

Enabling An Energy Efficient India

From Vision to Action to Traction



Cold Chain and Refrigeration: Solutions to Achieve Scale

India is predominantly an agrarian country with more than 50% of its people depending directly or indirectly upon agriculture and allied sectors.

But this important and big sector of our economy contributes only 17% to the GDP.

The proportion has declined over the years primarily due to growth in the manufacturing and services sectors but the growth within the agricultural sector hasn't been great either.

Important Role of Government

Ministry for Agriculture
and Farmers' Welfare

Ministry of Food
Processing Industries

Department of Agriculture
Cooperation & Farmers
Welfare

Mission for
Integrated
Development of
Horticulture (MIDH)

Pradhan Mantri Kisan
SAMPADA Yojana

National Centre
for Cold-chain
Development
(NCCD)

**Committee
on Doubling
Farmers'
Income (DFI)**

Integrated
Cold Chain
Availability
Platform

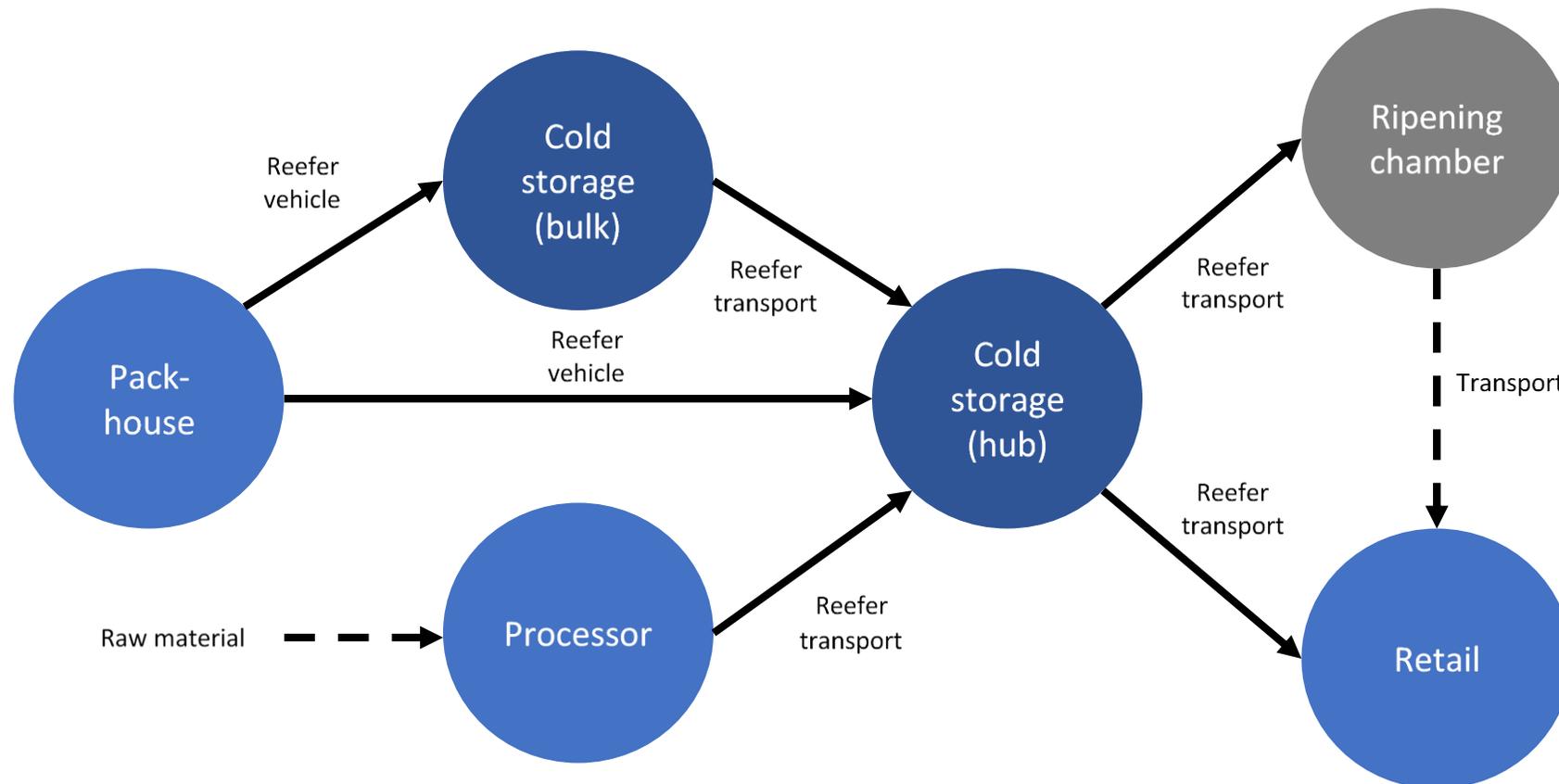
National
Horticulture
Mission
(NHM)

National
Horticulture
Board
(NHB)

Scheme on Cold
Chain, Value Addition
and Preservation
Infrastructure

What is a Cold Chain?

Simply put Cold Chain is the link between the farmers and the retail markets / food processing industries (FPIs) and further between the retail markets / FPIs to the end consumers.



Benefits of an Uninterrupted and Integrated Cold Chain

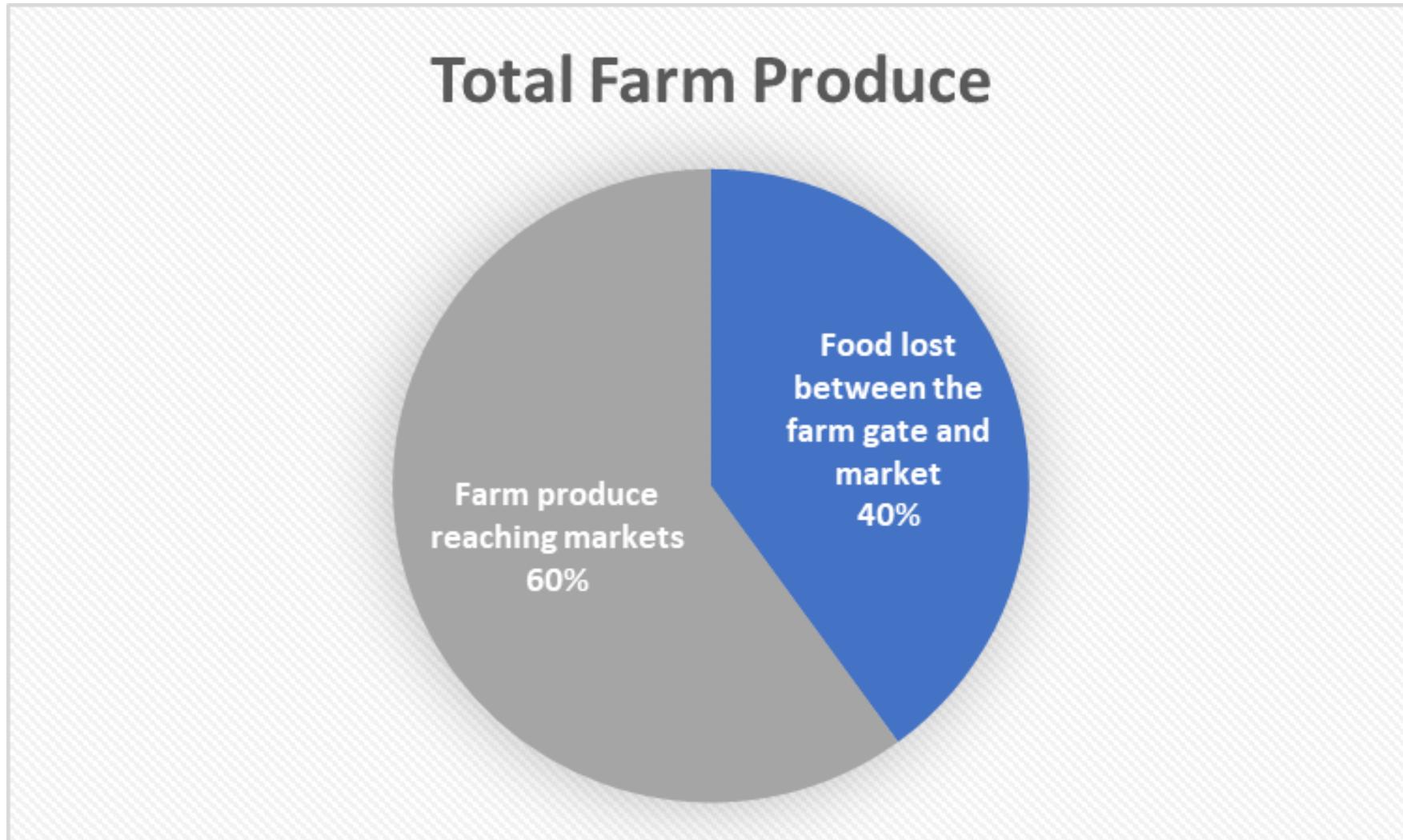
Cold Chain is

- An enabler in giving impetus to the transformation of the Indian agricultural sector, and
- A means of addressing the key issues of the agricultural sector, such as
 - marketability/handling of agricultural produce
 - diversification and modernisation
 - enhancing farmers' earning through value addition
 - strengthening its inter-linkages with food processing industry
 - push to exports of horticulture and processed food items.

Food Loss and Waste: The Silent GHG Emitter



Alarming Food Loss in India: According to various GoI reports



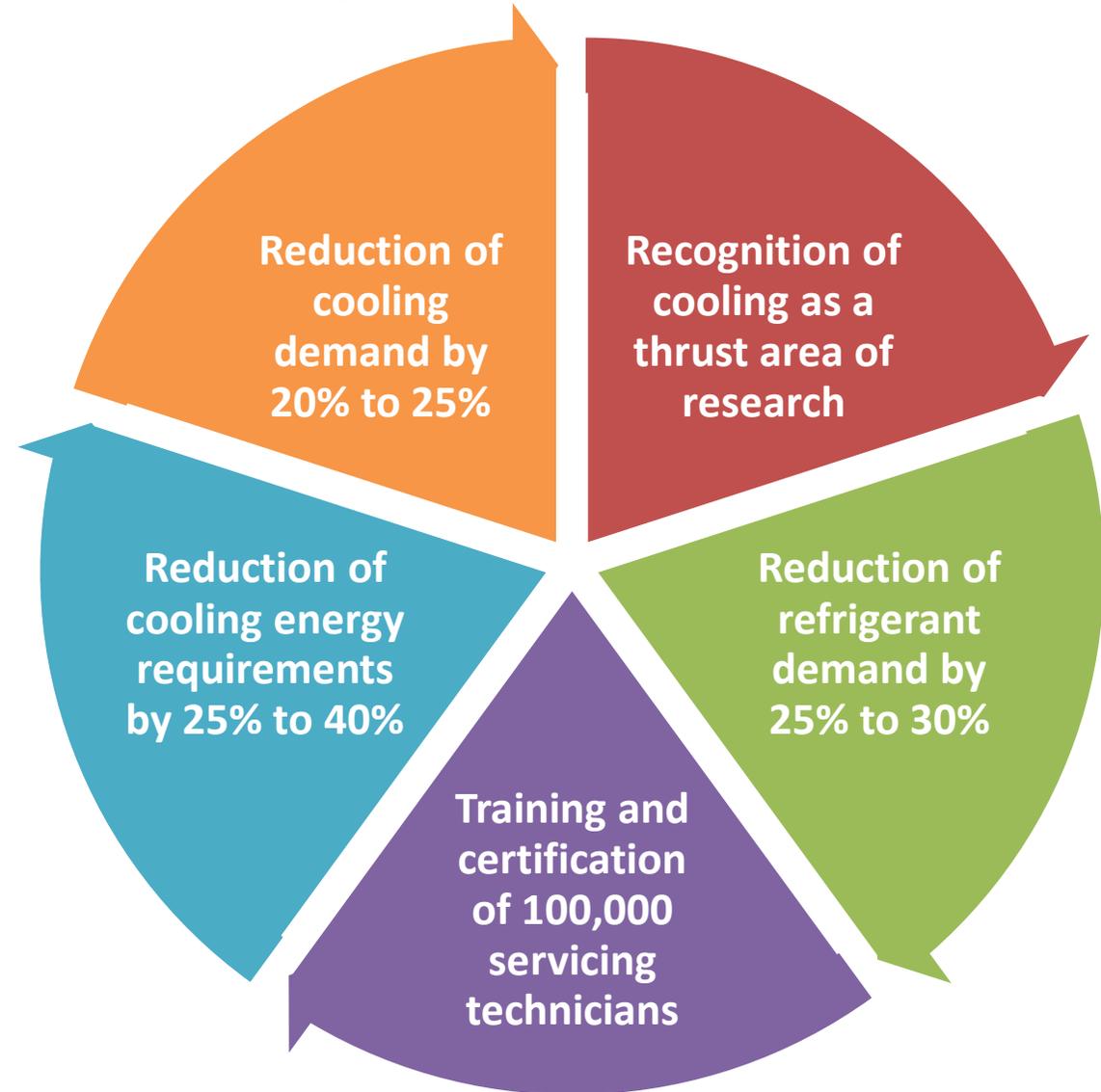
Massive Shortage of Cold Chain infrastructure and associated Investment Opportunity

Infrastructure Component	Shortfall, All-India	Unit Cost (Rs. Lakhs)	Investment (Rs. Crores)
Integrated pack-houses (units)	70,000	95	66,339
Reefer transport (units)	62,000	30	15,848
Cold storage (bulk) (units)	650	400	2,600
Cold storage (hub)(units)	360	350	1,260
Ripening chambers (units)	8,000	40	3,328
Total Investment (Rs. Crores)			89,375

Source: NCCD (2016).

- **Multi-stakeholder effort lead by MoEFCC** – one of its kind initiative of the Govt. of India
- **Lays out 20 year (2017-18 to 2037-38) outlook across sectors** on India's cooling demand, technology options, refrigerant use and energy consumption
- **AEEE lead the work on Space Cooling and the Cold-chain sectors apart from conducting the background analysis, compiling and collating all chapters developed by different Thematic Working Groups**

Key Goals of the ICAP

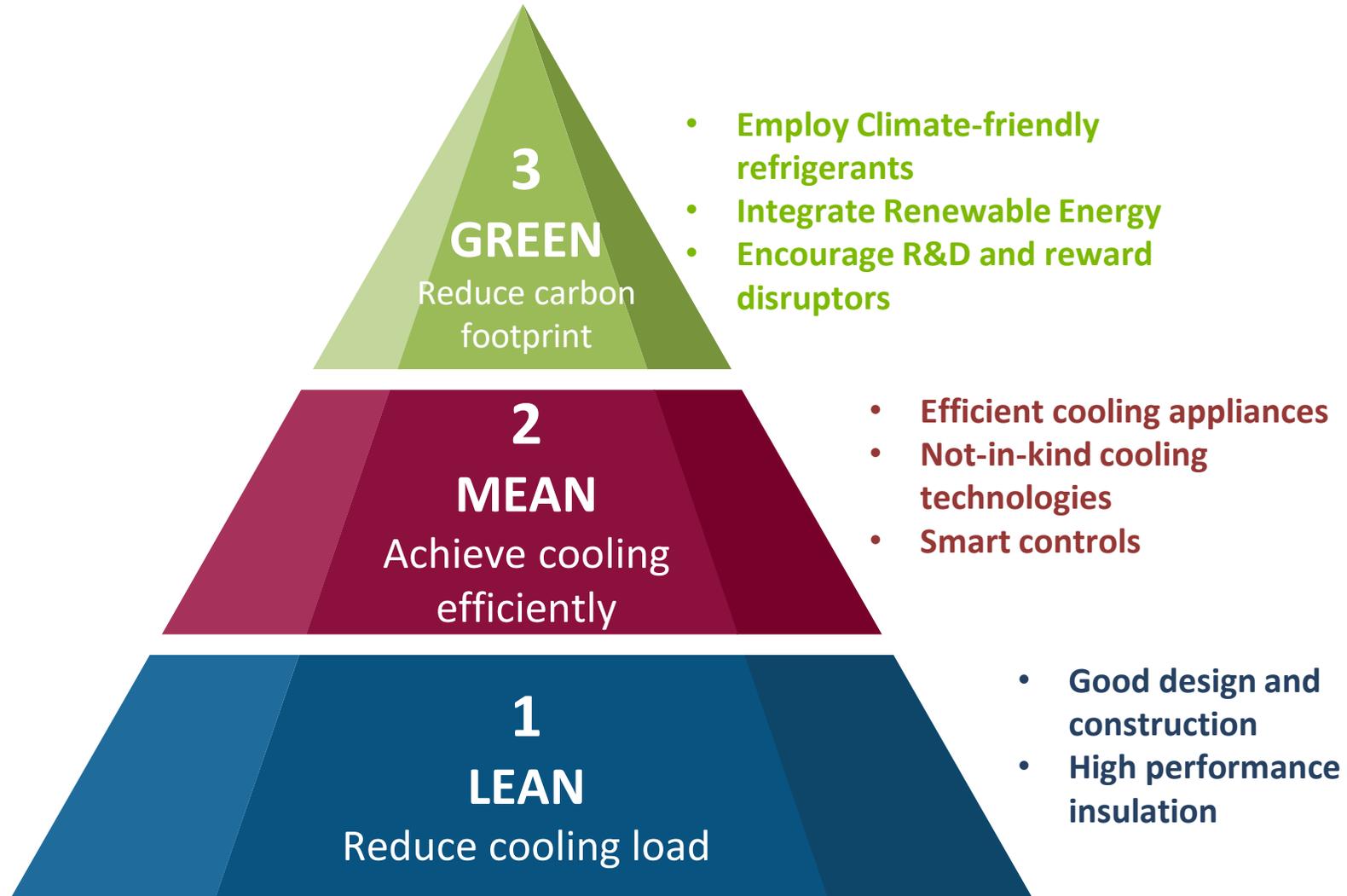


Key findings of the ICAP in the Cold Chain sector

- With around 500 pack-houses in India at present, the number is likely to grow to 55,000 in the next decade and to 1,25,000 in the subsequent decade attributing to an energy consumption of 2.4 TWh in 2028 and 5.2 TWh in 2038 respectively.
- The growth of reefer vehicles is related with increase in the pack-houses, and their estimated numbers will be 1,35,000 units in the next decade and 4,00,000 units in the subsequent decades from the present 15,000 units.
- Cold storages would grow at a marginal rate from the existing 35 Million Metric Tonne (MMT) to 40 MMT in 2028 and to about 48 MMT in 2038.
- There would be a steady growth in ripening chambers from current 1000 units to 9,000 units in the next decade and to 14,000 units in the subsequent decade.

- Encourage **development of cold chain infrastructure with energy efficient cooling systems and low-GWP refrigerants**
- **Development of safety standards for flammable and toxic refrigerants** for cold storage and other segments of the cold chain
- Develop programme for **retrofitting of existing cold storages** to reduce cooling, refrigerant demand and energy consumption
- **Standardisation of all design, construction** and associated specifications for small, medium and large cold-chain infrastructure components.
- **Linking the incentives** being provided for development of cold-chain infrastructure **with adoption of energy-efficient design, construction and maintenance practices and low GWP refrigerant and renewable technologies**
- Provide **specialized training facilities for cold chain professionals and technicians** to promote proper utilization and operation of technology, as well as energy efficiency
- Provide **training to farmers** so that they can better manage their produce both pre-harvest and post-harvest

Suggested Approach: Lean, Mean and Green Strategy



Thank You!

**We would be delighted to take this discussion
onwards.**



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Alliance for an
Energy Efficient
Economy