder the growth of the enterprises along with the opportunities that it may be poised to take advantage of.

Risk management: The final segment of the methodology brings together all the risks identified through the various stages of assessment and analysis. These risks are essential for the enterprise to mitigate for a better investment ecosystem to make them more attractive to investors. To this end, Intellecip assessed the enterprises through the lens of a risk framework with compartments such as likelihood, severity and visibility. The risk management exercise also provided guidelines and recommendations for the enterprises to undertake specific activities towards risk mitigation to help improve their investability.

Box 1 - Key assumptions made during the assignment and expectations from the enterprises

Key assumptions:

- The shortlisted enterprises by FCTLD competition were selected on the basis of a selection process which included ability of the technology to support low-carbon development through a fair, transparent and robust framework
- The information provided by the enterprises is not incriminating or legally inappropriate in any manner
- Intellecip also made assumptions on the overall business plan, readiness of the technology, workmanship of the personnel, maturity of the organization as well as leadership effectiveness while carrying out the assignment

Expectations from the enterprises

- Abide by any information requests made by Intellecip for investment readiness support
- Cooperate in providing financial and product-related documents that assist in carrying out the due-diligence and identification of financial gaps
- Provide information for developing a strong investor pitch and in reaching out to the investors as recommended
- Share timely feedback and assist in developing the models/framework regarding the market, enterprise and business model.

ENTERPRISE SELECTION FRAMEWORK

Intellecap prepared an enterprise selection framework to identify enterprises for investment readiness support across five key parameters of (i) profitability; (ii) maturity of business model; (iii) growth rate; (iv) team and institutional capabilities; and (v) ticket size and use of finance. The table below describes the key criteria for selection:

Table 1: Enterprise selection framework

Parameter	Description
Profitability	This metric is used to determine the scope of a enterprise's profit in relation to the size of the business. Enterprises that are profitable or are on a path to become profitable in the near future (within 1-2 years) will be considered for selection.
Maturity of business model	This shows how capable an organization or system is of achieving its targets. Enterprises with mature business models, products, and customer segments will be considered for selection.
Growth rate	For enterprises, growth rates typically represent the compounded annualized rate of growth of a enterprise's revenues, earnings, or dividends. Enterprises with a positive growth rate in the past few years will be considered for selection.
Team and Institutional capabilities	Management team is generally evaluated on relevant experience, integrity, strategic vision, market knowledge, and ability to execute and implement projects in a systematic manner over a long period of time. Enterprises with an experienced team will be preferred for selection.
Ticket size and use of finance	Overall ticket size and utility of finance by the enterprise are also key factors for investors. Ticket size needs to be linked with revenue and ability of enterprise to absorb the required capital.

Ranking Matrix	
	High
	Medium
	Low

Subsequently, Intellecap used this framework to objectively assess/ map all the 13 enterprises in discussion with UNIDO. The assessment was based on the information/data collected during the engagement workshop. This workshop was conducted with all the 13 enterprises of the FLCTD program to explain the scope of work, and understand their business models, financing requirements, and challenges faced in raising finance. The framework below ranks all the 13 enterprises based on their performance across the parameters:

Table 2: Ranking of 13 enterprises of the FLCTD program

Enterprise	Profitability	Maturity of business model	Growth Rate	Team and Institutional Capabilities	Ticket size	Use of finance
Basil Energetics Private Limited	✓ (recently)	✗ (not currently)	✓ (decent-recently got profitable)	✓ (senior management team needs to be further strengthened)	USD 10 million (not linked to revenue currently)	Market development and R&D
Oorja Energy Engineering Services Pvt Ltd	✓	✓	✓ (decent)	✓ (senior management team needs to be further strengthened)	~USD 5 million (linked to revenue)	Working capital for business
Promethean Power Systems	✓ (in 2017)	✓	✓ (decent)	✓ (experienced leadership team)	~USD 1 million (linked to revenue)	Develop new offering of pay-per-use model
Sun Moksha	✗ (not for the technology supported under FLCTD)	✗ (not for the technology supported under FLCTD)	NA (as technology is not piloted at large scale)	✓ (senior management team needs to be further strengthened)	~USD 500,000 to 1 million	Existing product enhancement
Village Industrial Power	✗ (not profitable)	✗ (not for the technology supported under FLCTD)	NA (as technology if not piloted at large scale)	✓ (India leadership team needs to be developed)	~USD 200,000 (mostly grant)	Marketing, demonstration, and working capital
Khethworks	✗ (not profitable)	✗ (not for the technology supported under FLCTD)	NA (as technology if not piloted at large scale)	✓ (senior management team needs to be further strengthened)	Small amount of capital	R&D and pilot in new geographies
PLUSS Advanced Technologies	✓	✓	✓ (decent)	✓ (experienced leadership team)	~USD 5 million (linked to revenue)	Working capital and expansion of manufacturing facilities
Promethean Energy	✓	✓	✓ (decent)	✓ (experienced leadership team)	~USD 3-4 million (linked to revenue)	Working capital and to develop sales & Marketing channel
Inficold	✗ (not currently)	✓	✗ (not much)	✓ (experienced leadership team)	~USD 1-1.5 million (linked to revenue)	Manufacturing, scale up, and trials

Enterprise	Profitability	Maturity of business model	Growth Rate	Team and Institutional Capabilities	Ticket size	Use of finance
TESSOL	× (not currently)	✓	× (not much)	✓ (experienced leadership team)	~USD 2 million (linked to revenue)	Expansion and scale of technology

Intellectap selected the final five enterprises on the basis of factors like profitability, maturity of business models, growth rate, team capabilities, ticket size and utilization of the funds. It was ensured that the enterprises are representative of different stages from early to growth stage. The framework below illustrates the final selection of the five enterprises:

Table 3: Ranking of 5 selected enterprises for investment readiness support

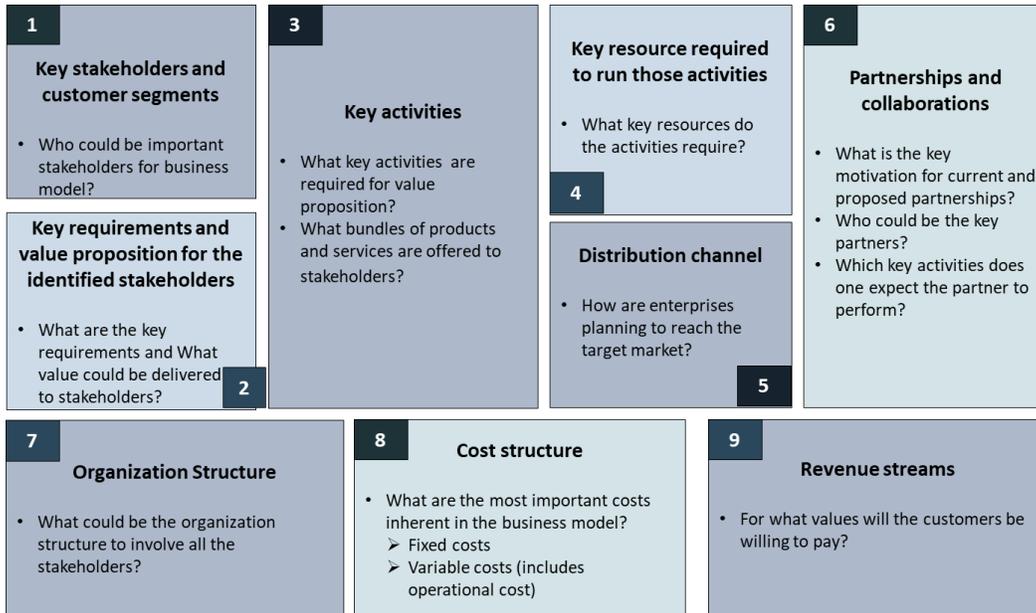
Enterprise	Profitability	Maturity of business model	Growth Rate	Team and Institutional Capabilities	Ticket size	Use of finance
Oorja Energy Engineering Services Pvt Ltd	✓	✓	✓ (decent)	✓ (senior management team needs to be further strengthened)	~USD 5 million (linked to revenue)	Working capital for business
Khethworks	× (not profitable)	× (not for the technology supported under FLCTD)	NA (as technology if not piloted at large scale)	✓ (senior management team needs to be further strengthened)	Small amount of capital	R&D and pilot in new geographies
PLUSS Advanced Technologies	✓	✓	✓ (decent)	✓ (experienced leadership team)	~USD 5 million (linked to revenue)	Working capital and expansion of manufacturing facilities
Inficold	× (not currently)	✓	× (not much)	✓ (experienced leadership team)	~USD 1-1.5 million (linked to revenue)	Manufacturing, scale up, and trials
TESSOL	× (not currently)	✓	× (not much)	✓ (experienced leadership team)	~USD 2 million (linked to revenue)	Expansion and scale of technology

BUSINESS MODEL CANVAS

Intellectap assessed the enterprises on nine key principles of the business model canvas that helped it understand the enterprise's value proposition, infrastructure, customers, and finances. The primary aim of breaking-down the enterprises into these nine key silos is to

highlight the strategic activities and focus areas along with upfront identification of gaps in the existing business model. The figure below illustrates the business model canvas used for mapping the enterprises:

Figure 3: Business model canvas



Based on the findings of this exercise, Intellecap provided recommendations on the future course that the enterprises should take in order to develop a more robust and commercially successful model. The recommendations ranged from new geographic areas to be explored for expansion to increase in manufacturing and distribution capacity; and from enhanced focus on research and development to deploying cost reduction strategies for higher profit margins. Meanwhile, inputs for assessing the impact of business model and evaluation of scalability were also provided as part of the growth strategy. Lastly, the enterprises were helped to assess capital requirement, develop robust financial projections and identify potential investors.

INDIVIDUAL ENTERPRISE SUPPORT

A pivotal part of Intellectap's engagement on this assignment was to provide strategic support to the five shortlisted enterprises. Intellectap leveraged its vast experience in guiding and building early-stage enterprises to deliver high-quality mentoring and develop focused strategic insights and recommendations to make the target enterprises investor-ready. The support included thorough review of enterprise documents and financials, key recommendations on the existing operational and financial plans, addressing post Covid-19 concerns and hand-holding through the pandemic, guidance on business model modifications, new market areas, and suggesting potential partnerships, among other key support activities.

The subsequent sections of this chapter take a deep-dive into the support provided to each of the enterprises along with the outcomes.

PLUSS ADVANCED TECHNOLOGIES

PLUSS Advanced Technologies (PLUSS) is a research and development (R&D) focused - materials manufacturing company in the field of specialty polymeric additives (SPA) for enhancing polymer properties and phase change materials (PCMs) for thermal energy storage. It has a strong 10-member R&D team and is recognized by the Indian Government's Department of Scientific and Industrial Research. PLUSS' innovations range from an affordable device to treat birth asphyxia developed in collaboration with Christian Medical College, Vellore, to a first-in-India vaccine transport box for temperature-controlled delivery. Besides domestic consumption, PLUSS also exports its products to international markets such as the US, Europe, Africa and Asia. With specialization in PCMs, PCM-based products and specialty polymers, the company has a portfolio of 77 stock keeping units (SKUs) covering a wide range of applications. PLUSS has 19 registered trademarks and 24 filed patents across Asia, US, Europe, and Brazil, of which eight are granted and 16 are pending. The company has a strong promoter, a senior management team with an average experience of about 12 years each and is backed by a marquee investor.

Figure 4: Product-wise division of SKUs

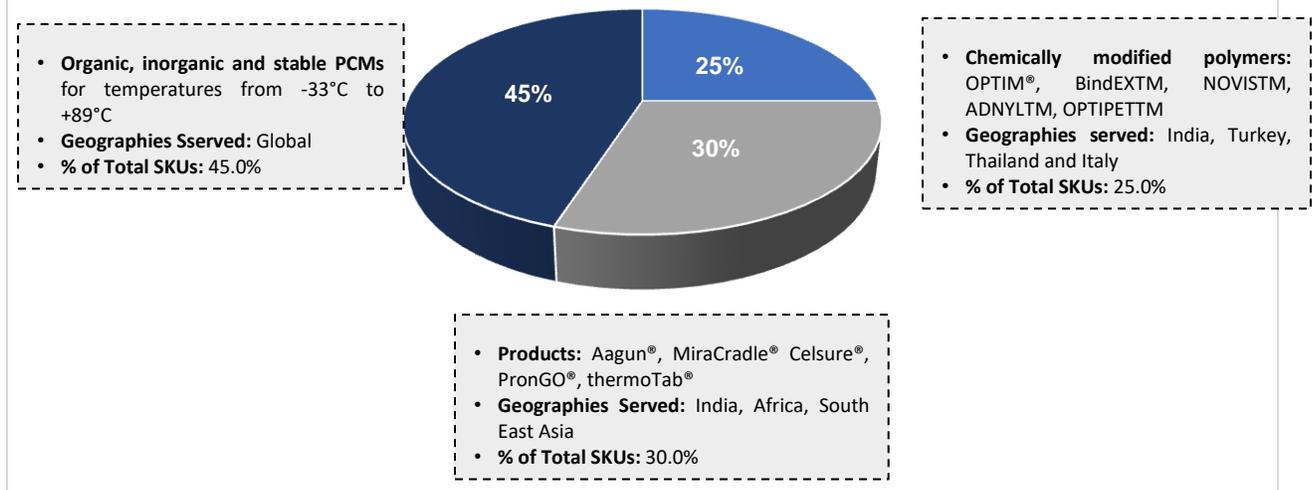
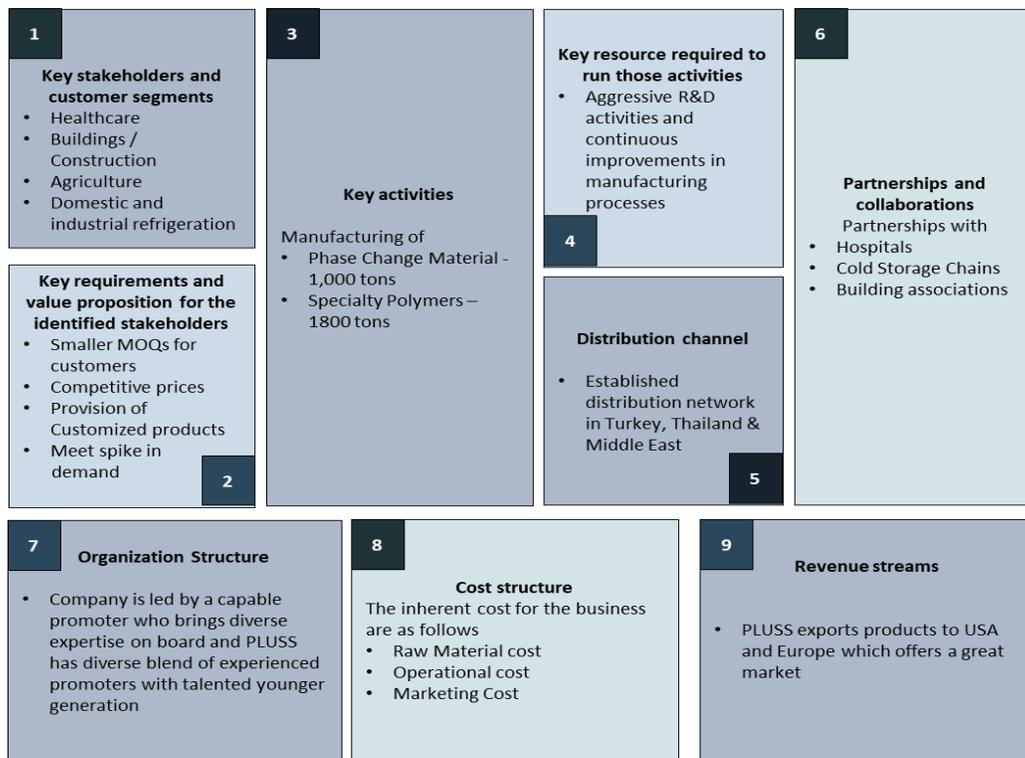


Figure 5: Business model canvas of PLUSS



Post a detailed study of the company's relevant documents and several virtual and in-person meetings, Intelicap provided a set of strategic recommendations including suggestions on business model and positioning of business in the Covid-19 scenario, investment strategy, valuations, and approach to investors. These included recommendations on the overall fund raising pitch and investment plan, and suggestions on different financial instruments and

potential investors. Intellectap also helped PLUS develop a strong investor pitch deck with inputs from seasoned investors in the sector.

INTELLECTAP'S STRATEGIC INSIGHTS FOR PLUS

Market size and growth

The PCM market was valued at USD 1.9 billion in 2019 and is expected to grow by ~17.4 percent from 2020 to 2026 to reach an estimated size of USD 4.4 billion. Considering this, Intellectap suggested that PLUS can focus on the construction and packaging industries, as the global PCM market will be primarily driven by these two segments. The construction industry accounts for about 35 percent of PCM consumption globally, primarily for heating, ventilation and air-conditioning (HVAC) applications. The demand is projected to amplify throughout the forecast period. Meanwhile, the packaging industry has seen a surge in innovations with the e-commerce boom, consuming about 22.5 percent of the PCM produced. The Covid-19 pandemic has also highlighted the increased need of PCM in the healthcare sector.

Competitive landscape

While the industry is fairly competitive with several global and domestic suppliers such as Acuro Organics Limited, Entropy Solutions LLC, Sasol, The Dow Chemical Company; PLUS has strategic strengths with multiple patents, manufacturing facilities and a strong management team. Intellectap suggests development of a competitors array and analysis of the market; including the following aspects: competitors in a related product/market, using related technologies, targeting the prime market segment but with unrelated products, competitors in other geographical areas and with similar products and new start-up companies organized by former employees and/or managers of existing companies. PLUS also has a strategic first mover's advantage in the PCM market. PLUS has entered the South-East Asian market with exports to Republic of Korea and Philippines. Its distribution in the US and European markets would give it a distinct edge over its competitors. Considering these parameters, Intellectap suggests strategic exploration of business in Europe and North America as it has a 29 percent market share and a robust distribution network.

Value proposition

PLUS' value proposition includes proprietary offerings across a wide temperature range from -33 degree Celsius to 89 degree Celsius. There exist significant growth prospects for development of positive temperature PCMs, with a market forecast of 50 percent in the near future. PLUS, in collaboration with companies like Sintex and FIC Italy, has developed temperature-controlled products for cold logistics supply chain. MiraCradle, a premium solution

from PLUSS, is recognized by World Health Organization as an innovative health technology for low resource setting. It is also recognized by National Neonatology Forum of India. Intellectap proposes use of the Value Proposition Canvas which will help to ensure that PLUSS' products are positioned around what the customer values and needs such as lower manufacturing costs, proprietary and technically proven formulations, customized products and the ability to meet demand spikes.

Technological R&D and innovation

PLUS has demonstrated applications of its technology in various sectors such as healthcare, construction, agriculture, and refrigeration among others. Intellectap's analysis finds huge potential for integrating PCM into products such as building materials, textile fibres, food industry, healthcare, and agriculture. Therefore, Intellectap suggests exploration of technology viability and applications in textile industry where 15.1 percent of PCM is utilized; and the electronic industry where 17.7 percent PCM is applied.

Innovation and replicability

PLUS' eight granted patents reflect its ability to ensure innovation across various sectors. These provide a strong defence against replicability of its products. The popularity of bio-based PCMs as it minimizes GHG emissions is on a growth trajectory. PLUS' OM 03-Bio based PCM material is strategically placed to take advantage of this trend. Intellectap recommends increasing R&D on eco-friendly PCM products to meet the sustainable development goals (SGDs) and sustainability regulations in Europe and North America.

Sustainability

PLUS' technologies enable energy efficient temperature control solutions. Based on competitor analysis, Intellectap advises PLUS to adopt renewable material for PCM manufacturing instead of crude oil or petroleum products to produce and market PCMs. This will enable PLUS to capture the temperature-controlled packaging market (mainly in the pharmaceutical industry) through its bio-based PCM. This material is highly desirable by manufacturers to market their products in a packaging that will not affect the quality of product and is biodegradable.

Techno-commercial analysis

In-depth market analysis indicates that PLUS offers lower pricing (by about 10-15 percent) than its competitors and has the ability to distribute smaller quantities. Intellectap proposes the use of techno-economic analysis as a tool to evaluate the commercial viability of PLUS'

technology by applying it at various stages of the R&D process. The major barriers to growth of PCM market are high cost of production and volatile prices of raw materials (such as crude oil) Hence, Intellecip recommends PLUSS to incorporate improvements in the production capacity to reduce the costs and renegotiate contracts with existing vendors for a better price point and eventually improve margins.

Manufacturing and scalability

PLUS has three TUV-certified manufacturing units with a total capacity of 1,000 tons of PCM and 1,800 tons of specialty polymers. Intellecip conducted a thorough review of the current manufacturing process and equipment utilized at the factory to identify the production bottlenecks. It also forecasted the effect of projected growth on the utilization of existing equipment and systems. A synthesized approach to develop multiple courses of action to effectively support projected growth has been suggested to PLUS. Given that PLUS's PCM is primarily bio-based, non-toxic and bio-degradable; Intellecip suggests strategic interventions like Six Sigma, Kaizen and quality control in production. Intellecip proposes development of a robust framework for entry in the European and North American markets to address key market entry barriers. Intellecip also recommends exploring local manufacturing opportunities of some products in Europe and North America.

Management and team structure

PLUS is led by a capable promoter who brings diverse expertise on board along with a blend of experienced and young promoters. The company has also developed a new team based out of the Netherlands for expansion in Europe. Intellecip's suggestions for developing strong teams for business expansion include building a capable sales team in India, hiring a chief marketing officer for Europe and North America, and increasing R&D spending to develop sustainable products. Intellecip also advises introduction of strong governance practices across the company for aligning strategies with goals, higher accountability, high level of ethics and integrity, clearly defining roles and responsibilities, and managing risks effectively.

Investability

PLUS has exhibited a robust product portfolio growth with attractive returns. PLUS' strategic advantages include strong R&D, diverse blend of promoters, and a first mover's advantage in the PCM market segment. The equity infusion from Tata Capital Innovations Fund in 2013 has resulted in team expansion, new product line, and strengthening of manufacturing and R&D capabilities. Intellecip recommends modifications in the investor pitch to highlight prevalent business models, sustainable growth perspectives, capacity to generate cash flow, various innovative applications of PLUS' technology, and strong management and governance ethics.

Intellectap highlights the need to provide exit to TATA Capital at appropriate valuation to ensure that it does not impact the overall company valuations. Furthermore, Intellectap suggests PLUS to use the funds for infrastructure development, PCM capacity expansion, procurement of R&D equipment, sales team expansion and establishment of foreign offices.

PLUS' INVESTMENT READINESS AND GROWTH STRATEGY

Intellectap used a multi-step approach to evaluate a portfolio of enterprises for the prioritization of capital raise support. The process included a thorough high-level assessment and due diligence of the enterprise and development of a growth plan and capital needs to articulate the pitch for investors. Several investors were analysed of which final possible investors were **TIW Capital, Adani Group and Godrej Group (for equity)**.

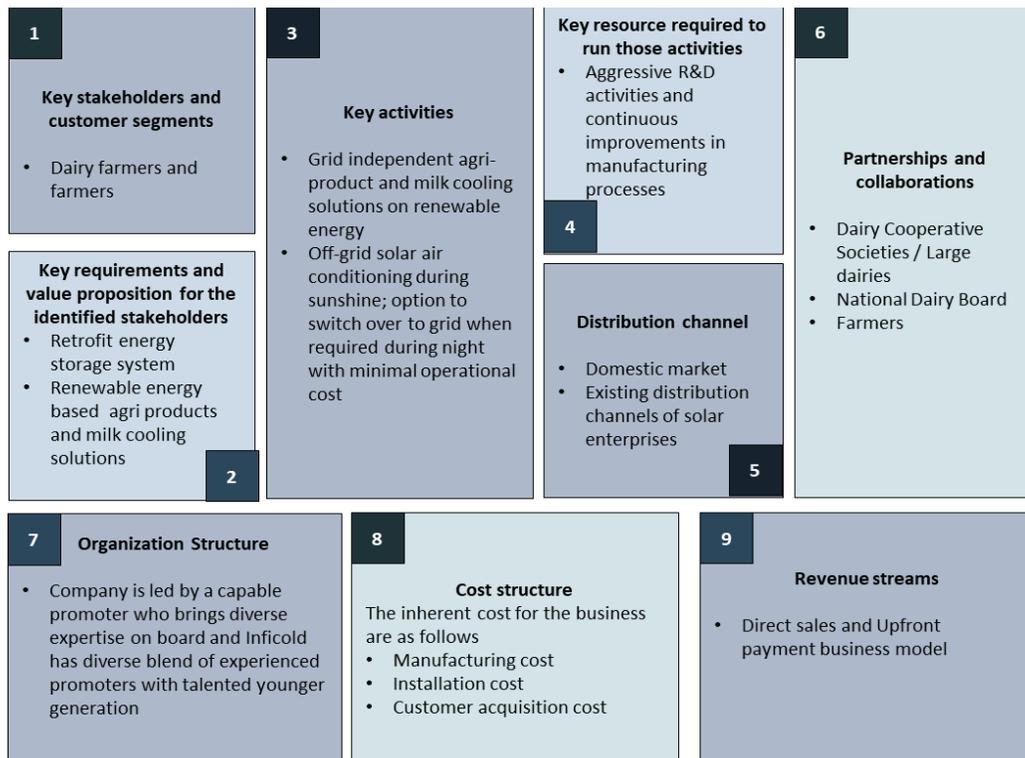
A roadmap with a timeline of six months for investment was decided upon with the following activities:

- Finalize investment memorandum (IM): This activity involves the preparation of the IM based on the market feedback along with a management and investor discussion to finalize the IM.
- Approach strategic investors: Currently underway, this activity requires PLUS to approach strategic investors as suggested by Intellectap and share collateral and pitch decks.
- Raise equity investment: Based on the negotiations in the previous activity, PLUS will raise equity investment and provide strategic exit to the existing investors.

INFICOLD

Inficold manufactures products to enable an efficient cold chain with offerings such as ice bank integrated milk cooler, modular cold storage (5 to 100 MT), instant milk cooler, solar milk cooler and solar air conditioner, among others. Inficold is present in the thriving dairy industry with an addressable market of over USD 1 billion. In India, about 21 percent of the USD 100 million per year milk is sold through the organized sector. Horticulture, worth about USD 6 billion, is the other target industry for Inficold. The enterprise focuses on a niche gap in the cold chain which is limited in India due to cost prohibitive polluting energy sources. This increases the demand for cost-effective clean energy solutions in these segments. Inficold has a strong R&D team with successful products, filed five patents and a robust innovation pipeline. It has over 45 full-time employees and a strong in-house sales team.

Figure 6: Business model canvas of Inficold



Intellecrap conducted a detailed study of Inficold’s business model, financial model, investor relations, funding requirement, among other relevant aspects. Its suggestions include expansion into new business areas (milk chillers), geographies considering the Covid-19 outbreak. Also, strategies in new areas such as asset light digital infrastructure can be implemented by Inficold. Other recommendations include improvement of the business model and financial scenarios before approaching strategic investors. . Intellecrap also featured Inficold’s business model in a first-of-its-kind solar off-grid refrigeration report to promote the organization in the relevant entrepreneurial circles.

INTELLECAP’S STRATEGIC INSIGHTS FOR INFICOLD

Market size and growth

The global modular chiller market was valued at USD 2.47 billion in 2019 and is expected to grow at a compound annual growth rate (CAGR) of 6 percent from 2020 to 2027 to reach a size of USD 3.94 billion. Meanwhile, the Indian cold chain market was estimated to be worth USD 0.24 billion in 2019. Crash cooling of milk arrests bacteria growth instantly and improves the quality of the milk. This benefits the dairy farmers by enabling longer shelf life of processed milk and accruing higher margins on value added products. The small milk chillers sold by Inficold can support small and marginal farmers in a particular catchment area. India requires 250,000

milk coolers growing at a CAGR of 18 percent in the next five years, resulting in a total addressable market for Inficold of around USD 1 billion on upfront sales at 50 percent market penetration. Intellecip recommends Inficold to explore the off-grid solar refrigerator market for highly perishable fruits and vegetables valued at ~USD 15 billion in India.

Competitive landscape

Inficold is strategically placed for strong growth considering its key assets and skills in the form of patents, manufacturing facility and strong management team. Inficold is positioning itself among the large traditional cooling solution providers. Intellecip analysed Inficold's market competitiveness along with an in-depth examination of unsuccessful companies and the reasons behind their failure. Based on the findings, Intellecip suggests that Inficold should strategically explore businesses in other sectors like healthcare, fishery etc. where cold storage at modular level may be required. Some of Inficold's competitors include Rinac, Ice Make Refrigeration, Blue Star, Stulz, and Voltas.

Value proposition

Inficold offers disruptive technology in the cold chain segment in stationary applications. It has proprietary offerings for a range of temperatures (from 4 degree Celsius to 20 degree Celsius) including grid-independent agriculture-based products and milk cooling solutions based on renewable energy. It also has off-grid solar air conditioners that have the option to switch over to grid-based power when required with minimal operational cost. Inficold has been able to reduce the operational cost of milk chillers by 50 percent, along with improving milk quality. Intellecip proposes the use of the Value Proposition Canvas which helps to ensure that a product or service is positioned around what the customer values and needs such as low manufacturing costs, competitive prices and customized products. Based on these aspects, Intellecip advises Inficold to work closely with the Government of India to promote its product within the government schemes and access support from innovative financial programs such as agricultural infrastructure funds.

Technological demonstrability

Inficold has proven technologies for thermal energy storage and solar compressors and has developed inverter-less solar integration for refrigeration systems. It has established an energy efficient curd making unit in Rajasthan using the reverse air-conditioning principle. Inficold will also be introducing a solar space cooling/heating solution for a hospital in Rajasthan. The renewable energy-based products eliminate the need for diesel generators, addressing a key gap in the existing market. Intellecip's suggestions to Inficold include strengthening key relationships in the dairy sector; strategic interventions in R&D of new eco-friendly refrigeration

material; and developing a robust monitoring framework and data collection strategy for showcasing impact and improving the efficiency of the products.

Innovation and replicability

Inficold has filed five patents, including one for cooling system with thermal battery. It has also developed the world's first retrofit energy storage system which can store solar as cold energy (ice) for any cooling system (National Technology Award 2019 and USPTO patent granted). This is an innovative solution with low competition in the market. Intellecip recommends an increase in focus on milk cooling at collection centers operated by dairies, farm level cold storage, and refrigerated trucks; using Inficold's technologies on energy storage and solar integration. Intellecip further suggests that Inficold should engage in aggressive marketing and R&D of its innovative retrofit energy storage solutions and strengthen its network with existing cold chain ecosystem of around 28.68 million MT to convert maximum cold storages into renewable-based cold storages.

Sustainability

Inficold's products are sustainable with direct contribution to SDG 7 (energy access) and SDG 13 (climate action). Cold storage units and milk cooler are powered by solar photovoltaics and energy is stored in the form of ice. Majority of the dairy farmers are presently using diesel generators as back-up systems for 18,190 thousand litres per day cumulative capacity of milk chillers. All Inficold's systems use eco-friendly refrigerants that are compliant with 4 GWP (global warming potential). The retrofitting of existing cold storages enables energy conservation and energy efficiency. Inficold has also partnered with Carbon Master. Intellecip suggests Inficold to explore the market for replacement of diesel generators with off-grid solar milk chillers to make the cooling solution more sustainable. Similarly, the existing cold storages can also be converted to solar-based cold storages. Additionally, Intellecip suggests exploring other renewable energy options such as biomass for agriculture cold storage.

Techno-commercial analysis

Intellecip's analysis of the market showed that Inficold offers its products at a lower price than its competitors and has the ability to retrofit existing systems with its solutions. The technologies have a wide range of cooling solutions. Inficold has bulk orders from large dairies such as Nandini, Schreiber Dynamix, Mother Dairy and others. So far, it has installed 19 solar-based cold storage units. Intellecip proposes to use techno-economic analysis as a tool to evaluate commercial viability of Inficold's technology. The two primary challenges in Inficold's target markets are highly unorganized and fragmented dairy market and lack of affordability of milk chillers in rural areas. To minimize the cost of its offerings, Intellecip recommends

development of a strong distribution network and incorporation of innovative business models such as leasing and pay-as-you-go (PAYG). The potential market could be the 1,90,516 dairy cooperative societies and more than 5,000 food producer organizations (FPOs) in rural areas of India.

Manufacturing and scalability

Inficold assembles the product in its facility in India and is seeking funds to expand its assembly unit. It has recently set up a 1.5 acre manufacturing facility. The enterprise is also negotiating with the National Dairy Development Board (NDDB) towards a contract for supplying its solar milk coolers under NDDB's USD 1.2 billion National Dairy Plan. After a detailed review of the manufacturing process, equipment and bottlenecks in the process and conducting growth projections, Intellecip advises Inficold to scale up its system assembly (contract manufacturing of components), installation and servicing capabilities to cater to different markets. For this, Intellecip recommends working with partners in Africa, South America and South East Asia for milk, fish and horticulture applications.

Management and team structure

Inficold has a strong promoter with a robust in-house team that strengthens its core structure. Intellecip suggests developing a sales team in India, establishing a R&D division and hiring local teams to scale-up assembly, sales and services for cold storage and dairy segments. Strengthening teams and distribution network will increase business opportunities for Inficold in the domestic and international markets. Intellecip also recommends improving governance practices to align strategies with goals, ensure accountability, delineate roles and responsibilities and manage risk effectively; as well as including a woman as a board member.

Investability

Intellecip's assessment suggests that Inficold is an investment ready enterprise. Inficold has multiple advantages including strong R&D, team of 45+ full time employees led by an experienced promoter, and investment by Shell Foundation in technology development through a USD 1.15 million grant for innovation. With these, Inficold plans to float an initial public offering by 2025 or is looking to be acquired by a larger company to provide exit to its investors and other stakeholders with an expected return on investment of 25 percent annually. Intellecip suggests listing of Inficold on the proposed Social Stock Exchange. Intellecip also recommends modifications such as utilizing the leasing and renting business model for cold storages with support of FPOs within India. Intellecip advises Inficold to use the funds to develop modern factory infrastructure, expand the sales team and set up offices in strategic locations in target countries. It also recommends expanding to the international

markets with local partners for sales, installation and servicing support, especially in African and South-East Asian countries.

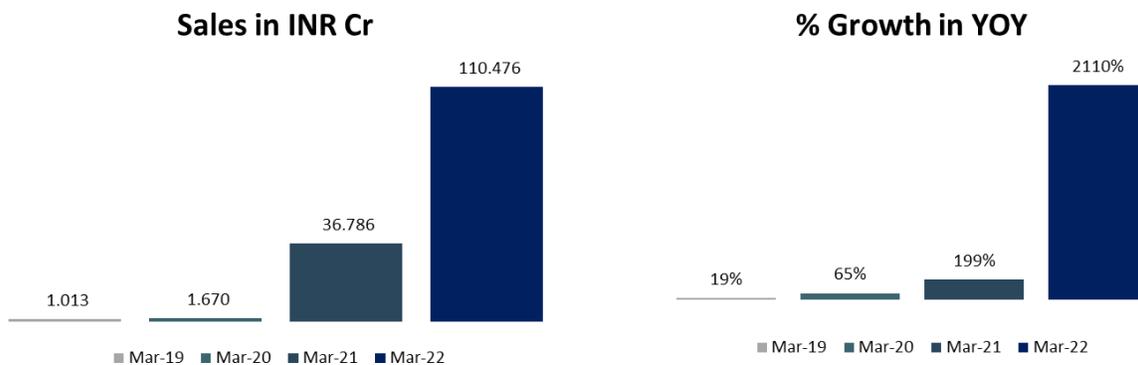
INFICOLD'S INVESTMENT READINESS AND GROWTH STRATEGY

Intellectap used a multi-step approach to evaluate a portfolio of enterprises for the prioritization of capital raise support for Inficold with a high-level assessment of enterprise documents and management expectations. After compiling investor teaser and investment memorandum, Intellectap developed a strategic roadmap for Inficold. InnoVen Capital and IntellectGrow (for debt) have been identified as possible investors.

A roadmap of six months was agreed upon with the following key activities:

- **Finalize collateral:** Intellectap helps Inficold finalize the enterprise deck for investment pitches and develop collaterals aligned with existing investors.
- **Launch new products:** The next step is to develop a go-to-market strategy to launch new products in new geographies/regions/areas as recommended by Intellectap.
- **Discussion with investors:** Once the strategies are ready, a detailed discussion with existing investors on investment and valuation will be done. Meanwhile, Inficold will have to reach out to new investors and discuss the upcoming models with them.

Figure 7: Inficold's financial projections



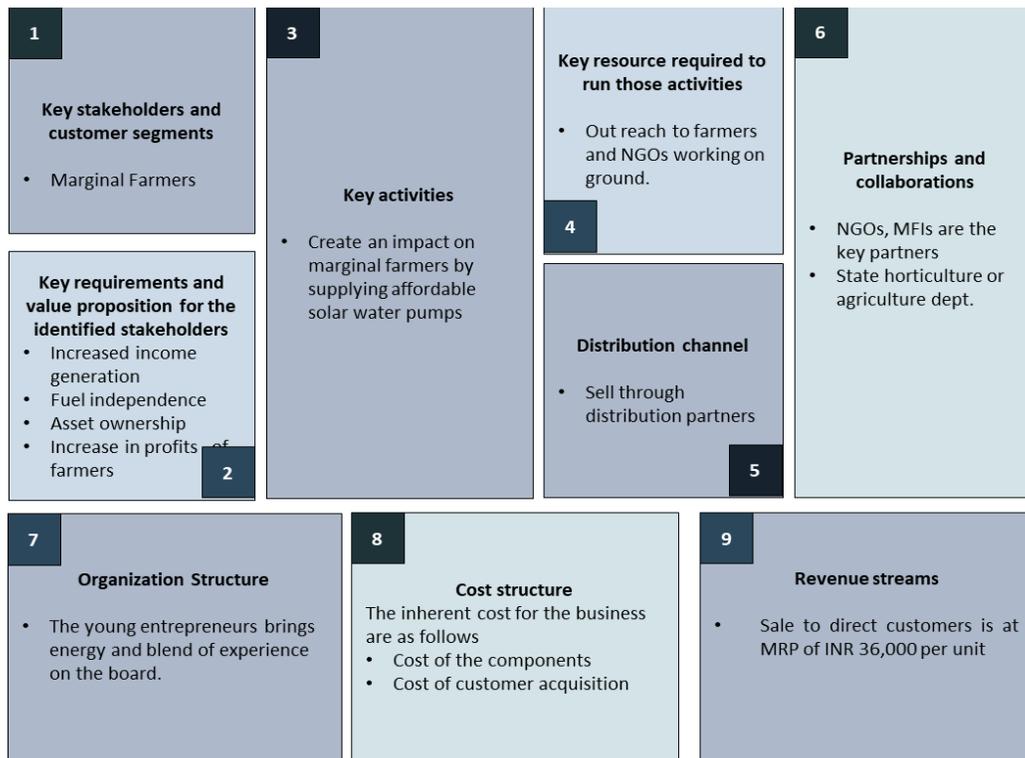
With Covid-19 acting as a major barrier to business for the first half of 2020, Intellectap suggests a three-pronged growth strategy for Inficold that includes greater penetration in existing geographies; expansion into new contiguous geographies; and expansion of product offerings to achieve the targeted growth by March 2023.

Intellectap has identified a total equity requirement of INR 5.5-7.5 crores for Inficold. The funds are planned to be used for team building (INR 3.15 crore), new business model trials (INR 2.65 crore), building manufacturing capacity (INR 1.10 crore), operational expenses (INR 1.76 crore) and working capital (INR 2.00 crore). In June 2020, Inficold was able to raise INR 3.75 crores from an angel investor, with a balance of INR 1.75-3.75 crores remaining to be raised. Inficold is currently under discussion with Shell Foundation for a grant of INR 3.75-5.6 crores with a 1-year disbursement linked to sales and equity raise.

KHETHWORKS

Khethworks provides solar pumps with market-leading efficiency for smallholder farmers. Built using patented technology, these are portable open-well submersible, centrifugal pumps with brushless DC motors and are powered by a set of two 160-watt solar panels. The pumps cost about INR 36,000 per unit directly to customers. Khethworks' pumps have a 1 litre per second flow at 10 meters of total dynamic head at a best efficiency point of up to 61 percent wire-to-water efficiency (laboratory conditions). The pump has around 0.3 horsepower (HP) but provides the equivalent flow of larger systems due to the efficiency gains made in the design of the technology. Its impact has been seen in increase in income generation, fuel independence, asset ownership, and increase in profits by over 300 percent. Khethworks has been able to identify a market gap in the form of marginal farmers who require 0.3 HP pump for 1 or 2 acres of land. It has a strong R&D team and a robust innovation pipeline with an experienced in-house design team led by a strong promoter.

Figure 8: Business model canvas of Khethworks



Intellecap conducted a detailed document review to understand the enterprise’s business model, financial model, investor relations, and funding requirements followed by discussions and suggestions on the same, considering the post Covid-19 scenario. Based on its findings, Intellecap’s recommendations to Khethworks include refining its existing 3-year plan; liaising with the Ministry of New and Renewable Energy (MNRE); applying for grants; and conducting a thorough assessment of its working capital, equity capital needs, pilot plans, and valuations to prepare a robust financial model.

INTELLECAP’S STRATEGIC INSIGHTS FOR KHETHWORKS

Market size and growth

The global solar water pump market is estimated to be at around USD 1 billion with a CAGR of about 9.5 percent from 2019 to 2025. The Indian solar water pump market is expected to grow significantly during 2018-2023 due to increasing application in domestic and agriculture sector and rising government focus. Through schemes such as ‘Kisan Urja Suraksha evam Utthan Mahabhiyan’ (KUSUM), the government offers high subsidies up to 70-95 percent on the upfront capital cost of the pumps which supports bullish market growth. Intellecap recommends extensive market research of other geographical areas in India and as well as Africa and South-East Asian countries for expansion of the business.

Competitive landscape

Khethworks' pumps provide double the flow of MNRE micro pumping specifications. The industry is fairly competitive with the presence of various global and domestic suppliers in the pumps value chains such as Shakti Pumps, Jain Irrigations, Kirloskar pumps, Lubi Solar etc. Intellecip analysed the market competitiveness through the lens of lessons learnt from failed ventures and assisted Khethworks in modifying its strength, weakness, opportunity, threat (SWOT) analysis to position its product in the right segment.

Value proposition

The use of pumps powered by free and abundant solar power implies irrigation without recurring costs. This allows farmers to expand their cropping area, cultivate high value crops across the year and provide sufficient irrigation resulting in increased yields. As a result, farmers are likely to generate higher income and adopt sustainable livelihoods. Intellecip proposes using the Value Proposition Canvas to ensure that Khethworks' pumps are positioned around the customer requirements of competitive pricing, proven technology and customized products. Intellecip estimated that Khethworks solar water pumps can directly benefit 85 percent of the small holder farmers in India.

Technological demonstrability

Khethworks has proven the results and benefits of using innovative solar water pumps while also highlighting the tangible benefits to the farmers. The patented technology has delivered an energy efficient, portable, and affordable solar water pump to meet the demand of the farmers. Khethworks' solution can cater to over 26 million small holder farmers (who tend to an acre or less of land) in East India, where 60 percent of renewable groundwater is unused and agriculture-grade electricity is unreliable. High fuel prices and unavailability of diesel pumps are the two key challenges faced by the farmers. The farmers are choosing not to cultivate during the summer season with highest market return for the harvest due to lack of irrigation facility to meet the high crop water demand. Intellecip recommends Khethworks to get its pumps tested in accredited Indian labs which can support empanelment of its products with MNRE. Intellecip also suggests conducting pilots in countries like Sri Lanka and Nepal.

Innovation and replicability

Rapid innovation and ongoing investments in the solar water pump market are likely to widen the opportunity horizon for investments in R&D of solar water pumps. Intellecip suggests increasing the R&D spend to improve the efficiency of the pumps, and developing variations in capacity of the pumps to irrigate more land using portable pumps.

Sustainability

The Khethworks pump provides up to 61 percent of wire-to-water efficiency with a flow-rate that is lower than diesel pumps. This leads to a reduction of evaporative losses, giving farmers more control over irrigation resulting in lower overall water usage. Considering that 13 percent of all diesel in India is consumed by agricultural pumps, adoption of solar-based pumps can lead to significant fuel savings and zero-carbon farming. Moreover, stringent regulations to adopt sustainable agriculture will drive the demand for energy efficient and automatic solar water pumps in the market. Therefore, Intellecip recommends Khethworks to explore IOT-based smart irrigation systems to avoid extra pumping of water.

Techno-commercial analysis

Intellecip's analysis indicated that Khethworks offers its pumps at a lower price than competitors and has the ability to serve marginal farmers. Intellecip proposes conducting techno-economic analysis (TEA) for a cost-benefit comparison using different methods such as assessment of the economic feasibility of projects, investigation of cash flows (e.g. financing challenges) over the lifetime, evaluation of the likelihood of different technology scales and applications providing the same service. Aspects of TEA can be used as an input to the financial and socio-economic analysis. Intellecip conducted a thorough TEA for Khethworks with the following findings:

- *Economic feasibility of a project:* Intellecip analyses the investment related costs for Khethworks including planning, consulting, licenses, and other infrastructure-related costs. It also delved deep into the enterprise's operational costs including working capital, manufacturing costs, labor and maintenance costs.
- *Cash flows over the lifetime:* Intellecip examines the enterprise's cash flows, profit and loss statements, cost of goods sold, and marketing costs. Intellecip further verified its internal rate of return (IRRs), net-present value (NPVs), payback period for the investment. The analysis also covered external benefits such as environmental, health and non-technical losses.
- *Feasibility of different business models:* During the analysis, Intellecip observed that the enterprise works with the farmers to design a product and service solution that is tailored around their requirements. To this end, it engages with its customers through direct sales, distributor-based sales and after sales services.
- *Environmental impact assessment, social impact assessment:* Intellecip assessed that Khethworks' pumps have several significant environmental and social benefits. According to the analysis, about 13 percent of all diesel used in India is for agricultural pumps. Capturing 1 percent of the market in East India can lead to a reduction of

159,000 metric tons of CO₂ per year, or the equivalent of the amount of CO₂ sequestered by 2.6 million trees over 10 years.

Intellicap verified that utilization of the Khethworks system can increase profits by over 300 percent for marginal farmers. To this end, Intellicap suggests developing new products and improving existing products after TEA of the solar power pumps. Further, Intellicap recommends hiring of experts to develop working capital strategies after financial analysis of the enterprise and conducting pilots in new regions post social and stakeholder analysis. Intellicap also advises Khethworks to increase production capacity to reduce its cost of manufacturing goods and undertake domestic procurement of pumps and motors to avoid import duty of around 27 percent; thereby resulting in a higher profit margin.

Manufacturing and scalability

Khethworks' in-house assembly team gives it more control over its operations in India. Early prototypes of Khethworks' pumps were manufactured in-house by the founders. The pilot systems were manufactured at the laboratories of Tata Technologies and motors were procured from China. Khethworks is trying to set up a motor manufacturing unit under the '*Make in India*' and '*Vocal for Local*' programs. Intellicap reviewed the current manufacturing process and bottlenecks along with the projected growth of utilization. Based on the analysis Intellicap suggests Khethworks' to forecast the impact of the implementation of anti-dumping and safeguard duty policies and the effect on cost of imported components from China. At the same time, Intellicap also advises Khethworks to develop robust in-house motor manufacturing capacity of imported components to reduce the overall cost of the goods.

Management and team structure

Khethworks is led by a capable promoter and has a diverse blend of experience and talented youth among its promoters. To expand its business in India, Intellicap recommends developing a strong sales team in India and hiring a vice president for sales. It also suggests an increase in R&D activities to develop sustainable products. Strengthening teams and exploring local distribution networks will increase business opportunities for Khethworks in India, Nepal, Sri Lanka and other South Asian countries.

Investability

Khethworks is a sustainable venture and is likely to break-even in the next two years with a similar pace of operations. The enterprise sells its pumps at INR 36,000 per unit, including an industry standard of 40 percent gross margin and a 20 percent distributor mark up, as derived from talks with potential distribution partners. Intellicap suggests developing a mature

business model, enhancing capacity to generate cash flow including working capital cycle strategies. It recommends designing a robust MFI-based business model. For MFIs, Intellectap has suggested a better demonstrability model in terms of setting up a field demo unit for consumers. According to Intellectap’s analysis, a blend of grant capital and venture capital will be more suitable for Khethworks at this stage which can help establish a commercially viable and scalable business model before commercial investment.

Box 2 - Khethworks’ Sales and Distribution Strategy

At present, Khethworks sells its pumps directly to both individual farmers and farmer aggregators. These aggregators may be women’s self-help groups (SHGs), farmer-producer organizations (FPOs), and livelihoods-focused NGOs [Professional Assistance for Development Action (PRADAN), Child in Need Institute (CINI), etc.]. These primarily serve as marketing channels to concentrate sales and also provide shared capital to facilitate the initial investment.

Khethworks also sells through distribution partners and generates revenue through commercial business-to-business channels. Herein, Khethworks does not bear the cost of customer acquisition or after sales servicing. The distributors establish market linkages and acquire customers.

For further expansion of the business, Intellectap suggests business models such as PAYG and leasing of solar pumps to farmers via FPOs.

KHETHWORKS INVESTMENT READINESS AND GROWTH STRATEGY

To develop Khethworks’ proposition for investors, Intellectap used a multi-step approach for the prioritization of capital raise support. The process involved reviewing enterprise documents, high-level assessment and discussions with the management to align with their expectations, and articulate an investor pitch with a financial model that would support the capital needs of the enterprise. Possible investors for Khethworks have been identified as cKers and InnoVen Capital.

Figure 9 : Khethworks’ financial projections



Based on the analysis, a roadmap of six months was agreed upon with the following key activities:

- Finalize a 3-year plan: Intellectap supports Khethworks to finalize its 3-year plan and associated financial and business models targeting strong growth and improved investability.
- Explore new partnerships: The next step for the enterprise is to finalize a go-to-market strategy to launch products in other regions of India and South Asia (including Sri Lanka and Nepal) and explore local partnerships for sales and service support.
- Discussion with investors: The final step in the roadmap will be to discuss a strong pipeline of products with existing investors and reach out to new angel investors before commercial equity investors.

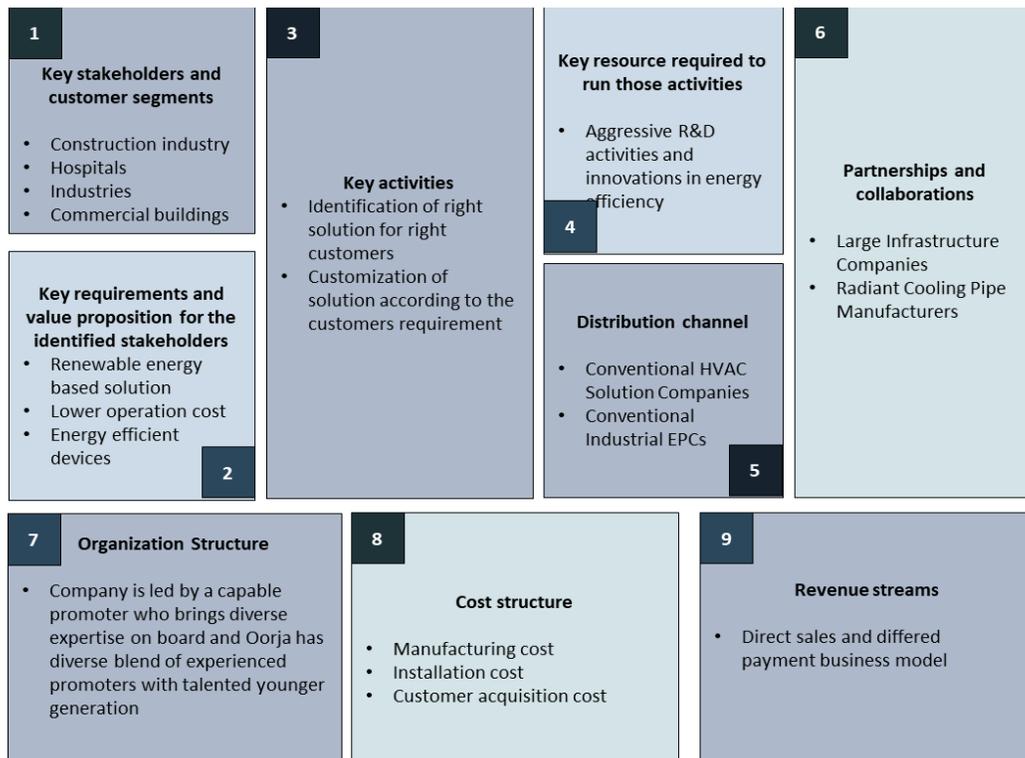
Intellectap recommends Khethworks to develop a well-defined growth strategy for the next three years (including strategies for product commercialization, diversification of products and business models) that would result in strong financial growth, despite the first two quarters of 2020 being nearly disrupted owing to the Covid-19 pandemic.

Intellectap has estimated that Khethworks would need a total investment of around INR 5 crores. In July 2020, it received a grant capital of INR 75 lakhs as it was selected for Rainer Arnhold Fellowship by Mulago Foundation. Post this capital infusion, about INR 4.25 crores are yet to be raised. The funds are expected to be used for strengthening team and product offerings, executing pilot projects in Sri Lanka and Nepal, expanding domestically beyond Jharkhand, and exploring other regions in South Asia.

OORJA ENERGY

Oorja provides sustainable solutions for industrial and commercial heating and cooling segments. Its solar process heat solution finds application in automotive, food and dairy industries; while its waste heat recovery solutions are deployed in cement, iron and steel industries and solar drying in thermal power generation. In the buildings sector, it has solutions such as radiant cooling, structure cooling, geothermal and radiant heating. Oorja has a pan-India market reach and is the benchmark in delivering innovative engineering solutions. Oorja is strategically placed in a thriving market segment of energy efficient solutions. The global sustainable heating space is estimated to reach over USD 25 billion by 2030, while the cooling market is likely to be worth about USD 20 billion by 2038. Oorja has a strong R&D team with multiple products in the pipeline with a robust in-house design team led by an experienced promoter.

Figure 10: Business model canvas of Oorja Energy



Intellecap’s analysis of Oorja involved detailed document review followed by several virtual and in-person interactions to understand the enterprise’s business model, financial model, investor relations and funding requirements. Following the assessment, Intellecap provided strategic insights and suggestions on the enterprise’s investor pitch, collateral preparation and approach to investors. Intellecap also explored the possibility of raising debt capital through non-banking financial corporations (NBFCs) and private banks for a quick working capital debt requirement for a project. It further recommended a number of debt providers who could be approached for financing.

INTELLECAP’S STRATEGIC INSIGHTS FOR OORJA ENERGY

Market size and growth

India offers a unique opportunity for cooling systems owing to several factors such as growing population, tropical climate, rising temperatures due to global warming, and an increasingly aspirational middle class population. Furthermore, an increasing built-up area and low residential air-conditioning penetration (~5 to 10 percent) presents a large addressable market. The country’s global commitments towards climate change have further enhanced the need for sustainable cooling solutions. To capture this market and explore newer sectors, Intellecap

recommends conducting market research for target industries with essential need for cooling across sectors such as healthcare.

Competitive landscape

While the industry is fairly competitive, Oorja has the advantage of key assets and skills through its patents, strong management team and manufacturing facilities. Some of Oorja's key competitors include Voltas, Blue Start, B-Kool, Chennai Cooling point, and LG. Intellectap assisted Oorja in modifying its SWOT analysis to position its products in right segment to ensure visibility and to engage with the right competitors.

Value proposition

Oorja's primary value proposition is providing cost-effective solar-based energy efficient cooling and heating solutions. It is undergoing a 1-year Stanford Seed Program to help achieve transformative growth, derive greater accountability of business, enable better team development, and improve operational efficiency. Intellectap's analysis was based on the Value Proposition Canvas which helped to ensure that Oorja's products are positioned around the customer's needs of competitive prices, proven technology and customized products. Intellectap's assessment suggests that the seed program will help Oorja build its core strength and efficiency that will reflect in its profit margins.

Technological demonstrability

Oorja has proven the results and benefits of using the innovative space heating and cooling, providing tangible benefits to its customers (i.e. industries and households). Oorja's products either eliminate or greatly reduce the need for fossil fuel consumption for the highly energy-intensive processes (specifically heating and cooling) in industries and commercial establishments. Intellectap recommends enhancing the demonstrability of technology and developing more energy efficient products for space heating and cooling.

Sustainability

It is estimated that India's cooling energy demand is expected to experience a 2.2x growth by 2027 over 2017's baseline. Reports suggest that energy efficiency in cooling can help avoid about 25 GW of new coal capacity during the same period. To capture this space, technologically advanced cooling solutions will be required. Based on these, Intellectap advises Oorja to develop IOT-based systems in the space cooling segment to monitor and track the consumption of energy for cooling in buildings.

Techno-commercial analysis

Intellectap's analysis of the market suggests that Oorja's products are priced lower than its competitors and have the ability to attract large industries owing to its sustainable value propositions. Intellectap further applied techno-economic analysis as a tool to evaluate the commercial viability of Oorja's technologies. It was found that with higher operational efficiency, Oorja may be able to reduce its cost of goods manufactured and improve overall profit.

Management and team structure

Oorja is led by a capable promoter and has a diverse blend of experienced resources and youth in its management team. Its in-house design and R&D team has proved to be an asset for the enterprise. Based on the findings of an in-depth study of the enterprise's operations, Intellectap recommends building an in-house sales team along with hiring a vice-president of sales. Additionally,, Oorja needs to increase its R&D activities to develop a wider range of sustainable products. Further, strengthening teams and distribution network will increase business opportunities for Oorja in India and other South Asian countries.

Box 3 – Oorja's Business Model

Oorja's business model is primarily based on two key principles -

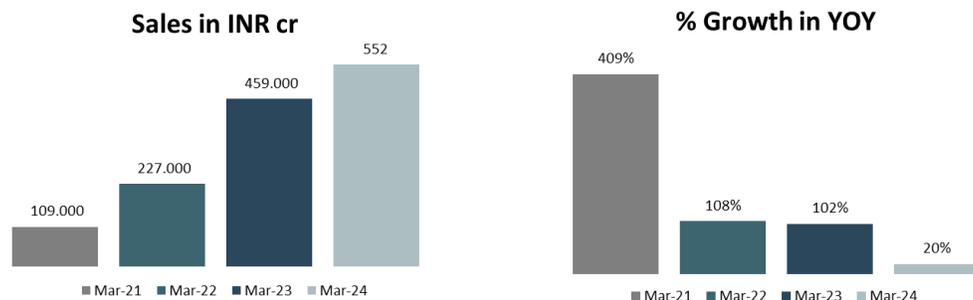
- ***Collaboration, not competition, with experts:*** Oorja has collaborated with some of the largest HVAC contractors and solution providers to gain from their expertise and plug its product into already established distribution channels. It has also collaborated with industrial engineering, procurement and construction (EPC) companies who outsource in-situ execution of HVAC systems to Oorja. For radiant cooling, the enterprise has collaborated with two European manufacturers in India.
- ***Leveraging industry associations:*** Oorja has been empanelled or forged partnerships with large industrial bodies such as Confederation of Indian Industries (CII), Alliance for an Energy Efficient Economy (AEEE) and The Energy Resources Institute (TERI), among others. These associations help Oorja in procuring market intelligence, peer-review of strategies and perusing high-level partnerships. Meanwhile, it has also partnered with academic institutions such as IIT Roorkee and IISc Bangalore for research and development of its products.

OORJA'S INVESTMENT READINESS AND GROWTH STRATEGY

Intellectap has used a multi-step approach to evaluate Oorja's investor readiness and to explore investors aligned with its growth expectations. The process involved an in-depth review of the financial and operational documentation of the enterprise and discussions with the management on business operations and challenges faced. Further, Intellectap carried out discussions to assess expectations from capital raising activities, for articulating a clear growth

plan for investors through a financial model, and prioritizing investors based on synergies with the enterprise.

Figure 11: Oorja's financial projections



Intellecap's financial projections for Oorja have projected a strong sales trajectory over the next four years. To achieve these by March 2022 as per Oorja's plans, Intellecap recommends a three-pronged growth strategy of greater penetration in existing geographies, expansion into new contiguous regions and expansion of product offerings. The possible investors identified for Oorja are Trifecta Capital, Alteria Capital and InnoVen Capital.

To make Oorja investor ready, Intellecap developed a detailed strategic roadmap with a six-month timeline. The key activities for the enterprise are as follows:

- **Finalize a 3-year growth plan:** Intellecap recommends that Oorja should finalize a 3-year plan and develop associated financial and business models clearly outlining the expected growth.
- **Explore new partnerships:** Intellecap suggests that Oorja should improve its go-to-market strategy and launch products in other regions of India and South Asia to take advantage of similar climatic conditions and demand trends.
- **Discussion with investors:** The next step for Oorja would be to discuss the geographical and product pipeline with investors and reach out to angel investors before approaching commercial equity investors.

After detailed activities were carried out, Oorja restrained itself from the advisory services provided by Intellecap and did not provide necessary documentation for further strategy planning due to unsuccessful demonstration of its technology. Basis internal discussion, Intellecap discontinued advisory services for fund raise and financial due diligence of Oorja.

TESSOL

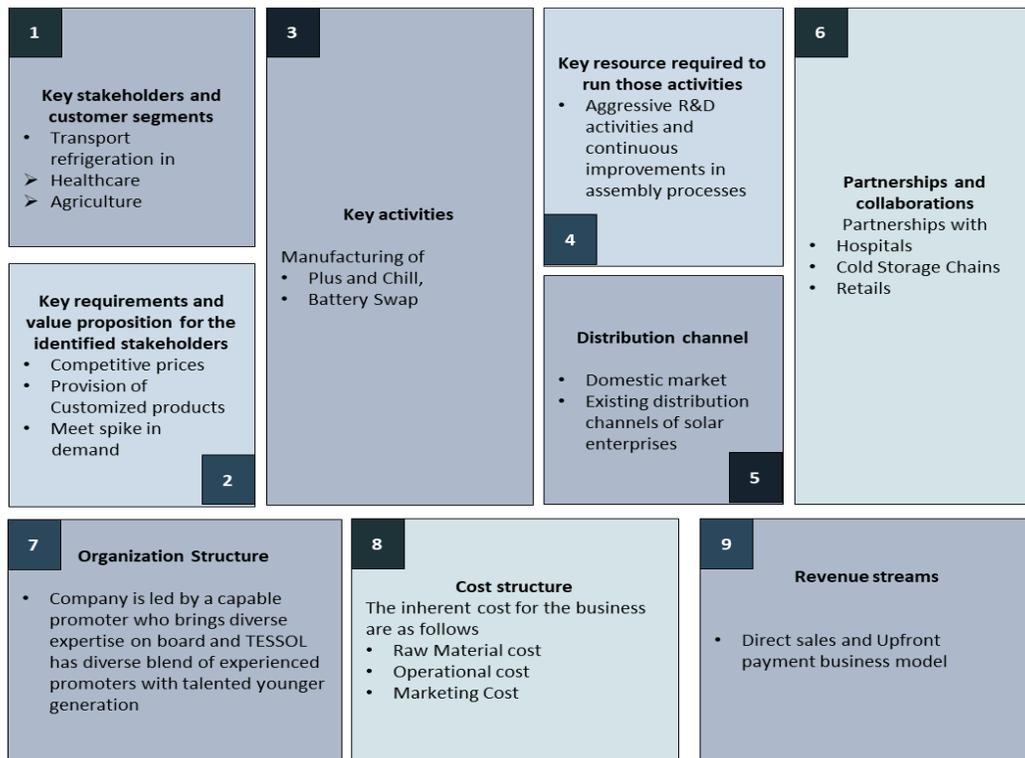
Thermal Energy Service Solutions Private Limited (TESSOL) offers end-to-end transportation of materials from source to customer without breaking the cold chain. It uses proprietary PCM (Phase Change Material) heat exchangers and chargers that store thermal energy and release it as required during the transportation. Its solutions include:

- Plug-n-Chill: TESSOL's solution has PCM heat exchangers and chargers permanently mounted on the vehicle's insulated body. They require a 5 to 6-hour charge post which they can run for 10 to 12 hours with multiple drops.
- Battery Swap: This involves "swapping" an exhausted thermal battery (a battery which stores thermal energy) for a charged battery. TESSOL has observed that its swap solutions work best for under-1-ton vehicles, partly refrigerated cargo, and 3-or 2-wheeler solutions.
- TAMsys: This is a remote asset management system built on an IoT platform. It is device agnostic and can support multiple hardware device formats. The TAMsys platform is a unique and extremely powerful tool providing a one-stop management information system to customers across the value chain.

While the Indian cold chain market is currently estimated to be around USD 2 billion with a CAGR of 21 percent, the global cold chain market is likely to reach USD 447 billion by 2025. TESSOL has been able to identify and plug two major challenges in the segment; (i) 65 percent of last mile cold chain distribution is being carried out in ambient conditions as existing solutions are not viable and reliable, and (ii) 20 percent orders require cold chain logistics solutions.

Over the last 18 months, TESSOL has piloted and deployed an e-commerce last-mile distribution solution capturing 75 percent of the ecommerce retailers, delivering a strong proof-of-concept and exhibiting scalability across the segment. It has a strong R&D team led by an able promoter and management team that have been instrumental in bringing on-board marquee brands such as Vadilal, Mondelez, Amazon and Reliance with a 100 percent repeat order track record.

Figure 12: Business model canvas of TESSOL



INTELLECAP'S STRATEGIC INSIGHTS FOR TESSOL

Market size and growth

The Indian cold chain segment is likely to demonstrate high growth of over 21 percent in the next few years. Hence, Intellecapp recommends TESSOL to increase its focus on the e-commerce, food delivery, poultry and flowers segments for improving last-mile distribution. This will provide TESSOL with a large share of the expanding home delivery segment which is expected to grow at a CAGR of 65 percent. The Covid-19 pandemic has also highlighted the need for cold chain services in the healthcare segment and it is likely to only increase given the need for vaccine storage.

Competitive landscape

Most of India's last-mile delivery in the cold chain is highly unorganized. TESSOL is one of the few organized players in the segment that addresses last-mile distribution challenges. Presence of unorganized players makes the market fragmented with a large presence of small and big suppliers in the value chain. Intellecapp's assessment of the market has highlighted that companies such as Rinac, InspiraFarms and Ecozen pose a direct competition to TESSOL.

Intellectap suggests strategic exploration of business by TESSOL in other market segments such as pathological labs, blood banks, and organ transfer vehicles.

Value proposition

TESSOL's value proposition is a strong blend of physical and technological assets. With over 350 vehicles and 75 home delivery units in operation, TESSOL is currently present in 18 cities across India. TESSOL's solutions are supported by an IOT-based remote monitoring system called TAMsys that provides a solution to the last mile distribution challenges. Intellectap used the Value Proposition Canvas to ensure that TESSOL's offerings are centred around the customer needs of low pricing, proven technology, customized products and the ability to meet demand spikes. TESSOL's positive temperature PCMs are forecasted for tremendous growth in the market. In the future, over 50 percent of the market is likely to be based on positive temperature PCMs while the rest will be based on ice storage. Considering these, Intellectap recommends that TESSOL must explore the expansion of its geographical reach to establish a distribution network in the North American and European markets.

Technological demonstrability

TESSOL has demonstrated its technology across the key sectors of dairy, poultry, seafood, agriculture, households and industries. It has delivered solutions to some of the largest companies in these segments. TESSOL's customer segments include dairy and dairy product suppliers (like Sarda farms, Gowardhan and Epigamia); poultry and seafood providers (such as Licious, Godrej Tyson, Zorabian foods, and West Coast); ice-cream vendors (like Mother Dairy and Vadilal); central kitchens (such as Haldirams, Birdys, Monginis, and Ribbons and Balloons); and e-commerce platforms (like Amazon, Reliance Fresh and Grofers).TESSOL's technologies show tremendous scope in the market and indicate towards wider acceptance across various sectors. Intellectap's assessment finds huge prospects of further penetration of cold chain in agriculture, horticulture, food, meat and fishery value chain. The potential in the healthcare sector is especially significant considering the ongoing pandemic and its aftermath. Therefore, Intellectap suggests TESSOL to explore the viability of its technology and applications in the target industries of fishery and healthcare.

Management and team structure

TESSOL is led by an able promoter along with a management team that has a blend of experience and youth. Intellectap's insights into the operations of the enterprise suggest the development of a stronger sales team for business expansion within India, beyond its traditional markets. TESSOL is also advised to invest more in R&D to develop a range of sustainable products. By strengthening its sales teams and improving its distribution network,

TESSOL will be able to increase business opportunities within India and potential target markets in North America and Europe.

Box 4 – TESSOL’s Business Model

TESSOL has solutions covering the cold chain starting from the secondary-level delivery of materials from the food factory or cold storage to the distributor. Its solutions also cover the tertiary-level where the ready packages are delivered to the franchisee or trade stores, from where TESSOL’s offerings take the packages to the consumers per the last-mile delivery.

Supply chain segment	Solution	Business model options
Secondary distribution or > 1 ton: movement from cold store or factor to distributor or retail store	Plug-n-Chill with TAMsys	One-time sale of unit and container + annual maintenance contract (AMC)
Tertiary distribution < 1 ton: movement from distributor centre to retailer	Swap solution with TAMsys	One-time sale of centralized freezer, cartridge and zenbox + AMC
Home delivery: delivery from retail store to home	Swap solution	One-time sale of freezer, cartridge, and bags + AMC + TAMsys
IOT tracking and asset management platform	TAMsys	One-time device sale or bundled with asset + subscription



TESSOL’S INVESTMENT READINESS AND GROWTH STRATEGY

Intellectap conducted an in-depth analysis of TESSOL’s activities, financials, operations and other documentation using a multi-step approach to evaluate its investability and to align the right set of investors that match its fund-raising objectives. Intellectap suggests aggressive penetration in existing geographies and exploring newer markets along with an increase in the range of offerings. However, due to the impact of Covid-19, TESSOL restrained itself from providing necessary documentation and further strategy could not be implemented.

FINDINGS AND CONCLUSION

The key outcomes of Intellectap's advisory support included designing a strategy for near term growth of the five enterprises and developing an overall roadmap for raising commercial capital from the inception to fund raise stage. This was derived based on the information and data provided by the enterprises on their business and financial strategies.

ROADMAP FOR COMMERCIAL CAPITAL RAISE

The journey for raising commercial capital for enterprises has seven typical stages as defined below:



Stage 1. Inception: The key activities are presenting the business idea; designing the business model; piloting the model; exploring partners for operations/distribution; demonstrating the technology; and gathering feedback on feasibility.

Stage 2. Technology trial: This comprises of conducting technical due diligence; examining the relevance of the product in the market; and filing for intellectual property protection of the innovation.

Stage 3. Business model development: This includes refining the business model and strategies; piloting business models in new regions or market segments; and finalizing the business models for scaling the technology.

Stage 4. Commercialization of product: The main aspects are increasing revenue; augmenting product, sales and manufacturing capabilities; expanding teams; and adding new products to the portfolio.

Stage 5. Investment readiness: The key activities are compiling an information kit for investors; and preparing collateral to showcase business plan and growth strategy.

Stage 6. Selection of investors: This involves identifying relevant equity and debt investors based on their focus areas such as technology, finance or people.

Stage 7. Commercial capital raise: The includes estimating the ticket size of equity/debt capital; defining the timeline for raising funds; developing a plan for usage of the funds; and preparing the exit strategy for investors.

KEY FINDINGS

The critical insights regarding the business strategy and growth pathway of the five enterprises are given below:

- **Need for handholding support to design strategies:** All the enterprises were at the early stage of business model and required comprehensive support for developing the product and defining the revenue strategies.
- **Limited scale of production:** Some of the enterprises faced challenges regarding product scalability in new geographies and establishing market linkages. Considering the early stage of majority of these enterprises, there were certain gaps identified in the existing operations of the enterprises due to lack of manufacturing capacities, limited manpower, lack of understanding of last mile distribution, among others.
- **Poor investment readiness:** The overall investment readiness of the enterprises was low due to early stage and nascent stage of technology. There is a need for the enterprises to implement strategies to improve their growth rate and showcase a plan to the investors for initiating fund raise.
- **Impact of Covid-19:** There has been significant impact of Covid-19 on the start-up ecosystem as well as investor appetite. In India, around 70 percent of the start-ups have been adversely impacted by the pandemic. Some of the portfolio enterprises of the FLCTD program scaled down their businesses thereby impacting their growth pathway. Further, investments in India fell 81.1 percent to USD 0.33 billion in March 2020, as compared to USD 1.73 billion in March 2019.

Five stages in the business cycle of an enterprise with distinctive characteristics based on its growth level. These are (i) development and ideation, (ii) early stage start-up, (iii) growth, (iv) expansion, and (v) maturity. The matrix below showcases the distinct features of an enterprise across these stages:

Features/ Enterprise Stage	Development and Ideation stage	Early Stage Start-Up	Growth stage	Expansion stage	Maturity stage
Business plan	Defining the business structure	Developing different business models for targeted customer segments	Developing innovative business models		Examining the future growth trajectory in terms of expansion or exit
Product development/	Designing the product/	Piloting the product in the market and	Focusing on research and development of new products and		-

validation	technology	incorporating feedback by customers	technology, and increasing inventory capacity		
Market segmentation	Conducting a market needs assessment	Establishing the customer base and market presence	Exploring new customer segments and tackling market competition in the existing geographies	Expanding to new domestic and international markets	Consolidating the market share
Financial strength	Using private capital to initiate pilot	Seeking initial capital infusion after demonstration of the product/technology	Improving cash flow with steady revenue generation	Identifying new streams for revenue	Stabilizing profits and relying on internal financial sources for sustaining operations
Partnerships	Identifying potential partners for collaboration at different steps of the business value chain	Fostering partnerships for varied business operations (such as sales, distribution, marketing, advertising, testing etc.)	Establishing long-term partnerships for scaling operations	Strengthening partnerships in existing and new geographies	
Team management	Developing the institutional and governance structure of the enterprise	Hiring core team members for multiple functions	Expanding teams specially for sales/distribution	Team expansion and motivation especially in new national and international geographies	

KEY CONCLUSIONS

The conclusions that are largely applicable to all early-stage technological enterprises looking for investors are given below:

- **Post-FCTLD support:** The enterprises selected through the FLCTD program had mature technologies but required significant support in enhancing their business model effectiveness and value propositions.
- **Development of business model:** Development of mature business models for enterprises has a direct impact on its scalability and the overall profitability, in turn, directly impacting its investment attractiveness..

- Value proposition: Commercial scalability of the product remains a strong value proposition in the enterprise portfolio. In terms of investment, growth strategies for product value enhancement are key for the enterprises and highly attractive to investors.
- Comprehensive roadmap for fund-raising: Fund raising requires a comprehensive roadmap tailor-made to meet the specific ambitions of each enterprise. This will help to identify the target financial institutions and ensure the right fit between the stakeholders.
- Investor pitch: Developing a robust investor pitch to showcase the enhanced business proposition is critical for enterprises to become investor ready. The enterprises need requisite support on the same as part of the program to make them attractive to investors.

The overall project concluded with comprehensive technical and business support provided to all five target enterprises. While three of the enterprises – PLUSS Advanced Technologies, Inficold and Khethworks were able to benefit from Intellectap's advisory services, two others – Oorja and TESSOL were unable to continue the last stage of the assignment due to unsuccessful technology demonstration and impact of Covid-19, respectively.

KEY RECOMMENDATIONS

This section details out the recommendations at the enterprise and program level for UNIDO. For enterprises, Intelicap has identified the relevant debt and equity investors for all the five enterprises as per their scale. At the program level, the suggestions pertain to selection of enterprises during the program design phase and strategy for program management to facilitate fund raising.

EQUITY AND DEBT INVESTORS SUPPORTING LOW CARBON TECHNOLOGIES

The key equity investors supporting low carbon technologies are TIW Private Equity, Godrej Group, Caspian Investment, Infuse Ventures, Ankur Capital, and the Indian Angel Network, The table below gives a brief description of the equity investors for each of the five enterprises:

Table 4: List of relevant equity investors

Stage of the enterprise	Name of equity investor	Description of the investor
Mid and Growth Stage PLUSS, TESSOL Oorja Engineering	TIW Private Equity	TIW Private Equity is an SME focused, sector agnostic, buyout private equity fund; preferring investing in first generation. It focuses on consumption driven sectors and domestic demographic dividend to drive superior alpha returns (such as FMCG, manufacturing consumption, digital consumption, real estate services, financial services, auto ancillary, specialty chemicals, pharma, food and agriculture etc.)
	Godrej Group	Godrej Group invests in innovative companies supporting low-carbon technology deployment. Its focus areas are sustainable inputs, solar energy, agriculture services, farm equipment and water management.
	Caspian Investment	Caspian Equity brings 12+ years of experience and primarily invests equity in innovative enterprises engaged in food and agriculture, clean energy and financial services for SMEs. It invests in companies with innovative business models and high-quality entrepreneurs willing to work towards social and/or environmental performance
Early Stage Khethworks, Inficold	Infuse Ventures	Infuse ventures is an early stage venture capital fund focused on the sustainability and clean energy sector in India. This includes innovations in areas such as renewable energy, energy efficiency, sustainable agriculture, green buildings, green IT and clean web.
	Ankur Capital	Ankur Capital provides capital for innovative business models across various themes to address core challenges across sectors including cleantech, agritech, food, healthcare, financial, logistics, retail, education, among others. Ticket size varies between USD 500K to USD 5 million.
	Indian Angel Network	Indian Angel Network is a network of angel investors that invest in early stage businesses with the potential to create disproportionate value. The network looks at investing up to USD 1 million, with an average of about USD 400-600K. The exit is over a 3 to 5-year period through a strategic sale.

The debt providers are Syndication with Banks (e.g. Equitas, Suryodaya, Bandhan, and IDFC), Trifecta, Innoven and Alteria Capital. The table below gives a brief description of the debt investors for each of the five enterprises:

Table 5: List of relevant debt providers

Stage of the enterprise	Name of debt provider	Description of the investor
Mid and Growth Stage PLUSS, TESSOL Oorja Engineering	Syndication with Banks	Syndicated loan, also known as a syndicated bank facility, is financing offered by a group of lenders, who work together to provide funds for a single borrower. The loan can involve a fixed amount of funds, a credit line, or a combination of the two. Syndicating the loan allows lenders to spread risk and take part in financial opportunities that may be too large for their individual capital base. Possible banks that could be approached for syndication are Equitas, Suryodaya, Bandhan, and IDFC.
Early Stage Khethworks, Inficold	Trifecta	Trifecta Capital Advisors is India's first independent venture debt firm. The financing is usually structured as a combination of a loan along with limited equity investment rights (warrants).
	Innoven	Innoven Capital is Asia's leading venture lending firm with offices in India, Southeast Asia and China. It has a sector agnostic approach, however, prefers to partner with disruptive enterprises in cleantech, technology, internet, media, healthcare and consumer sectors.
	Alteria Capital	Alteria Capital is a venture debt fund focussed on innovative start-ups. It is sector agnostic, and look to invest in early stage innovative start-ups

FLCTD PROGRAM DESIGN AND IMPLEMENTATION STRATEGY

The key recommendations for enterprise selection process during the program design are:

- Identify the enterprise according to the technology maturity: The technical due diligence exercise should include inputs on customer segments, value proposition, partners, operating model and effectiveness of technology in solving key challenges.
- Recon business model maturity and existing penetration of product in the market: The program design should focus on development of business models and scalability of operations to make enterprises investment ready. This includes developing business models; identifying customer segments; estimating the market potential across segments; exploring partnerships; identifying key areas of improvement; designing a robust financing mechanism; and developing a management and operational team.
- Assess the support required for enterprise for scale up: The enterprises should be provided strategic support in developing collaterals for investors; liaising with relevant investors; and identifying types of investment according to the projects and strengths of the enterprise.

The key recommendations on program management to facilitate funds raising by enterprises are:

- *Conduct technology assessment:* The technical due diligence of the program should include key factors such as problem and solution assessment, effectiveness of solutions, and scalability and sustainability of the product.
- *Provide strategic inputs for developing mature business models:* The key activities for business planning support include mapping of existing business models; developing innovative models; evaluating the new business models with respect to customer segments, revenue generation and impact; and assessing the scalability of the business models.
- *Advise on scalability and sustainability to support product commercialisation:* This involves identifying the stage of enterprise and its product; defining various customer and market segments; and preparing a growth strategy from short to long term.
- *Support enterprises to develop strategies to increase valuation for capital raise:* This includes developing collateral for investors; identifying capital requirement and sources of finance; defining the growth strategy and financial projections; and identifying potential investors.