



# Business opportunities in cold-chain development

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Collaborator:



UNIVERSITY OF  
BIRMINGHAM

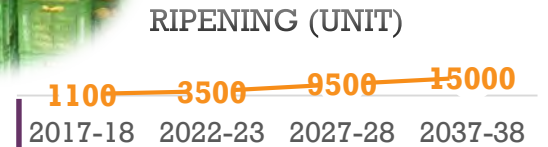
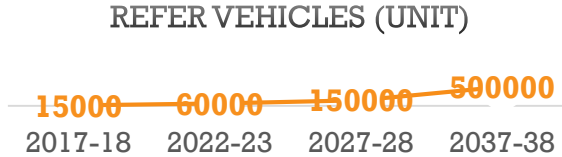
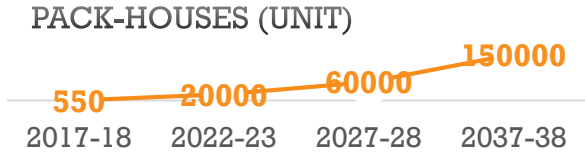
INDIA INSTITUTE

- Government of India's motivation to **double the farmers' income** while taking the farm produce to the market with the right quality and yield - Improved efficiencies in the entire supply chain is critical.
- **Cold-chains** need an essential push through **environmentally benign policies, access to finance and technology innovations** leading to higher holding life for the produce – most importantly benefits to the farmers are most essential!
- MP Ensystems is working with the Shakti Sustainable Energy Foundation (Shakti Foundation) and **University of Birmingham** (and **UKTI**) as a collaborator to promote. **energy efficient and clean cold-chains.**
- Other partners in the project include: Technology providers, Research Institutes, Farmers Producers Organizations, Financing Institutions (NABARD and NABCONS)
- Research project scope includes: Rapid assessment of energy and environmental footprints, Techno-economic assessment, technology vision and assessment of financing and implementation options
- Other activities such as National Cooling Action Plan (NCAP) attempted projecting numbers related to cold-chain use



# Cold-Chain: Demand Projections

Systems-level thinking at the core of this assessment



COLD STORAGE (MILLION MT)



COMMERCIAL REFRIGERATOR (MILLION TR)



DOMESTIC REFRIGERATOR (MILLION UNITS)

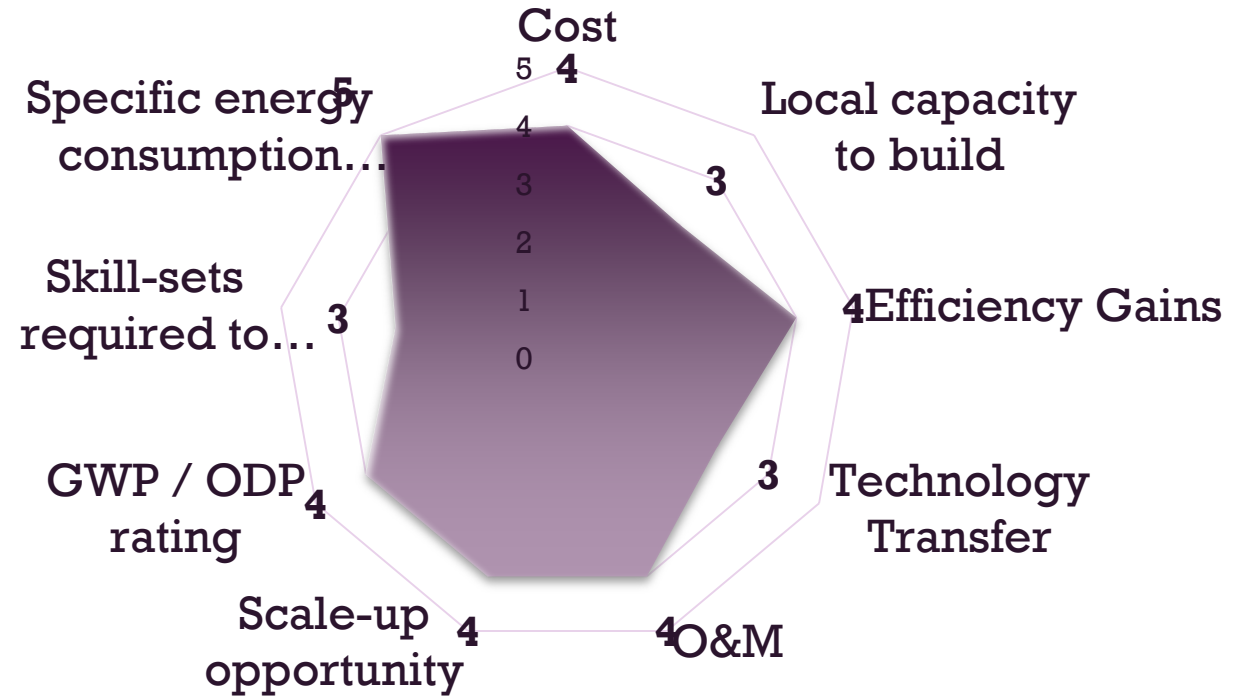


# + Field exploration spread over 4 states in India

- Government (State and National) officials from agriculture, horticulture, electricity, renewable energy , energy efficiency and water resources departments;
- Interviewed small and large farmers' producers' companies and member farmers (primarily fruits and vegetables growers) including women farmers;
- Agri-value-chain start-ups including those run by women entrepreneurs;
- Interactions with Indian and UK technology providers dealing with integrated system designs with a focus of understanding “cooling-as-a-service” through bilateral and deep-dive roundtables
  - Specific Exploration of application of mobile technologies;
- Four leading banks in India providing credit to FPCs, farmers, technology providers; and vii) angel and venture capital fund managers focusing on agri-value-chains

# + Technology assessment

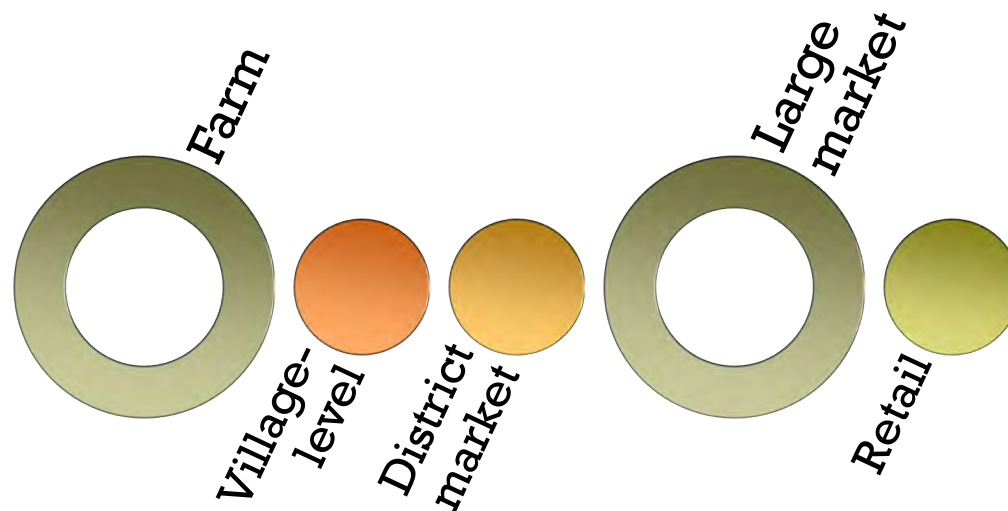
- Suitability (Serves the purpose/ Fit-for-use and fit-for-market)
- Adoptability (Convergence of social, economic and technology)
- Sustainability (Environment, Social, Governance)
- Transition (timelines)



*An example*

# + Technical-social-economic assessment

Carbon impact through the supply-chain and benefits through reduced wastage and connectivity  
*Direct (refrigeration) and indirect (energy-use (focus on thermal))*



## Key attributes:

- Farm-to-the-fork and fork-to-the-farm ~ both approaches important
- Equipment and services (IT-enabled triggers to harvest at right time essential)
- Approach includes improving finance-flow to farmers
- Paradigm shift towards services

Increased Income  
(INR) (farm-gate)

Economic value (INR)

*Farms transforming as agri-businesses*

Mobile money (IT enabled value creations)

*Jointly developed with UoBirmingham*



# Upcoming report

- Drafting and Peer-review process during November 2018 to middle of January 2019
- Launch session planned in India (middle of February 2019) and U. K. (end of February 2019)
- Next steps:
  - Supporting setting-up of Living Labs with Farmers' Producers' Organizations/Companies (FPOs/FPCs)
  - Financing services and equipment businesses – opportunity to leverage funding worth billions of dollars



# Contacts

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