



**ENhanced understanding of Trade Impacts
on Climate, industries, and the Environment**

*29th Annual Conference on Global
Economic Analysis, Kyoto (17-19 June 2026)*

**Environmental implications of
protectionist trade policies:
mapping channels and advancing
analytical capacity**

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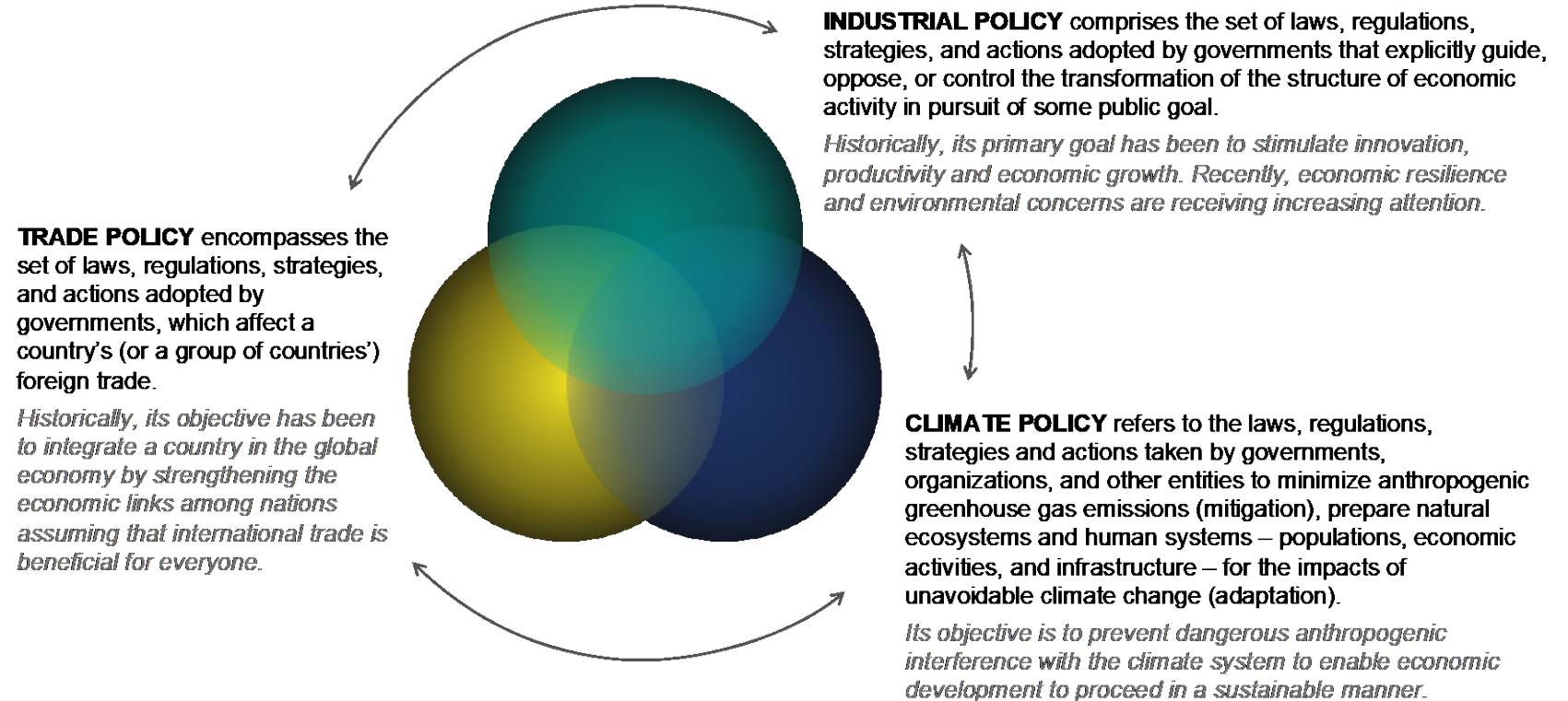
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State Secretariat for Education,
Research and Innovation SERI

- Global economic governance: decades of liberalisation → domestic competitiveness & autonomy
- **Policy shifts:** US IRA, EU CBAM, industrial subsidies target clean technologies but restrict trade.
- **Risk:** Weaken international collaboration, distort markets, override global climate commitments





Objective 1 | Integrate the direct and indirect channels through which trade affects environmental outcomes into a unified framework

Objective 2 | Evaluate the capabilities and gaps of existing analytical frameworks to assess evolving trade regimes

Objective 3 | Provide methodological recommendations to improve empirical and economy-wide modeling assessments

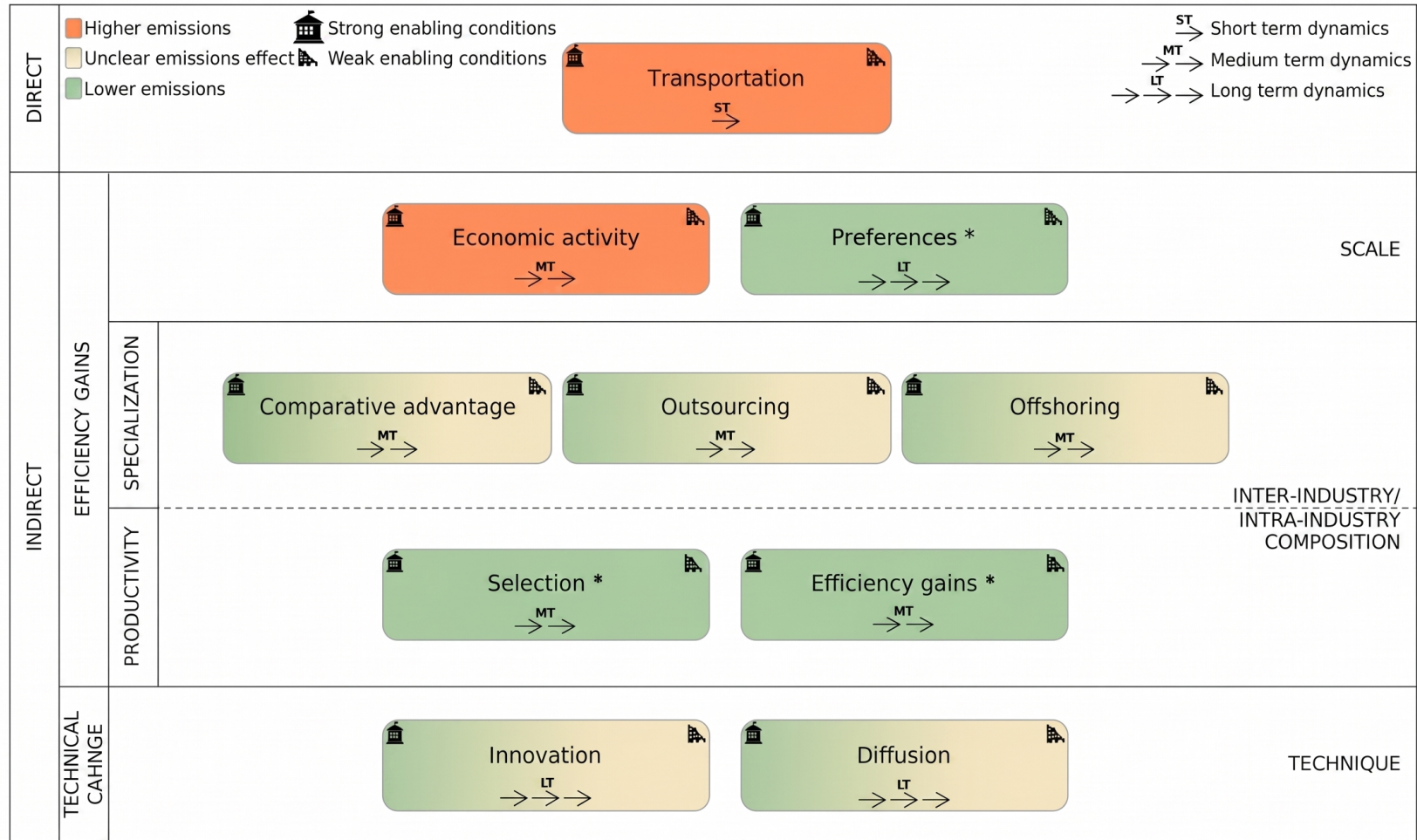


Disentangling trade-emissions channels

Direct Effects (**Transport**): International aviation and shipping drive roughly 3% of global fossil CO₂ emissions; shifting trade patterns directly impact these volumes and routes.

Indirect Effects (**Scale & Composition**): Trade expansion increases resource demand (scale effect), while inter-industry dynamics can lead to the offshoring of emissions-intensive sectors, driven by the Pollution Haven Hypothesis.

Indirect Effects (**Technique**): Trade induces firm-level efficiency gains (intra-industry composition) and fosters technological change through innovation and cross-border knowledge diffusion.



Regulatory Frameworks

- Asymmetries in environmental rules: carbon leakage
- Coordinated mechanisms (climate clubs or CBAMs): aligning competitiveness & decarbonisation.

Institutional Quality

- Weak institutions: limited absorptive capacity for green tech
- Lock-into carbon-intensive paths (regardless of openness)

Stakeholder Influence

Political calculations dictate whether protectionism strategically builds clean local supply chains or simply entrenches carbon-intensive incumbents.



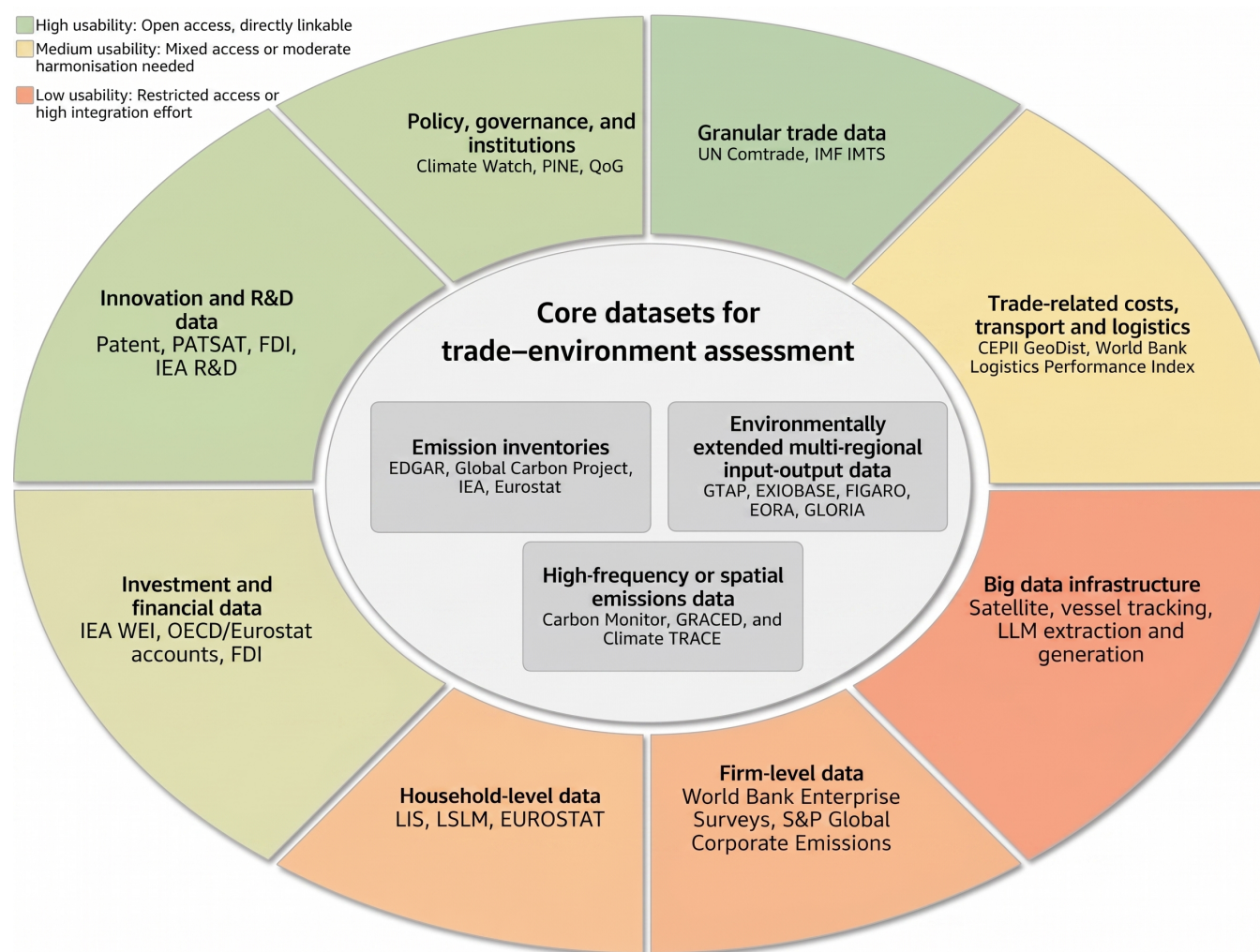
Bridging the analytical gap: data needs



- Current macroeconomic datasets struggle to trace emissions within complex global value chains
- They also struggle to trace critical raw materials accurately.
- EEIO tables often rely on proportional linking, failing to capture specific transport modes, logistics efficiencies, and trade-related costs.
- There is a critical need to integrate firm-level heterogeneity, foreign direct **investment** (FDI) **data**, and household-level **microdata** to evaluate distributional climate impacts.



Bridging the analytical gap: existing datasets & assessments





Bridging the analytical gap: advancing economy-wide modelling



Trade theory

- Typically relying on "Armington" elasticities
- Missing firm heterogeneity and market structures endogeneity

Value chains

- Needing explicit representation of MNCs to capture "tariff-jumping" and spatial reconfiguration of supply chains under protectionism

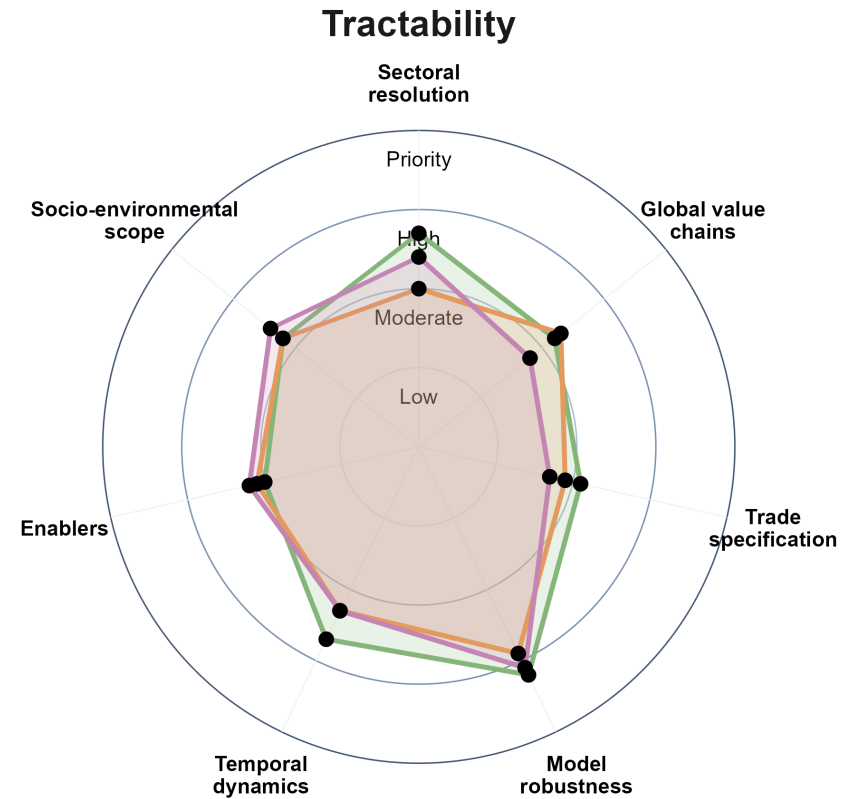
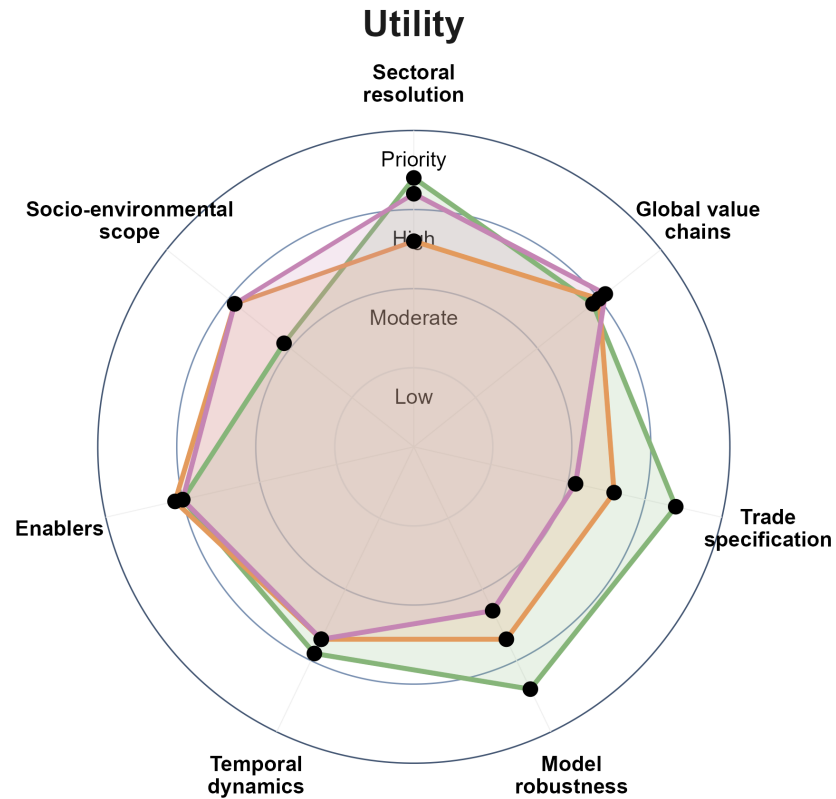
Temp-sectoral depth

- Smoothing out short-term disruptions
- Missing endogenous innovation
- Lacking resolution for critical minerals and clean-tech manufacturing





Bridging the analytical gap: model utility vs. tractability



Perspective Researchers International decision-makers Domestic decision-makers



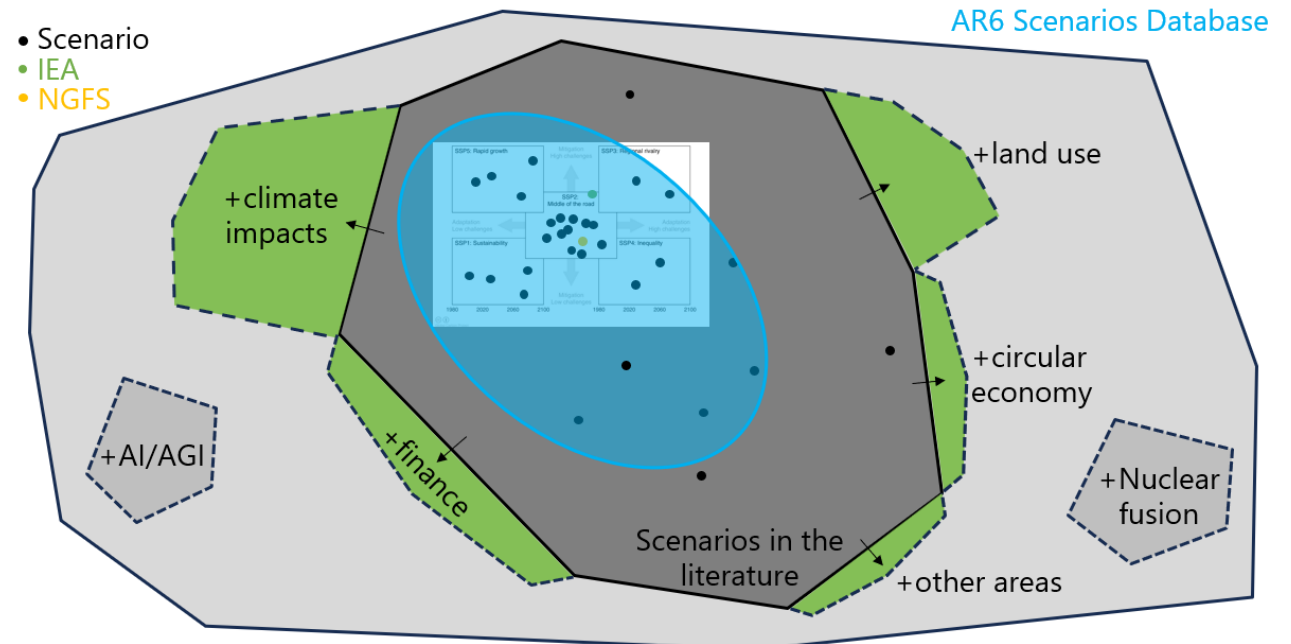
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Bridging the analytical gap: expanding the scenario space

Mainstream scenarios lack explicit treatment of **geopolitical fragmentation** and **abrupt trade policy shifts**

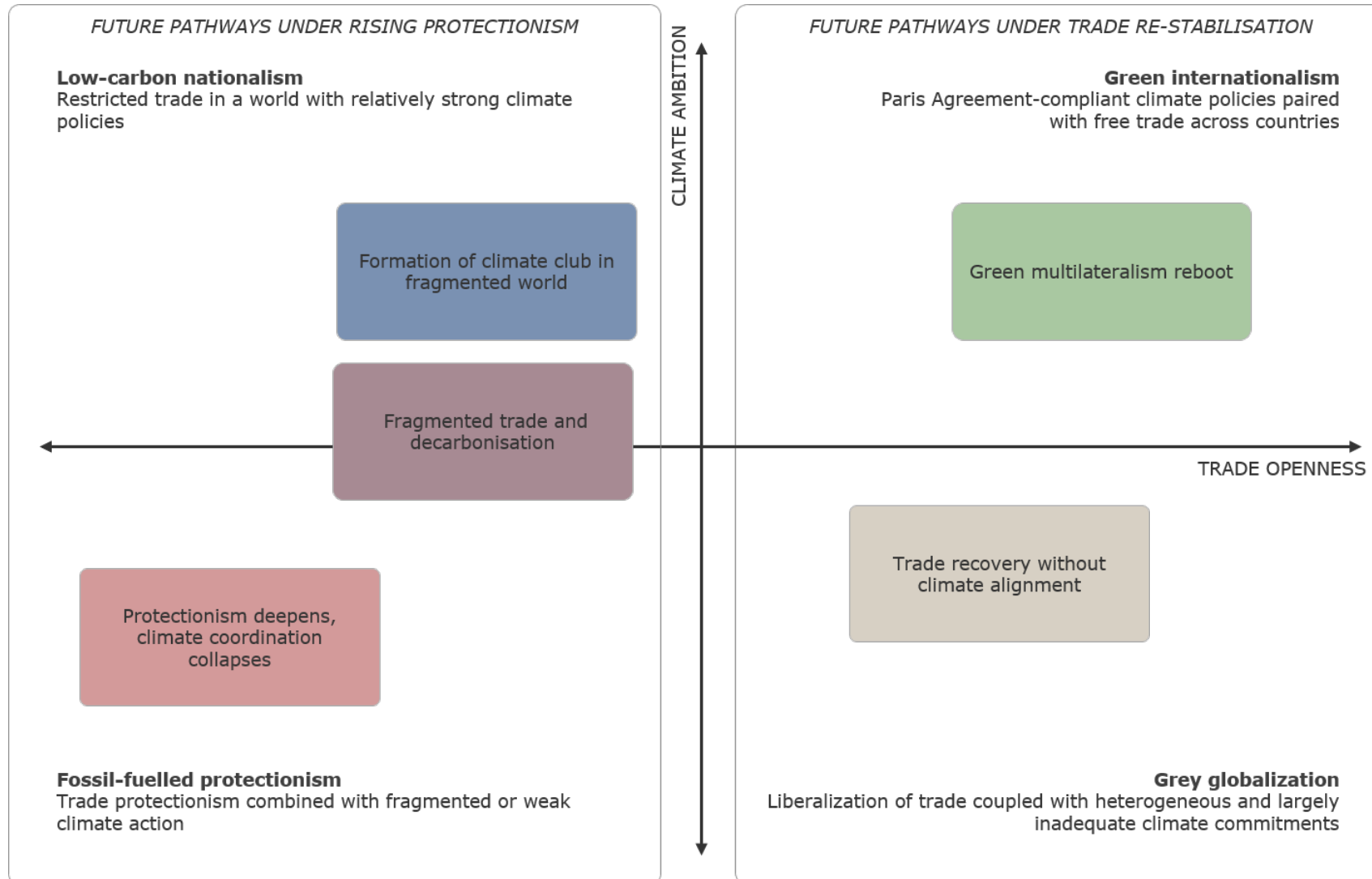
While trade barriers are implicitly considered in narratives of frameworks like SSP3 ('regional rivalry'), scenarios must better **reflect today's paradigm shift** toward targeted industrial policy

Moving **away from deterministic trajectories** toward conditional framing allows for robust testing of first-order trade dimensions





Bridging the analytical gap: a novel scenario framework



Bridging the analytical gap: distributional & spatial integration

The effects of trade-climate policies are highly asymmetric across demographics and geographies.

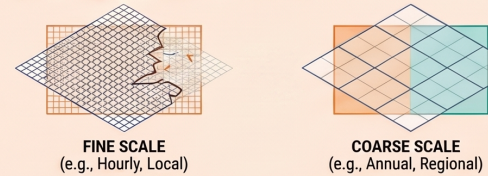
Protectionist measures (e.g., tariffs on energy vs. solar tech) impact low- and high-income groups unevenly, requiring detailed multi-household structures.

Spatial granularity is required to map where environmental pressures and industrial reshoring actually occur.

The Architecture of Model Linking: Bridging Energy and Climate Assessments

Technical & Conceptual Hurdles

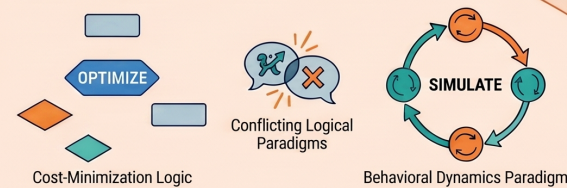
• Spatiotemporal Resolution Mismatches



• Variable Definition Inconsistency



• Epistemological Conflicts



The Best Practice Checklist

• Prioritize Harmonization

- Models often differ to cultural energy and condonation
- Identically named variables in enorre relatate co vonocsmts and homose.s.xnnes
- Different models embody Agree on common drivers to consistency across linked Assumptions

• Implement Standardized Interfaces

API & AUTOMATED DATA TEMPLATES

Reduce Manual Errors, Increase Transparency

• Dedicated Interpretation Stage

MODEL COMPROMISE EVALUATION

Explicitly evaluate effects on final results before policy sharing

KEY RECOMMENDATIONS SUMMARY

Consideration Area	Key Recommendation
Scaling	Prioritize linking models with similar spatial/temporal granularity when possible
Harmonization	Create a full mapping of assumptions to ensure consistency across the linked system
Interpretation	Document the linking process to clarify how emergent properties should be understood



No Simple Symmetry: Protectionism does not simply mirror the inverse of trade liberalisation; its climate impacts depend heavily on path-dependent enablers and institutional capacity.

Sectoral Disaggregation: The modeling community must prioritise data harmonisation for critical minerals and energy-transition supply chains.

Future Agenda: Research must clarify the conditions under which protectionist policies yield climate-positive outcomes versus when they stifle global transition efforts.





Thank you!

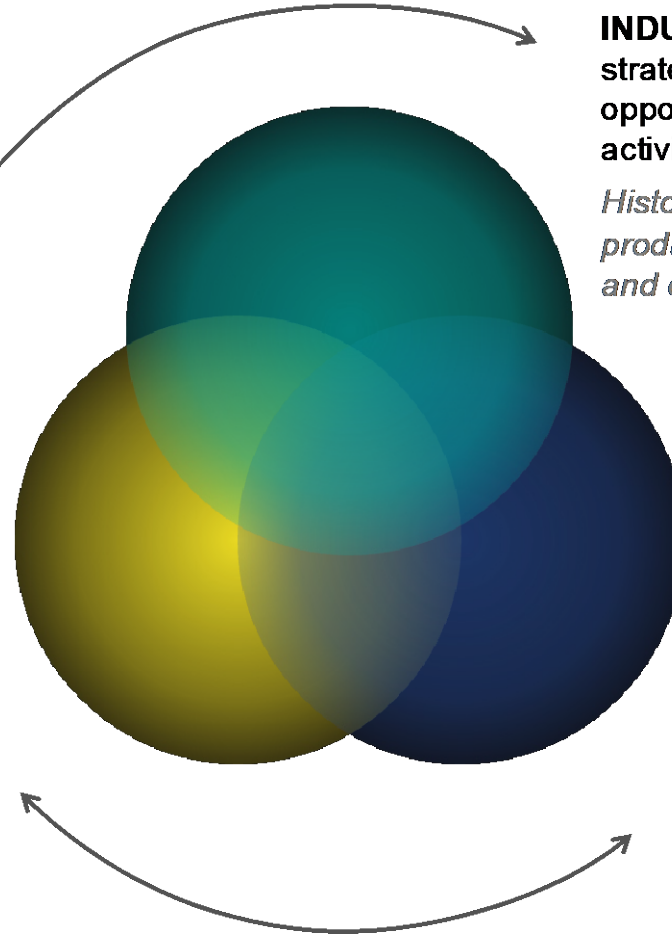
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TRADE POLICY encompasses the set of laws, regulations, strategies, and actions adopted by governments, which affect a country's (or a group of countries') foreign trade.

Historically, its objective has been to integrate a country in the global economy by strengthening the economic links among nations assuming that international trade is beneficial for everyone.



INDUSTRIAL POLICY comprises the set of laws, regulations, strategies, and actions adopted by governments that explicitly guide, oppose, or control the transformation of the structure of economic activity in pursuit of some public goal.

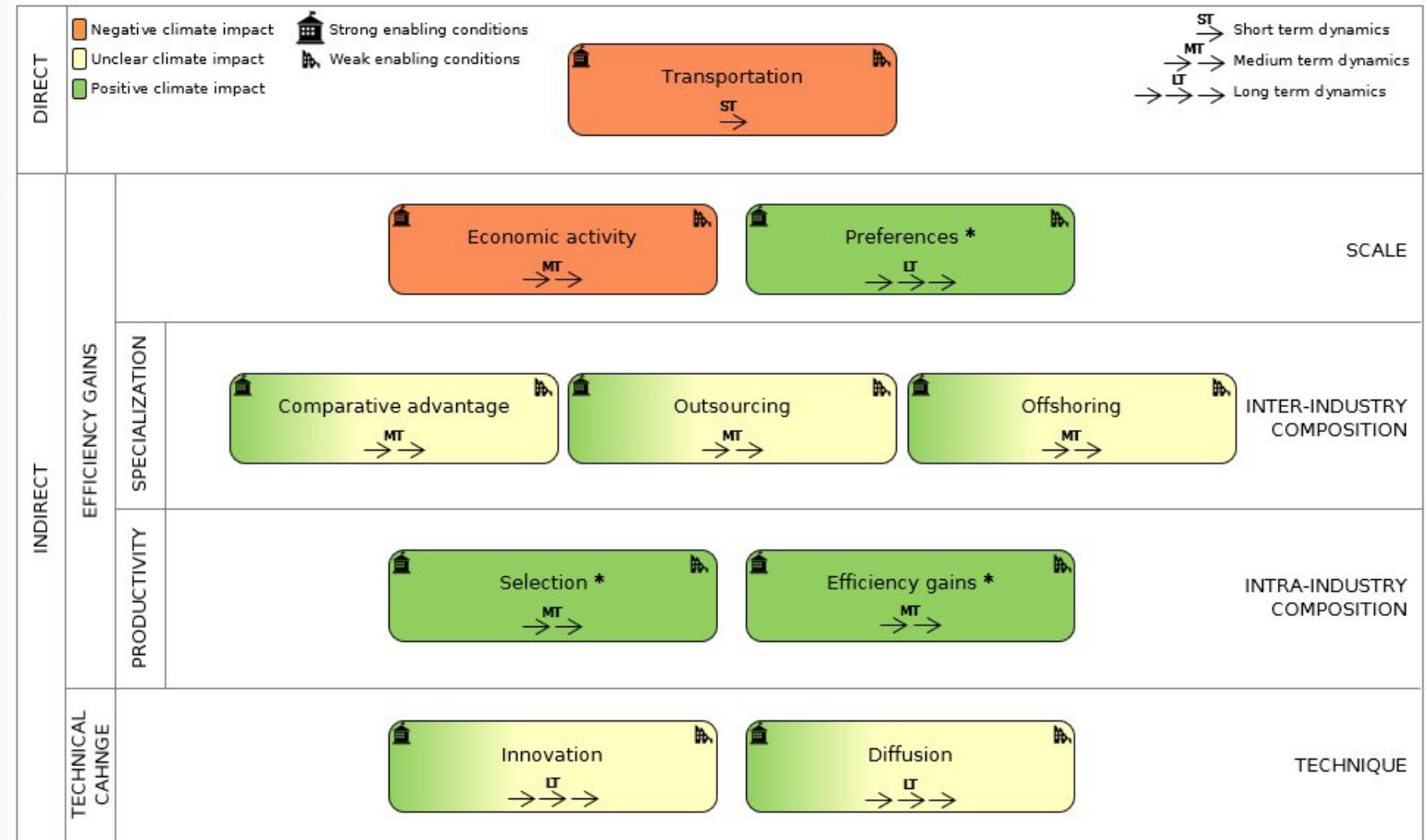
Historically, its primary goal has been to stimulate innovation, productivity and economic growth. Recently, economic resilience and environmental concerns are receiving increasing attention.

CLIMATE POLICY refers to the laws, regulations, strategies and actions taken by governments, organizations, and other entities to minimize anthropogenic greenhouse gas emissions (mitigation), prepare natural ecosystems and human systems – populations, economic activities, and infrastructure – for the impacts of unavoidable climate change (adaptation).

Its objective is to prevent dangerous anthropogenic interference with the climate system to enable economic development to proceed in a sustainable manner.



Annex: Channels & enabling factors





Annex: Recap of prospects



- Data

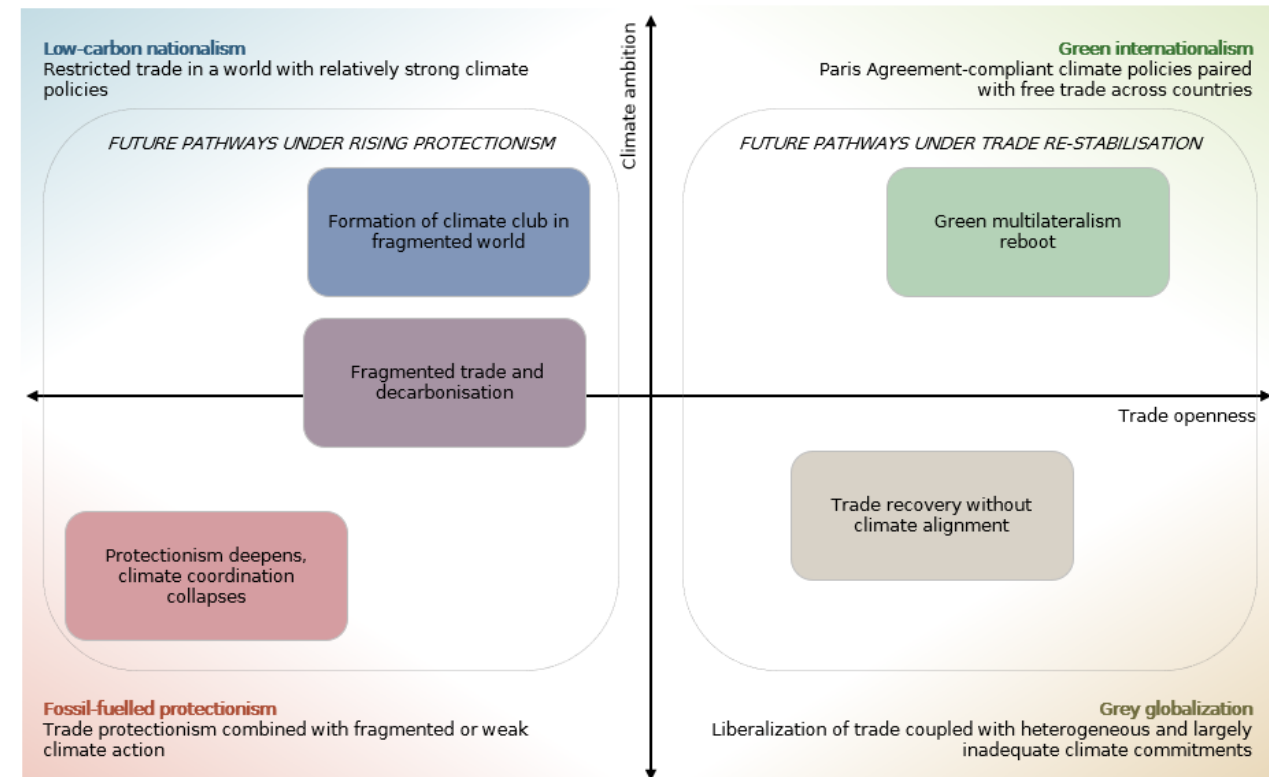
- Granular trade and macroeconomic data
- Clean tech, materials, and transport/logistics
- Capital costs, investment, and financial risk
- Firm-level and innovation indicators
- Governance and institutional quality metrics

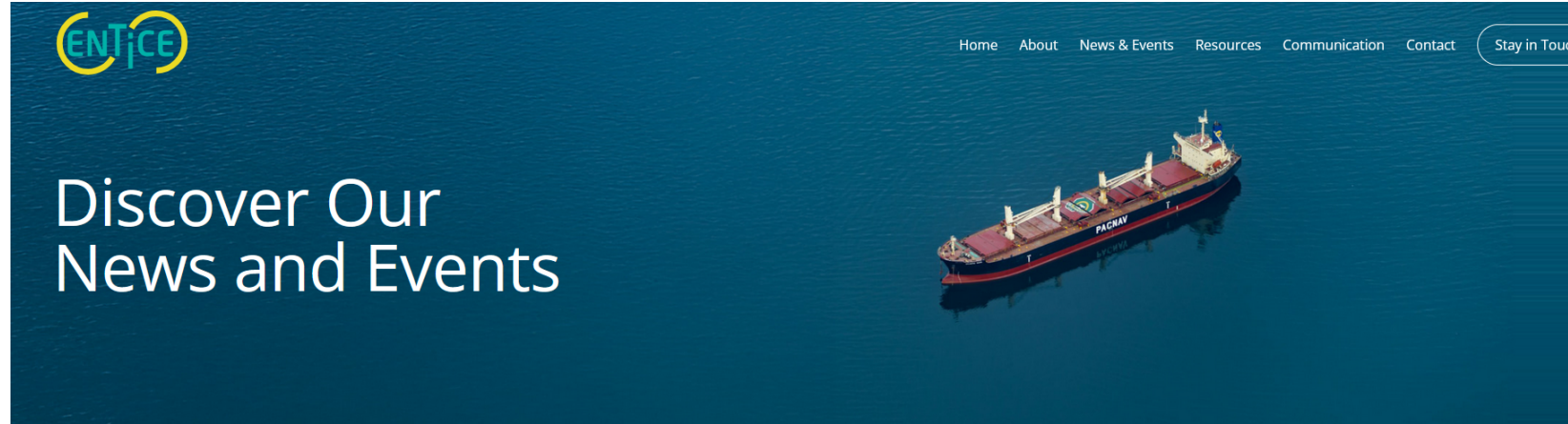
- Models

- Firm heterogeneity and new trade theories
- MNCs, endogenous markups, and FDI dynamics
- Technological detail with hybrid/linked models
- Time dimension (dynamic, forward-looking structures)
- Embed enabling conditions: regulation, institutions, political economy

- Scenarios

- Account for geopolitical fragmentation and diverging trade-climate pathways
- Explore trade-offs and feedbacks over short and long-term horizons





Expert Webinar on Trade and Climate after COP30

The ENTICE project teamed up with the Green Trade Network (GTN) to co-host an expert webinar on 16 December 2025, examining the evolving relationship...

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ENTICE at the 4th Conference on Trade, Value Chains and Financial Linkages

On December 15–16, 2025, the Bank of Italy, in collaboration with the European Central Bank and the World Bank, hosted the 4th Conference on “...

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Several ENTICE scientists have co-signed the Búzios Scientific Statement, which delivers a clear assessment of the world's remaining options to...

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