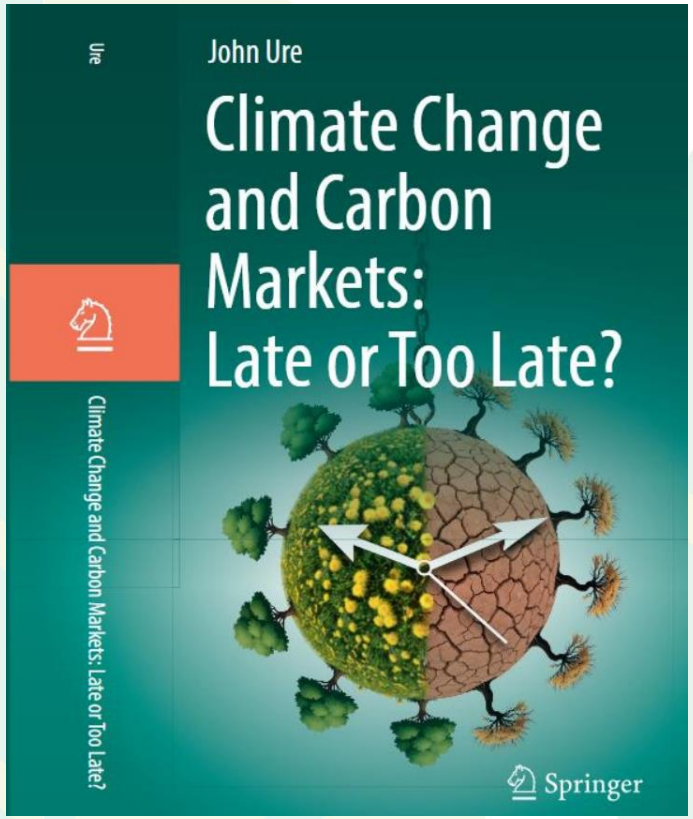
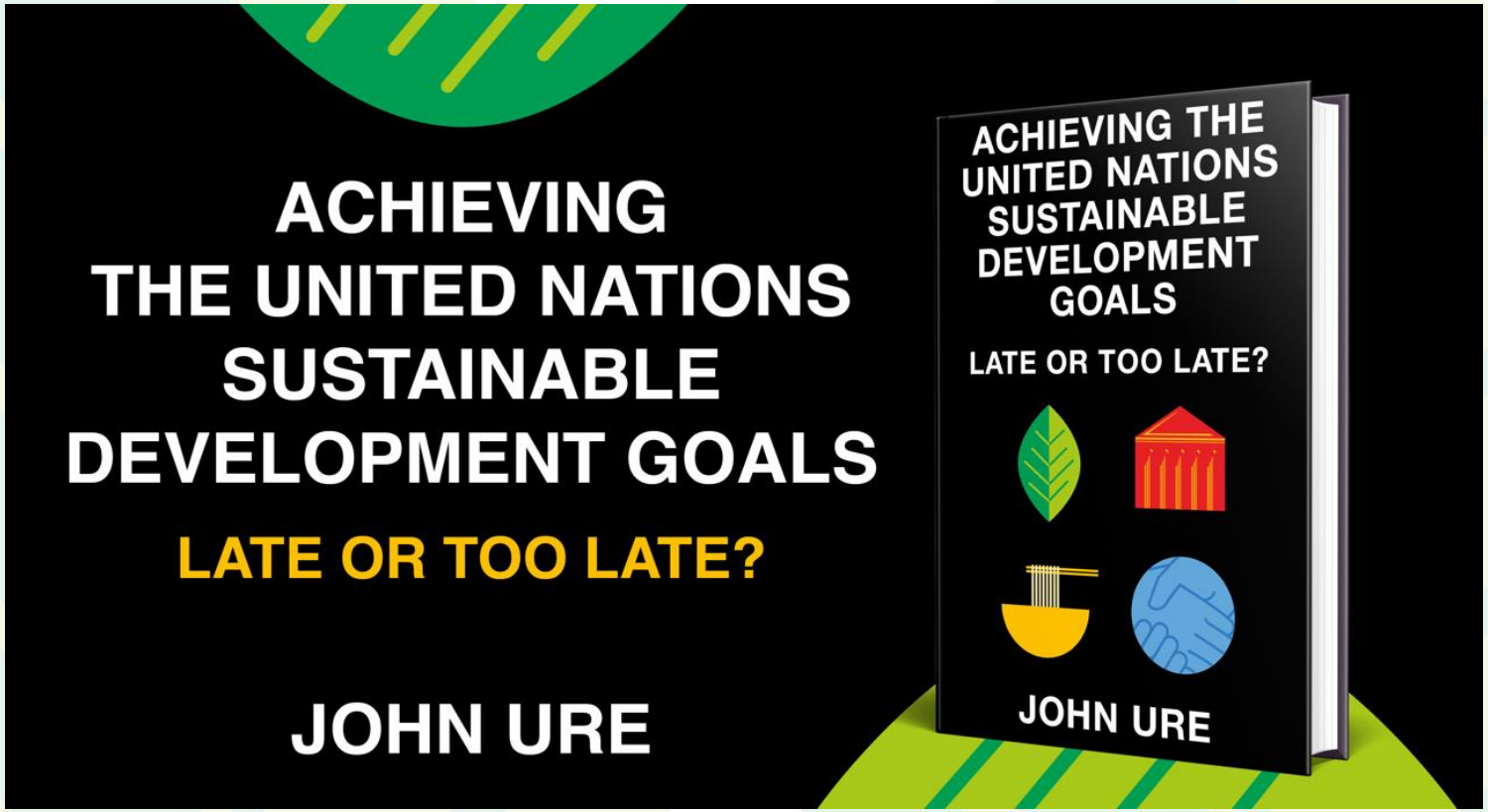
The Otto Poon Centre for Climate Resilience and Sustainability – 3rd Oct 2025





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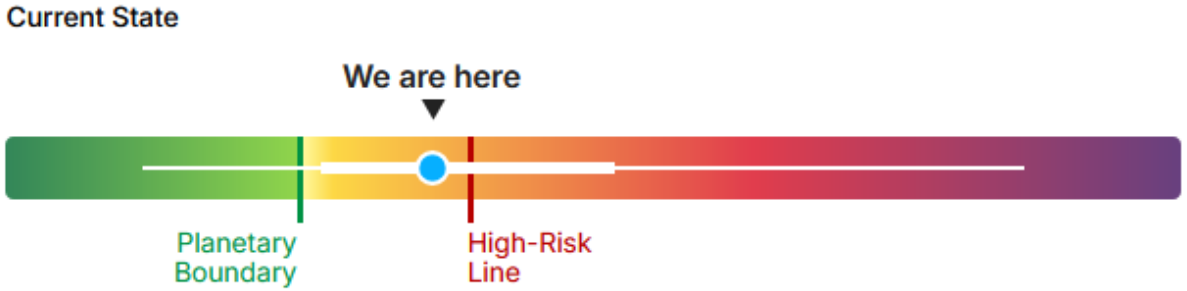
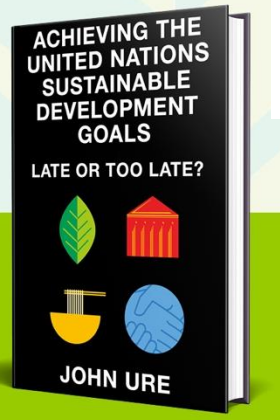
CCRS – Start with a health warning from the Potsdam Institute of Climate Impact Research

[https://www.planetaryhealthcheck.org/]

Our planet's vital signs are flashing red

We have breached 7 out of 9 Planetary Boundaries.
The Planetary Health Check 2025 makes it clear: We have to act now.





Takeaway = It is only too late when it is!

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CCRS – A methodological point on answering questions and questioning answers

When there seems to be *only one* answer to an enduring problem, even if that answer appears to be impractical or unattainable due to commercial or political considerations (*not* due to adverse laws of nature) then it is important to stick to it and reiterate it.

Apparent impracticality does *not* mean irrelevance, it means thinking of alternative pathways

It may be that other solutions arise along the way, but until they do, REPEAT and REPEAT

Takeaway = Academics can think abstractly, private sector have to think practically; finding a cross-over point is the challenge

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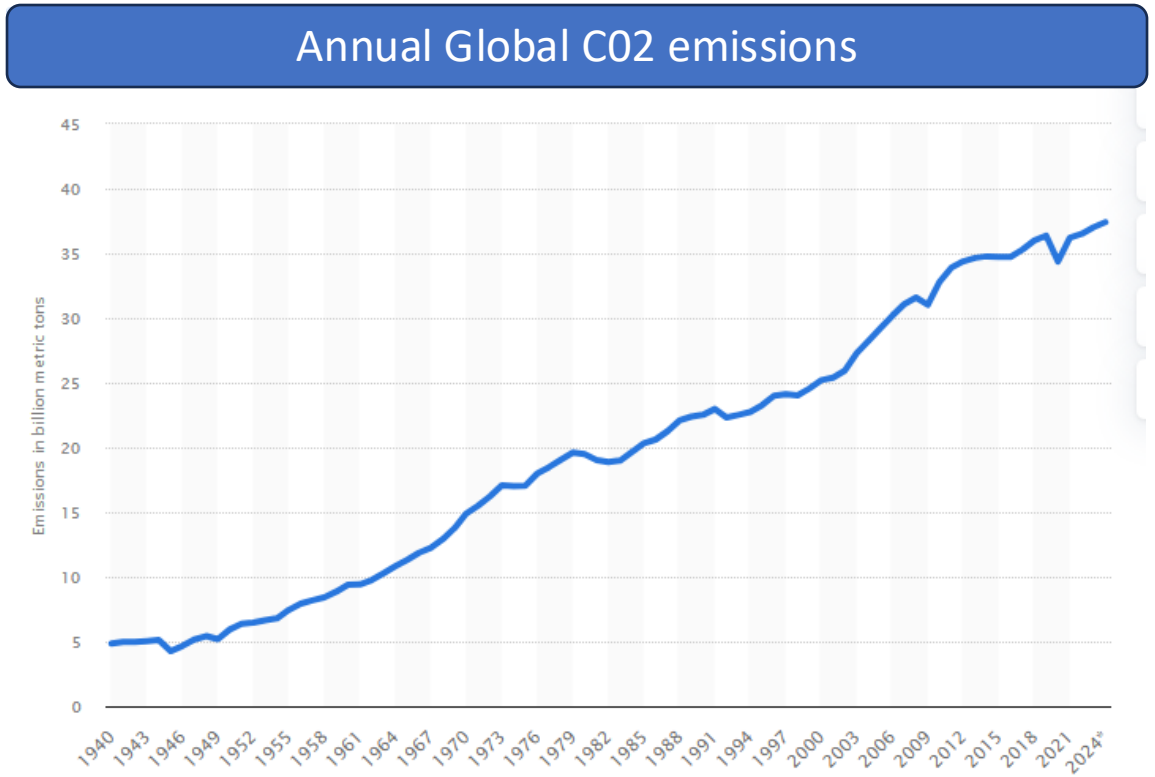
CCRS – a taxonomy issue: global emissions (*production + consumption*)

- **Primary (production/distribution) + End-User Energy Consumption**
  - Primary includes all energy used (or wasted) in energy generation/ distribution (Scope 2)
  - End-user refers to industries and other sectors (including households) who consume (Scopes 1 & 3)
- **Global Measurements (Statista)**

  2019 - + 36 GtCO2e (GHGs) *annual*

  2024 - + 37 GtCO2e (GHGs) *annual*



Note: (1) different sources, different measurements ! (CO2 vs CO2e); (2) Conversion ratio (US) TWh:Gt 0.394; BTU ~ 1,000 exajoules (EJ ~ 278 TWh)

Takeaway = GHGs still on the increase, and know no borders

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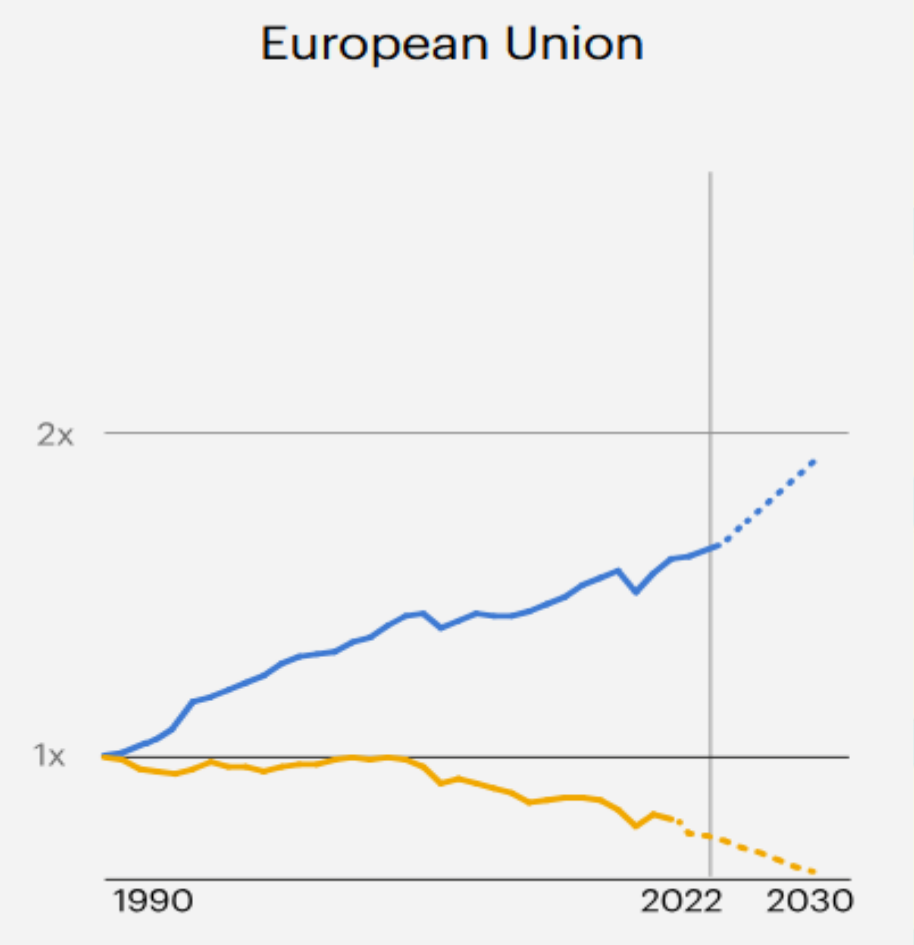
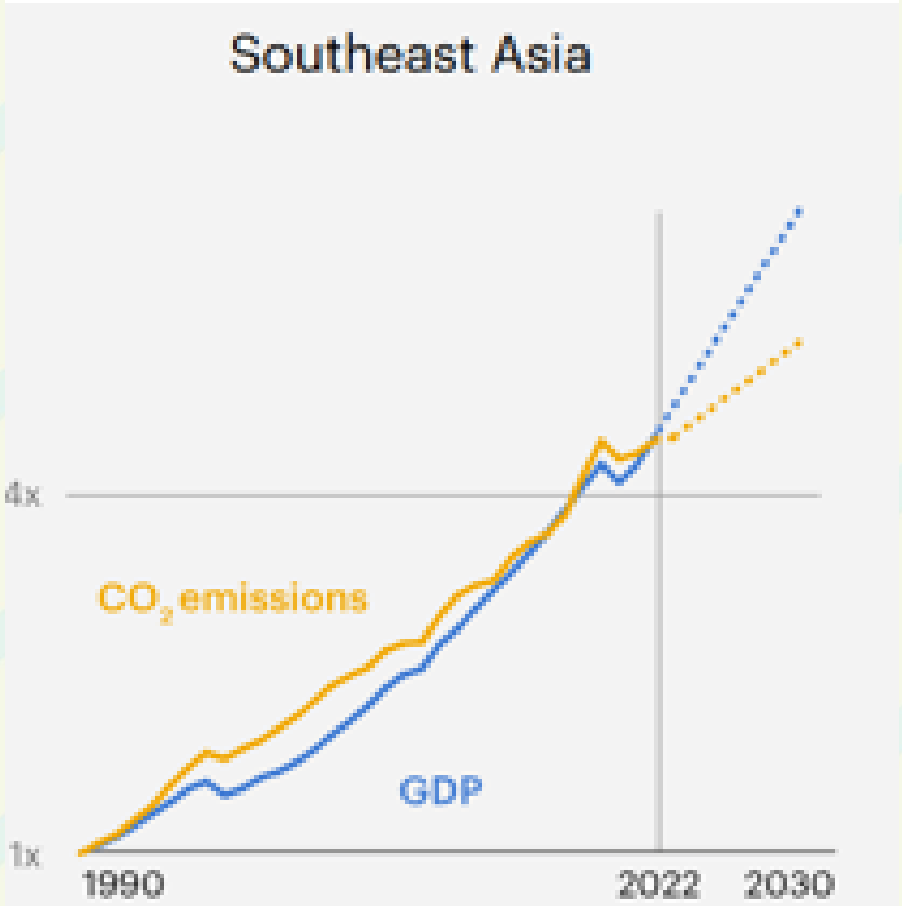
CCRS – GHG emissions less driven by GDP growth (IEA 2024)





Takeaway = good news that EMDEs beginning to replicate divergence between GHG and GDP growth

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CCRS – A risk/uncertainty reality

If climate scepticism is given credibility, then there is little incentive to find solutions to global warming, but in reality **isotopes** tell the true story of the Anthropocene = GHG increases *since 1850* are predominantly caused by human activity (*see Appendix*).

The *probabilities* that underpin all scientific method = different combinations of high/low risk and high/low certainties

The dilemma arises when the risks (e.g., climate tipping points) are judged to be high = existential

Takeaway = the risk is only known when it really happens and the closer we get the less time we have to take mitigation or adaptation

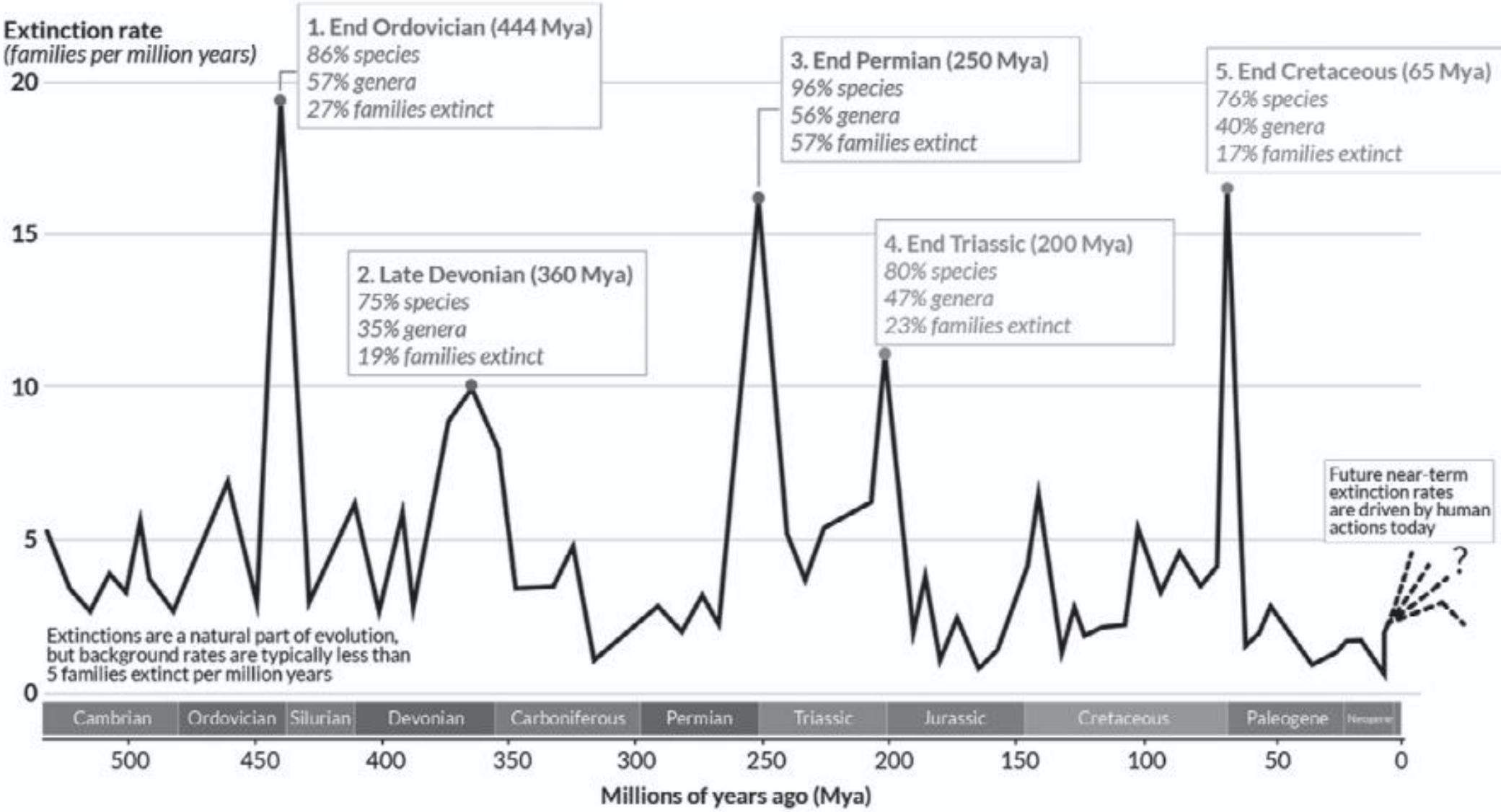
CCRS – Climate Change - Extinctions and Climate Action pose Qs

Five major extinctions involving climate change – danger now is the Anthropocene tipping point

`

Action for Carbon…

- **Avoidance (difficult)**
- **Reduction (Doable)**
- **Removal (Less certain)**



CCRS – So what is the issue?

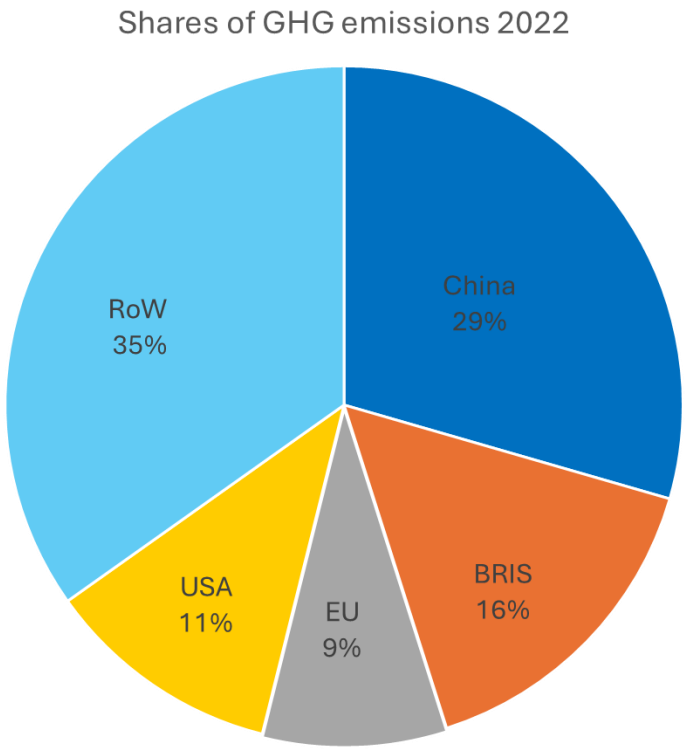
- Most GHGs come from the Global South, but that's not where the finance goes
- UN FCCC (Framework Convention on Climate Change) for Green Finance = based upon the **catalytic model** but *it is proving fatally insufficient*

(1) incremental steps from MDBs, low-carbon industrial hubs, Article 6 and ITMOS [Internationally Transferred Mitigation Outcomes], carbon markets, etc.

(2) Growing collaboration between regional banks, starting with taxonomy, but *logical and necessary outcome* = an international Green Bank ***exclusively*** focused upon the Global South with China and India as leading participants

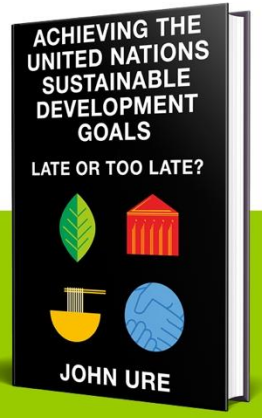
Takeaway = mismatch between green finances and GHG emitters

CCRS – Emissions from the Global North and South (production + consumption)



Most GHGs come from the Global South, but that is not where the finance goes

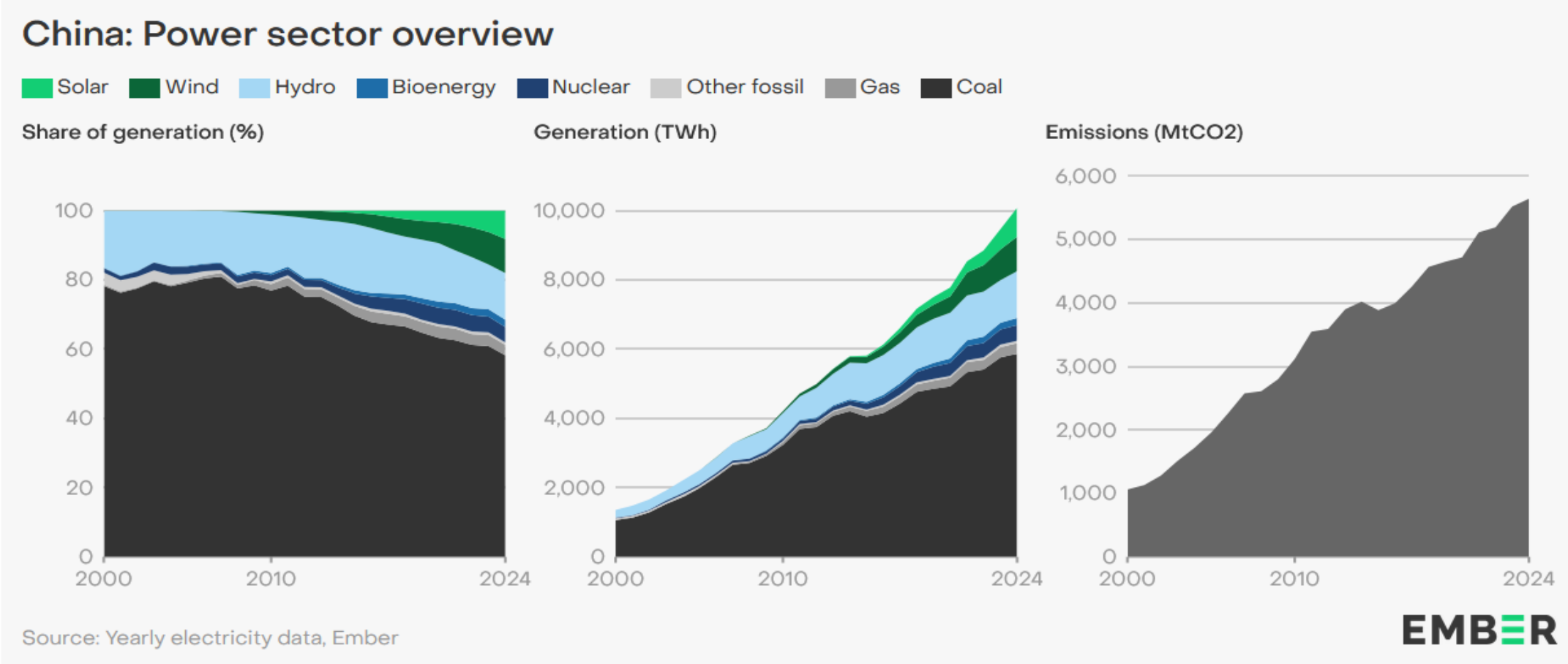
UN FCCC (Framework Convention on Climate Change) for Green Finance = based upon the catalytic model and it's totally insufficient

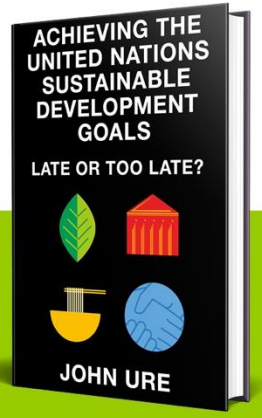


Takeaway = China, India, Indonesia, etc., are the major polluters; so that is where the green finance needs to go to mitigate carbon

SDG 7 – China – Primary energy (2024)

- Fossil fuel ~ 60%





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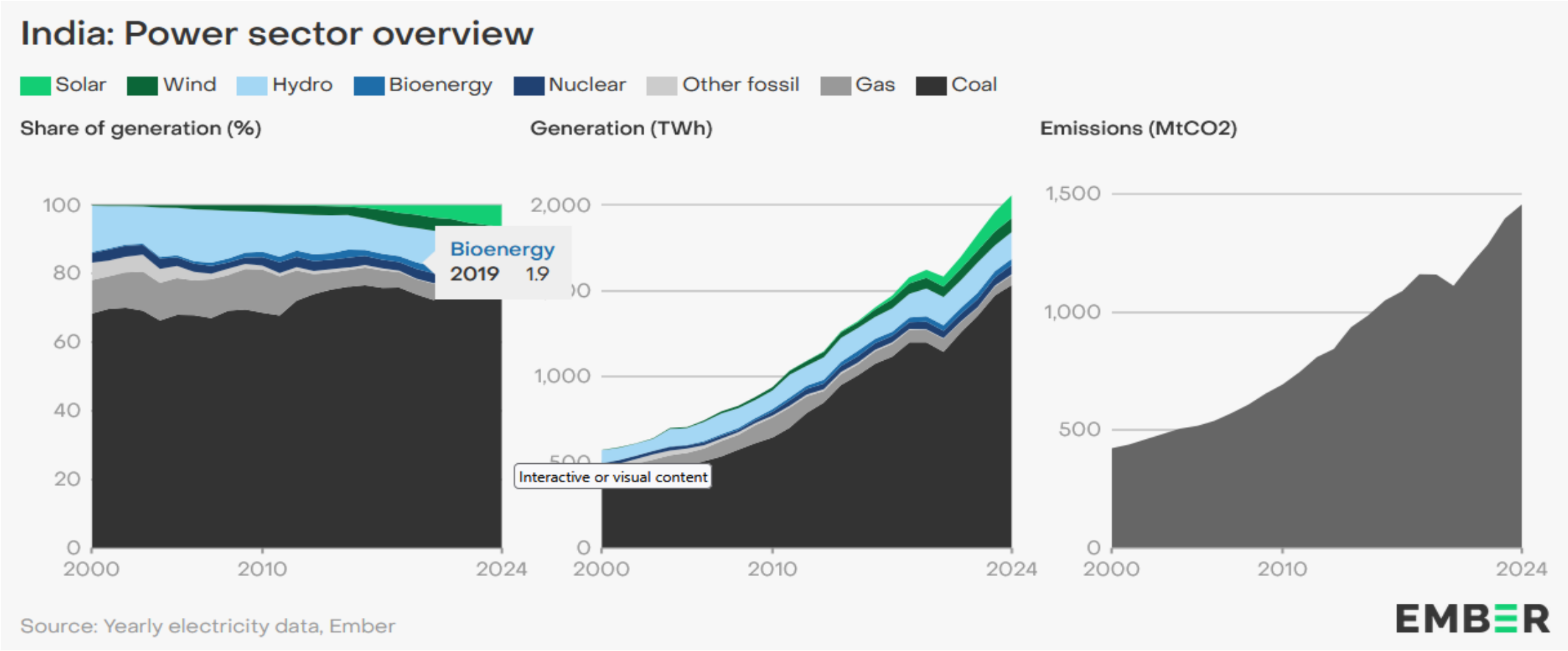
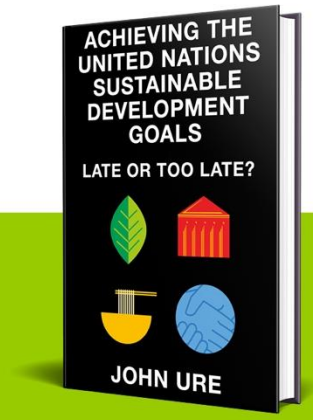
SDG 7 – India – Primary energy (2024)

- Fossil fuel >70%





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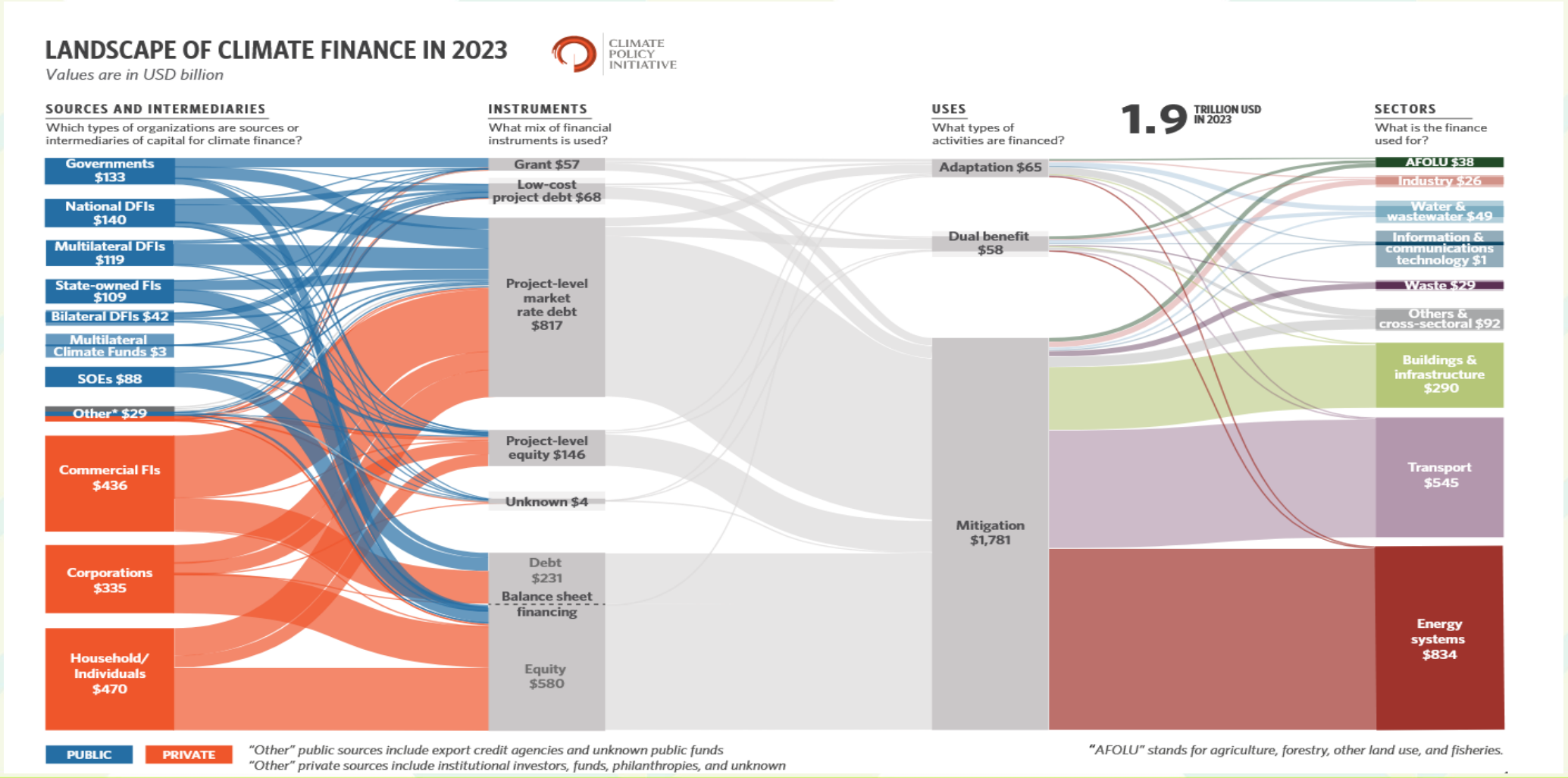
CCRS – Green finance: where come from and where does it go?



Takeaway = 1. < 5% goes to Adaptation; 2. ex-China only 14% goes to EMDEs and 2% to LDCs (WB Blog, 2024)

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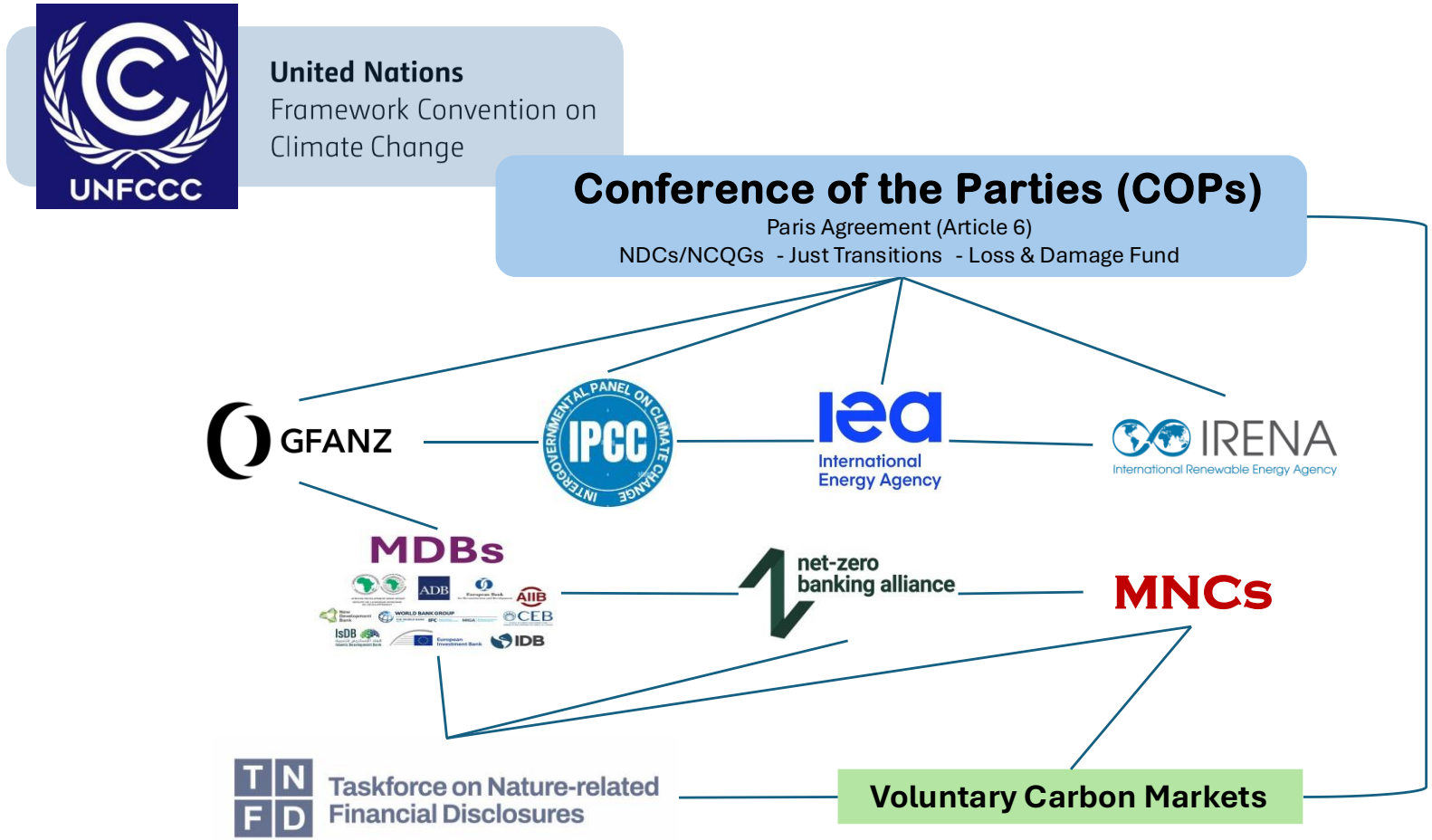
CCRS – the UNFCCC catalytic model

Note: USA withdrawn from the Paris Agreement and from GFANZ [Glasgow Alliance for Net Zero]



Takeaway = Presumption is that public funding will catalyse private; claims of 1:4 or even 1:10 but independent research suggests maybe only 1:1 or maybe even less!

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CCRS – Green finance needs in EMDEs + LDCs (= global South)

- **TNC** - Global climate finance surpassed $2 trillion in 2024, but annual needs are estimated at $7.4 trillion through 2030 - The Nature Conservancy *Playbook for Climate Finance: Investing in a Thriving Planet (*2025)
- **CPI** - EMDEs will need to increase more than fourfold to US$2.4 trillion *per year* by 2030.
  EMDEs will need around US$1 trillion per year *in external finance* by 2030.

"This will require a fifteenfold increase in private finance, a fivefold increase in concessional finance, and a tripling in multilateral development finance as reflected in the Songwe-Stern report on "A climate finance framework" acknowledged by the recent COPs."

[See https://www.climatepolicyinitiative.org/publication/accelerating- sustainable-finance-for-emerging-markets-and-developing-economies/]
Also https://www.climatepolicyinitiative.org/wp-content/uploads/2000/10/G20-IHLEG-VCEF-Review.pdf

Takeaway = The annual financial gap (>$1 trillion external financing) cannot be closed without a *redirection* of funds and an *increase* in funds

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CCRS – alternative sources of Green Financing

1. Multilateral Development Banks extend their portfolios – pressure from COP-29
2. More blended finance to reduce private sector risk and uncertainty
3. Low-carbon industrial hubs (cf SEZs) to offer investments at scale with local State support offering real returns on investments (e.g., PPPs, BOT, BTO, shared-risk insurance, Scope 3 'Chain-of-Command assurances', etc.)
    3a. Industrial conglomerations in the Global South? (Indonesia, Malaysia, etc)
4. Article 6 ITMOS carbon credits contributing to NDCs (Nationally Determined Contributions)
5. Nature-based Project (NbPs) funded by multinationals
6. Carbon credit financing = dodgy? Standards Bodies expensive = need for an intermediary project assessment process to weed out unlikely candidates? (*My suggestion*) Importance of monitoring, measuring, reporting, validating (MMRV)

Takeaway = public funds in short supply; private funds risk-adverse; the voluntary markets are fragmented; most green finance goes North not South

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CCRS – a critical need for an International Green Bank (IGB)

- The proposal for an IGB is not new e.g., **Hafez Ghanem, former VP of the WB** [https://oecd-development-matters.org/2023/03/20/calling-for-an-international-green-bank/and https://findevlab.org/wp-content/uploads/2023/06/FDL_Policy-Paper-8_-International-Green-Bank.pdf] – a Green Bank would:
  - knowledge products that help develop effective green projects, support advocacy, and provide policy advice;
  - direct equity contributions to private companies investing in green projects;
  - loans to private sector projects;
  - guarantees against sovereign risk for green investments; and
  - grants to buy down the interest on sovereign lending by multilateral development banks for adaptation projects.

Takeaway = "whose only mission would be to combat climate change"

CCRS – a critical need for an International Green Bank (IGB)

- **President Ruto of Kenya** called for an IGB in 2023 at an African Climate Summit meeting – [https://www.forbes.com/sites/earlcarr/2023/09/15/kenyas-proposal-for-a-green-bank-the-imf-world-bank-and-chinas-role/]

- My own view is as follows:
  - Funded by green bonds from all major trading nations, with China and India in prominent leadership roles
  - Exclusive focus upon the Global South
  - Offer concessionary finance & technology transfers according to national strengths
  - Assist *and insist* upon good governance, MRV, etc.
  - Engage with state and private capital to create sustainable */oca/*capital markets
  - Work in parallel with Article 6 developments
  - Leverage low-carbon hubs in the Global South to create returns on investment and create local Scope 3 (low-carbon) chains of command to create national multiplier effects

Takeaway = the role of state and sovereign capital is crucial and central to financing climate change mitigation and adaptation projects

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CCRS – direction of travel towards greater international collaboration?

- Following COP-29, China and the EU began a collaboration on a Common Ground Taxonomy (CGT), later joined by Singapore to create the **Multi-Jurisdiction Common Ground Taxonomy (M-CGT)** to facilitate *cross-border green loans and bonds*:
- ***Differences***
  - EU is bottom-up with a "Do No Significant Harm" (DNSH) requirement, mandatory for large companies and for voluntary Green bonds with environmental concerns included – i.e. climate mitigation should not be at the expense of the environment, such as biodiversity
  - China is more top-down focused upon an ICMA (International Capital Markets Association) Green Bond Principle (GBP) with a focus on principles rather than a strict taxonomy [https://www.icmagroup.org/assets/Analysis-of-Chinas-Green-Bond-Principles.pdf]

Also see *Green Finance & Development Center* [https://greenfdc.org/to-meet-global-green-finance-needs-the-eu-and-china-must-cooperate/?cookie-state-change=1759382504470] and Carbon Bonds Initiative [https://www.climatebonds.net/files/documents/241113-common-ground-taxonomy-instruction-report_en.pdf]

Takeaway = convergence can *pave the path* towards an IGB?

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CCRS – direction of travel is a question of choice

- There are alternative views, such as:

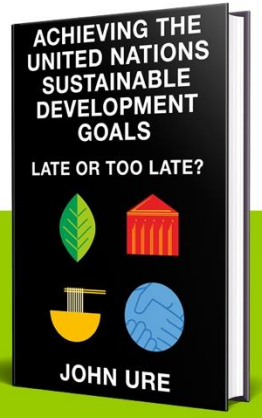
"Stop appeasing China at the World Bank and IMF" [The Hill
https://thehill.com/opinion/international/4598915-stop-appeasing-china-at-the-world-bank-and-imf]

- A better choice is a world in which China, India, the USA, and even a post-Putin Russia, along with many others join forces to fund an IGB
  - Needed is a will to act beyond borders to help the Global South act for itself
  - It will be an incremental process for sure, but time is running out.

Takeaway = what can be imagined, can be achieved

Thank you

ure.john@gmail.com
Johnure.net



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CCRS – Appendix: What is an isotope and why does it matter?

- The *atomic number of an element* is given by the number of protons which attach to neutrons in the nucleus of any particular atom, a number that never varies, while the number of neutrons, which does vary, gives *the mass or weight of the element* such that the *atomic number x mass* produces different isotopes of the same element. For example, ^{1}H, ^{2}H,^{3}H are three hydrogen isotopes of heavier or lighter weight. Lighter isotopes decay faster than heavier isotopes giving clues as to temperatures millions of years ago.

- Similarly with carbon isotopes. C^{12} and C^{13} are stable (and therefore last longer in the atmosphere) owing to the number of neutrons being equal to the number of protons in the atom, whereas with other carbon isotopes neutrons outnumber protons and need decay before stability is established, which renders them temporarily radioactive, such as C^{14}. C^{12} isotopes emitted by plants during photosynthesis are lighter than C^{13} emitted by the burning of fossil fuels, but as the latter are diluted in the atmosphere the ratio of C^{13}: C^{12} decreases which is an indicator of by how much the burning of fossil fuels has increased atmospheric CO2. Currently estimates suggest that human (anthropogenic) activities using fossil fuels have added 50% to CO2 in the atmosphere

IAEA (2024) *What are Isotopes?* https://www.iaea.org/newscenter/news/what-are-isotopes
Yale University *Isotope Evidence for Climate Change* https://oyc.yale.edu/geology-and-geophysics/gg-140/lecture-26

Takeaway = Most *additional* GHGs are the result of human activity

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