LODHA

The Embodied Carbon Challenge:

Bridging the Gap Between Decarbonization, Speed, and Scale

Summit on Sustainable Construction
By CWSC, EPFL – Jan 2025

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Energy Transition – What's Different this time?

Demand Driven

- *Failure is fine*
- *Time not a constraint*
- *Prepared - Empty stomach*

Crisis Driven

- *One chance*
- *Relevance of time*
- *Unprepared - Innumerable Constraints*

India's Growth Trend

Speed and Scale

15%

India's contribution to global GDP growth

USD 15k

India's target per capita income by 2047

100 m

Household becoming home ownership capable in coming decade

70%

Urbanization shift: From scattered, owner driven to concentrated, developer led

Optimistic growth path → **inherent risks**

Climate, Energy and **Material** Security to sustain growth

Sustainable Growth or **No Growth**

Climate Action, Decarbonization – Policies and Markets

…and increasing

7-8% in India → **10-15%** in developed economies

REAL ESTATE'S SHARE IN INDIAN GDP

$275-300 Bn

DEVELOPER'S SHARE IN THE REAL ESTATE DEVELOPMENT | **25%**

$70-80 Bn

LISTED AND LEADING UNLISTED DEVELOPERS WITH CAPACITY TO APPLY POLICY | **30%**

$20-25 Bn

Market

CATALYZE

- **Confidence**
- **Business Models**
- **Scale**

Policies and Standards

Market-based solutions can enhance, speed up, and expand the implementation of policies, codes, and standards aimed at decarbonizing the economy.

Urban Chaos: Mumbai

164th out of 241 in Mercer's Liveability Index (2023)

75% housing is of substandard quality

Disregard of common spaces

Long transit times for short distances

Our vision: Palava City

- One of the Top 50 Livable Cities
- Economically Feasible, High Quality and Sustainable Urbanization
- 5-10-15 Minute Walkability Strategy
- Post Occupancy Governance and Civic Upkeep

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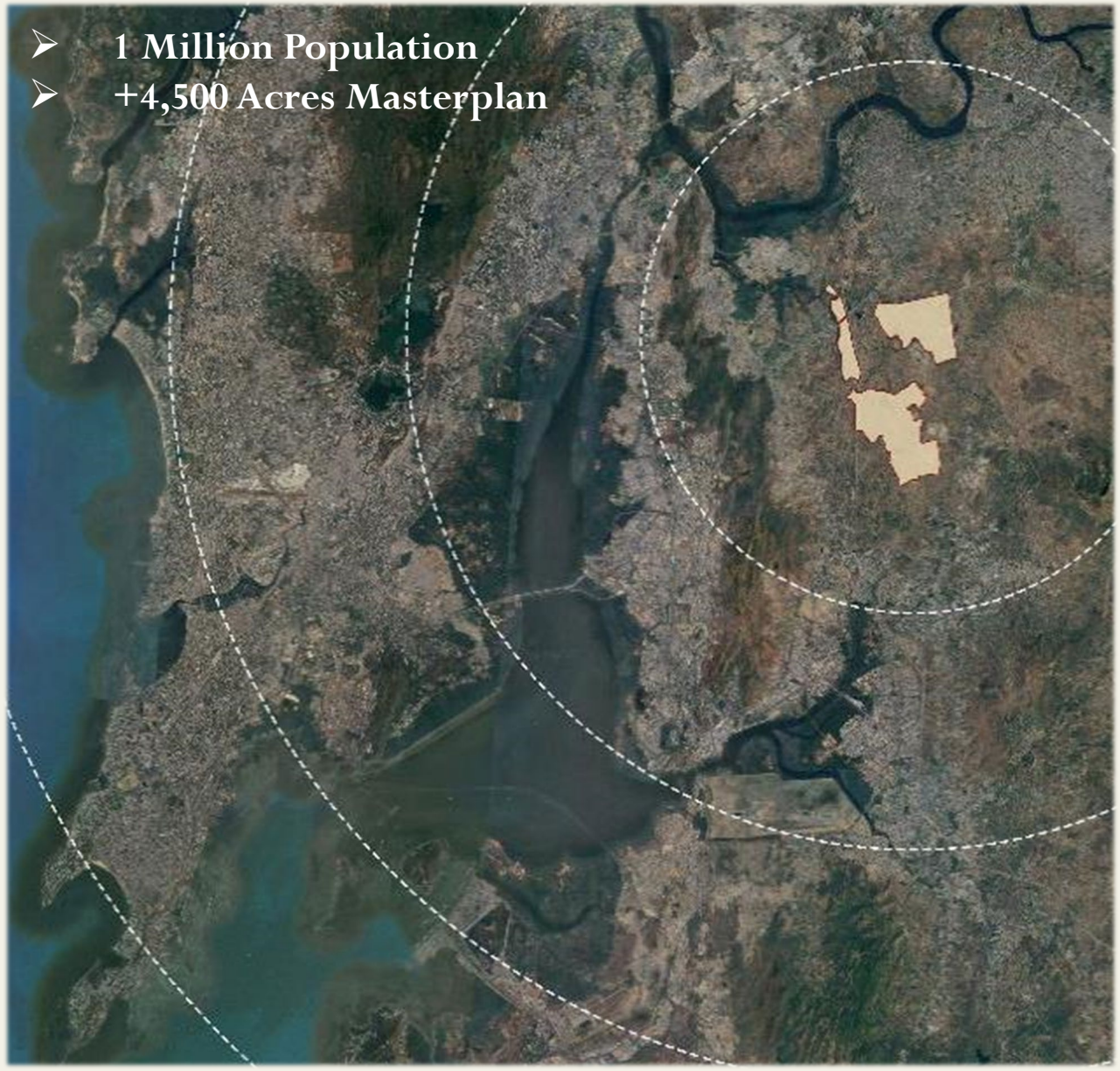

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LODHA

BUILDING A BETTER LIFE

One of India's largest real estate developers, also **pioneering sustainable urbanization** in India, exemplified by **Palava**, our flagship city development

INDIA'S **1st** REAL ESTATE COMPANY WITH SBTI VALIDATED NET ZERO TARGETS

> 50 Mn SQFT OF GREEN CERTIFIED PORTFOLIO

60,000 HOUSEHOLDS TODAY

LODHA FOUNDATION

Purpose: To make a **tangible difference to the goal of enabling India to become a developed economy** (per capita income of US$22,000+ in 2023 terms) by 2047

- **Women**
- **Children & Education**
- **Sustainable Urbanization**
- **Indian Culture**

RMI

ENERGY. TRANSFORMED.

An international think tank focused on **transforming the global energy system to secure a clean, prosperous, zero-carbon future for all.**

700+ EXPERTS AND PROFESSIONALS

FOCUSED ON **4** CRITICAL SECTORS

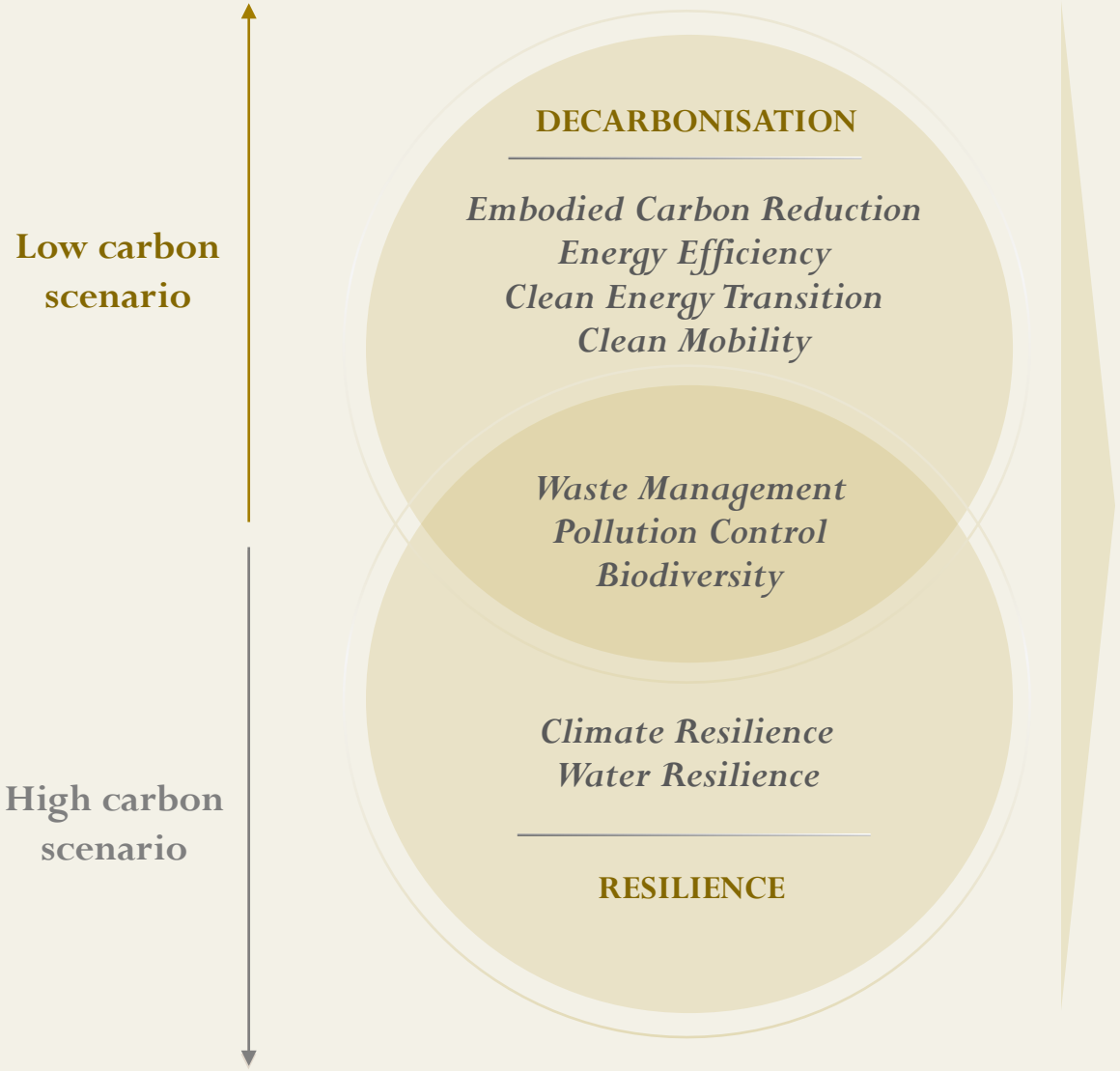
WORKING AND PARTNERING IN **61** COUNTRIES

RMI INDIA FOUNDATION

Mission: To support the **transformation of India's economy into a clean, thriving, and inclusive energy future.**

- **Mobility**
- **Power**
- **Built Environment**
- **Industries**

Introduction to Net Zero Accelerator



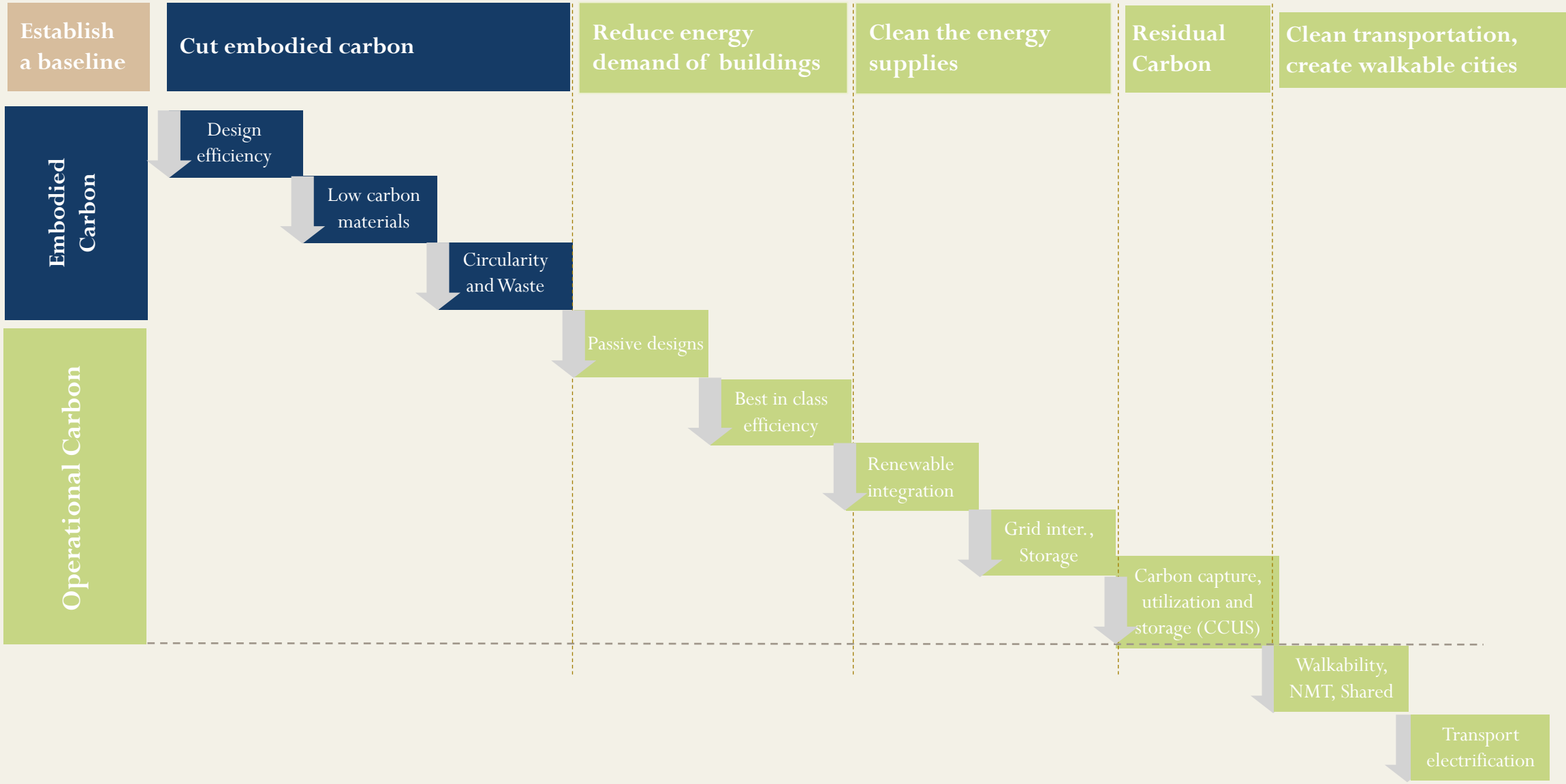
Key objectives

- Conduct research and implementation to drive the urban resilience & decarbonization agenda for the development of "Built Environment" in India
- Lead by example: Enable Lodha to become a global exemplar for sustainable urban development by 2030

LODHA FOUNDATION + RMI INDIA FOUNDATION

PALAVA CITY

Decarbonisation – Steps to Net Zero



The Carbon Stack (SCOPE 3)

	EMBODIED CARBON | 40%	OPERATIONAL ENERGY* | 57%
Baseline Year FY2022	400 kgCO2e/m2	36 kgCO2e/m2 | EUI 41
	Cement and Concrete, 45%-50%	Urban Heat, 20%
	Steel, 15-20%	Building Envelope, 25%
	Aluminum, 10%-15%	Equipment, 35%
	Blocks, Paints, Tiles, 4-5% each	User Behavior, 20%
	Others, 5-10%	Renewable energy Integration
Target FY2030	290 kgCO2e/m2 (-30%)	20 kgCO2e/m2 (-60%) | EUI 25

50% REDUCTION

SCIENCE BASED TARGETS

* Indicative segregation of potential impact by factors contributing to operation energy demand

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Net Zero Accelerator – Embodied Carbon Reduction Effort

Cement and Concrete 45%-50%	Steel 15-20%	Aluminum 15%-20%	Blocks, Paints, Tiles 4-5% each	Others 5-10%
Resource-efficient designs (Right-sizing)	Benchmarking (cost, quality, carbon)	Optimise window sections (plus thermal performance)	Thermal performance plus EC reduction potential	Design innovative incentive mechanisms and business models
Greener concrete mixes (GGBS, LC3, etc.) – Global Concrete Challenge	Increased recycled steel content	Supply chain fragmentation and decarb. potential	Bio-based alternatives – TRL and FRL	Supplier engagement & Awareness creation – for data and decarbonization
Codal comparison (permissible use of SCMs)	Increased durability	Enhanced procurement criteria (increased scrap, RE integration, etc.)	Lifecycle comparison of solvent-based and water-based paints	
De-materialisation (novel technologies)	Light-weighting (use of high-strength steel)	Aluminum quality wrt to scrap quality	Kiln electrification, heat recovery and tile re-dimensioning	
Efficient waste management	Use of Glass-fibre rebar	Aluminum circularity	Supply chain defragmentation	
Applicability & Market readiness (AI, CCUS, etc.)		Lifecycle comparison with alternatives		
35% › 60%	30% › 75%	20% › 60%	20% › 50%	

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Ingenuity Under Constraints: *Lessons from Crisis*

Apollo 13: When failure in not an option

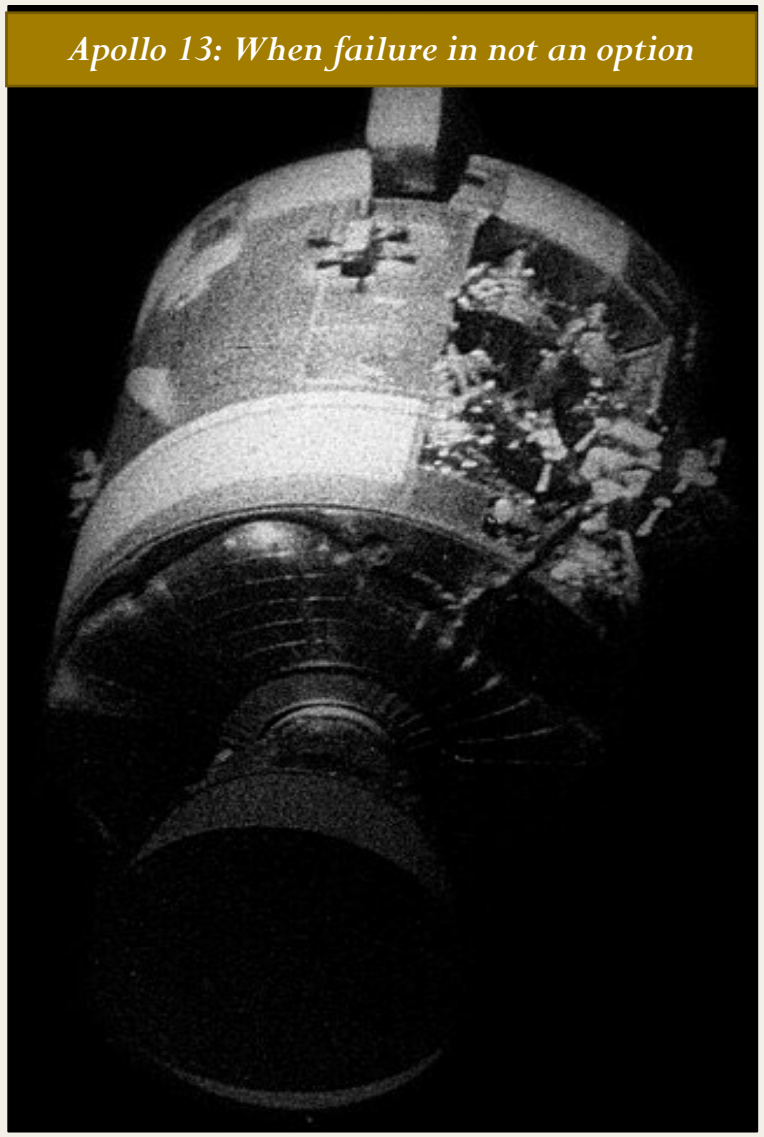

Photo: World's largest snowball: Guiness Book Website

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Thank You!

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