

Aligning national action with global climate ambition

ACEF pre-forum 2026

Monday, 8 June

ADB Headquarters, Manila

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RFF
CMCC

European Institute
on Economics
and the Environment



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- We study the tension between
 - **national development objectives** and
 - **Paris-aligned mitigation pathways**.
- Goal: identify pathways that are both **climate-consistent** and **nationally relevant**.





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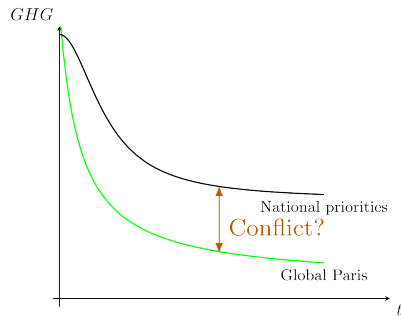
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- If based on fossil-intensive pathways, they can lock in emissions.
- This motivates our central hypothesis:
 - there may be a conflict between **national priorities** and **global climate ambition**



Socio-economic goals and climate policy targets



ENERGY IMPORTS INDEPENDENCE
TOTAL CONSUMPTION CARBON INTENSITY OF GDP
CLIMATE DAMAGES GDP EMPLOYMENT
AIR POLLUTION DAMAGES ELECTRICITY PRICES
FOOD PRICE FOREST COVER





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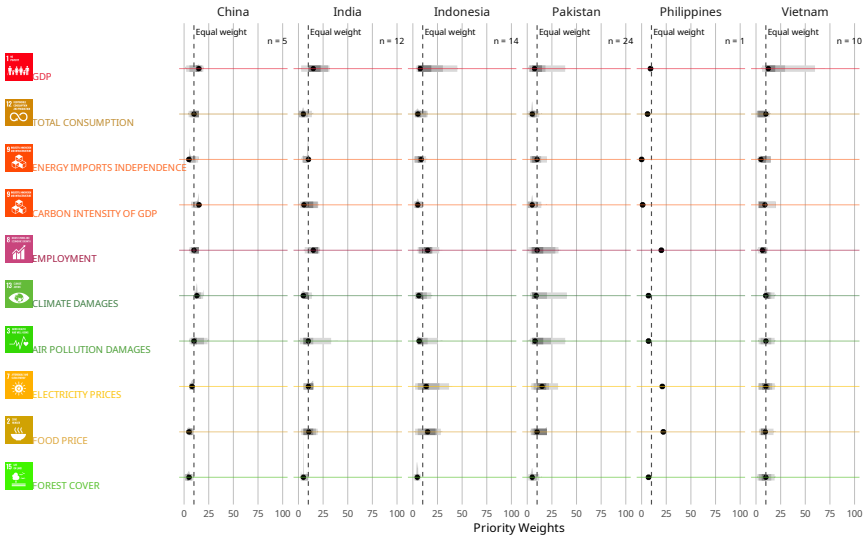


What we do

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- We **measure** it using energy-economy models and dedicated scenarios
- We compare climate scenarios/pathways using:
 - development indicators
 - climate indicators
 - stakeholder preferences.



Stakeholder surveys





Computation of indicators

- Most indicators are directly obtainable from scenario results
- Energy sector employment computed from electric capacity and installations¹
- Air pollution concentrations computed using a source-receptor model, FASST(R),² and an exposure function³
- Climate impacts computed using RIME⁴

¹ Sandeep Pai et al. (2021). *One Earth*; Aman Malik et al. (2021). *Energy Policy*.

² Rita Van Dingenen et al. (2018). *Atmospheric Chemistry and Physics*; Lara Aleluia Reis, Laurent Drouet, and Massimo Tavoni (2022). *The Lancet Planetary Health*.

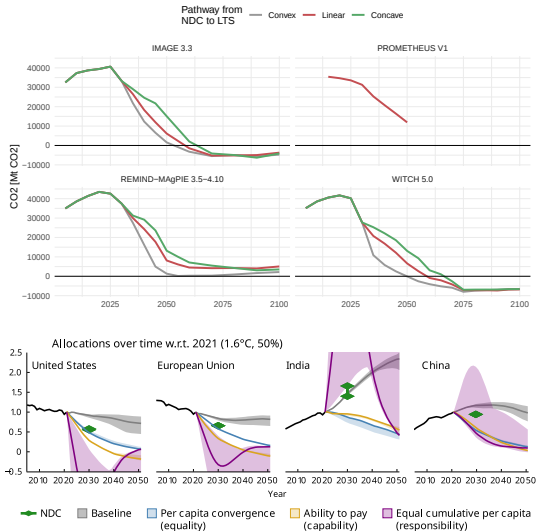
³ Richard Burnett et al. (2018). *Proceedings of the National Academy of Sciences*.

⁴ Edward Byers et al. (2025). *Environmental Research: Climate*.



Policy targets and scenarios

- Both Global and National models
- Current policy (CurPol)
- NDC → LTS
- 2°C target with effort sharing⁵



⁵Mark M. Dekker et al. (2025). *Nature Climate Change*.

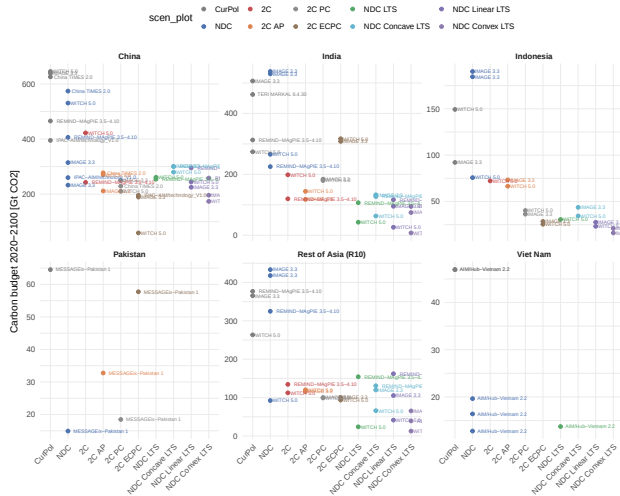


Scenario analysis results



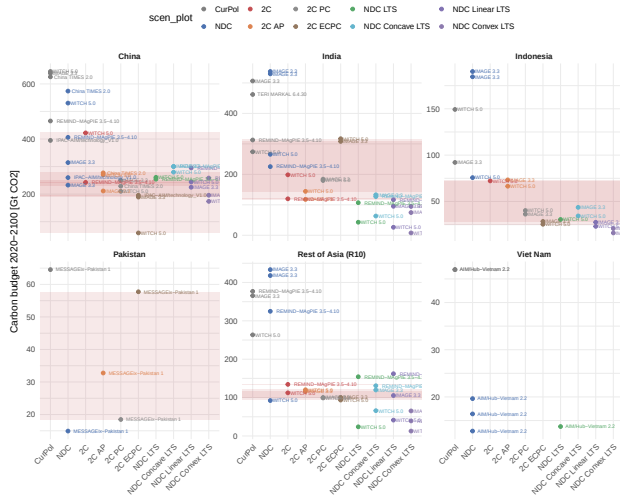


RQ1: How do alternative pathways from NDCs to LTSS affect development and climate outcomes?



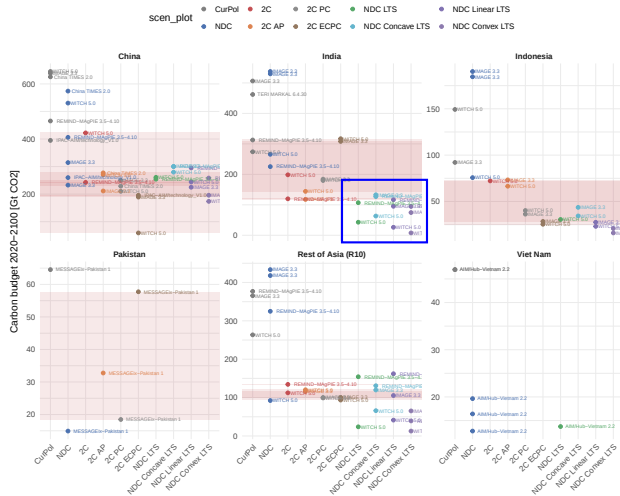


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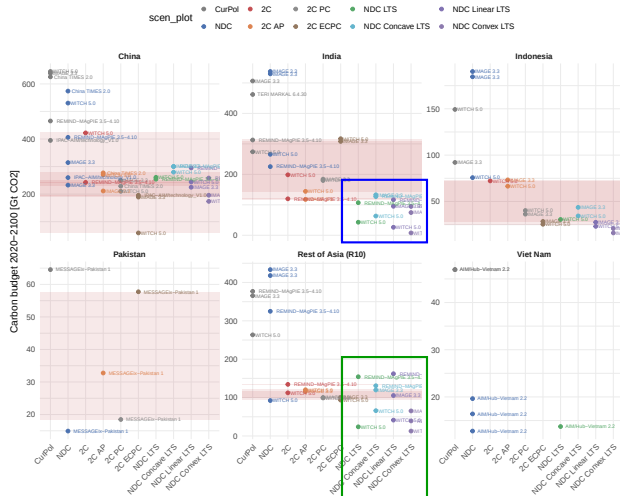


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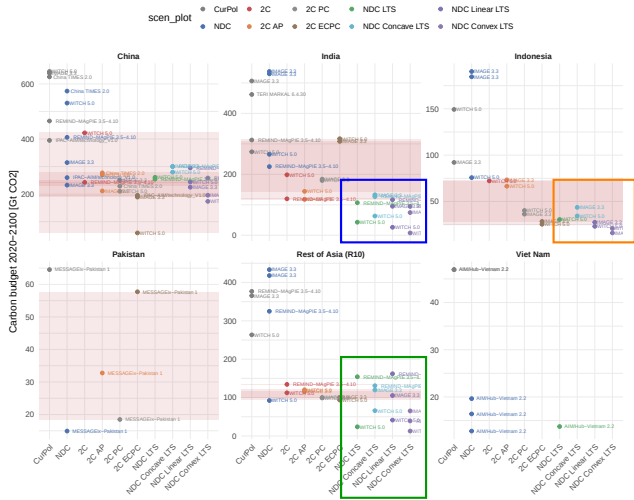


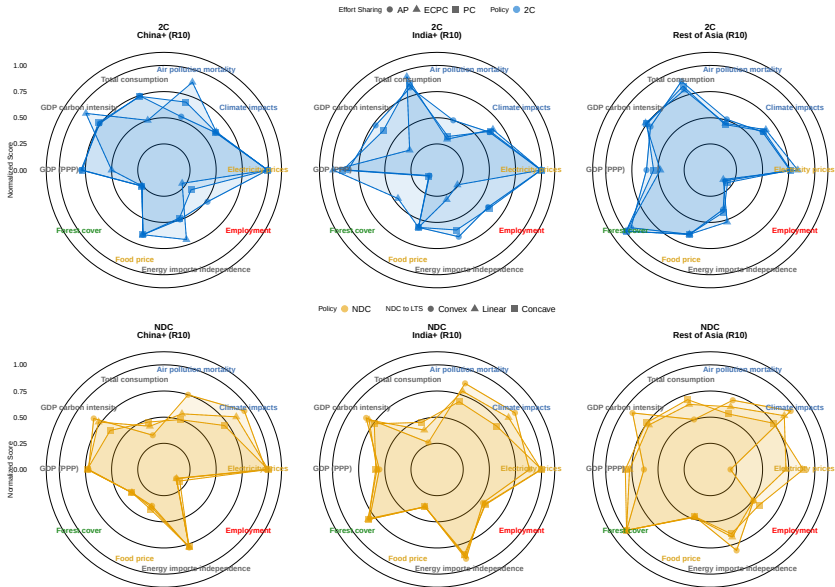
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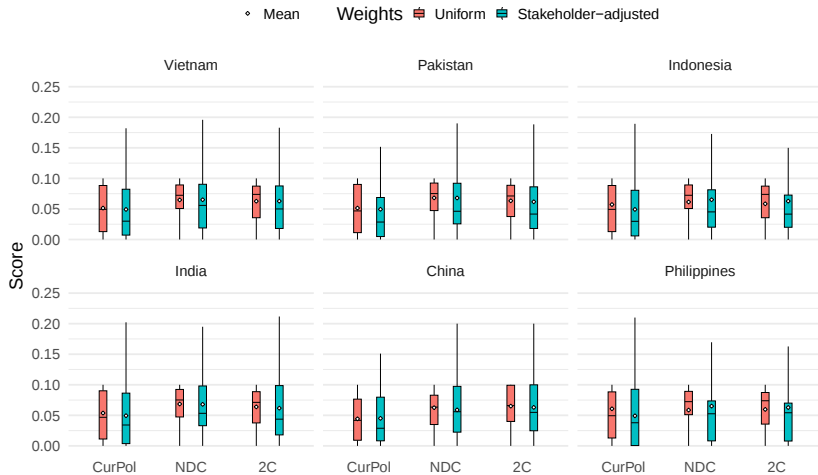
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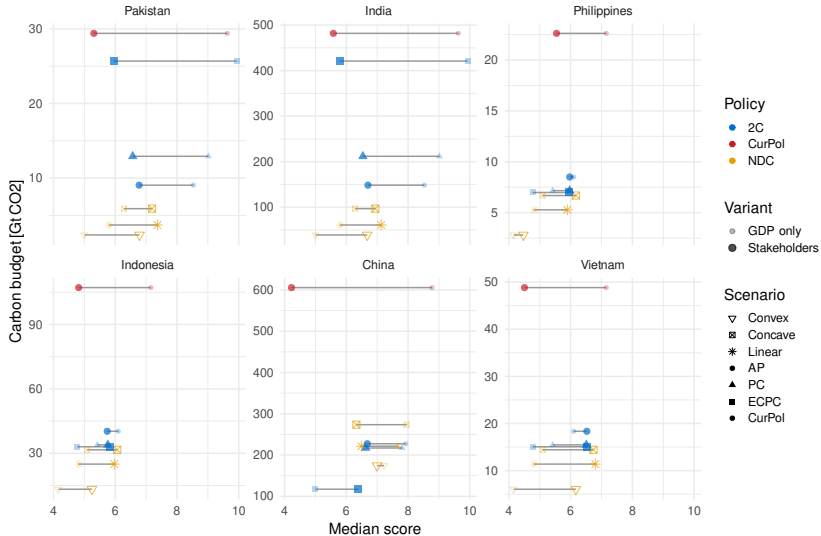


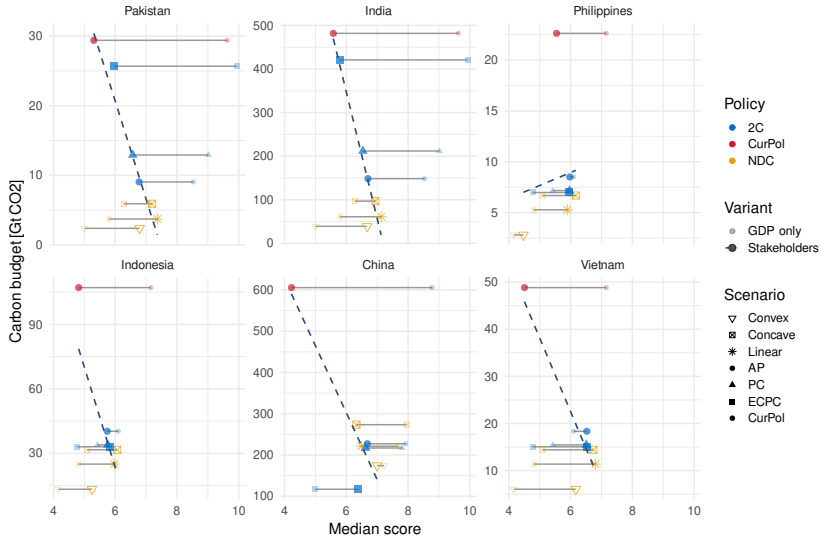


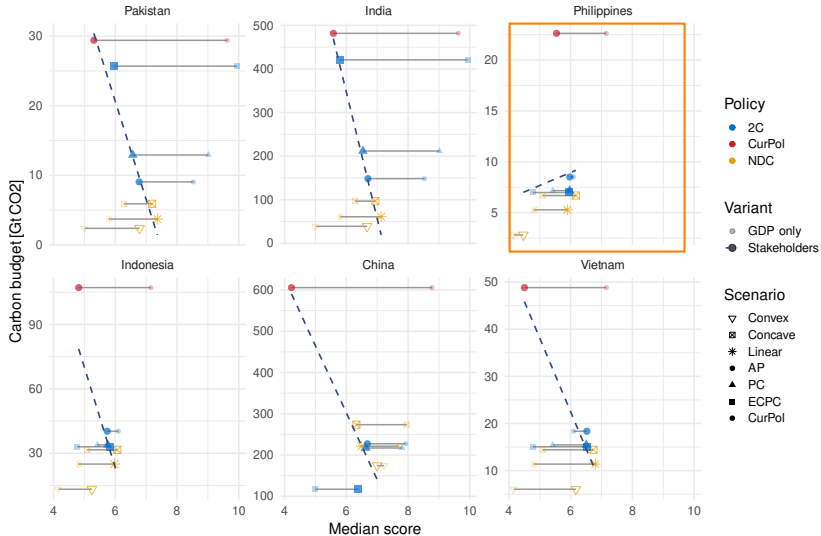


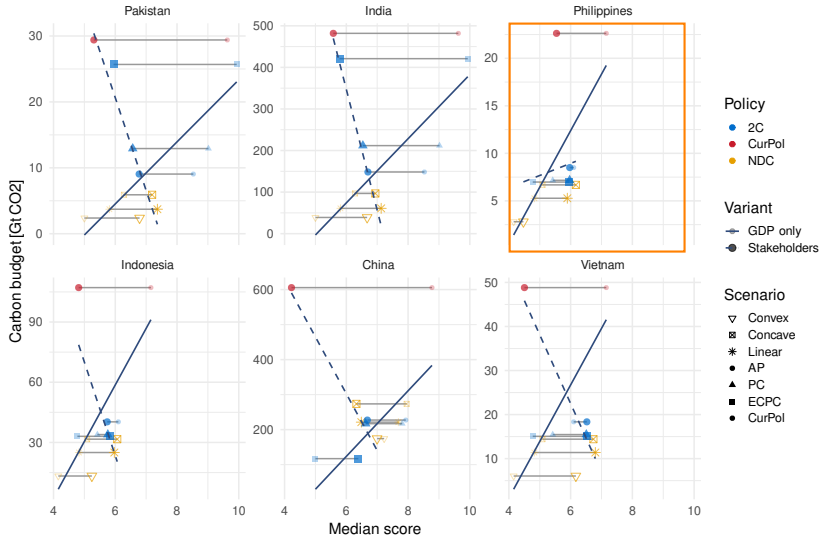
Stakeholder adjusted scenario scores





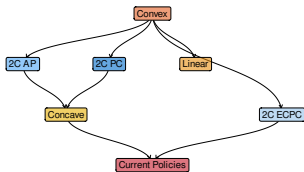




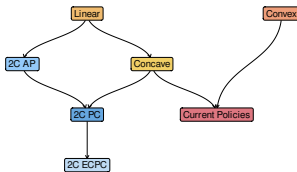




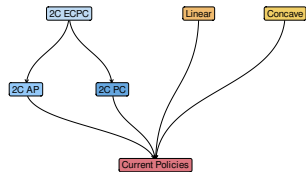
Robust scenario rankings



(a) China



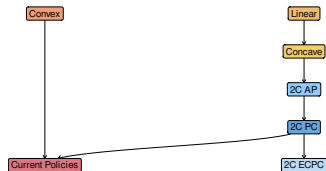
(b) India



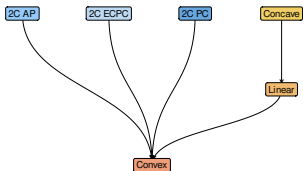
(c) Indonesia



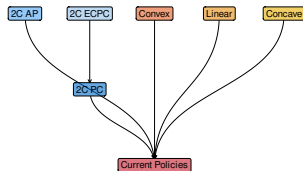
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(d) Pakistan



(e) Philippines



(f) Vietnam



Results: Climate implication of nationally preferred pathways

- We select the **top-ranked scenario** for each country.



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 - **675 GtCO₂** [569–1222], with a concave NDC-to-LTS rest-of-world pathway



Results: Climate implication of nationally preferred pathways

- We select the **top-ranked scenario** for each country.
- Implied median carbon budget:
 - **675 GtCO₂** [569–1222], with a concave NDC-to-LTS rest-of-world pathway
 - **777 GtCO₂** [331–2326], across all rest-of-world pathway choices



Conclusions

- Accounting for national priorities instead of just GDP shifts the highest-ranked scenario from current policies to more stringent policy options.
- All NDC → LTS pathways lead to at least a 50% chance of achieving 2°C.
- Only the convex NDC → LTS scenario has a high chance (67%) of achieving 1.5°C.
- 2°C scenarios score better than NDC → LTS on total consumption and food price.
- The opposite holds for climate impacts and energy independence; mixed results for the other indicators.
- The scenario most closely aligned with each nation's priorities is not sufficient to limit warming to 1.5°C, but is consistent with stabilizing global temperature below 2°C.





Take-home message

Aligning national priorities with climate ambition is possible, if pledges are fully implemented, up to around 2°C, but closing the gap to 1.5°C remains difficult.





Thank you

We look forward to your questions

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