



Cold chain

UK-India centre for sustainable postharvest management and cold-chain

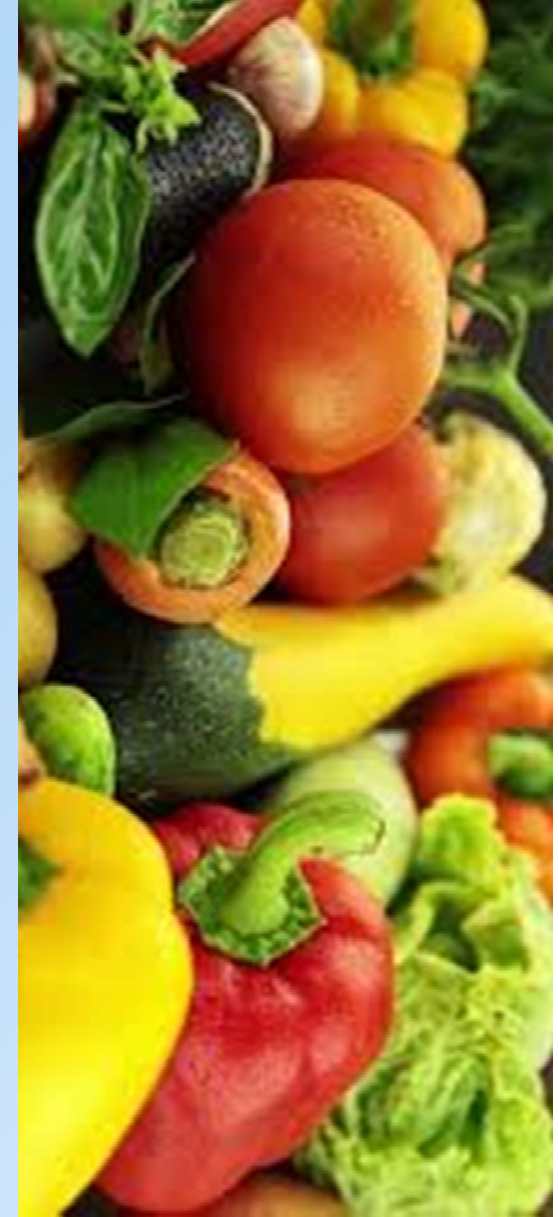
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University

Food industry

- ❄ ~1/3rd of perishable products requires refrigeration
- ❄ 6,300 million tonnes global food production
 - ❄ ~400 million tonnes preserved using refrigeration (in chilled and frozen state)
 - ❄ ~2,000 million tonnes requires refrigerated processing
- ❄ India - less than 4% of the country's fresh produce transported under low-temperature conditions, >90% in the UK
- ❄ 20-30% food loss due to lack of refrigeration (average: 9% in developed countries, 23% in LICs)
- ❄ ~30% food waste in developed nations
- ❄ Food industry about 3% of total electricity (3-3.5% of emissions)



Issues, India

- ❄ Large number of small farms, low income
- ❄ High levels of food loss (~30%)
- ❄ Farmers need to see benefits of cold chain technologies
- ❄ Focus on money and not energy or carbon
- ❄ Often missing links in chain (e.g. pack houses but limited refrigerated transportation)
- ❄ Lack of integrated cold chains and architecture in cold chains (direct connectivity from farm-gate to final markets)
- ❄ Refrigerants, phase down of refrigerants (Montreal and Kigali)
- ❄ Training and skills
- ❄ Standards and regulations (in particular needed by large companies when entering market)
- ❄ Opportunity to by-pass transitional issues that have occurred in other countries
- ❄ But not just to impose solutions which may not be optimal for local conditions

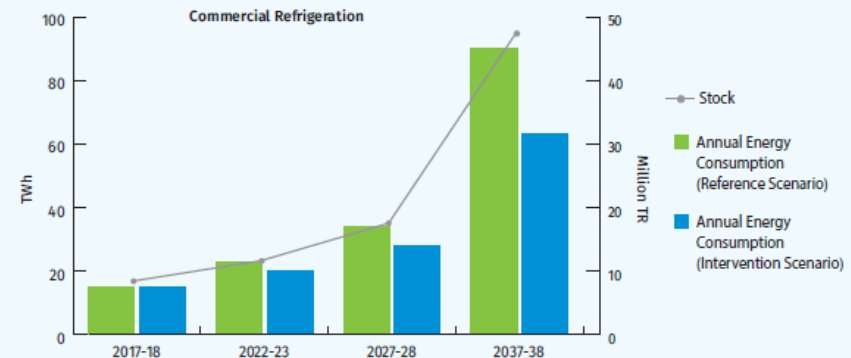
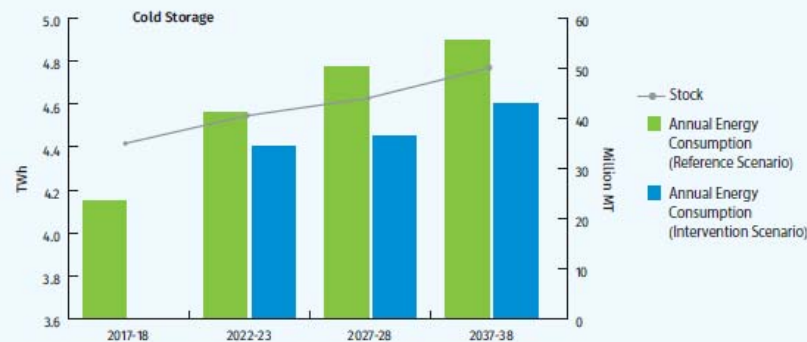
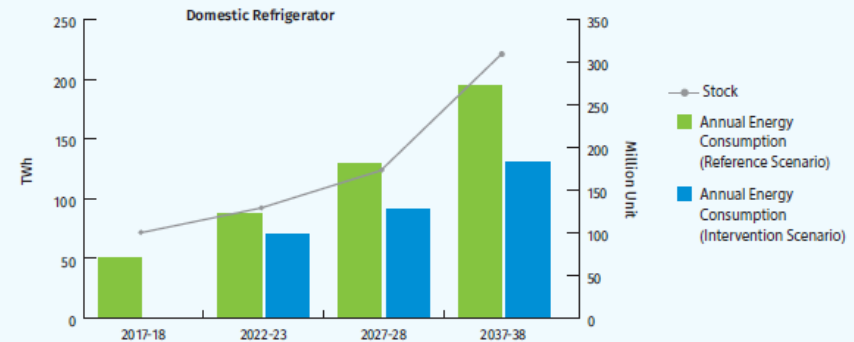
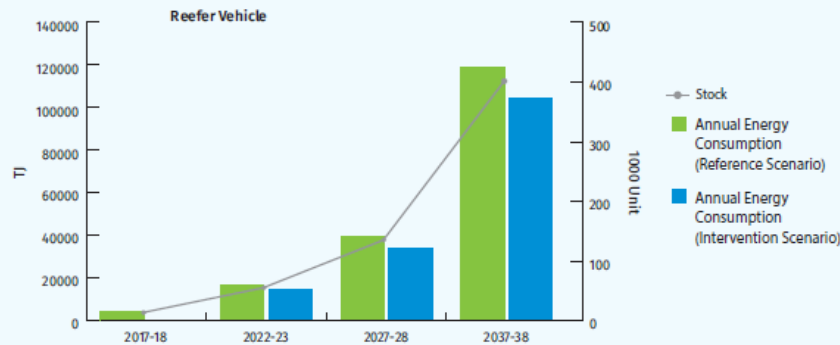
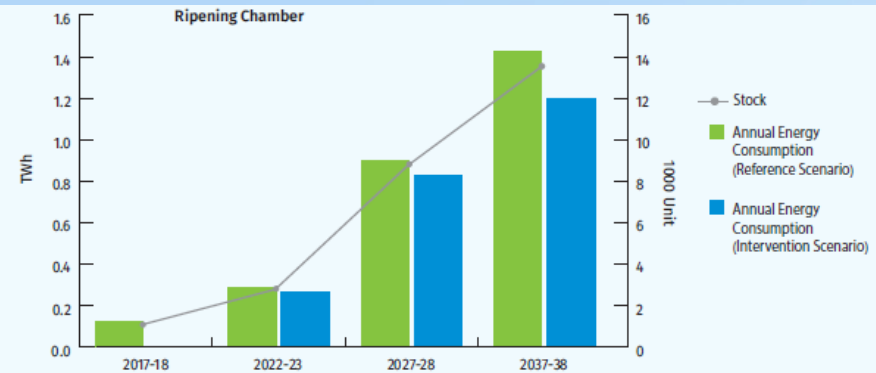
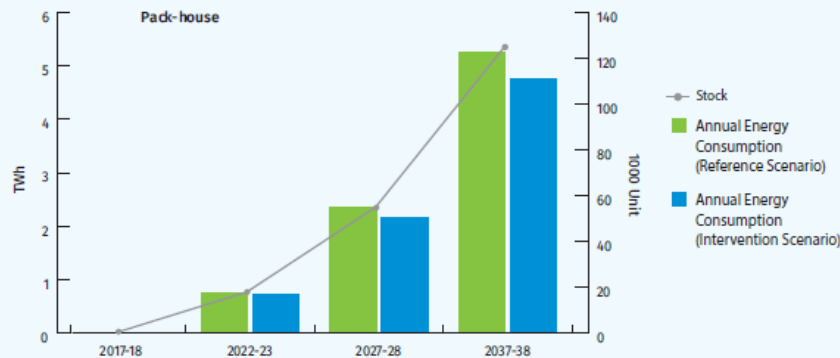


Need for cooling in cold chain, India

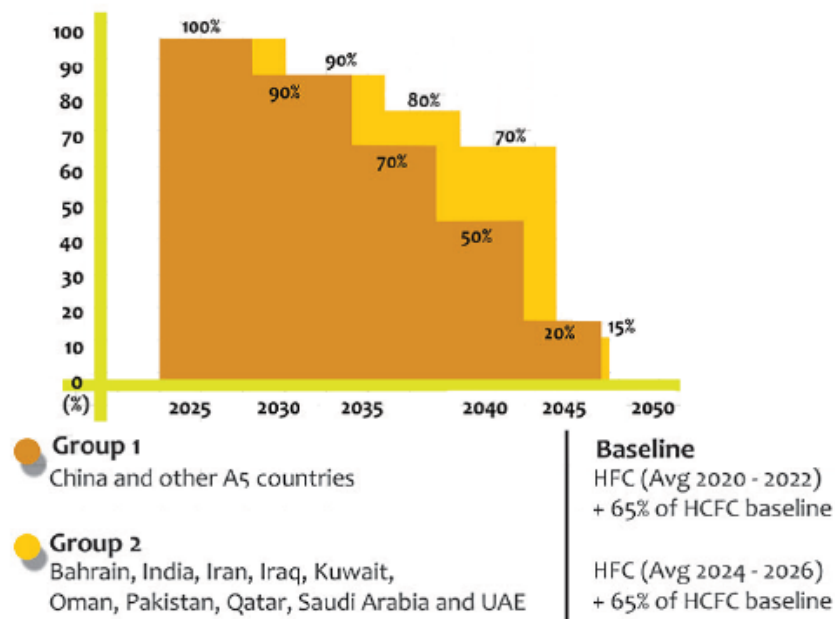
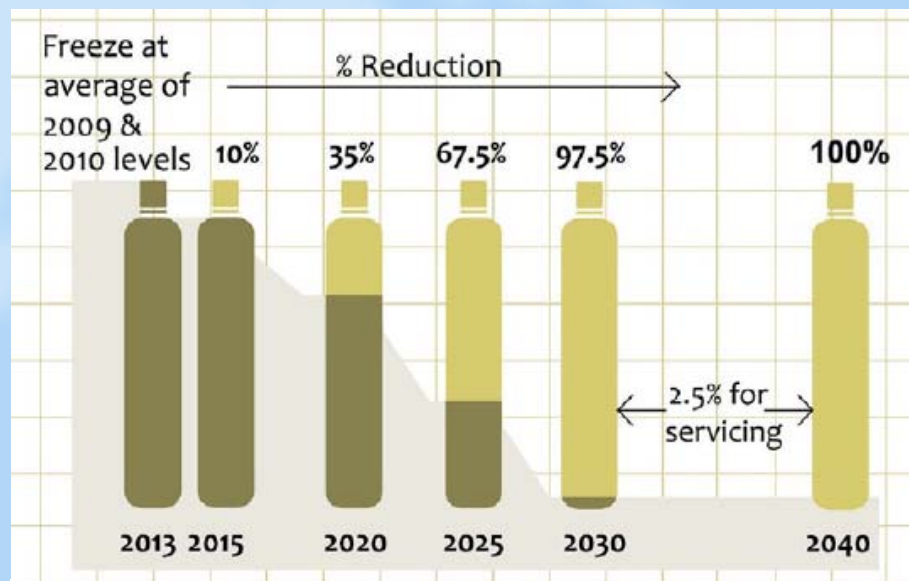
Cold-chain Component	Requirement	Created	Gap
Pack-house (MT)	11,21,274	3,984	97%
Cold storage (Bulk) (MT)	3,41,64,411	31,823,700	9 %
Cold storage (Hub) (MT)	9,36,251		
Reefer transport (MT)	4,94,608	72,000	85%
Ripening chamber (MT)	91,306	8,120	91%

Cold-chain – Current Infrastructure & Gap (NCCD, 2015)

Market growth, India



Refrigerants, India



Montreal Protocol on Substances that Deplete the Ozone Layer: HFC Phase-down Schedule for Article 5 Parties

Kigali Amendment to the Montreal Protocol: HFC Phase-down Schedule for Article 5 Parties

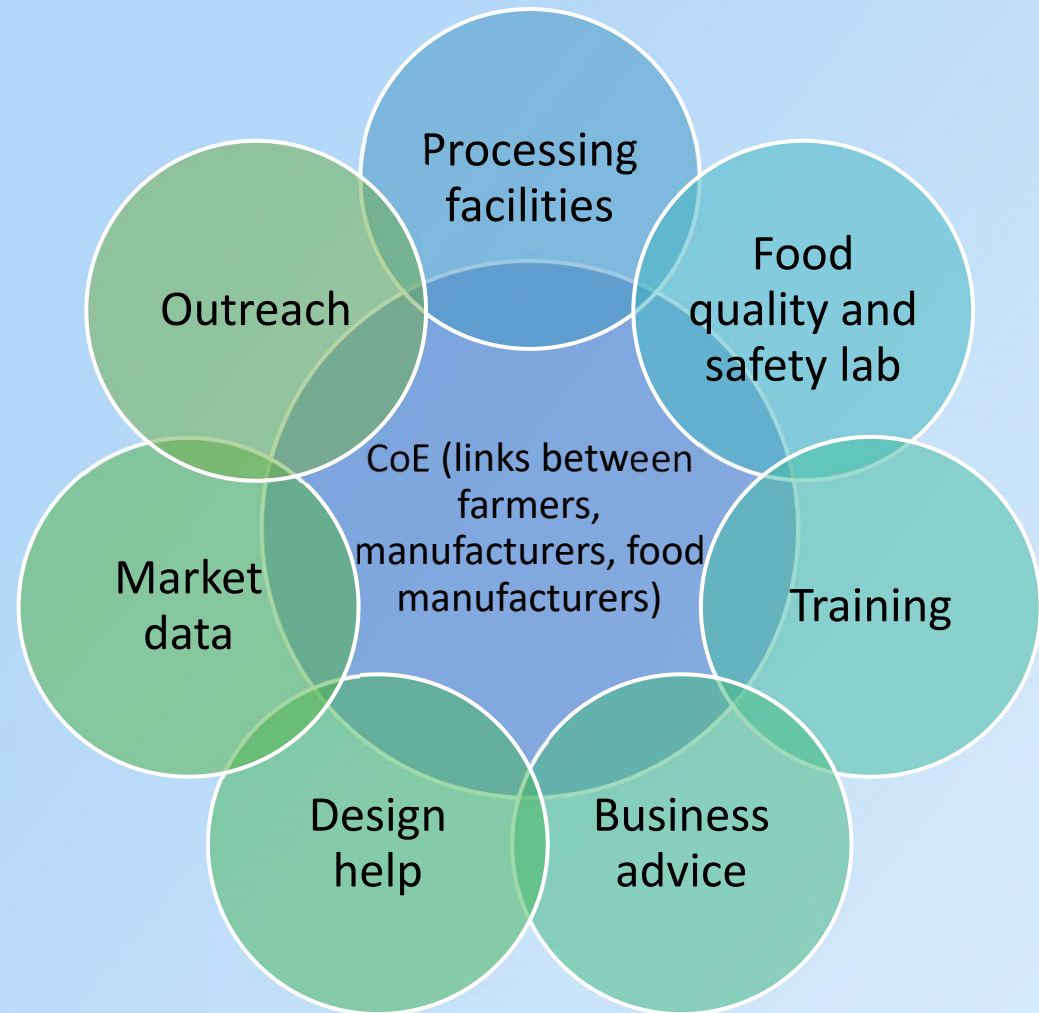
CoE

* Vision:

- * Advice/consultancy
- * Demonstration
- * Design
- * Training
- * Assessment of food quality and safety
- * Business advice
- * Aligned with cultural and local needs

* CoE

- * Fixed centre plus outreach to villages
- * Processing hall
- * Quality/safety lab
- * Training facilities
- * Access to team of experts
- * Business incubator
- * Links between cold chain actors



What needs to be achieved

- ❄ Increase farmers income
- ❄ Provide long term sustainable realistic and practical solutions to cold chain issues
- ❄ Prove the benefits of technologies and processes
- ❄ Improved integration throughout cold chain
- ❄ Develop sustainable business models
- ❄ No increase in carbon or other emissions
- ❄ Move to low GWP refrigerants
- ❄ Optimise use of resources
- ❄ Up skill the cold chain
- ❄ Please discuss involvement in the CoE with us





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