Facility for Low Carbon Technology Deployment



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Sandeep Tandon
National Project Manager

Objectives of FLCTD Project

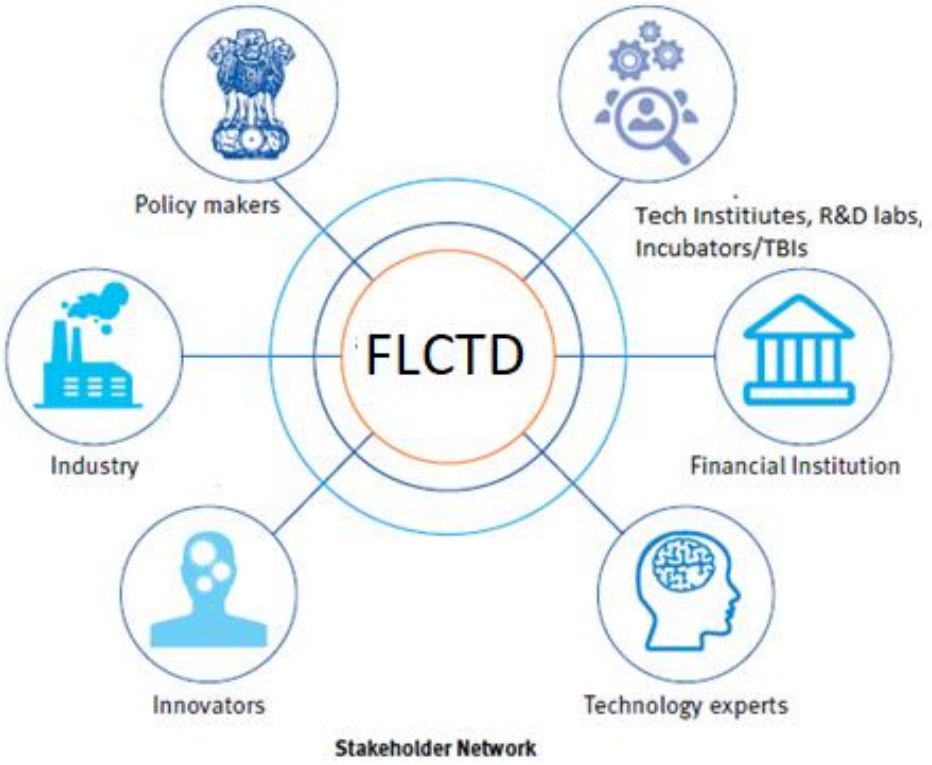
- Identify technology gaps/high-impact challenges for energy saving

- Identify innovative technology solutions to such challenges

  that also address demand-supply gap

Project Goals

- ✓ Facilitate demonstration of innovative technology solutions - validate their efficacy
- ✓ Promote scale-up of innovative solutions
- ✓ Strengthen cleantech innovation eco-system



Partners

- ✓ Global Environment Facility (GEF), Washington D.C.
- ✓ Bureau of Energy Efficiency, Govt. of India
- ✓ United Nations Industrial Development Organization
- ✓ Confederation of Indian Industry – Sohrabji Godrej Green Business Centre, Hyderabad
- ✓ Intellecap Advisory Service Private Limited, Mumbai
- ✓ Sangam – Atal Innovation Centre, Delhi NCR

Technology Verticals for Innovation Challenge

- Waste Heat Recovery
- Space Conditioning
- Pump & Pumping System

The first annual innovation challenge was completed in 2018

Project Website
www.low-carbon-innovation.org



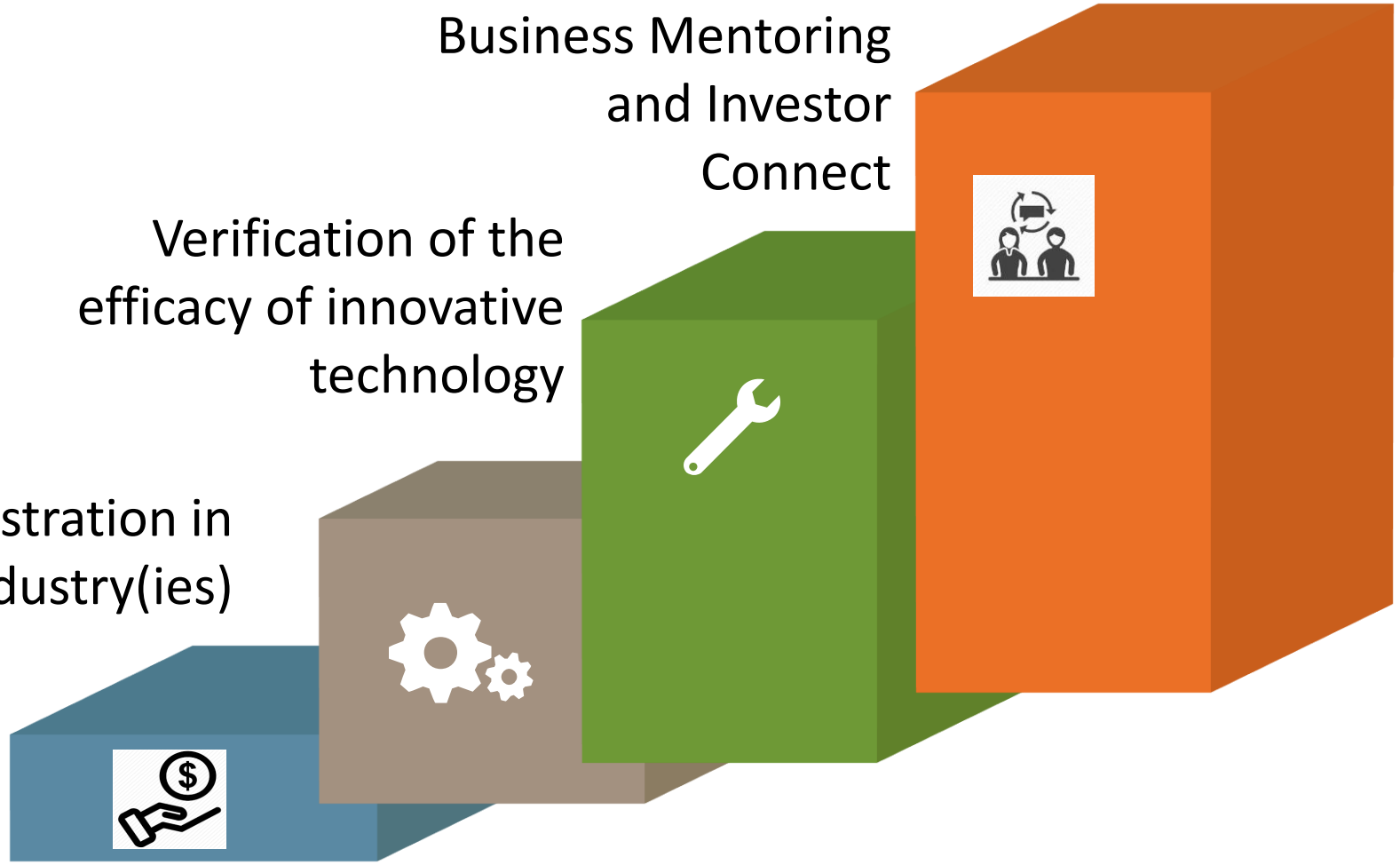
Incentives for Challenge Winners

Business Mentoring and Investor Connect

Verification of the efficacy of innovative technology

In-field demonstration in target industry(ies)

Grant up to US $ 50,000



Qualifiers for Application Submission



1. Innovations that result in overall efficiency improvement
2. Emerging / novel technology applications to reduce energy use
3. Design improvements to overcoming application constraints
4. Improvement in material of construction
5. Integration with renewable energy source
6. Use of refrigerants with zero ODS and low GWP

All innovative solutions should clearly demonstrate the replication potential

Who Can Participate ?

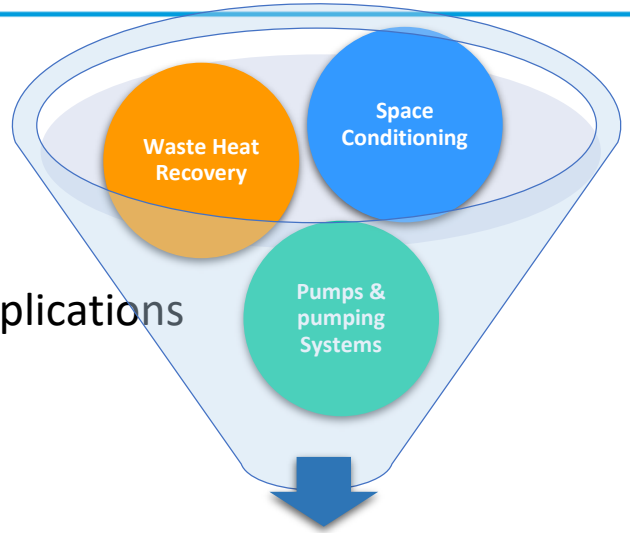
- Entrepreneurs / Startups,
- Indian Technical Institutes / Universities,
- Research Institutes,
- Not-for-profit Organizations,
- Micro, Small and Medium Enterprises
- Industries
- Public Sector Enterprises
- Government Laboratories



Project welcomes collaboration between industry and academic institution to develop innovative solutions / Proof Of Concept

Outcome: 2018 Innovation Challenge Round

FLCTD
Low Carbon Technology Innovation & Deployment



127 applications

37 applications shortlisted

13 winners

Support of US $ 504,728 for
Technology demonstration

+

Independent Validation
- In field by CII - GBC
- NABL accredited lab

Replication of innovative solutions in Industries

UNIDO
UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Winners in Waste Heat Recovery Category

Oorja energy engineering

Oorja Energy Engineering Services Pvt Ltd

Hyderabad

Innovation:

Radiant Heat Recovery from Rotary Kilns in Cement Plants

Target Sectors/Industries:

Cement

Steel

PROMETHEAN ENERGY

Promethean Energy Pvt Ltd

Mumbai

Innovation:

Heat Recovery in Milk Chilling Centers

Target Sectors/Industries:

Food Processing

VIP

Village Industrial Power Pvt Ltd

Pune

Innovation:

Heat Recovery in Traditional Jaggeries to Reduce Fuel Consumption

Target Sectors/Industries:

Jaggery making units

Winners in Space Conditioning Category

Basil Energetics Private Limited

Chennai

Innovation:
DC powered Air-conditioners

Target Sectors/Industries:

- Domestic Sector
- Commercial Sector

Inficold India Pvt Ltd

Ghaziabad

Innovation:
Retrofittable Instant Milk Chilling System

Target Sectors/Industries:

- Dairy and milk collection

Metafabs

Metafabs

Thiruvananthapuram

Innovation:
Refrigeration Solution in Fishing Trawlers

Target Sectors/Industries:

- Food value chain
- Fishing

Pluss Advanced Technologies

Gurgaon

Innovation:
Deep freezer with Thermal Energy Storage for Enhanced Energy Efficiency

Target Sectors/Industries:

- Cold-chain Sector

Promethean Spenta Technologies

Pune

Innovation:
Thermal Energy Storage based Mobile Cold-Storage

Target Sectors/Industries:

- Food Value-chain
- Farm-produce Aggregators

Thermal Energy Services Solutions

Mumbai

Innovation:
Application of Thermal Energy Storage Battery Swap for Cold-chain

Target Sectors/Industries:

- Food Value-chain
- Pharmaceuticals Value-chain

Winners in Pumps Category

Basil Energetics Private Limited

Chennai

Innovation:
DC Powered High-speed Pumps

Target Sectors/Industries:

Domestic Sector

Commercial Sector

Khethworks Pvt. Ltd

Pune

Innovation:
Portable Solar Pump for Smallholder Farmers

Target Sectors/Industries:

Agriculture

Shakti Pumps (I) Ltd

Indore

Innovation:
Energy efficient Slip-Start Synchronous Motor-based Water Pumps

Target Sectors/Industries:

Industrial Sector

Domestic Sector

Sunmoksha Pvt. Ltd

Bengaluru

Innovation:
Smart AQUAnet™ IoT-based Efficient Water Management System

Target Sectors/Industries:

Agriculture

2018 Innovation Challenge
Details of Winners
in Space Conditioning Vertical

Thermal Energy Service Solutions Pvt Ltd

TESSOL
Innovate. Preserve. Grow

TESSOL provides energy efficient and fuel saving refrigeration technologies for cold chain storage and logistics

FLCTD Innovation: Application of Thermal Energy Storage Battery Swap for Cold-chain



- TESSOL displaces diesel-use for refrigeration in cold-chain logistics
- Uses "Phase Change Material (PCM)" that acts as thermal energy storage (batteries) for refrigeration
- These storage units are PCM cartridges that can be swapped or panels (permanent fixtures) and are used for temperature controlling for cold-chain transportation
- These cartridges/panels are charged only once from central stations
- Ideal for 1 ton and smaller vehicles for distribution in Urban areas

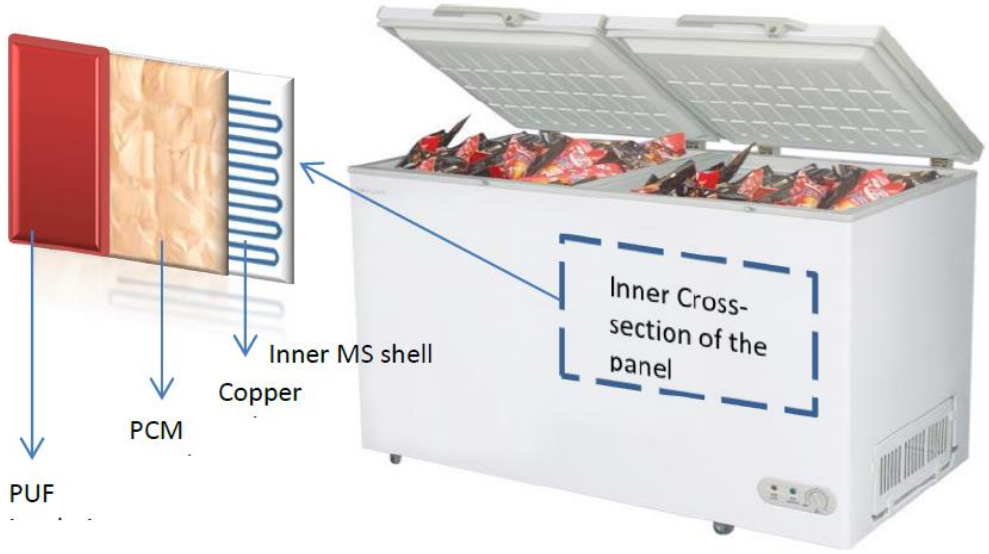
Pluss Advanced Technologies -

PLUSS® | TECHNOLOGY FOR A BETTER WORLD

Pluss manufactures Phase Change Materials (PCM) that absorbs and releases latent heat during the process of melting and freezing – acts as Energy Storage material

FLCTD Innovations: Deep-freezer with Thermal Energy Storage for Enhanced Energy Efficiency

- Better temperature control with the use of eutectic materials leading to reduced energy consumption from decreased compressor operation
- Demonstration of savE® PCM in chest cooler and chest freezer to store thermal energy at +1° C and at - 23° Celsius
- Up to 15% energy saving in chest cooler and 25% energy saving in chest freezer



Inficold India Pvt Ltd

Inficold develops products providing cooling backup for various cold-chain applications

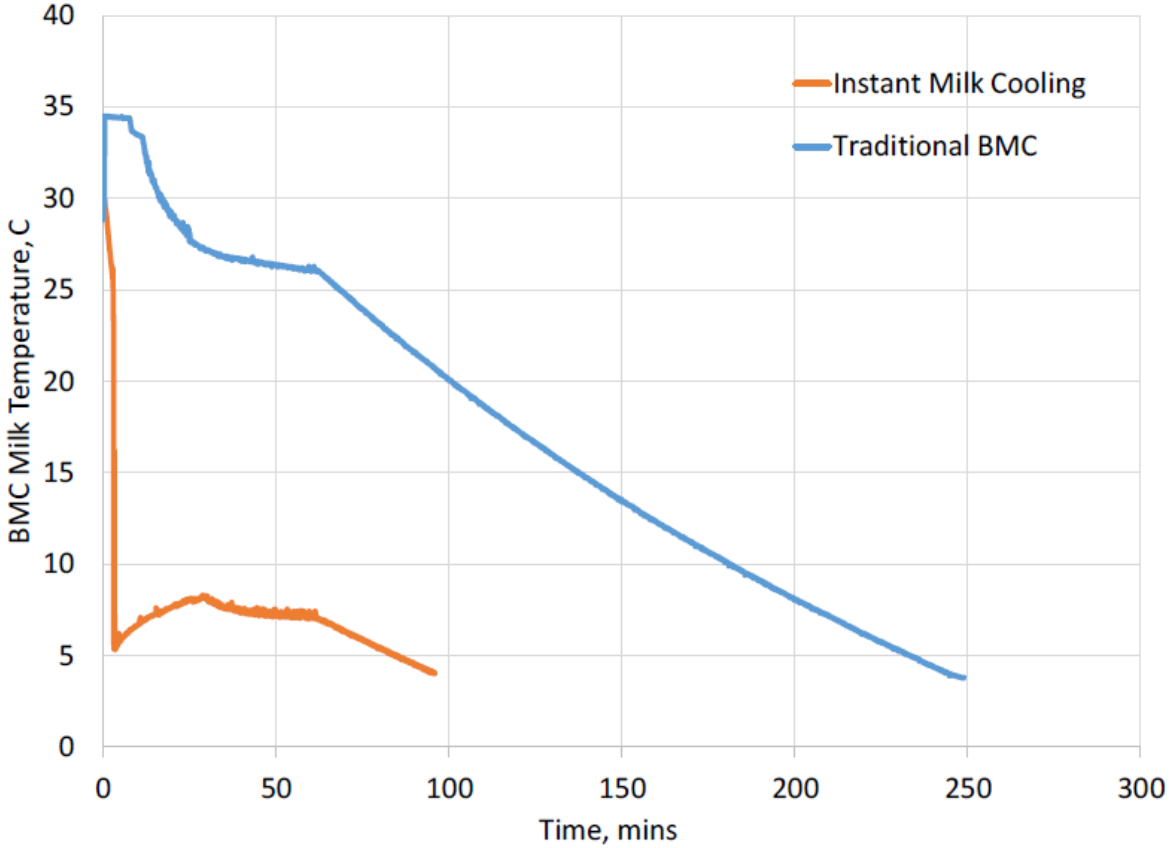
FLCTD Innovation: Retrofittable Instant Milk Chilling System



- Inficold eliminates the need of diesel generators for bulk milk coolers (BMCs) and allows fast cooling and increases the cooling capacity of existing milk collection infrastructure.
- Offers thermal storage based power backup for to BMCs
- The system stores energy in the form of ice for later usage
- The system instantly cools milk at 750L/hr to 4 deg C
- Starts the cooling process during power-outages and works without diesel generator

Inficold's Innovation Details

- ❑ Inficold solution for milk-chilling in regions that face severe power outages
- ✓To chill the milk immediately to 4C for maintaining milk quality
- ✓Not limited like the traditional BMCs that requires minimum 15% of milk to start cooling
- ✓Retrofittable Instant milk chilling system which integrates to existing BMCs and works on the same condensing unit and refrigerant



- ❑ **Demonstration planned:** Mother Dairy, Bulandshahr, U.P., and Schreiber Dynamix / Nestle (tentative)

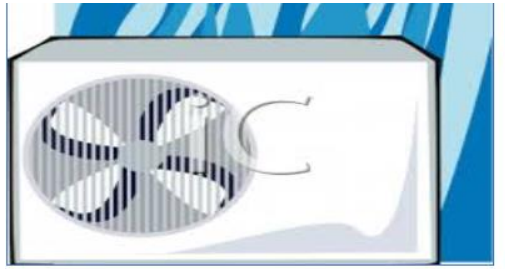
Promethean Spenta Technologies Pvt. Ltd.

Promethean offers refrigeration systems for cold-storage and milk chilling applications in off-grid and partially electrified areas

FLCTD Innovation: Thermal Energy Storage based Mobile Cold-storage

- Two versions of the innovation:
  - ✓ Chill the farm-produce during the transport (Chill-As-You-Go)
  - Avoids investment in cold storage at farm gate
  - ✓ Maintain the temperature of pre-cooled fruits and vegetables during distribution
  - Avoids the use of diesel-engine based chilling system in vehicle using Thermal Storage system

Demonstration planned: (i) Green Tokri, a Mumbai-based farm and (ii) Akshya Kalpa, farm to home delivery of organic milk in Bangalore



Eliminate the compressor from the truck



Combines Chilling & Transportation



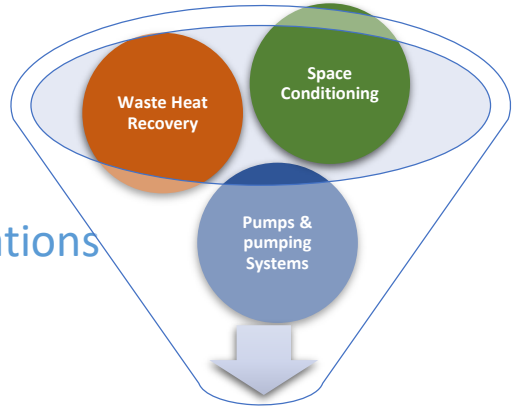
Use grid power instead of diesel to chill the produce



Outcome: 2019 Innovation Challenge Round

FLCTD
Low Carbon Technology Innovation & Deployment

88 applications



28 applications shortlisted

Final round of Selection process selected:

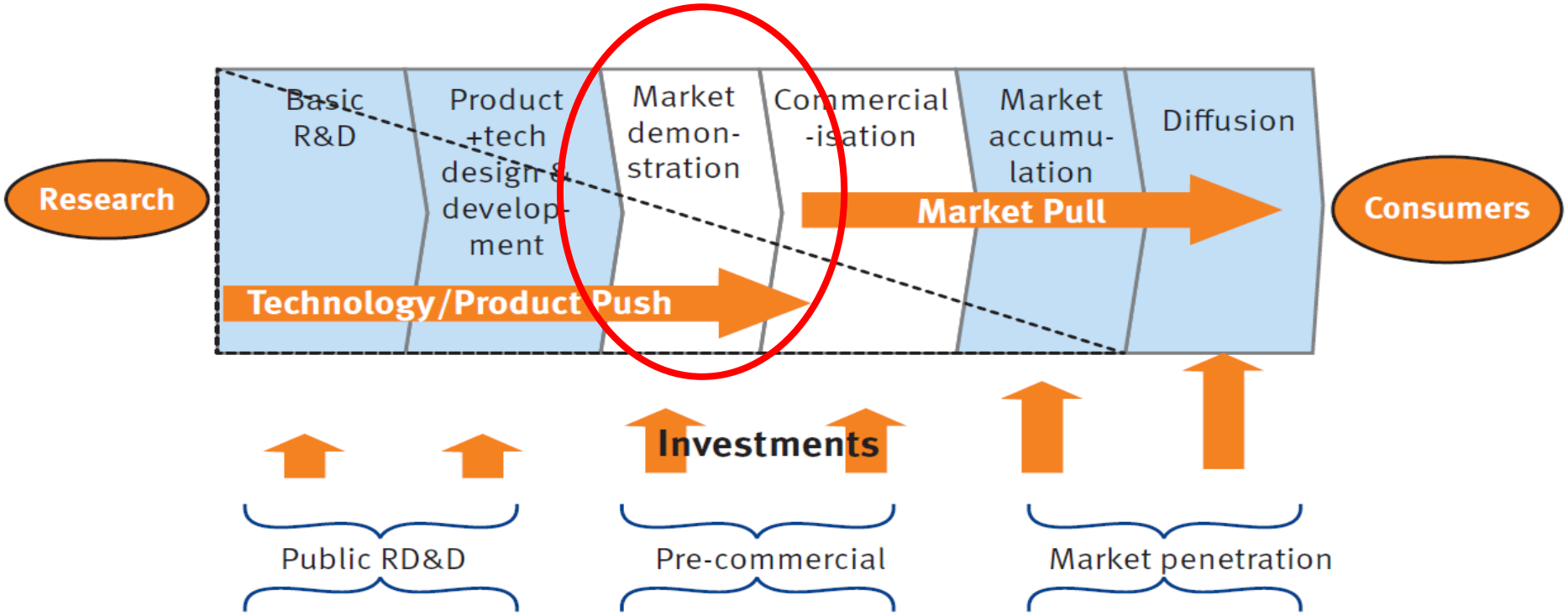
7 winners - Waste Heat Recovery

5 Winners - Pumps and Pumping System

5 Winners – Space Conditioning

FLCTD
Low Carbon Technology Innovation & Deployment

Validation of Innovative Technology Solutions



Contact Us

www.low-carbon-innovation.org



Mr. Sanjaya Shrestha
Project Manager
UNIDO/Vienna
S.Shrestha@unido.org

Mr. Sandeep Tandon
National Project Manager
S.Tandon@unido.org