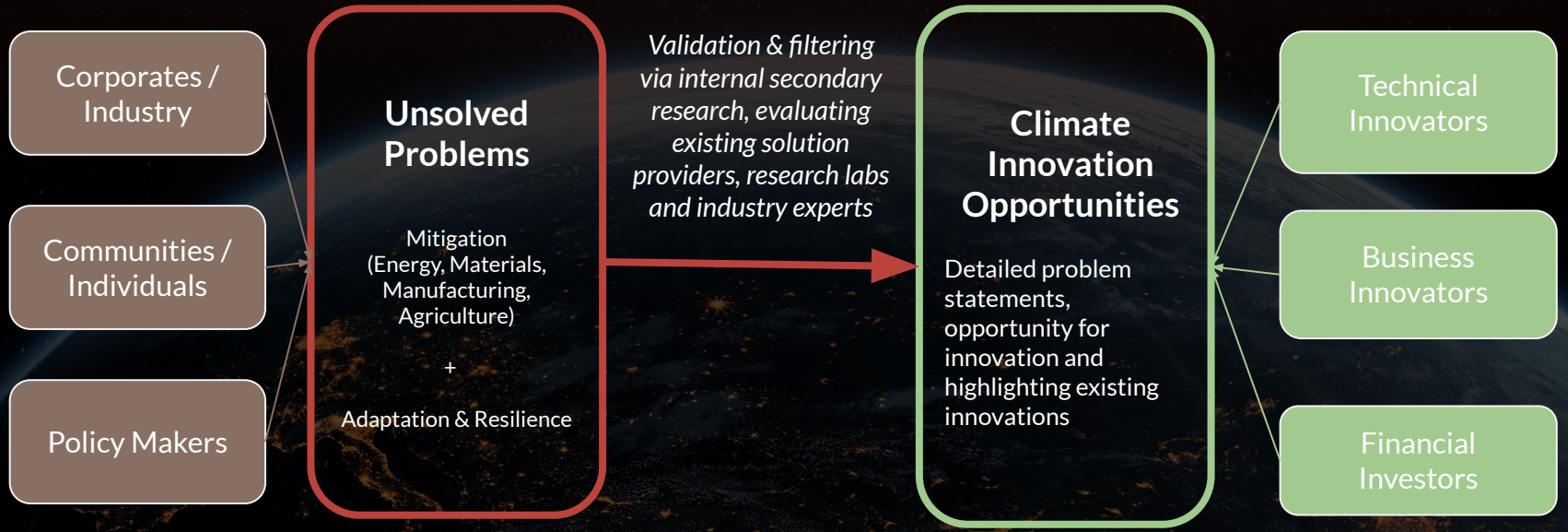
METHODOLOGY

PRAGATI EARTH | CLIMATE INNOVATION COMPASS

A problem-led approach to identify innovation opportunities



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Opportunity Statement Selection Criteria

Market Attractiveness & Readiness	Estimated Economic Potential (Using market size, savings and growth) Understanding customer needs, profile and adoption urgency Estimated Adoption Readiness Level (modified DoE framework)
Impact Potential	Environmental & Social Impact Potential: **Mitigation**: Estimated Greenhouse Gas emissions in India, CO_2 equivalent, does not include particulate matter or other non Kyoto Protocol gases in the estimates. **Adaptation:** Climate Vulnerability Score to assess adaptation impact
Need for Innovation	**Blue Ocean:** Mapping presence of incumbents and startups based on geography and scale to identify whether the problem needs additional players to solve **Scope for Innovation:** Mapping if the problem can be solved by innovation (science breakthrough or engineering or business or financial) or relies only on policy and capital deployment

All estimates are directional and intended for opportunity prioritization rather than precise market forecasting.

Sources include industry interviews, published literature, startup ecosystem mapping, market reports, and expert consultations.

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Proposed Modified Adoption Readiness Level (ARL)

ARL Parameters	Low	High
Economic Switching Cost	Existing solutions are heavily subsidized or too cheap to replace (e.g. coal in some states, heavily subsidized electricity use for irrigation)	The cost of status quo is rising rapidly (e.g. high DSM penalties for grid deviation)
Regulatory and Policy Force	The problem is recognized by scientist, but there is no regulation, or penalty for ignoring it (e.g. Methane leaks with no fines)	Legal mandate or compliance risk for the industry (eg. CCTS, CBAM, DSM, ZLD, etc.)
Infrastructure Readiness	Large-scale new physical or digital infrastructure is required before deployment becomes viable at scale (e.g. Hydrogen pipeline for India for transport fuel)	The problem can be solved by a plug-and-play or drop-in solutions (e.g. retrofitting existing industrial boilers, drop-in fuel substitute)
Value-chain Consensus	The bottleneck is not yet widely recognized across the value chain (e.g., if in the electricity sector - utility or IPP doesn't see it as a priority)	All stakeholders recognize the issue as a major operational or strategic bottleneck (e.g., Grid Interia seen as a problem for investors, regulators, and utilities)

Using the existing ARL framework from DOE:OTT with 17 metrics, we have selected and modified 4 relevant ones to identify market pull potential.

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Adaptation Impact Metric

Based on the IPCC Framework for Climate Risk Assessment, to gauge how severe is the problem.

HAZARD	EXPOSURE	SENSITIVITY	ADAPTIVE CAPACITY
How frequent, intense, or severe is the climate event or stress?	How many people, livelihoods, or physical assets are in the path of the climate hazard?	How seriously does the event disrupt health, income, infrastructure, or daily life?	How well can people or systems anticipate, absorb, and cope with the impact?

Vulnerability = Sensitivity / Adaptive Capacity

Adaptation Risk = Hazard × Exposure × Vulnerability

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How scoring works?

Each driver is scored as “Low”, “Medium”, or “High”, then combined into one comparable adaptation risk score. These are combined into a single risk score, so very different problems (like slow-building heat stress and sudden floods) can be compared for Climate Risk and ranked on the same scale.

For each problem statement, assess the five drivers individually, then combine them to compare adaptation needs across sectors, geographies, and user groups.

Eg: **Problem Statement - Tourism sector in climate-vulnerable states**

Hazard	High	3
Exposure	High	3
Sensitivity	HIgh	3
Adaptive Capacity	Medium	2

ARI = 3*3*(3/2) = 13.5

Low Score: 1

→ Hazard: The event is less frequent, localised, with a good threshold to impact.

→ Exposure: is limited or broadly distributed.

→Sensitivity: Harm is contained, manageable and near-term with quick recovery.

→ Adaptive Capacity: Coping Capacity is weak, inaccessible, or insufficient.

Medium Score: 2

→ Hazard: The event is recurring, worsening periodically, with stress beginning to show impact.

→ Exposure: is medium, with some concentration in affected groups or targets.

→ Sensitivity: Harm is significant, recovery needs aid and adjacent systems are stressed such as health, daily life, income, or operations.

→ Adaptive Capacity: Coping capacity exists but is partial, uneven, or under strain.

High Score: 3

→ Hazard: The event frequency is high, chronic in nature, with severe impact.

→ Exposure: is widespread or heavily concentrated across affected target segment.

→ Sensitivity: Chronic or Immediate Harm with low recovery. Multiple systems collapse affecting livelihoods, health, infrastructure, or ecosystems.

→ Adaptive Capacity: Existing coping mechanisms or buffers are in place and easily accessible.

Note: The adaptive capacity is scored in reverse as it is inversely proportional to Risk.