

Facility for Low Carbon Technology Deployment



An Overview

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Specialized agency of the United Nations
Promote and Accelerate Sustainable Industrial Development

171 Member States

48 Regional and Country Offices

Mandated Functions

- Technical Cooperation
- Action-oriented research & policy advisory
- Normative standard-related activities
- Partnerships for knowledge & tech-transfer

Government Counterpart

Bureau of Energy Efficiency Government of India



- ❖ Set up on 1st March 2001 under Energy Conservation Act
- ❖ Develops Policies and Strategies to Reduce Energy Intensity of Indian Economy

Flagship Programmes

ECBC Energy Conservation Building Code	Star Label Standards and Labeling
PAT Energy Efficiency in Large Industry	SME Energy Efficiency in Small & Medium Industry
SDA Energy Efficiency in States	DSM Energy Efficiency Through Demand Side Management

Facility for Low Carbon Technology Deployment

Project Activities

Component 1

Component 2

Commercialization Support for Innovations

Strengthening the Technology Transfer Ecosystem

Accelerator Program

Innovation Challenge

Financial Due-diligence and Fundraising support

Training Need Assessment of Tech transfer Offices

Capacity Building Program

Facility for Low Carbon Technology Deployment (FLCTD)



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



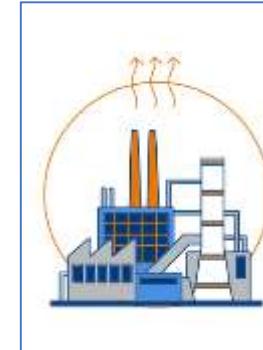
ABOUT:

- Programme to identify Low Carbon Technologies (for Industrial and Commercial Sectors)
- US \$ 8.7 m project funded by Global Environment Facility (GEF)
- Emission Reduction Target: 2.3 million tons CO₂eq
- Targets: - 120 innovations identified/demonstrated; 40 – Commercialized

OBJECTIVES:

- Identify technology-gap areas having scope for energy saving
- Select innovative technology solutions that address the gap
- Support demonstration and validate efficacy
- Facilitate Scale-up

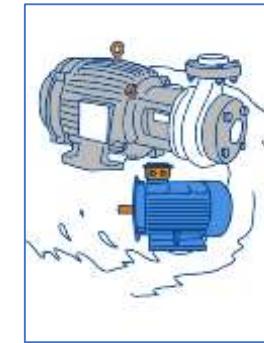
Project Partners / Technology Areas for Innovation



Waste Heat
Recovery &
Thermal Efficiency



Industrial Resource
Efficiency



Pumps &
Motors



Industrial
IoT



Space
Conditioning



Electrical Energy
Storage Systems



What FLCTD Project Offered



Financial support
up to
US \$ 50,000 for
Field trials &
Validation of
efficacy
(β -testing)

Technical
Mentoring by
CII-GBC and
Subject Experts

‘De-risking’ of
innovation
before
commercial
launch

Industry
Linkages

Financial
Mentoring and
Fund Raising
Support

Partners in Technology Trial and Validation

Trials with technology end-users at 248+ locations across India

Large Industries - 20



Dairy units - 35



FLCTD – A Vehicle for Technology Validation / Commercialization



Support for fund raising / Commercialization

FLCTD

Support to Innovation Challenge Winners



Accelerator Programme Support

Govt. Support -
Ideation to Lab. POC



#startupindia

TRL 9:	Commercialization & post market studies
TRL 8:	Pre-commercialization
TRL 7:	Late stage Validation
TRL 6:	Early stage validation
TRL 5:	Early stage validation
TRL 4:	Proof-of-concept established
TRL 3:	Proof of Concept Demonstrated
TRL 2:	Proof of Principle
TRL 1:	Ideation stage



TRL 9

System Test, Launch & Operations

TRL 9

System/Subsystem Development

TRL 8

Technology Demonstration

TRL 7

Technology Development

TRL 6

Research to Prove Feasibility

TRL 5

Basic Technology Research

TRL 4

TRL 3

TRL 3

TRL 2

TRL 2

TRL 1

TRL 1

Technology Validation & Commercialization

Total Applications	Shortlisted	Selected	Mentoring and Technology validation Support	FLCTD Financial Support	Validation Completed	Innovative technologies Commercialised
1476	430	162	140 (Target: 120)	88	53	38 (Target:40)
			9.4% of total applications	63% of the portfolio	At 250 site locations	27%* of Start-ups supported



Simple Payback on investment in new technologies

1-2 years

Estimated annual electricity savings from 1% penetration in the market by innovative technologies commercialized

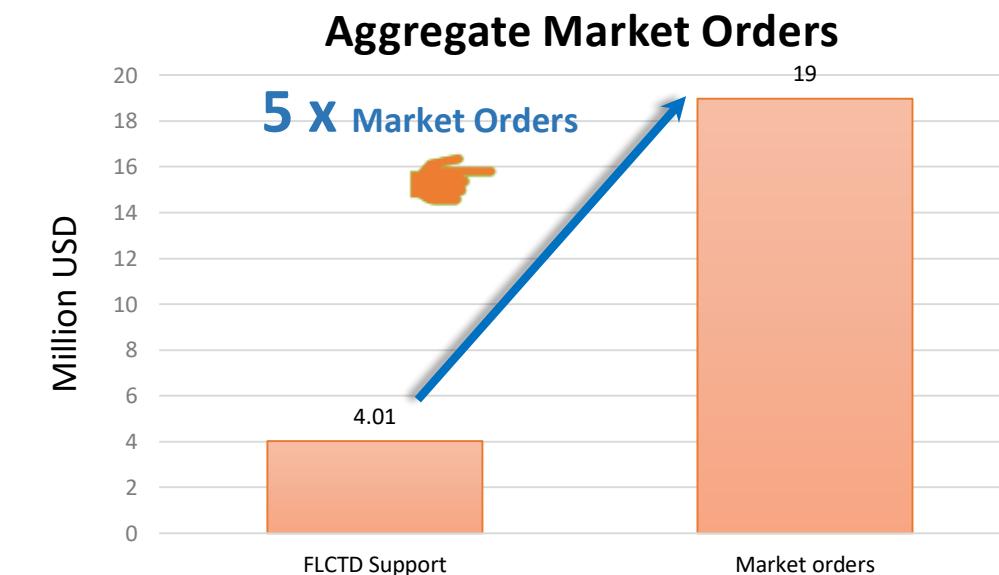
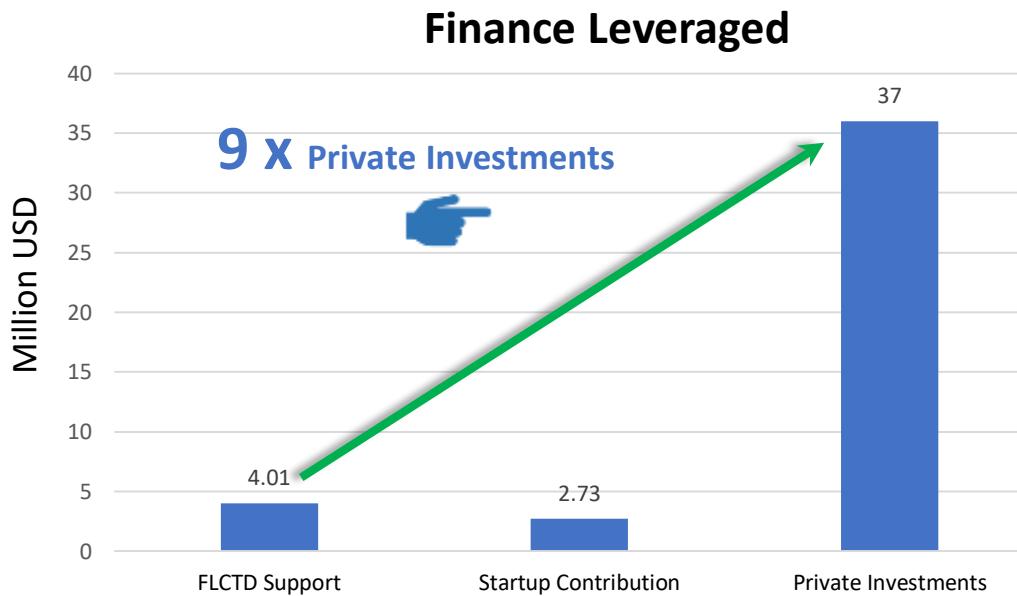
2558.8 GWh

Estimated annual reduction in CO₂ emissions from 1% market penetration

3.8M tons CO₂/year

Technology Validation & Commercialization – FLCTD Impact

2017-2023: 140 Start-ups selected for Technology Validation, Mentoring & Fundraising ~ USD 4m



Investors



COMPONENT 2: Technical Support for Technology Transfer Support Facility

Study of the Technology Transfer Ecosystem to Increase Commercialization of Innovation

Implementing partner:



Development of a Training Program on Technology Transfer

Implementing partner:



Training Need Assessment of Tech. Transfer Offices

1. Mapping and characterisation of the 'as-is' Indian technology transfer ecosystem.
2. Insights into the bottlenecks and inhibitors of the technology transfer process in the country.
3. Good practices framework developed from studying five international ecosystems.
4. Insights into the kind of Capacity Building efforts that can be provided to strengthen the low-carbon tech transfer ecosystem.



Mapping of Technology Transfer Ecosystem



Coverage of National Ecosystem (25 institutes)

- Central Universities
- State Universities
- IITs – older IITs and new-generation IITs
- NITs
- Private Education Institutes
- National Research Laboratories
 - CSIR
 - ICAR

Questionnaire for primary data collection prepared based on the **Oslo Manual**

Benchmarking Good Practices from

- Switzerland
- USA
- Germany
- South Korea
- Isreal

Focused Capacity Building Programme for TTO

Training and Capacity building programs focusing on TT-specific skill sets

- ◆ Technology Transfer handbook for establishing a new Tech. Transfer Office
- ◆ Development of training programme for researchers, practitioners and decision makers

Introductory Modules	Technology Readiness Levels	Tech. Transfer Function	Tech Transfer Administration	Transferring Clean Technologies
<ul style="list-style-type: none">• Importance of Tech. Transfer and steps involved in Tech. Transfer	<ul style="list-style-type: none">• Technology Readiness Level assessment; technology valuation; marketing	<ul style="list-style-type: none">• Core TT skills such as negotiation, deal design, term sheet	<ul style="list-style-type: none">• Budgeting• Reporting and performance evaluation of TTO functioning	<ul style="list-style-type: none">• Identification of Clean technologies and their USP.• Special emphasis on Clean technologies.

Recognition to Entrepreneurs
&
FLCTD

National Energy Conservation Award 2022



ENCON - Regenerative Burner

(Winner of 2019 Innovation Challenge –WHR category)



CEEP – WHR from dyeing effluent



AFECO –Aluminum holding furnace



Cancrie Private Limited

National Energy Efficiency Innovation
Award 2023



- **Zerocircle Alternatives Private Limited**
International Vienna Energy and Climate Forum
2023

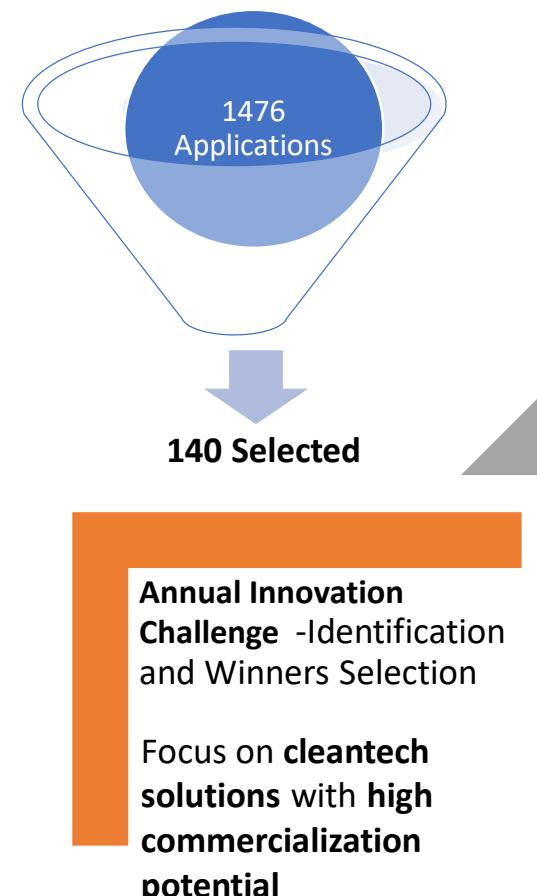
National Award for Excellence in Energy Management 2024

23rd Energy Efficiency Summit, Hyderabad 10-12 September, 2024



UNIDO showcases 18 “MADE IN INDIA” Innovative Climate Technology Solutions for Industry

FLCTD – A Suite of Support for Climate-tech Startups



FLCTD Accelerator
- Mentoring and
Business Strategy
67 climate-tech startups
trained



Sangam AIC
Energy | Innovation | Capital

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Financing for
Technology Trial
and Industry
Linkages

88 Innovation
Challenge winners
receive US\$4m

250 technology trials in
industrial sectors



CII-Sohrabji Godrej
Confederation of Indian Industry Green Business Centre



Technology
Validation and
Commercialization

Sector-specific solutions
developed with industry
partners

53 Innovative solutions
validated
38 technologies
commercialized
16 solutions under
validation

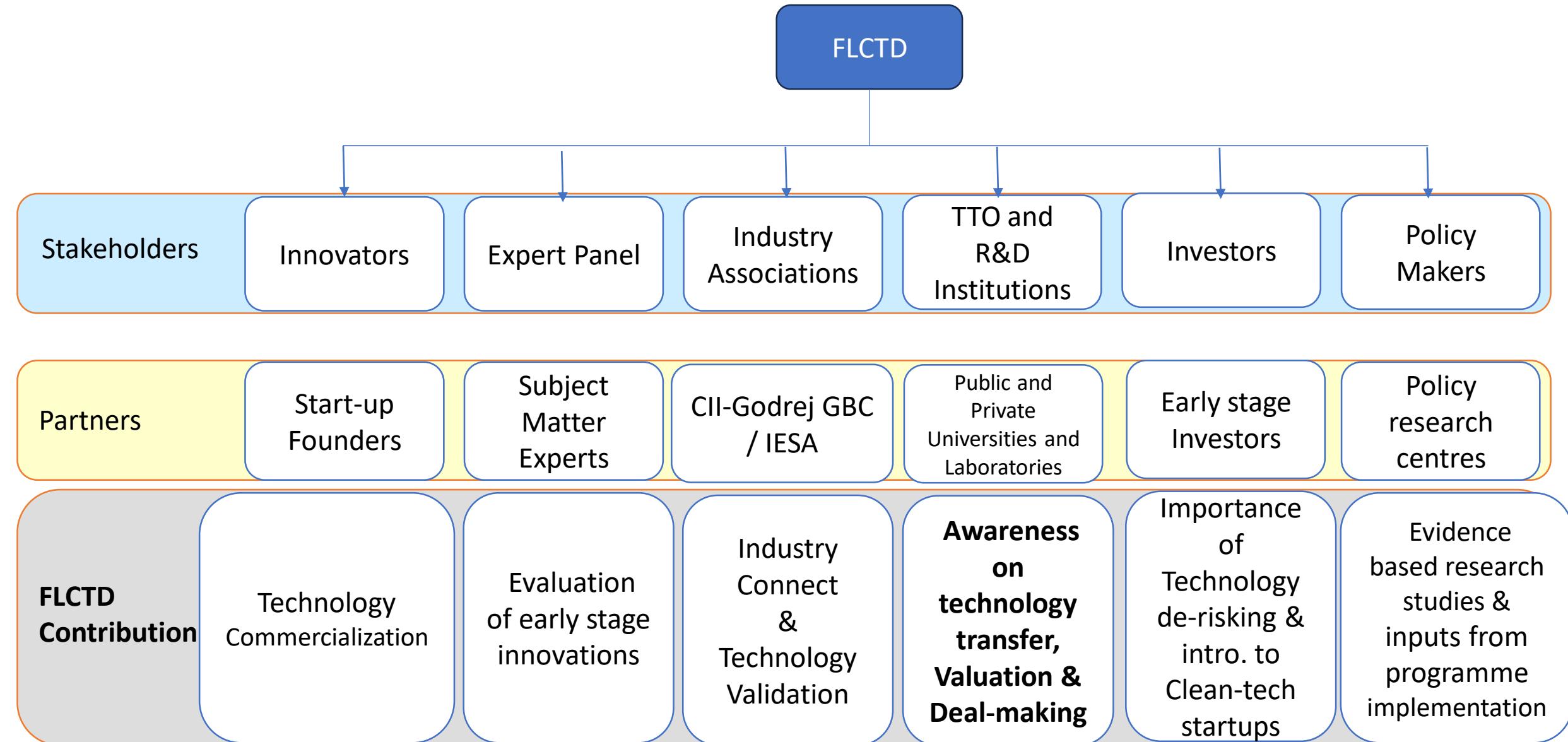
Mentoring for
Fund Raise and
Scale-up

Bespoke Enterprise
Development Plan
prepared for 25 startup
post technology validation

19 Startups scale up
operations and setup
production facility



Capacity Building of Program Stakeholder



THANK YOU

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www.low-carbon-innovation.org