Egypt Climate Innovation Collaborative

**Supporting Clean Tech Entrepreneurs in Egypt
Through Partnerships and a Market Development Focus**

Concept / Business Plan | May 2018

Acknowledgements

Abstract

The following concept is the result of user-centric-design and a consultative process to develop a business plan to support clean tech startups and SMEs in Egypt. Over 24 startups and 18 ecosystem players were consulted over 231 interaction hours through workshops, focus groups, interviews, and design thinking session. A key finding and message in the business plan was that in order to effectively support clean tech startups, a dual approach would be needed where a support program focuses on i) the unique needs of clean tech entrepreneurs, but also ii) market development, which requires looking beyond accelerating entrepreneurs to include market system acceleration.

Contents

Executive Summary

Clean Tech Entrepreneurship is Emerging in Egypt
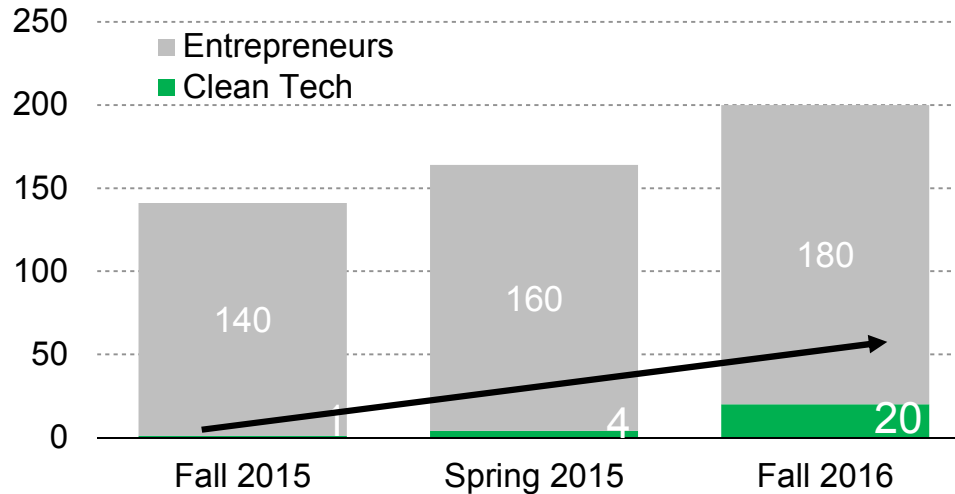
Strong Pipeline Emerging

Early Success Stories

521 APPLICATIONS
ENCPC/UNEP SWITCHMED
GREEN PROGRAM 2015/2016
(1ST YEAR)

APPLICATIONS
521

Egypt National
Cleaner Production Center

UNEP

Applicants to American University in Cairo Venture Lab (VLAB) Acceleration Program *(Targets Established Operational startups)*

	Entrepreneurs	Clean Tech

- Fall 2015: Entrepreneurs 140, Clean Tech 1
- Spring 2015: Entrepreneurs 160, Clean Tech 4
- Fall 2016: Entrepreneurs 180, Clean Tech 20

KarmSolar
كرم للطاقة الشمسية

2 of *Forbes 20 Most Promising Egyptian Entrepreneurs* are Clean Tech Startups

Who are they?

- **30% Female Founders**
- **90% University Graduates**
- **75% site social motivation**

Entrepreneurs average age (male/female): 23-33

Source: Clean Tech Arabia Survey of 100 Clean Tech Entrepreneurs - 2015 Findings

Where are they?

63% Outside of Cairo

- Cairo
- Upper Egypt
- other
- Alexandria

What do they do?

57% Renewable Energy & Waste Mgmt

- Waste Management
- Renewable Energy
- Other
- Organic Agriculture
- Energy Efficiency

Who are their customers?

60% Agri. Business

- Agriculture
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- Tourism & Commercial
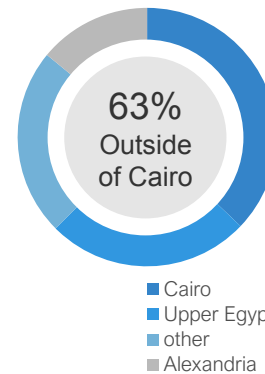
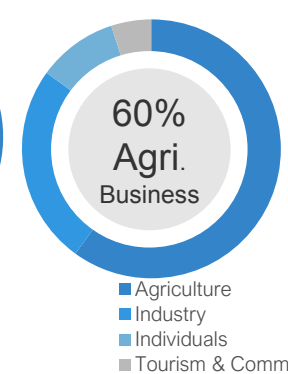Source: ENCPC /UNEP SWTICHMED Program 2015/2016
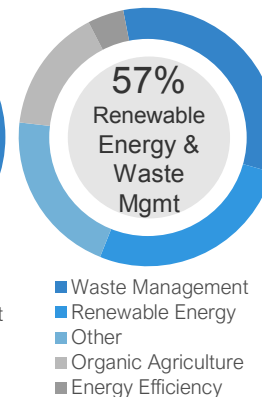
Source: Clean Tech Arabia Survey of 100 Clean Tech Entrepreneurs - 2015 Findings

However, Despite a Significant Market Opportunity…

Diesel-powered pumps in Egypt consume an estimated 3.7 million Tonnes of diesel per year, and release over 10 million Tonnes of Carbon Emissions.

Source: Regional Center for Renewable Energy and Energy Efficiency (RCREEE); "*Diesel to Solar Transformation, Accelerating Achievement of SDG 7 on Sustainable Energy: Assessing Untapped Solar Potential in Existing Off-Grid Systems in the Arab Region*" 2016.

Many hotels and resorts along the Red Sea and Mediterranean coasts are not connected to the national grid and are entirely dependent on diesel for all operations including water desalination.

Source: Regional Center for Renewable Energy and Energy Efficiency (RCREEE); "*Diesel to Solar Transformation, Accelerating Achievement of SDG 7 on Sustainable Energy: Assessing Untapped Solar Potential in Existing Off-Grid Systems in the Arab Region*" 2016.

Potential PV Peak Capacity 2,097 MW

Annually Egypt generates approximately 21 million tons of municipal solid waste, 30 million tons of agricultural waste, 6 million tons of industrial waste.

Source: GIZ; country report on solid waste management in Egypt, 2014.

Energy intensive industries in Egypt represent 1% of the number of factories in Egypt, yet consume 65% of industrial energy consumption.

Source: UNIDO; Industrial Energy Efficiency in Egypt, Industrial Energy Efficiency Strategies and Policies, 2015.

…. clean technology startups have not reached their potential in Egypt

Clean Tech Startups Face Unique Challenges

1 *Clean Tech Startups have different needs than other entrepreneurs*

2 *Clean Tech Startups are operating in markets & value chains which are yet to be defined*

Longer Lead-times

Clean Energy application startups emphasized the unexpected long time (i.e. > 1 year) needed for them to be able **to build their tech capability and network**.

Gaps in Expertise

Solar energy startups were not able to find the right connections to **experts or suitable labs** to develop their tech.

Technology, Not Business Focused

Most of the startups interviewed displayed high focus on their tech and **minimal focus on their business model**. Offer a technology to customer, not an integrated solution.

Customer Financing

Customers are **reluctant to pay upfront 'equipment' costs**. Need financing options to increase startups scaling potential.

Customer Resistance

Customers are displaying resistance to trying clean tech products. **Risk aversion** and **behavioral** change prove to be significant barriers to growth.

Initial Investment

Many solar components are imported and costly. Initial entry barrier, higher **working capital / inventory requirements** to meet customer needs.

Supplier/Distributor

Supplier/Distributor relationship dynamics not well established. Value Chain gaps relationships not developed and 'mode of operation' not defined.

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Egypt's Ecosystem Has Effectively Supported IT/Mobile App Startups

However, clean tech startups have had mixed success. After 'graduating' from programs many clean tech startups still lack the know how, market access, finance, and ability to successfully launch or continue their business.

IT / Mobile support is not fully transferable to Clean Tech. Clean tech startups often follow path of IT startups, but do not find the tailored support they need.

There is lack of continuity in support programs. Clean tech startups typically use hardware based solutions which can take longer to develop. Clean Tech startups require longer support program, or a series of linked programs.
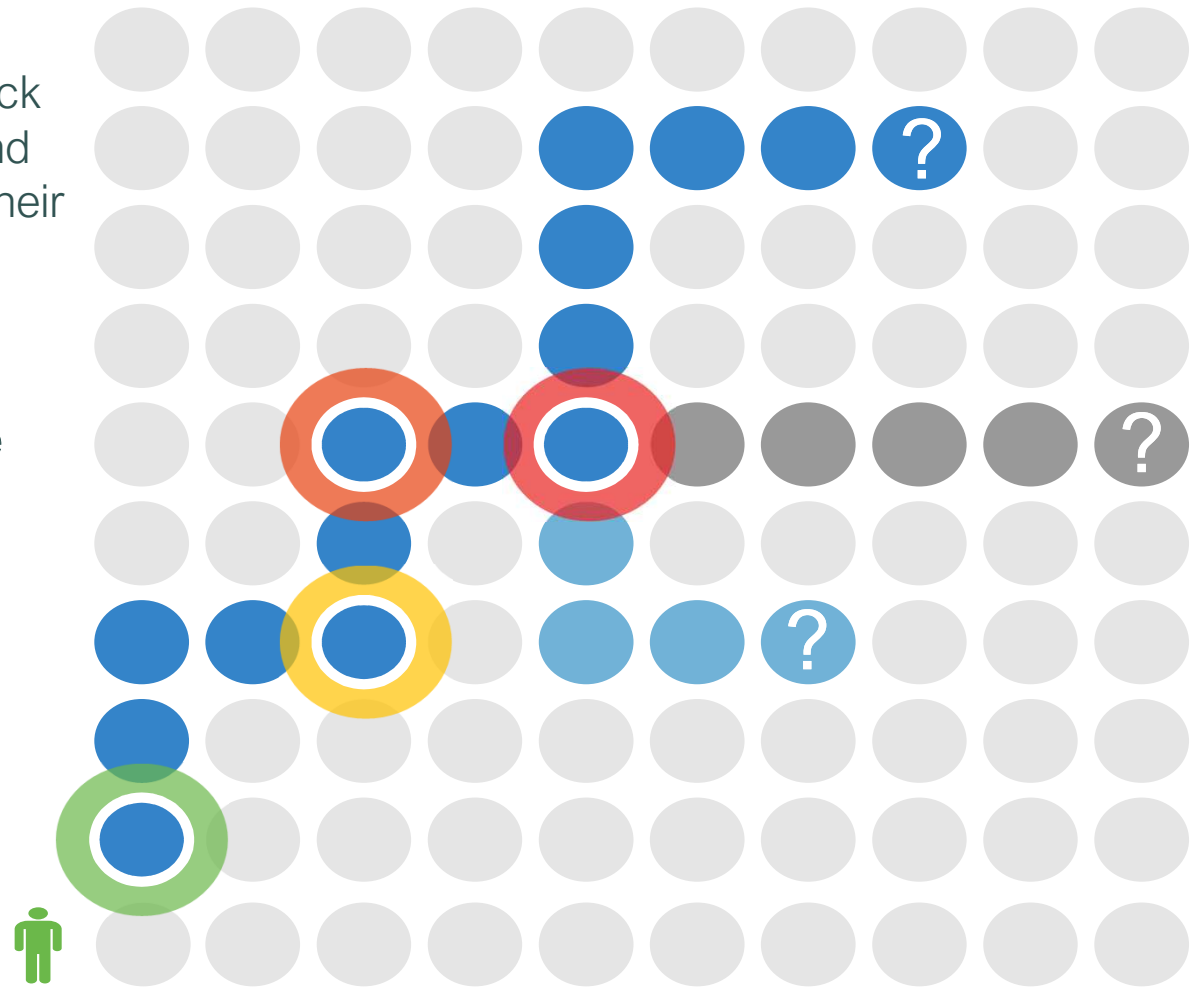
Egypt Needs to Proactively Build The Clean Tech Ecosystem

Key Elements to Building an Effective Clean Tech Ecosystem
Will require a focal point / group to convene relevant players, leverage global partnerships, while fostering market development focus.

Collaboration to Support Across Startup Life Cycle
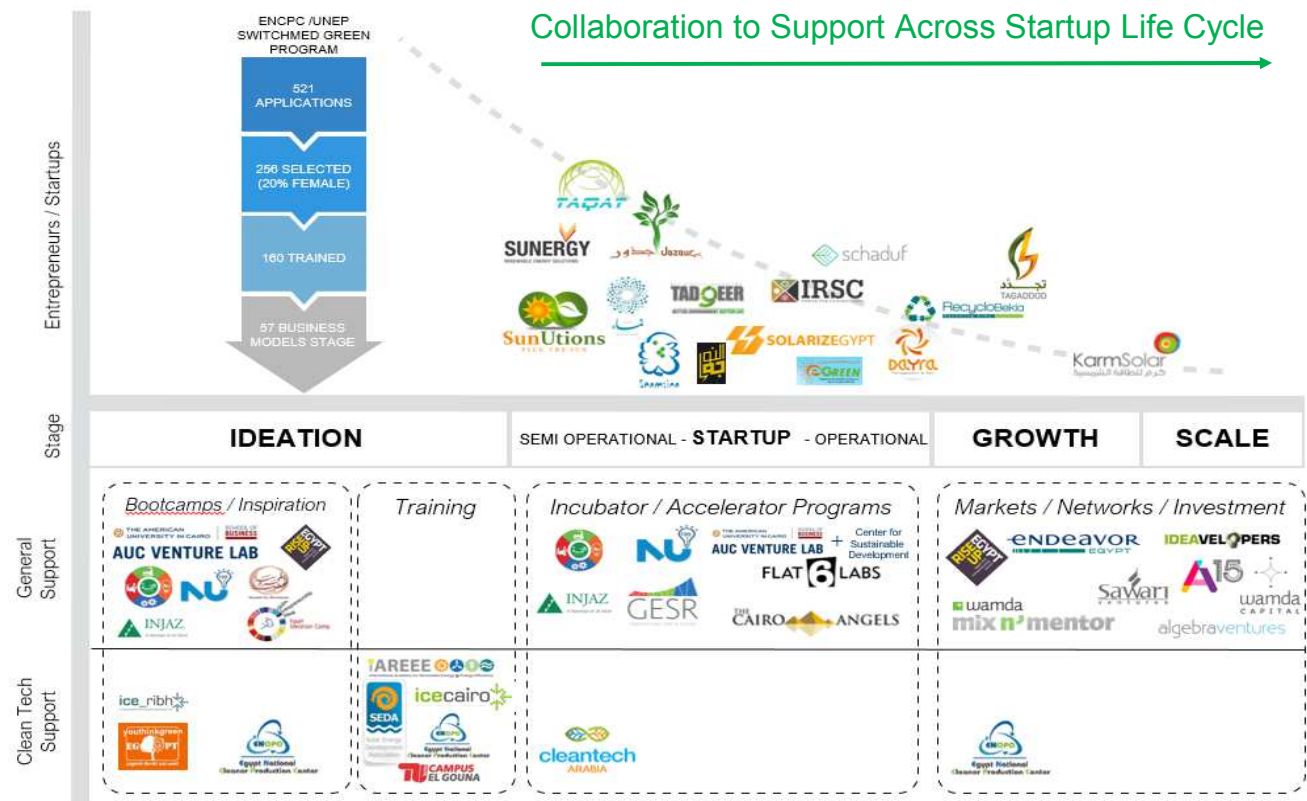
Collaboration
A collaboration of programs interconnected and with a uniform vision to support clean tech entrepreneurs and address market / system challenges.

Global Access
Access to global knowledge, experts, content, and networks in order to provide the Focal Point/Consortium with resources to inject in Egypt. This could be via WB Climate Technology Program, Climate Innovation Center (CIC) network, and other resources.

Market Focus
Expand the approach to support clean tech entrepreneurs by shinning the spotlight on opportunities through market data, and addressing market and system challenges by creating 'space' for collective action and market innovation.

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Principles for Improved Local and Global Collaboration

Upgrading from existing Past/Fail to a Placement System across multiple ecosystem players

Upgrade from the pass or fail existing system to a placement based case by case system, using need-based criteria.

Evaluation criteria to initially place the entrepreneur and follow up placement once he/she receives startup support or service.

Leveraging Existing Programs for Continual and Improved Support

Building on existing brands and reputations

Leveraging networks, infrastructure, systems, and geographical reach, in particular outside of Cairo.

Continual support to entrepreneur through coordinated programs and initiatives.

Developing Partnership Frameworks and Market Vision

Coordination of multiple partners is complex. It requires:

A. Market Vision to share understanding of market challenges/ opportunities and way forward

B. A unified vision, metrics, and clear roles

C. Allowing Partners to remain autonomous to meet their mandates.

D. Frameworks, contracts, agreements

'Greening' General Support Programs Through Global Resources

Help the partner programs improve their content through the global partners such as the WBG climate technology program (CTP) knowledge, materials, people, and networks.

Link to global technology, business models solutions, and partners.

Principles for Improved Market Development Focus

New Innovative Business Models are needed to unlock Clean Tech Markets for Startups to Scale. Developing these business models will:

- Require a multi-sectoral/disciplinary approach

- Benefit from matchmaking and exposing Egyptian startups with other models globally

Programs should look beyond individual startups support, and consider supporting **Groups of Startups and Value Chain players** in their support models, by:

- Catalyzing Markets Through a Facilitated Innovation Process

- Using Open Innovation Challenges to Develop Market Solutions

"The Open Innovation approach can help green firms take market demand as a starting point, without locking themselves into a particular technology, by scouring the horizon for the right technologies and business models."

Source: Connecting Green Technology Entrepreneurs – World Bank Group infoDev Study 2016

Pioneers

Investors

Innovators

Wild Card

Experts

Entrepreneur

Suppliers

Customers

Distributors

Contractors

ANNEX 1: DETAILED FINDINGS

Overview
Methodology
Key Findings
Concept Recommendations
Operation Plan

Overview

Growth of Entrepreneurship in Egypt

Steady Entrepreneur Pipeline Growth
Evidence of Emerging Clean Tech Entrepreneurs

Applicants to American University in Cairo Venture Lab (VLAB) Acceleration Program

(Targets Established Operational startups)

Chart: Applicants to VLAB Acceleration Program

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Legend: Entrepreneurs, Clean Tech

ENCPC / UNEP SWITHMED GREEN PROGRAM 2015/2016 (1ST YEAR)

Egypt National Cleaner Production Center — UNEP

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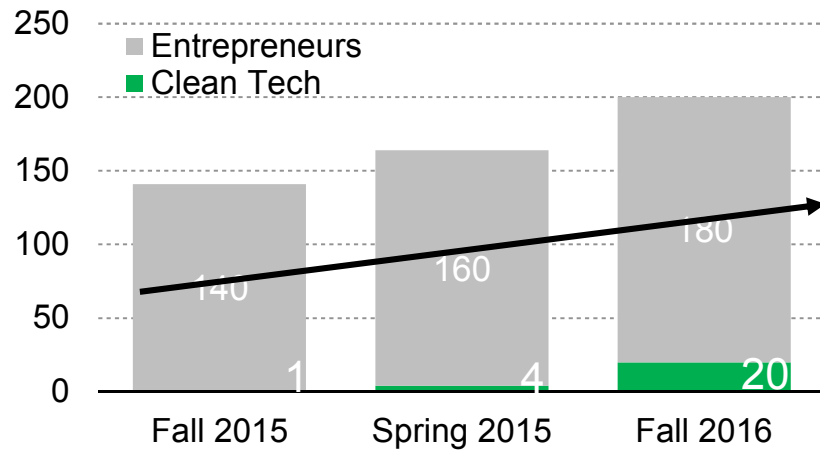
ERC, KarmSolar sign contact to construct $2.5m solar station

KarmSolar company will rent ERC's 50,000 sqm land while ERC receives 2% of the project's profits

Sara Aggour · June 21, 2015 · 0 Comments

2 of Forbes 20 Most Promising Egyptian Entrepreneurs are Clean Tech Startups

Egypt's Clean Tech Startups

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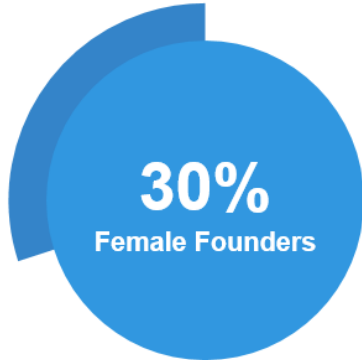
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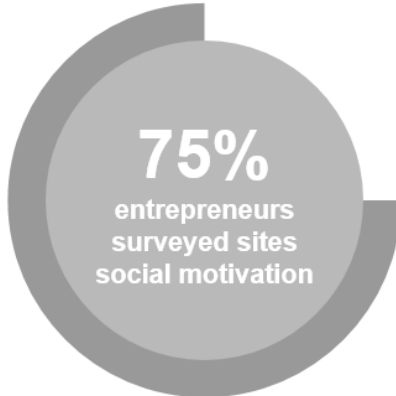
" It is a way for people to create change, own their destiny, and help their communities"

Clean Tech Arabia Survey of 100 Clean Tech Entrepreneurs - 2015 Findings
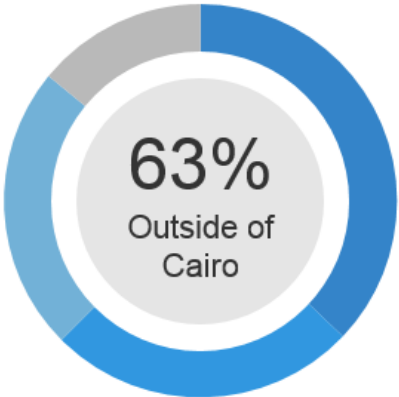
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ENCPC SwithMed Program 2015/2016

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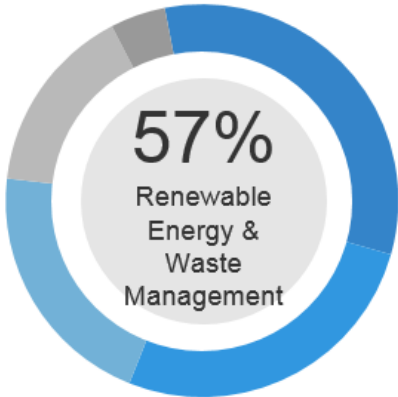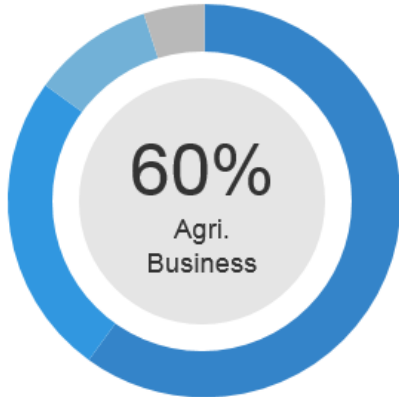
Methodology

Problem Identification and Program Design through Human Centric Engagements

Applied human centric approach with key stakeholders to design a program to support clean tech startups

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Startups
Covering a wide spectrum of clean tech fields including: renewable energy (Solar), waste to energy, energy efficiency, and recycling startups.

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Support Programs
Interacted with key entrepreneurship/clean tech ecosystem players, including: universities, incubators/accelerators, NGOs, foundations.

74
Interaction Points
including multiple workshops, focus groups, interviews, one to one meetings, & design thinking sessions.
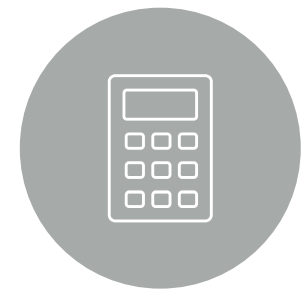
231
Interactions Hours
Aggregate time spent interacting with entrepreneurs and support programs over the span of a 6 month period.

A Journey of Discovery

Through a combination of **ethnographic interviews, business model design workshops** and on **site visits** to watch Clean Tech startups in action, our team engaged the ecosystem to better understand the needs of startups and the entrepreneurs behind them.

Human Centric Approach, Lead to Better Insights…

By combining business design frameworks with design thinking techniques, our team, with the help of a local business design consultant, managed to uncover key insights from the clean tech startup world.

Key Findings

Initial Trends & Analysis

Through our initial interactions and data gathering sessions with entrepreneurs and other stakeholders we mapped key observations and trends, identifying initial challenges and themes to explore further.

Understanding Clean Tech Challenges along the Startup Lifecycle

Entrepreneurs / Startups

ENCPC /UNEP SWITCHMED GREEN PROGRAM

- 521 APPLICATIONS
- 256 SELECTED (20% FEMALE)
- 160 TRAINED
- 57 BUSINESS MODELS STAGE

Stage

IDEATION	SEMI OPERATIONAL - **STARTUP** - OPERATIONAL	GROWTH	SCALE
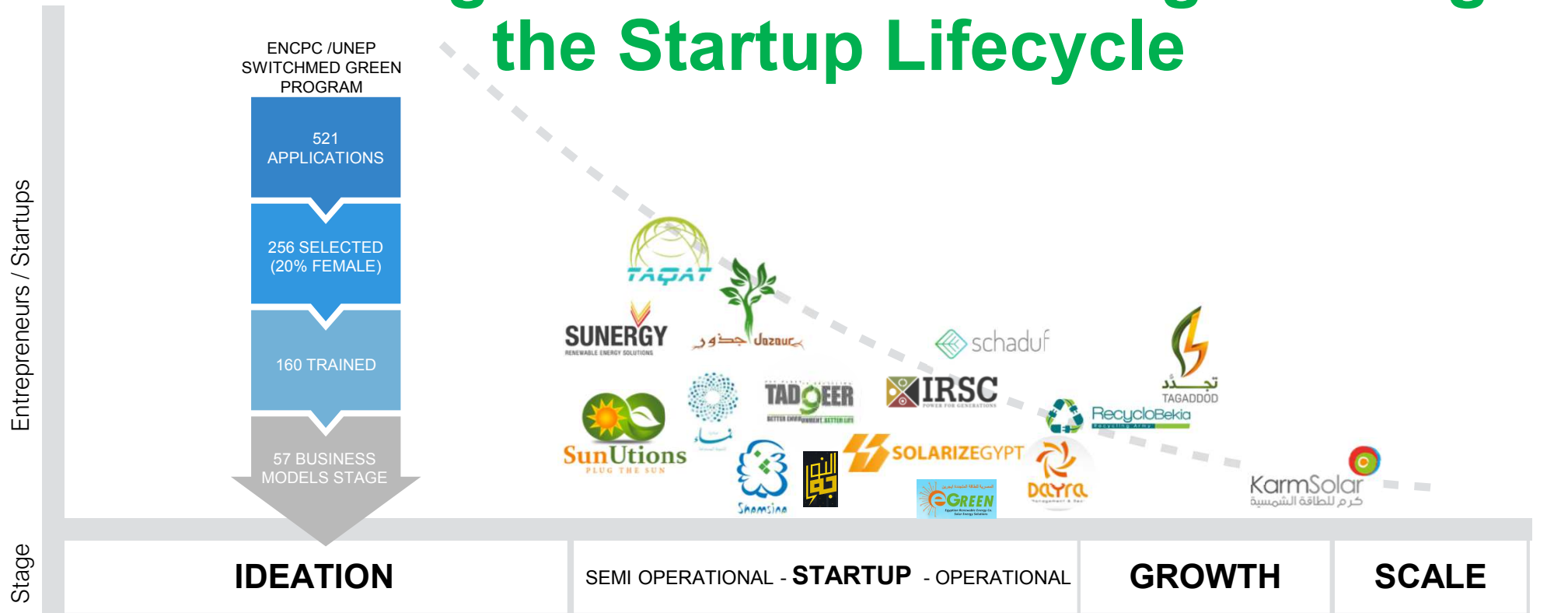
Challenges

IDEATION
- Good (and bad) **ideas die early**
- Some good ideas are **not able to access support** (particularly true outside Cairo).
- **No clear process** to go from idea to market (trial & error)
- **Minimum funding** for producing early tech prototyping.
- **Lack Access to Market Data** or knowledge on how to use it.
- Offered programs can be too general and **do not cater to Clean tech**
- After entrepreneur receives Ideation Support, **where do they go next**?

SEMI OPERATIONAL - STARTUP - OPERATIONAL
- **Building credibility** (in solution provided or supply chain being developed) seek Certifications.
- Without clear business model, **struggle to find proper Angel financing**. Also find it hard to communicate with **Angels who do not understand Clean Tech**
- **Relationships** - Building suppliers and distributor structures
- Understanding **regulatory implications**
- **Customer resistance** - despite product benefit and value customers remain resistance to change their habits
- **Expertise** - startups need more sophisticated technical support, lab access, R&D.

GROWTH / SCALE
- **Markets are still immature** despite proven product and track record
- **Customer financing and usage models** are necessary for scalable growth
- **Securing steady input supply or inventory** in order to meet customer demand.
- **Access to larger financing pool** of **value added** investors to further scale their operations.
- **Competition** startup is attracting positive attention and competition. Possible M&A / Consolidation period.

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Clean Tech Entrepreneur Profiles

Who are they?

Inventors

Passionate for developing clean tech based products, Intrigued by how things work. Want to make their Uni project a reality.

Contractors

Individuals who are keen to use available tech to integrate it into clean tech based solution.

Problem Solvers
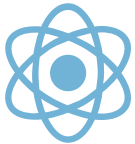
Community members looking to help solve problems they see in their community.

Transformational Entrepreneurs

Hard core entrepreneurs, with passion and vivid drive to solve problems with clean tech based viable business models.

'Traits'

- Inventors, (Academics + Students)
- Pushes the boundaries of creativity
- Notorious for creating something nobody needs
- Not in it for $

- Sense a good opportunity to make $
- Made initial financial commitment
- Early mover and risk taker
- Engineers who want to be EPCs
- Struggling with customers, feel stuck

- Interested in solving day-to-day problems
- Deep understanding of their customers and community
- Notional technical and business know-how

- Visionary
- Pioneer
- Driven

Opportunities

- Build on their creativity to create new business opportunities
- Future pipeline

- Harness their energy and willingness to take risk
- Existing semi-operational startup, 'low hanging fruit' to produce impact (growth, revenue, jobs)

- Build on their understanding of market needs and opportunity for clean tech to fill a gap.
- Also existing semi-operational startup, 'low hanging fruit' to produce impact (growth, revenue, jobs)

- Break open the market
- Attract high value investment
- Inspire and excite others (building future pipeline)

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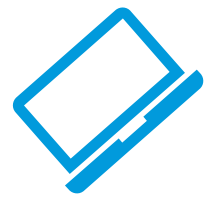
IT Startups ≠ CT Startups

Product Development

Shorter Development Times
Coding as knowledge is popular and easy to learn with available MOOC and local courses, making app./web. development possible

Longer Lead Times
Development requirement is slowed by the technical expertise gap and nature of the product

Customer Testing

Easier Access To Potential Customers
It is substantially easier to share a new app./web. application with friends/family to test and give feedback.

Customers Tend to be Industry or Agribusiness
Accessing potential customer is a real barrier. 'Knocking on factory doors' is not an easy task. Testing Tech Prototypes is faced with several regulatory & permission hurdles.

Financial Commitment

'Light' On Assets
Rely on tech savviness, marketing and outreach to attract users.

Upfront Costs & Inventory
Scale production to meet customer demand requires substantial working capital.

Channels

Social Media & Mobile platforms are the Norm
Access to online platforms, makes it substantially Easier to reach customers and Scale.

Undefined Value Chains & Distribution Networks
entrepreneur is developing new ways to reach their customers and define market structures.

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Variations Within Clean Tech

Solar Powered Applications – Challenges at both ends of the value chain

Component Supply Activities	Product Development	Sales	Services	End User
A. Essential **components imported**. FX fluctuation and access. B. **Supplier relationships** and exclusivity C. Imports regulation slows down import process.	A. **System integration** between imported and local component, and adapting to local context. B. **Access to skilled** workers and experienced engineers.	A. **Customer financing** of **high initial equipment cost** a barrier. Need to reduce risk for customer. B. **Channels to reach customer** lack clarity, relationships and norms not established.	A. **Offer Maintenance and after services**. Need to offer value added services and maintain ongoing relationship with customer.	A. **Customers resistant** to **behavior change** and **question quality / validity of benefits** of solar energy. B. To grow **need to reach several multiples of customers**

Value Chain Findings (based on 15 business models review for solar applications):
Solar power application companies are challenged on both sides of their value chain; on one side, importing essential components are problematic and increase the price of their solutions considerably. The end user is finding the solution expensive, risking, and questions validity of benefit..

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Variations Within Clean Tech

Waste to Energy Applications – challenges at the beginning of the value chain

Component Supply Activities	Manufacturing	Distribution	Sales	End User
A.Securing steady supply of raw material such as oil, agri waste is difficult and has to go through informal networks, causing price fluctuation. **B.Logistics of collecting** the waste is problematic yet manageable.	**A.Calibrating product** to meet quality standards challenging **B.Creating a certified manufacturing facility** is time consuming and capital intensive. **C.Access to skilled** workers and experienced engineers.	A. Rely on existing distribution networks	A. Gaining clients trust as reliable supplier is essential for a long term B2B relationship.	A. International buyers/brokers represent a great sales opportunity. B. Make large sales at once via distributors or agents. C. To grow can rely on a **handful of key customers.**

Value Chain Findings (based on 10 business models review for waste to energy applications):
Waste to energy application companies main challenge is namely at the beginning of the value chain, requiring securing steady supply of waste in order to scale (working with the informal sectors) and meeting quality standards for their products to be used.

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Key Findings & Insights

1 *Clean Tech Startups **have different needs than other entrepreneurs***

2 *Clean Tech Startups are operating in **markets & value chains which are yet to be defined***

Longer Lead-times

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Supplier/Distributor relationship dynamics not well established. Value Chain gaps relationships not developed and 'mode of operation' not defined.

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Entrepreneur Support Programs are focused on IT / Mobile Apps
limited sector / market depth, but solid foundation to leverage

Entrepreneurs face several **support gaps** in their journey

Several Good Programs but operating **in Silos**

Current focus is on **Outputs** *(i.e. startups supported, training, competitions)* rather than **Impact**

Some **'Less traditional'** Players are **not fully integrated into the Ecosystem** but have an important role to play

VACUUM

Clean Tech Training

Clean Tech Programs

Clean Tech Institutions

Market & Investor Access

Entrepreneurship Programs (General)

Clean Tech Ecosystem Support Gaps

Steady Pipeline, however gaps of support to Clean Tech

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Entrepreneurs / Startups

Stage	IDEATION	SEMI OPERATIONAL - **STARTUP** - OPERATIONAL	GROWTH	SCALE

General Support

Bootcamps / Inspiration	Training	Incubator / Accelerator Programs	Markets / Networks / Investment

Clean Tech Support

Concept Recommendations

Addressing Scaling Barriers Through a Dual Focus

Scaling barriers are not limited to the entrepreneur alone.
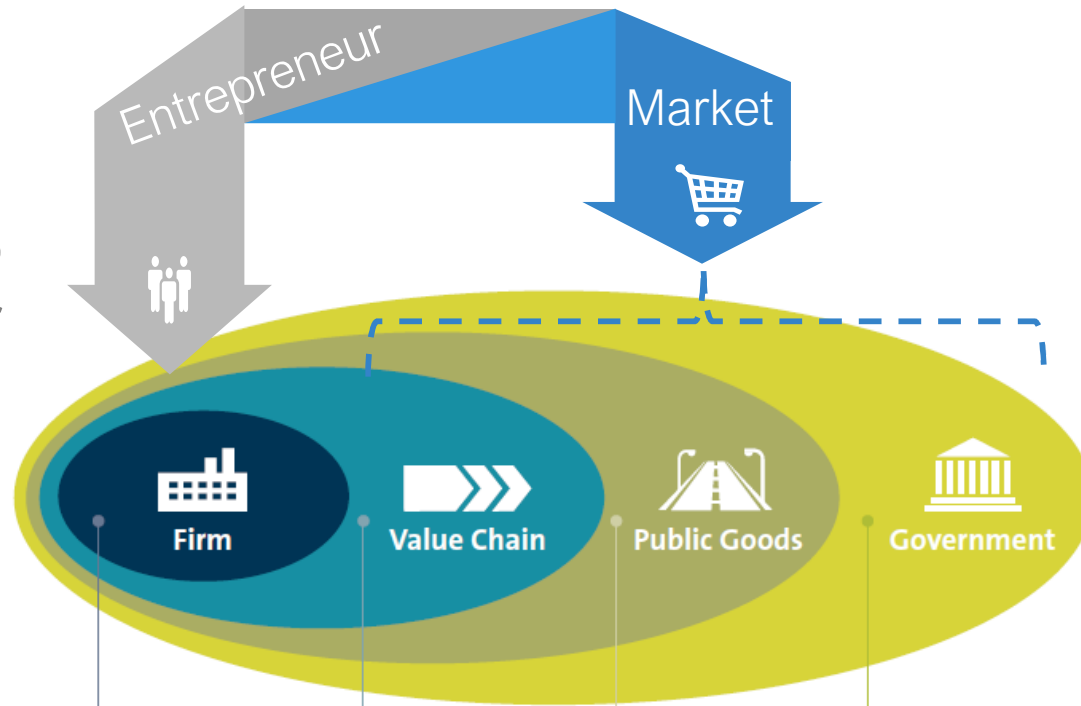
Often, market expansion and scaling is not realized due to value chain, public good, policy, or system challenges

Entrepreneur

Market

Firm

Value Chain

Public Goods

Government

The markets and systems which startups operate need to be supported to unlock growth potential

Firm
- Weak business model
- Weak proposition to customers/producers
- Weak leadership
- Lack of managerial and technical skills
- Lack of capital

Value Chain
- Lack of suitable labor/inputs
- Weak sourcing channels from BoP producers
- Weak distribution channels to BoP customers
- Weak linkage between BoP producers and end demand
- Lack of financing for customers, distributors and producers
- Lack of support service providers

Public Goods
- Lack of customer, producer or channel awareness of new market-based solution and appreciation of its benefits
- Lack of market information and industry knowhow, e.g., customer insight, business models
- Absence or ineffectiveness of standards e.g. for quality
- Lack of hard infrastructure

Government
- Inhibitory laws, regulations and procedures
- Inhibitory taxes and subsidies
- Adverse intervention by politicians or officials

Figure: Scaling Barriers for Inclusive Industries

Why is a Dual Role Necessary?

Key Challenges

What's not working Today

ENTREPRENEURS

1) Clean Tech Startups have **diff** **needs** than general entrepreneur

2) Clean Tech Startups are operating in markets/value chains which have not yet been defined

MARKET DEVELOPMENT

Entrepreneurs:

Go from program to program with little direction.

Self diagnose their needs….incorrectly.

Most of the existing ecosystem support programs do not cater to unique needs of clean tech entrepreneurs.

Unable to find clean tech depth in programs or access labs and research needed

Fixate on money as the main solution to their problems. Do not look at market/system challenges

Not clear what to do next, get stuck or plateau.

Markets:

Even after providing strong support to entrepreneurs market and system barriers are a key impediment to transformational growth.

While some startups successfully develop a product and sell to "'early adopters' or to niche markets (i.e. environmentally conscious) growth plateaus and they are unable to make a significant market expansion due to wider system challenges.

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Dual Role of a Climate Innovation Center / Program

Key Challenges

1) Clean Tech Startups have **different needs** than general entrepreneurs
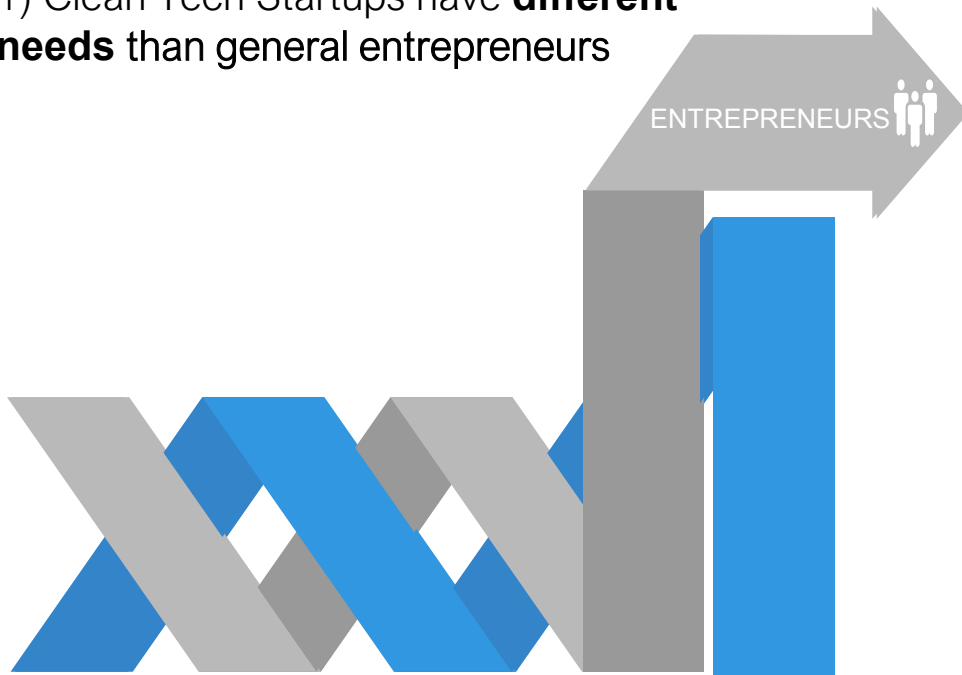
ENTREPRENEURS

MARKET DEVELOPMENT

2) Clean Tech Startups are operating in markets/value chains which have not yet been defined

Proposed Solutions

Support Services to Entrepreneurs by leveraging & 'greening' existing ecosystem programs:

Ensuring a steady and growing **flow of new startups** is key to clean tech future innovations.

Tailoring services (inspiration bootcamps, challenges, training, incubation, acceleration, technical / consulting / R&D support) to entrepreneurs based on their size , needs and a larger market/ system objective.

Connecting to Global players, such as Climate Business Innovation Network, Shell Foundation etc.

Market Innovation & Development:

Support startups and key stakeholders to form a task force to address market barriers, shape the value chain, solidify relationships, and unlock market potential via crowdsourced innovation, and/or through structured market innovation processes.

Task forces would be given access to experts and innovators, to **design their own market solution** to be evaluated and eligible for **support from WB** experts and resources (i.e. follow-up TA).

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Improving Direct Services To Entrepreneurs

Current Journey

Clean Tech Entrepreneurs are not sure where to start. They often follow path of IT startups, or join what's available.

Clean Tech Entrepreneurs struggle to identify which programs can best serve their needs. Many entrepreneurs self-prescribe, or can't find programs relevant to their needs and work alone.

After 'graduating' from a program many entrepreneurs still lack the know how, market access, finance, and ability to successfully launch/continue their business, they lack belonging, and their idea/business either fail, stagnate, or plateau.
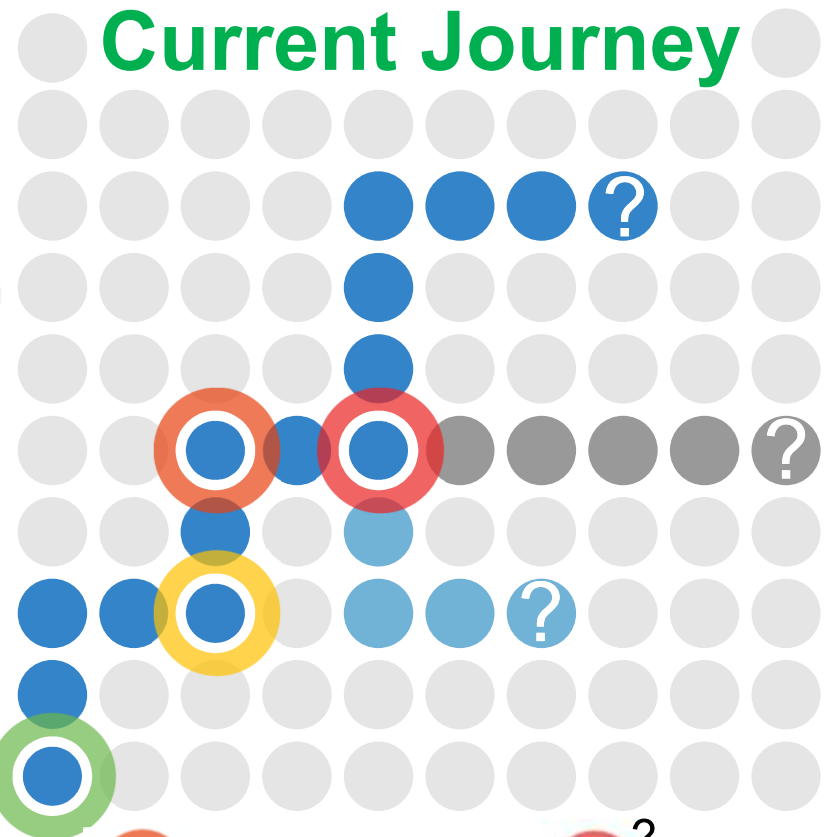
Arbitrary Search

Getting informed about helping options: word of mouth, social media & big events like RiseUp.

Multiple Application Processes

Applying to program after weighing options based on their perception of what they need.

Application Results

Application result:

A. **Accepted**: good match ✓
B. **Accepted**: mismatch ✗
C. **Rejected** ✗

What's next?

No Clear Follow up activity, whether accepted and finished the program or rejected.

KEY TAKEAWAYS:
1. Process can be arbitrary and can be frustrating and demotivating for early entrepreneurs.
2. Some entrepreneurs tend to try for any program that will take them,
3. Entrepreneur needs are being "self diagnosed" and not based on professional feedback, which can lead to 'incorrect diagnosis' of what they would benefit most from.
4. After completing a program, its not clear what to do next

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Improving Success Rate through Lifecycle Support

Requires Collaboration of Multiple Players

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IDEATION	SEMI OPERATIONAL - **STARTUP** - OPERATIONAL	**GROWTH**	**SCALE**

NO BUSINESS MODEL TECH IDEA/INVENTION

SOME KIND OF BUSINESS MODEL SOME KIND OF INVENTION PROTOTYPE

BUSINESS MODEL FUNCTIONING PRODUCT

TRANSFORMATIVE BUSINESS MODELS / MARKET MAKERS

Strong pipeline of clean tech Entrepreneurs

Survival rate can be improved with Clean Tech tailored support

Need for success stories to encourage more entrepreneurs to enter clean tech and maintain steady pipeline

Through partnerships, and shared vision, multiple programs can support entrepreneurs through the lifecycle of their journey, share knowledge and progress of the entrepreneur, and leverage their comparative advantages and networks to provide more effective and tailored support.

Lifecycle Journey

KEY PRINCIPLES:

1. **Focal Point** bringing together service providers and entrepreneur interface
2. **Placement** of entrepreneur in most beneficial programs
3. **The journey does not end** once a program is completed. Follow-up activities are recommended prior to admission into next support program placement.
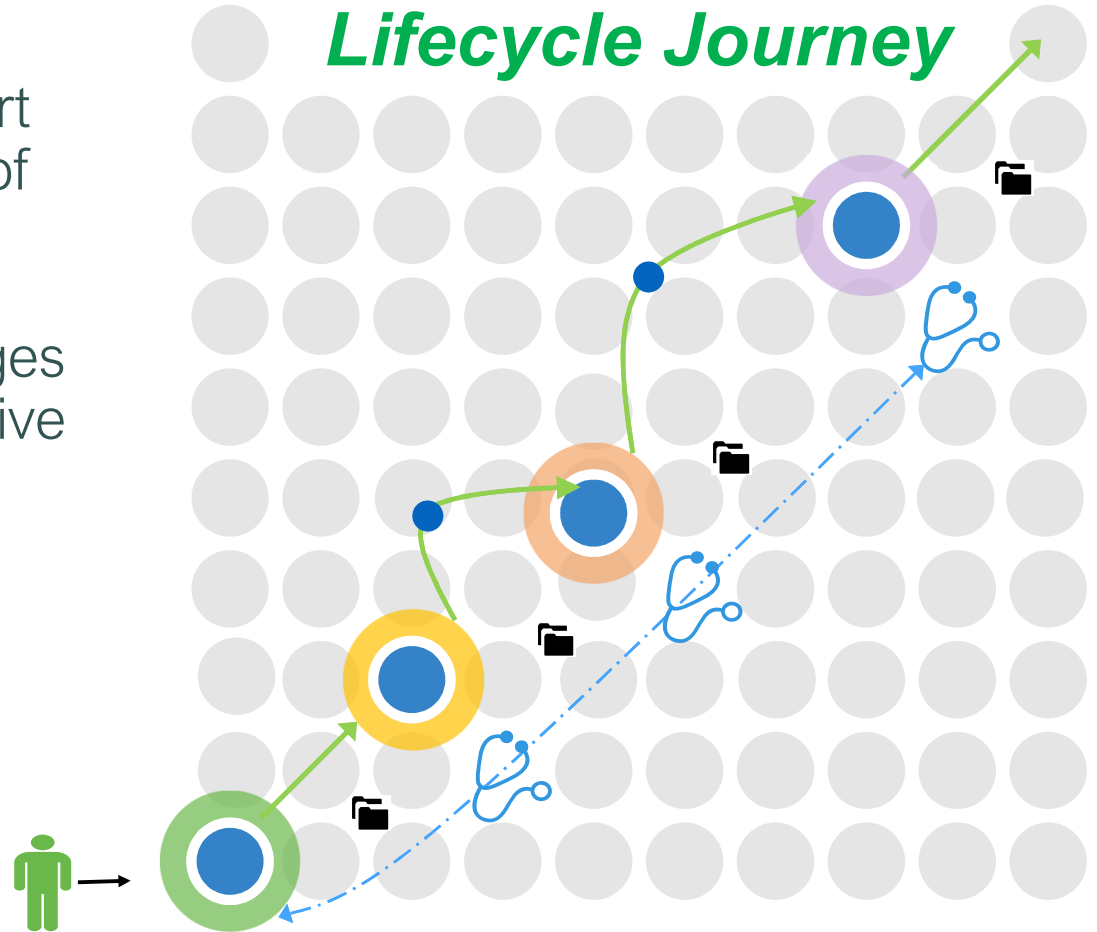
Partner Programs provide a variety of services throughout the lifecycle of the entrepreneur

After completing each Program, the **Partner Evaluates and Guides Startup** on key **next actions** and shares back with the collaborative **assessment of Market and needs**

Shared **data and M&E** to evaluate entrepreneurs and support Programs to improve effectiveness of overall support.

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Market Development Role

What are the Clean Tech Market Opportunities in Egypt?

Diesel-powered pumps in Egypt consume an estimated 3.7 million Tonnes of diesel per year, and release over 10 million Tonnes of Carbon Emissions.

Source: Regional Center for Renewable Energy and Energy Efficiency (RCREEE); "*Diesel to Solar Transformation, Accelerating Achievement of SDG 7 on Sustainable Energy: Assessing Untapped Solar Potential in Existing Off-Grid Systems in the Arab Region*" 2016.

Many hotels and resorts along the Red Sea and Mediterranean coasts are not connected to the national grid and are entirely dependent on diesel for all operations including water desalination.

Source: Regional Center for Renewable Energy and Energy Efficiency (RCREEE); "*Diesel to Solar Transformation, Accelerating Achievement of SDG 7 on Sustainable Energy: Assessing Untapped Solar Potential in Existing Off-Grid Systems in the Arab Region*" 2016.

Potential PV Peak Capacity 2,097 MW

Annually Egypt generates approximately 21 million tons of municipal solid waste, 30 million tons of agricultural waste, 6 million tons of industrial waste.

Source: GIZ; country report on solid waste management in Egypt, 2014.

Energy intensive industries in Egypt represent 1% of the number of factories in Egypt, yet consume 65% of industrial energy consumption.

Source: UNIDO; Industrial Energy Efficiency in Egypt, Industrial Energy Efficiency Strategies and Policies, 2015.

Despite these market opportunities, clean technology startups have not yet scaled significantly in Egypt **?**

Challenges Clean Tech Faces in Market Expansion
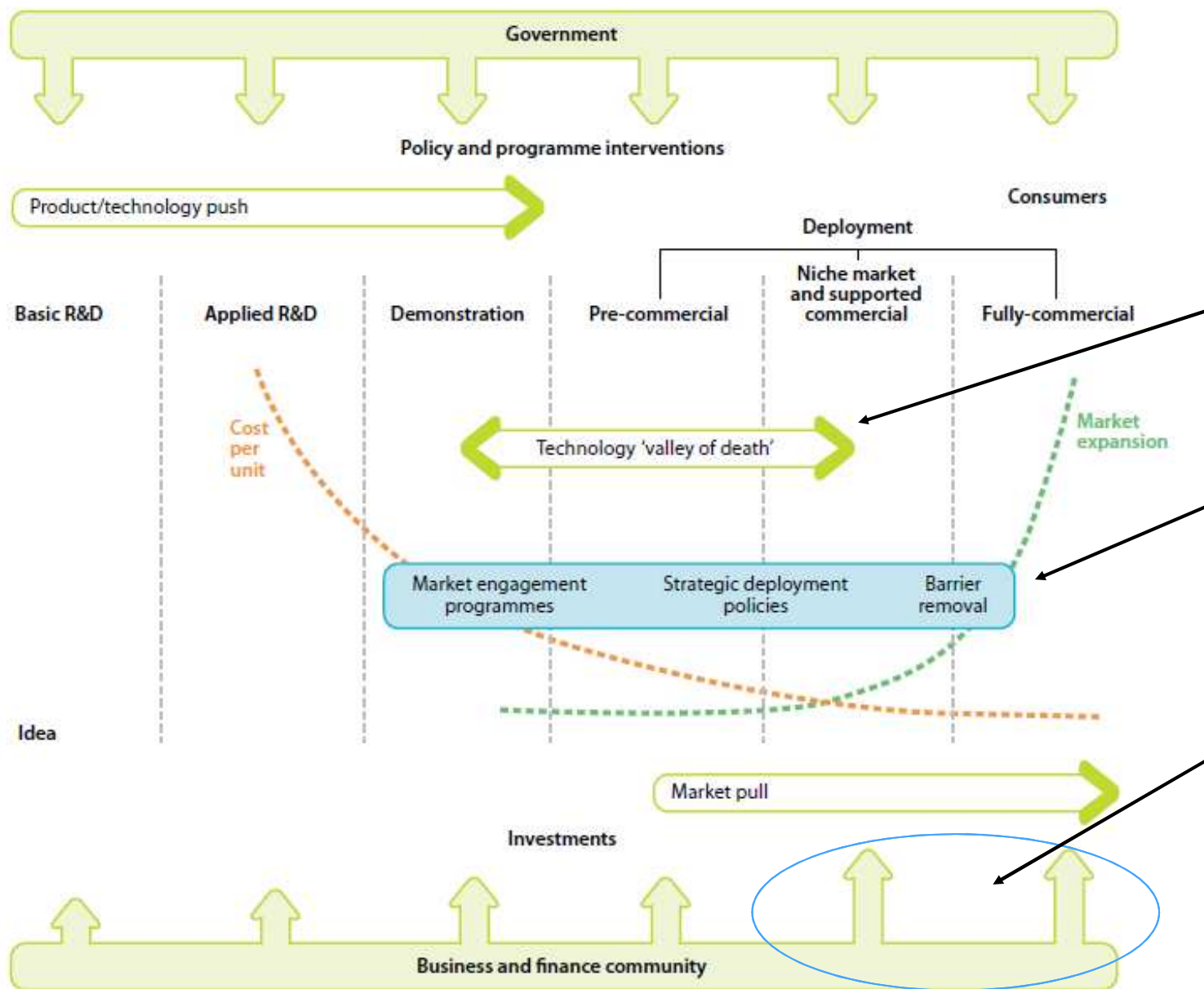
Having a market focus is key to **help bridge the technology valley of death**

Venture Capital and other finance enter once there is evidence of potential market expansion

- VC finance has not picked up in Egypt's Clean Tech sector because there has been limited evidence of scale potential.

- Market and system barriers can prevent significant scale potential of clean tech startup

Source: Grubb, Michael (2004) Technology Innovation and Climate Change policy: an Overview of Issues and Options, Keio Economic studies, as adapted and reproduced by Committee On Climate Change, Building a low-carbon economy the UK's innovation challenge, July 2010.

Why is a focus on Market Development Key?
M-KOPA Case Study

Market Opportunity

- Huge Off-Grid Market
- On average off-grid household spends $164 on Kerosene, $36 on Charging their phone, and $72 on batteries

Market Reality

- Despite a clear value proposition (access to energy, potential savings from kerosene use, reduction in pollution and danger cause by burning kerosene lanterns) demand did not increase.
- Solar providers **could not achieve significant uptake**

Market Barriers

- **High upfront costs** - limited cash availability for BoP customers
- **Trust and risk aversion** - Does the technology really work? Quality? Will break in a few years?
- **Channels / distribution networks** – No norms or familiar 'ways to transact' / requires **behavioral change.**

New business model introduced by M-KOPA addressed key market barriers

- **Innovative Financing:** Rather than selling customers a Solar panel with high upfront costs, M-Kopa made energy affordable by selling them pay-as-you go energy, combining micro financing with mobile payment technology.

- **Reduced customer perceived quality risk through a pay-per-use system:** To address risk aversion, trust issues, are reduce trial barriers. If the panel did not work, limited cost to customer (i.e. initial deposit, 'pre-paid time')

- **Leveraged existing systems and channels**: by using the very familiar M-Pesa service and network to sell pay-as-you go energy. Now selling also complementary products (i.e. radios, mobiles, EE lamps) and looking to monetize user data going forward.

Results

- M-Kopa's business model *'Pay-as-you go Solar'* has become **a new norm** for how these transactions occur.

- **Demand was always there**, *'Pay-as-you go Solar'* shaped how the market was structured/ functioned ultimately unlocking demand.

- Several new companies (Mobisol, Azuri, SolarNow and others), have followed suit expanding through-out Africa with variations of this business model.

- **M-KOPA revolutionized financing** through a clean tech and fintech value proposition.

- Nov 2015 M-Kopa **raised $19 million**
- As of Sept 2015 **Sold over 250,000**

Unlocking Markets by Catalyzing Innovation & Collaboration

"The Open Innovation approach can help green firms take market demand as a starting point, without locking themselves into a particular technology, by scouring the horizon for the right technologies and business models."

Source: Connecting Green Technology Entrepreneurs – World Bank Group infoDev Study 2016

1) Using Open Innovation Challenges to Develop Market Solutions

- Initiate local clean tech focused challenges to stimulate the existing pool of local talent and bring key players to develop innovative solutions tied to a clean tech challenge with significant market potential.

- This process, can be online or through a facilitated process will aim to help clean tech startups in finding like minded partners from both the private and public sectors to assist them further developing innovative market solution which will enable growth in the sector they are working in. (i.e. payment and financing solutions for small holder farmers which can benefit from smart agri, or clean technologies.

- Leverage existing open innovation platforms (i.e MIT Climate CoLab)

- Outcome to be supported through WBG Technical Assistance

MARKET ISSUE IDENTIFIED

SHARE MARKET CHALLENGE

PLATFORM (PHYSICAL OR ONLINE) TO DEVELOP UNDERSTANDING

FIELD VISIT, OR EVENT TO CO-CREATE A SOLUTION

TEAMS USE FEEDBACK TO FINE TUNE IDEAS

FINAL SELECTION OF WINING IDEA TO SUPPORT

open IDEO

The Lab
India Innovation Lab for Green Finance

MIT Climate CoLab

Variations of "Open Innovation Model"
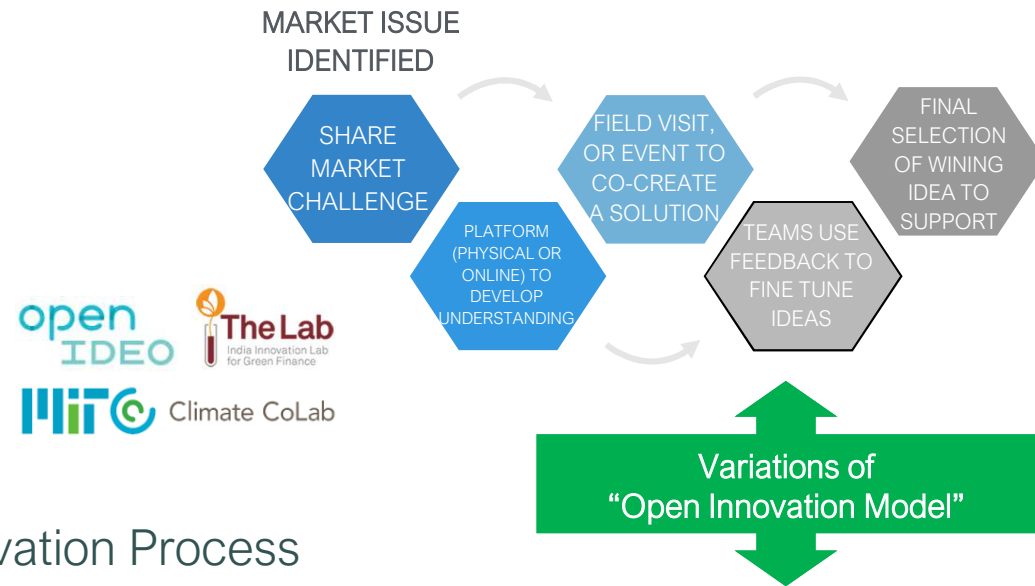
2) Catalyzing Markets Through a Facilitated Innovation Process

Bringing together diverse startups & intermediary institutions to develop a joint understanding of market challenges and co-create innovative solutions

WB to map a clean tech subsector (i.e. off-grid) identify key entrepreneurs, value chain players, intermediary institutions, linkages, challenges, opportunities, and data, with the aim develop a joint vision and action plan to catalyze the market.

This process would be more facilitated and managed by the WB group and GoE with a market objective as the main driver of activities. Participants can be startups, companies, potential suppliers, distributors government agencies, innovators, other technology providers (i.e. FinTech or Payment infrastructure).

WBG Additionality

The WBG will leverage its network to convene relevant startups, intermediaries, value chain players, and other stakeholders to pull together a team, share relevant market data, and provide design thinking tools to facilitate the design of an action plan with the aim of catalyzing the market.

Supporting the Outcome through TA

If the outcome of this process requires further technical assistance, there is the possibility of the WBG providing it.

Facilitator

Pioneers

Innovators

Investors

Experts

Wild Card

Entrepreneur

Customers

Suppliers

Contractors

Distributors
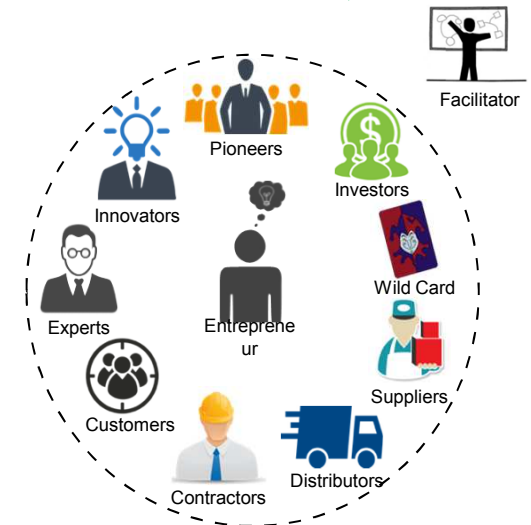
Example* of a recent IFC project which is piloting the facilitated innovation process as a result of this business plan

El-Khodeiry Biogas · Green Eagle Tech · Cleantech Arabia · Sparks Renewable · World Bank Group - IFC · Dandara NGO · MoTI - ENCPC · Outgreens · World Bank Group - IFC · Farm Owner · Napata · IRSC · Portable Pumps · Paymob · Chemonics Egypt · World Bank Group - IFC · Aman · Farm Owner · Farmers · Agri-tech

Legend: Organizational Team | Solar Energy Startups | Fintech | Agriwaste / Bio Gas Startups | NGO | Farmers
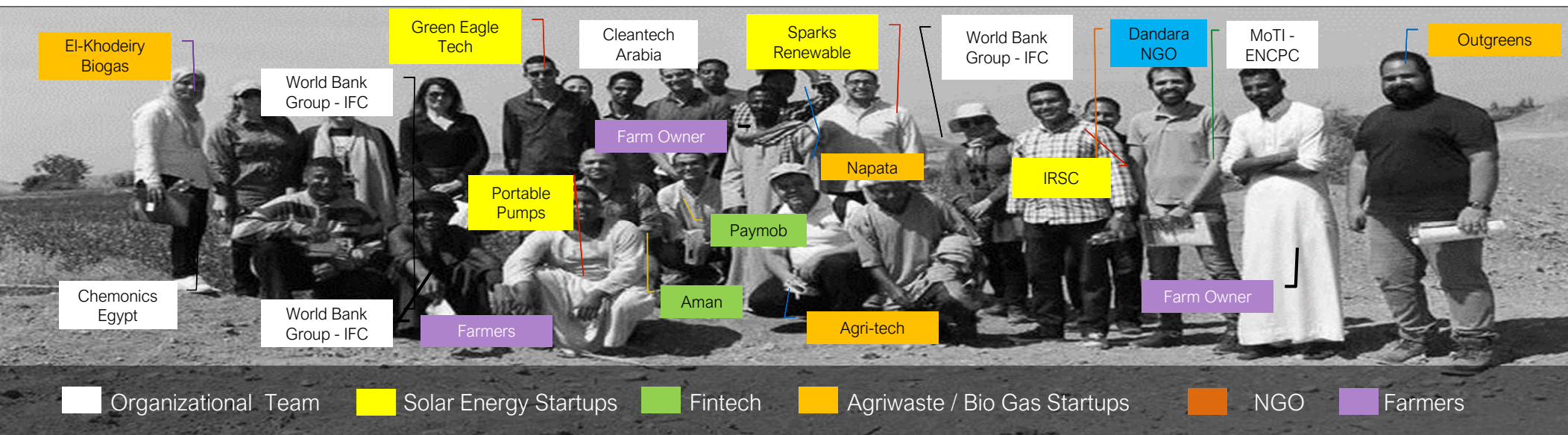
Catalyzing Markets Through a Facilitated Innovation Process

The clean tech entrepreneurship & market creation project (#601695) further piloted this innovation process by looking deeper at the off-grid solar sector in agriculture markets in Egypt which was cited as having significant potential.**
The project used sector analysis and stakeholder mapping to identify key players in the market (those directly connected to the market as well as those who could have a innovation role).

One key findings was that mobile payments and financing were a key barrier to clean-technology uptake in agriculture, accordingly, a team of Solar, Agriwaste, and FinTech (financial technology) startups were brought together to visit three farms in Aswan, with the objective of:
i) developing a share experience and understanding of the challenges and practices in the agri sector,
ii) to expose these startups to each others' knowledge (i.e. fintech & cleantech, Cairo & Upper Egypt, solar & agri),
iii) convene relevant intermediaries who can help support the innovation process; Ministry of Trade's Cleaner Production Center (ENCPC), Clean Tech Arabia an acceleration program, and Dandara an Upper Egypt NGO with strong links to farmers and local institutions.

iv) Develop a shared vision, objectives, milestones, and follow-up for support.

Diesel pump efficiency lower than expected

Renting and sharing equipment is common

Wide access to mobile technology

Farmers pay 'transport fees' for diesel

What ingredients are needed to bring this all together?

How Can We Make This Happen?

Collaboration

Convening a set of relevant programs, interconnected and with a uniform vision to support clean tech entrepreneurs and address market / system challenges.

Global Access

Access to global knowledge, experts, content, and networks in order to provide the Focal Point/Consortium with resources to inject in Egypt. This could be via WB Climate Technology Program, CIC network, and other resources.

.

Market Focus

Expand the approach to support clean tech entrepreneurs by shinning the spotlight on opportunities through market data, and addressing market and system challenges by creating 'space' for collective action and market innovation.

A Magnet for the Clean Tech Ecosystem Programs, Stakeholders, and Entrepreneurs

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An Ecosystem approach with a focal node is needed strengthen the Clean Tech support ecosystem?

Upgrading from existing Past/Fail to a Placement System across multiple ecosystem players

Upgrade from the pass or fail existing system to a placement based case by case system, using need-based criteria.

Evaluation criteria to initially place the entrepreneur and follow up placement once he/she receives startup support or service.

Leveraging Existing Programs for Continual and Improved Support

Building on existing brands and reputations

Leveraging networks, infrastructure, systems, and geographical reach, in particular outside of Cairo.

Continual support to entrepreneur through coordinated programs and initiatives.

Developing Partnership Frameworks and Market Vision

Coordination of multiple partners is complex. It requires:

A. Market Vision to share understanding of market challenges/ opportunities and way forward

B. A unified vision, metrics, and clear roles

C. Allowing Partners to remain autonomous to meet their mandates.

D. Frameworks, contracts, agreements

'Greening' General Support Programs Through Global Resources

Help the partner programs improve their content through the global partners such as the WBG climate technology program (CTP) knowledge, materials, people, and networks.

Link to global technology, business models solutions, and partners.

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OPERATIONAL PLAN

What Core Support Activities Should the Consortium Offer?

Ideation Stage 01

Goal: To develop from an idea to a business model, while maintaining a healthy pipeline.

Approach:

Semi- annual BootCamp (1 week)

Technical training (1-2 week)

Corporate Challenges (1-2)

Target: To reach a momentum of 50 to 60 startups supported per year.

Operational Stage 02

Goal: To help startups develop both a viable business model & feasible technology.

Approach:

General Business incubation program

Tech support & consultancy via reputable local entities.

Target: To reach a momentum of 20 to 30 startups new applicants per year.
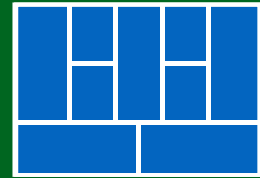
ENABLED THROUGH ECOSYSTEM PARTNERSHIPS

03 Growth Stage

Goal: To help startups develop strong network of market leads, CleanTech experts, dedicated mentors in their field of expertise. To assist ready startups to scale.

Approach: Providing access to

Local networks (Experts, Markets, Investors)

Global WB + CIC country network.

Target: To reach a momentum of 5 to 7 startups per year.

04 Market Scale

Goal: To involve startups in shaping their markets through a diligent, design based, stakeholder inclusive, innovation process, to tackle local market creation challenges.

Approach: To offer startups and other key stakeholders the opportunity to solve a Market Challenge using variations of Open Innovation Models supported by WB experts, innovators, peers and others to design their own solution and action plan with the aim of ultimately catalyzing the market.

Target: 1 – 2 market development 'innovation processes' and endorsed / supported actions plans per year.

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Goal: To develop from an idea to a business model, while maintaining a healthy pipeline.

Approach:

Semi- annual BootCamp (1 week)

Series of CT events

Technical training (1-2 week)

Corporate Challenges (1-2)

Target: To reach a momentum of 50 to 60 startups supported per year.

Ideation Stage

01

How To Make This Operational?

Corporate Challenges

How?
- Enable 2-4 challenges (i.e Pepsi's litter of light)
- Develop more partnerships with other corporates

Why?
- excitement and inspiration
- validation
- relationship between corporates and startups
- identify potential stars

Training Placement

How?
- Leverage existing Training Programs
- Help them improve content
- Make sure they have a place to go

Why?
- basic technical skills
- Avoid feeling of rejection, want to keep those 'ideation' stage entrepreneurs in the system

Bootcamp Placement

How?
- Leverage existing Bootcamps
- Help them cater some content to clean tech
- Make sure they have a place to go

Why?
- Move the idea to reality
- Identify those ready for business model support

Example Partners & Affiliates

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Goal: To help startups develop both a viable business model & feasible technology.

Approach:

General Business incubation program

Tech support & consultancy via reputable local entities.

Target: To reach a momentum of 10 to 20 startups new applicants per year.
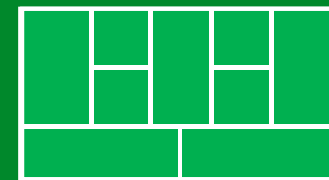
Operational Stage

02

How To Make This Operational?

General Business Incubation

How?
- Leverage existing Incubation/Acceleration Programs (very structured of 2 to 4 month period)
- Help them cater some content to clean tech
- Make sure startups have a place to go for follow-up support

Why?
- To assist inventors/tech focused entrepreneurs to commercialize their product

Example Partners & Affiliates

Tech Support & Consultancy

How?
- Identify and classify pool of relevant experts through partners
- Hire experts and consultants to support entrepreneurs addressing technical challenges over a 4-6 month period.
- Flexible structure based on needs of entrepreneurs and through contractual agreement.

Why?
- To help entrepreneurs overcome technical barriers.
- To provide entrepreneurs with very specific support to their specific needs.

Goal: To help startups develop strong network of market leads, CleanTech experts, dedicated mentors in their field of expertise. To assist ready startups to scale.

Approach: Providing access to

Local networks (Experts, Markets, Investors)

Global WB + CIC country network.

Target: To reach a momentum of 5 to 7 startups per year.

Growth Stage
03

How To Make This Operational?

Access to Funding

How?
- Exposure to international clean tech investors
- Educating local investors on the potential of clean tech as an investment

Why?
- well informed investors are key to the development of any industry.
- Clean Tech startups requires savvy funding.

Access to Markets

How?
- Plug the entrepreneurs into the CIC global network.
- Plug the entrepreneurs into other global networks, for example, endeavour, International CleanTech Network.

Why?
- To help entrepreneurs with viable business model scale.
- Limited, to no, networks outside of Egypt.
- Lack of understanding to deal in a foreign market.

Access to Networks

How?
- through partnerships, agreements and commitments
- based on entrepreneur needs

Why?
- To assist entrepreneurs with their scaling efforts to reach a wider target market, increase production capabilities, etc…

Example Partners & Affiliates

THE CAIRO ANGELS | RISE UP EGYPT | ENOPO Egypt National Cleaner Production Center | infoDev CLIMATE TECHNOLOGY PROGRAM — Accelerating Innovation in the Development, Deployment and Transfer of Clean Technologies | INTERNATIONAL CLEANTECH NETWORK | ENDEAVOR EGYPT | wamda mix n' mentor | RISE UP EGYPT

Goal: To involve startups in shaping their markets through a diligent, design based, stakeholder inclusive, innovation process, to tackle local market creation challenges.

Approach: To offer startups and diverse set of stakeholder, experts and innovators the chance to design their own solution to a market challenge. The 'Market Innovation Lab' could leverage virtual open innovation models where ideas are crowdsourced, or through a managed / facilitated model which brings key people together and provides them tools to develop a solution.

Market Scaling
04

How To Make This Operational?

Inducing Market Innovation

How?

- Through an annual innovation process for parties, that demonstrate commitment, to design and tackle a sector specific market challenge.

  1. ***Co-create innovative solutions*** to address market challenges, using variations of 'open innovation' models. And/Or,
  2. ***Innovation through a 'managed' / facilitated process*** which has high barriers to entry in order to ensure seriousness and ability to commit, supported with innovation/design thinking tools, sector experts, pioneers, value chain members and untraditional players.

- Solutions would be eligible for follow-up support from World Bank experts, technical assistance (TA) and other resources.

Why?

- Clean tech markets are not defined, or are 'displacing' well established incumbent products.
- Market barriers are multi-faceted encompassing social, financial, behavioral, structural, and regulatory dimension
- Market barriers are affecting even successful startup ability to scale significantly.

CHALLENGE IDENTIFIED

CALLS FOR IDEAS

MULTI-DISCIPLINARY TEAMS SUBMIT IDEAS

EXPERTS SHORT LIST PROMISING IDEAS

TEAMS USE FEEDBACK TO FINE TUNE IDEAS

FINAL SELECTION OF WINING IDEA TO SUPPORT

open IDEO   The Lab India Innovation Lab for Green Finance

MIT Climate CoLab

Facilitator

Pioneers
Investors
Innovators
Wild Card
Entrepreneur
Experts
Suppliers
Customers
Contractors
Distributors

M&E Results Framework

Results Chain	Performance Indicators	Targets
IMPACT Access to clean, safe, reliable and sustainable energy, water and other natural resources for poor communities in developing countries	Number of entities with access to new/improved products/services	25,000 (used a proxy of the diesel pump market – 10%)
	CO2 emissions avoided (metric tons)	1m Tons (used proxy of the diesel pump market – 10% of emissions)
OUTCOME Climate-compatible technologies are deployed in developing countries by local sustainable high growth climate businesses that are creating jobs and influencing policy change	Number of businesses who registered their prototype/final product with Intellectual Property (IP) office	135 (half those coming out of 2nd and 3rd phases)
	Number of businesses who raised follow up finance	33 (25% of those registering a prototype)
	Number of units sold of new/improved products/services	25,000 (used a proxy of the diesel pump market – 10%)
	Number of new laws/legislations/amendments/codes/government policies/ministerial decrees drafted, or contributed to the drafting	5 (identified and addressed through the market innovation lab)
	Number of new laws/legislations/amendments/codes/government policies/ministerial decrees enacted or government policies adopted	3
	Number of procedures/practices/norms related to clean tech markets recommended for change	5
	Number of procedures/practices/norms changed	3
OUTPUT CIC capacity to deliver responsive and quality financial and non-financial services to climate technology entrepreneurs	Number of partnerships with non-financial services providers	10
	Number of businesses served by CIC	850
	Number of workshops, training events, seminars, conferences, etc.	30 (boot camps, and follow intake innovation labs and other)
	Number of participants in workshops, training events, seminars, conferences, etc.	3,400 (assume on average 2 members per startup)
	Number of participants providing feedback on satisfaction	2,550 (75% of participants)
	Number of participants reporting satisfied or very satisfied with workshops, training events, seminars, conferences, etc.	1,912 (75%)
	Number of businesses/entrepreneurs having access to technical facilities (academics)	30 (6/year)
	Number of businesses applying for grants/ technical service	135 (half those coming out of 2nd and 3rd phase)
	Number of businesses receiving grants/technical service	35 (25% of applicants)
	Number of media appearances	15
	Number of knowledge sharing events	5
	Number of clean tech curricula pieces/case studies developed	10
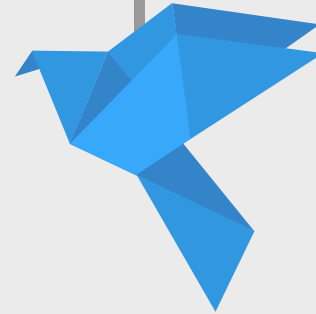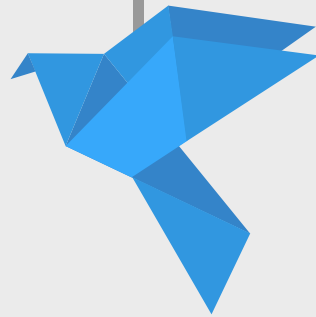
ANNEX: ADDITIONAL MATERIAL

Example Cases
Prototypes
Ecosystem Canvas
Stakeholder Map

Ahmed Abd-El Hamid

CEO & Co-Founder

SUNUTIONS

SunUtions

PLUG THE SUN

Established in 2014

www.sunutions.com

SunUtions is a start-up company that works on the production and development of solar systems to provide green energy solutions using the sun. The University graduates of electrical and mechanical engineering worked on their graduation project together and wanted to turn it into a real business. They are currently developing a lighting solution: the "DayLight Collector". It is a fundamental system that uses a rooftop collector to gather sunlight and with the help of fiber optic cable bundle and unique mirrored bulbs, it carries sun light into the building.

Benefited From Corporate Challenges & Mentorship

Won first prize in INJAZ company competition

Registered the company.

Founders first **Practical Experience in scaling a product**

Completion of Project & Scaling with Daylight collector final prototype.

Inspired by their **graduation project** Sunutions starts working on DayLight collector prototype.

Won first place in the elevator pitch event in RiseUp Summit 2013 & awarded **mentorship by Pepsico.**

Pepsico Liter of Light project "Challenge"

Sunution benefit from **Pepsico Expertise** (Procurement) and **Access** (Brand)

| 2013 | EARLY 2013 | MID 2013 | LATE 2013 | JAN.2 014 | MID 2014 | LATE 2015 | 2016 | 2017 |

PHASE 1	PHASE 2	PHASE 3
Sunutions team focus on prototyping their initial idea. Competing in INJAZ and RISEUP summit allowed the availability of both mentorship (Pepsico and Mobinil), seed funding (award prizes) and exposure.	Sunutions registers as a company to begin its journey with Pepsico's Liter of Light project, their **first major serious engagement with the market**. The project represented also a great learning experience with great i**nfluence on the technical and business learning curve of the team**.	With Pepsico increasing the scale of the Liter of Light Project, Sunutions secures a profitable engagement with strong effects on their Daylight Collector future scaling efforts.

mobinil https://www.youtube.com/watch?v=H1L1r5Oip_Y&list=PLkoete0tjoZGbQzbt5zqGskpDv8ElD2tE

PEPSICO https://www.youtube.com/watch?v=bNiRJzt1DcI&index=2&list=PLkoete0tjoZGbQzbt5zqGskpDv8ElD2tE&spfreload=10

Nour El-Assal

CEO

TAGADDOD

TAGADDOD

Established in 2013

www.tagaddod.com

Tagaddod (Arabic for 'renewal') is a pioneering renewable Energy and Waste Management Egyptian company, established in 2013 in Cairo, Egypt. Tagaddod operates an ISCC certified production facility, that produces Biodiesel from used cooking oil (UCOME). Biodiesel is a green fuel that is used in conventional diesel engines, which can directly substitute for or extend supplies of traditional petroleum diesel.

Certifications & Value Added Investors Were Key

Tagaddod team **incubated at flat 6 labs**. Company Registration.

Tagaddod receives its first serious **funding through local Angel investor network.**

Turning point when secure **financing** from **Investor with Industry links**

Research partnership via German R&D labs

Tagaddod team **graduation project** releases their first working prototype.

Tagaddod establishes a workshop & **receives quality certification** for their final product.

Factory Operational.

Factory Complete Certification of quality & sustainability.

Plans for their first factory.

Tagaddod **Exporting to Agents** in Europe

| 2013 | 2013 | LATE 2013 | 2014 | LATE 2014 | MID 2014 | MID 2015 | EARLY 2016 | MID 2016 |

PHASE 1	PHASE 2	PHASE 3
Tagaddod Team develops its first working prototype. Receives seed funding and incubation by flat 6 labs. Turns a graduation project into a registered company. First workshop operations enhances final product quality output.	With a strong display of know how and management capabilities, Tagaddod receives its first serious financing and plans to establish its first factory, increasing its scale of production. With its factory operational, commercial activities takes place in parallel with continuous production efficiency efforts.	Tagaddod management team engages in serious expansion of sales activities with focus on export to international biodiesel brokers & traders, gradually exporting higher capacities.

https://www.youtube.com/watch?v=pZQLjZL0ZXA

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http://edition.cnn.com/videos/world/2016/03/30/african-start-up-tagaddod-spc.cnn

Startups Spectrum:
Market Shaper

AHMED ZAHRAN

CEO

Karm Solar

KarmSolar
كرم للطاقة الشمسية

Established in 2011

www.karmsolar.com

A solar technology and integration company that delivers innovative solar solutions to the agricultural, industrial, tourism and business sectors. KarmSolar is Egypt's largest private off-grid solar energy integrator.

Developed Customer Centric Solutions through Partnerships & Financial Products Innovations to Catalyze the Market

Karm Solar team develop first prototype of solar water pumping solution.

First implementation of solar water pumping solution on a large commercial farm. Achieving breakeven.

Expansion in number of projects.

KarmSolar secured $ 1 million financing from SFD to finance 23 solar stations. (SFD's 1st renewable energy financing)

Company established.

Karl Solar wins HTC-Wharton Innovation Award in 2012 for its solar water pumping solution.

Karm Build & Karm Power Established.

KarmSolar sign contract to construct $2.5m solar station (2MW)

2011   2011   MID 2011   2012   2013   2014   2015   2016   MID 2016

PHASE 1

Smart Money: All capital they raised was from investors who understand the sector and want to invest in it.

Put all investors on board of directors.

PHASE 2

Product innovation: Replacing need for batteries with water storage systems.

Benefited from network of Egyptian Diaspora.

PHASE 3

Product expansion: Offer Energy Management Solutions.

Customer financing: Partnership with Leasing Plus.

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Prototype 1

DIRECT SERVICES TO ENTREPRENEURS

ACCESS TO EXPERTS

Access to Technical Experts

- Local Experts
  - ▶ Mentor
  - ▶ Consultant
- Global Experts
  - ▶ Consultant
  - ▶ Fellowships
  - ▶ Mentor

Access to Business Know-how Experts

- Local Experts
  - ▶ Mentor
  - ▶ Consultant
- Global Experts
  - ▶ Mentor
  - ▶ Consultant

ACCESS TO MARKETS

Market Makers & Enablers

- High-Profile Individuals
- Networks, Associations

Corporate Partnerships

- Corporate/technology sponsors
- CSR

Government Initiatives

- National projects
- Donor Programs
- Ministry Challenge Competitions

ACCESS TO CLEAN TECH INVESTORS

- Banks
- Angels & VCs
- Diaspora
- Crowdfunding
- Seed Fund

GIVING BACK INITIATIVES

ACCESS TO INDUSTRY-ACADEMIA COLLAB

R&D

- Structured Feedback Mechanisms

Talent

- Structured Feedback Mechanisms
- Entrepreneurs as mentors

ACCESS TO GOVERNMENT

Policy Advocacy

Annual White Paper

Prototype 2

ACCESS TO EXPERTS

Access to Technical Experts

- Local Experts ► Mentor ► Consultant
- Global Experts ► Consultant ► ~~Fellowships~~ ► Mentor

Access to Business Know-how Experts

- Local Experts ► Mentor ► Consultant
- Global Experts ► Mentor ► Consultant

New Ideas:
Peer to Peer Learning – making it work globally
Company Shadowing - local and global
Grants to High-performers
Consultants vouchers –

Re-think:
Fellowships – they complain it takes too much time away from entrepreneur especially those which are further along
Technical and Business Experts - How to tailor services to different stages

ACCESS TO MARKETS

Market Makers & Enablers

- High-Profile Individuals
- Networks, Associations
  - Want Market Data & Due Diligence

Corporate Partnerships

- Want direct links to companies
- Corporate Challenges
- Corporate/technology sponsors
- CSR — Shared Value

Government Initiatives

- ~~National projects~~ → Linking to Public Proc for SMEs
- Donor Programs
- ~~Ministry Challenge~~ → Corporate Challenges
  Competitions

4) Catalyze Clean Tech demand:
- Crowdsourcing Innovative Financing Schemes

New Ideas
- Want Market Data
- Want to link to buyers

Re-think:
Upper Egypt – access to those markets and entrepreneurs

ACCESS TO CLEAN TECH INVESTORS

1) Mobilizing Finance Through:

- Banks — Links to CBE initiative
- Angels & VCs — Patient capital and global links
- Diaspora
- Crowdfunding
- ~~Seed Fund~~ — Valley of Death Fund

2) Capacity Building:
- To potential CT investors and Banks
- To entrepreneurs to access CT Finance

Crowdsourcing innovative finance schemes to support customers

New Ideas:
- CT Angel Fund between $25k to $200k (patient capital)
- Innovative Finance Schemes to support customers

Re-think:
Diaspora – Need mechanism to do Due Diligence of Ent.

Re-think:
CT Resource Platform – IT solution to connect resources

ACCESS TO INDUSTRY-ACADEMIA COLLAB

R&D

- ~~Structured Feedback~~ Mechanisms

Facilitating Access to:
- Lab Equipment
- Corporate grants to CT R&D

Talent

- ~~Structured Feedback Mechanisms~~
- Entrepreneurs as mentors

Capacity building for professors on entrepreneurship

University students as startup employees/interns

Graduation projects to be linked to corporate challenges

Facilitate setting up CT entrepreneur 'Class' Program in University

ACCESS TO GOVERNMENT

Policy Advocacy

- To gather information from entrepreneurs/ investor/ ecosystem players of challenges faced in Sector
- To package these challenges and communicate to gov't via WBG, their Primary Donor, and local think-tank's/bus associations.
- Networking Platform / Advocacy Events
- Targeted Sector Papers for policy advocacy

Highlighted Regulatory issues to address:
- Improving Procurement to target CT SMEs
- FeedinTariff for SMEs < 500Kw
- Intellectual Property Reforms
- Financial Regulation Reform (i.e Term Sheets, Vesting, Arbitration, M&A, Fund Regulations, insolvency/brankruptcy)
- SME Incentives
- Incentive reform for Uni Professors to commercialize research
- Delinking STDF grant mechanism from professors, open to entrepreneurs

Parking Lot
- Integrated Gov't regulatory solution
- Expert database
- Quota for CT SMEs Central Bank Initiative

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Prototype 3

Direct Services to Entrepreneurs
- Connecting local and global ecosystem providers -

Market Transformation
- Innovation Lab -

ACCESS To EXPERTS & KNOWLEDGE

Access to technical and business experts:
- Mentors (Global & Local)
- Consultants (Global & Local)
- Peer to peer learning networks
- University students as startup employees/interns

Partnerships to facilitate access to:
- R&D
- Labs

ACCESS To MARKETS

Market Makers & Enablers:
- High-Profile Individuals
- Networks, associations
- Market Data

Corporate Partnerships:
- Corporate 'green' challenges
- Corporate /tech sponsors
- CSR/ Shared Value
- Corporate R&D financing to Univ.

Catalyze CT Demand:
- Crowdsourcing innovative financing (innovation lab)

ACCESS To CLEAN TECH INVESTORS

Mobilizing financing through:
- Angels & VCs (patient capital via local/ global links)
- Diaspora
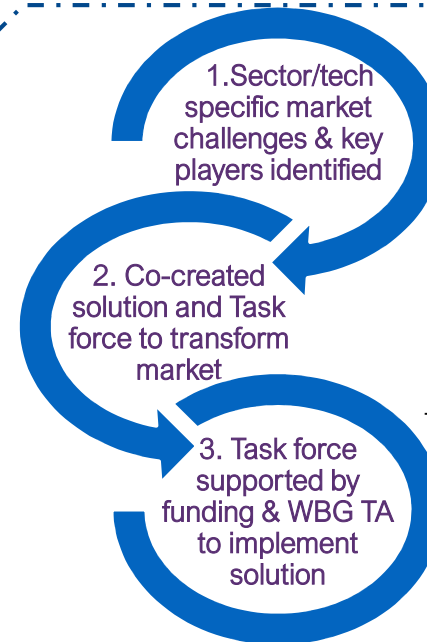- Crowdfunding
- Valley of Death' Fund

Capacity Building:
- To potential CT investors and banks
- To entrepreneurs to access CT finance

1. Sector/tech specific market challenges & key players identified

2. Co-created solution and Task force to transform market

3. Task force supported by funding & WBG TA to implement solution

- Based on feasibility analysis (i.e. viability of diesel to solar market) & proven potential
- Detailed value chain map to understand sector and identify key (and untraditional) stakeholders
- Innovation lab would facilitate a 'co-created' solution where stakeholders are **supported by CIC & innovation tools to design own solution**
- Stakeholders would form a Task Force to implement solution
- Innovative (and realistic) solutions with clear milestones and **task force commitment would be funded and supported by WBG TA .**

On an semi-annual basis, the Innovation lab would run a CIC facilitated innovation process where market stakeholders are encouraged to form and collaborate in order to design and implement market transformation solutions. The formed task force will then be supported by financing & WBG TA to implement their solution.

Direct Services to Entrepreneurs would be for multiple technology / sectors and for companies at multiple stages (startup – growth stage). These services aim to ensure there is a steady pipeline of entrepreneurs entering into Clean tech space, while providing targeted services for proven 'Gazelles' at the tipping point of substantial growth.

Why is an innovation lab needed?
- Clean tech markets are new / being created
- Challenges go beyond regulatory / economic
- Consumer behavior changes are needed
- Leveraging existing networks, distributors, tech services (i.e. mobile payment) is promising.

Why a sector / tech focus?
- Brings together those who have a stake in it
- Creates buy-in and improves opportunity to collaborate

Prototype 4

A Placement Approach

IDEATION	STARTUP/ PROTOTYPE	GROWTH	MARKET SHAPERS
GOAL: To help startups develop from an idea to a desirable business model. **APPROACH:** - **Bootcamps:** To offer startups the opportunity to attend (twice a year) - **Training Events:** For ideation stage startup needing technical exposure. **TARGET**: To reach a momentum of 20 to 60 startups new applicants per year.	**GOAL:** To help startups develop both a viable business model & feasible technology. **APPROACH:** - **General Acceleration Program:** 3 months (twice a year) - **Tech support & consultancy Program:** flexible 4-6 months can run in parallel or in sequence to acceleration program. **TARGET:** To reach a momentum of 10 to 20 startups new applicants per year.	**GOAL:** To help startups develop strong network of market leads, CleanTech experts, dedicated mentors in their field of experts to assist them to scale. **APPROACH:** To leverage existing local players network + the international CIC and WB network. **TARGET**: To reach a momentum of 5 to 7 startups new applicants per year.	**GOAL**: To enable startups to shape their markets through a diligent, design based, stakeholder inclusive, innovation process, to tackle local market creation challenges. **APPROACH:** To offer startups the opportunity to participate in the market shaping innovation process (once a year), with key stakeholders in their respective markets to develop, tackle and reach an action plan to shape their market.

A series of year round clean tech events, to inform, educate and develop the conception of clean tech in the local market, involving stakeholders, including investors, regulators, entrepreneurs, and any other related local entity with global key players and subsequently creating an evolving market.

Ecosystem Canvas

Resources: Aspiring CT entrepreneurs have good access to *general entrepreneurship support services* at the prototype and start-up phase (mentoring, business training, co-working spaces), but are limited in their options in the early growth and late growth stage and *lack significantly later stage support.* CT specific resources are limited to ICE Cairo, CTA, and SEDA who are new to the ecosystem, and do not provide later stage support. Due to the size/resources of these programs, they *lack reach and recognition.* Capital is limited to 1 substantial angel group which lack CT expertise but is interested. 2-3 early stage VCs focused on IT. There is *huge competition for this limited local capital.* Global capital has not entered into CT market. There are many engineering graduates but not focused on CT, and those who are lack practical skills. *Innovation has been limited,* many early players are only importing equipment, however *there are successes* in the application of solar tech for pumping use, and innovation of existing business model to meet local needs. *Academia has not been a source for innovation.* Limited resources to support ecosystem player, only ad hoc donor funding for specific activities.

Engagement: Stakeholders interact socially, the ecosystem players *refer to each other as friends.* They typically interact through the *referral process, word of mouth, and participation in joint events.* The ecosystem is very much confined to Cairo. Stakeholders indicated they lack an online platform, while facebook pages are used for event organization, they view that a more sophisticated platform could be of value to them, investors, and entrepreneurs. Lines of communication are word of mouth and referrals. Community *members collaborate through joint events* (RiseUp Summit) as through referrals. Global partner engagement is limited to RiseUp and Endeavor. RiseUp by connecting entrepreneurs to Accelerator programs and bringing speakers to events. Endeavor by providing access to markets and mentors within their network. Some global partners based outside of Egypt (i.e. TechWadi), seek to engage in Egypt but have had limited success due to lack of local partner and ability to fund initiatives. Young people get involved by participating in events and volunteering in events. *Start up weekend, MIT competition, and Rise Up* are key events which are successful because they are not in the traditional 'conference' setting, rather they are co-organized and 'fluid' which breaks down hierarchies.

Culture: People are *excited* about clean tech entrepreneurship mainly due to the idea of building a green economy which will solve many of Egypt's problems, but more are starting to see the financial potential in the sector. 'Clean tech is a lifestyle' lots of energy. Will create a sense of urgency, by communicating that this is an up and coming sector, we are at a *once in a lifetime turning point,* and its is a closing window of opportunity to be a leader in this sector. Egypt has a large environmental movement, in particular there was a strong anti-coal campaign which gathered quick support and media attention. As well there are strong youth entrepreneurship social networks developing. People are *risk-averse,* and have not had a good track record on dealing with risk through planning/mitigation. Failure is a major social stigma, not acceptable, even punished legally. Unfortunately people do not seek perfection, nor iteration. Sometimes rely on privilege access, first mover advantage, and networks for the success of their business.

Stakeholders: *Capital providers* are very interested in CT, are concerned they lack familiarity and know-how. *General support organizations* are interested to support CT are concerned they lack know-how and resources. *CT support organization* are few and need funding to expand and to develop their brand recognition in the market. Also need a way to better cooperate with existing players. *Global players* need access to business opportunities in emerging markets, are concerned they lack local know-how and networks, and need a bridge. *Academia* Goal is be published in academic journals and receive tenure. Concerned that pursuing commercially viable R&D will not be rewarded by Uni. Need incentives to commercialize R&D. *Business Association Goal* is to unlock CT opportunities for its members. Concerned about existing policies, need functioning mechanism for their policy recommendations to be implemented. *Banks* goal is to expand credit, concerned they lack know-how on CT, alternate financing mechanism. *Government* goals is to address energy challenge, and create jobs, concerned that CT is only a small piece of the puzzle, need to see early success.

Activities: General entrepreneur support services are available, however they tend to *mostly focus on IT and F&B entrepreneurs.* Ecosystems are very much interested in collaboration, and there is a *positive culture of collaboration,* however they admit that they have not figured out how to make it work and effective. Participation in the community has been successful through mentorship programs, as well as key events. RiseUP Summit, training, and pitch events create the biggest buzz. Training events have flourished, but participants are now *expecting more* depth to them (i.e. not general business skills, but very specific and detailed valuation training). RiseUp Summit has been a major success due to its theme of being organized/outsourced to all ecosystem players. Startup Weekend and MIT Competition are also key events. Need to communicate the *"sum is greater than its parts", and the value we bring to entrepreneurs is through the collaboration between ecosystem players locally and globally.*

Frameworks: Current Feed-in-Tariff is favorable to large companies, rather than SMEs. Bankruptcy law is very severe, general operating licenses are hard to acquire, access to government contracts is limited, duty reduction on important capital goods are not being implemented and there are severed delays at the border. NGO laws in Egypt are strict and the government is very concerned to understand what the money will be used for and who it will go to. Social norms are shifting in city centers to encourage entrepreneurship, but remains a risk-adverse family unit which encourages 'safe' public or corporate jobs.

Implementing Partners + SMEs: Reputation (VLAB, Flat6, Endeavor) **Resources** (VLAB, Flat) **Commitment** (Clean Tech Arabia, Ice Cairo). Local SMEs are focused on IT apps, and F&B, SMEs start small and tend to stay small. Clean Tech Entrepreneurs are a combination of Ex-Oil & Gas or electrical engineers, environmentalists, but limited business backgrounds. Also CT entrepreneurs more recently are *simply solar panel importer/distributors.* Most lack innovation in their business models, and in many cases are stuck. By strengthening existing CT ecosystem providers (CTA, ICE, VLAB) they can become the new leaders and champions especially by bridging them to global players (Techwadi, LACI, MIT, Endeavor, etc).

Role Models: There lack CT role models, however a few role models in the making include: KarmSolar, Solarize Egypt, Future Energy Corporation and others. Failure can be expressed by a first mover in online food delivery "otlob" with huge potential that did not manage to capitalize on it's position, and exited at a much lower multiple that it could have. This can be attributed to the local angels/VCs which only added $ to the company and limited value added services/insights. Regions with *similar attributes* could include, Kenya, Morocco, Singapore, Germany, Finland, and California. Partners with *shared vision.* RiseUp and Endeavor, TechWadi, AUC Vlabs, Nahdet etl Mahrousa, CleanTechArabia, and ICE Cairo.

Egypt's Clean Tech Entrepreneurship Ecosystem Stakeholder Map

International Organizations

Support Organizations

- TechWadi
- WAMDA
- Diaspora networks
- VentureWell
- RISE (Boston)

Donors

- UNEP / SwtichMed ***
- UNIDO **
- RCREEE
- GIZ
- DANIDA
- USAID SEED*

Local Support Organizations

Climate/Green

- Clean Tech Arabia ***
- YouThinkGreen***
- RiBh **
- Heliopolis U Entrp Program **
- ENCPC ***

General

- Flat6labs
- AUC Venture Lab
- Nahdet el Mahrousa *
- Innoventures
- Injaz*
- GESR *

Networks

- WAMDA Mix n'Mentor
- Endeavor
- RiseUp

Academia/R&D

- AUC TTO + SD + A2K4D
- AAST
- Cairo Univ (ERC) Energy Research Council
- Heliopolis University
- TU Berlin El Gouna
- E-JUST
- ITTU Assiut
- NileU
- Gov't Labs (NREA, GOIEC, EOS)

Training

- SEDA***
- iAREEE***
- ICE Cairo ***
- ENCPC***
- TU Berlin El Gouna
- ITC & IMC

Financing

- Family & Friends
- WAMDA Capital
- Cairo Angels
- Algebra Ventures
- SFD
- A15
- Crowdfunding
- Sawari Ventures
- CBE 5% program
- Bedaya
- Ideavelopers

Associations

- SEDA***
- ENCC
- EJB
- Regional Bus Associations

Government

- MoTI
- MIIC
- EEAA
- MoF
- NREA***
- EgyptERA
- ENCPC ***

Legend:

*** 100% Climate/Green Focus
** 50% Climate/Green Focus
* < 25% Climate/Green Focus