RESOURCES for the FUTURE

Climate and trade under geopolitical competition

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Outline:

- The nexus of climate and trade
- Geopolitical competition and fragmentation
- Carbon border adjustments & carbon tariffs
- Green industrial policy
- Data challenges
- Future policy scenarios in the US, EU & globally

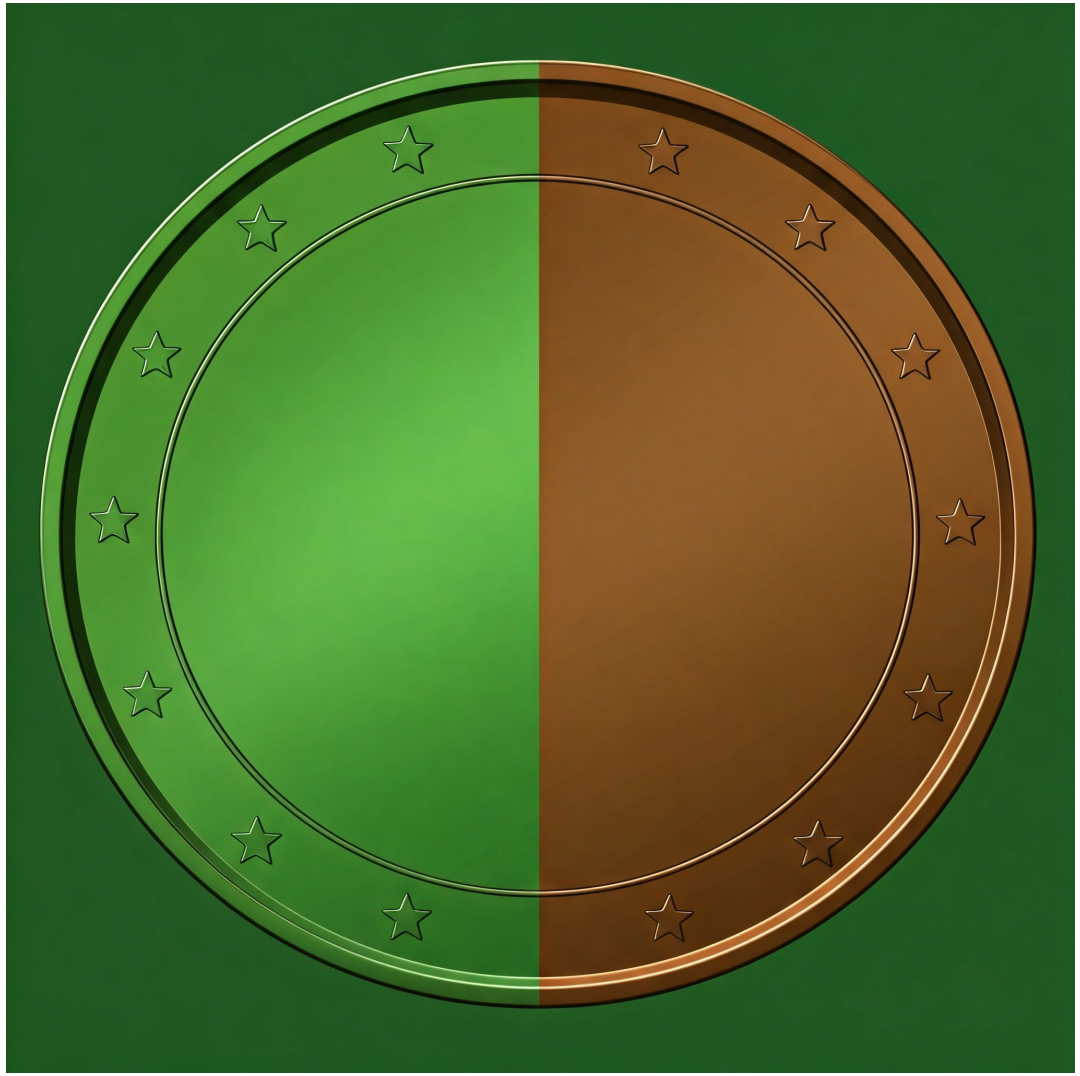
Tribute to Ray Kopp

The nexus of climate and trade policy:

Brown & green sides are part of the same nexus

Low-carbon production:

- Competitiveness
- Low-carbon technology deployment/diffusion
- Green industrial policy
- Subsidies
- Subsidy control & countervailing
- Domestic content
- Critical minerals



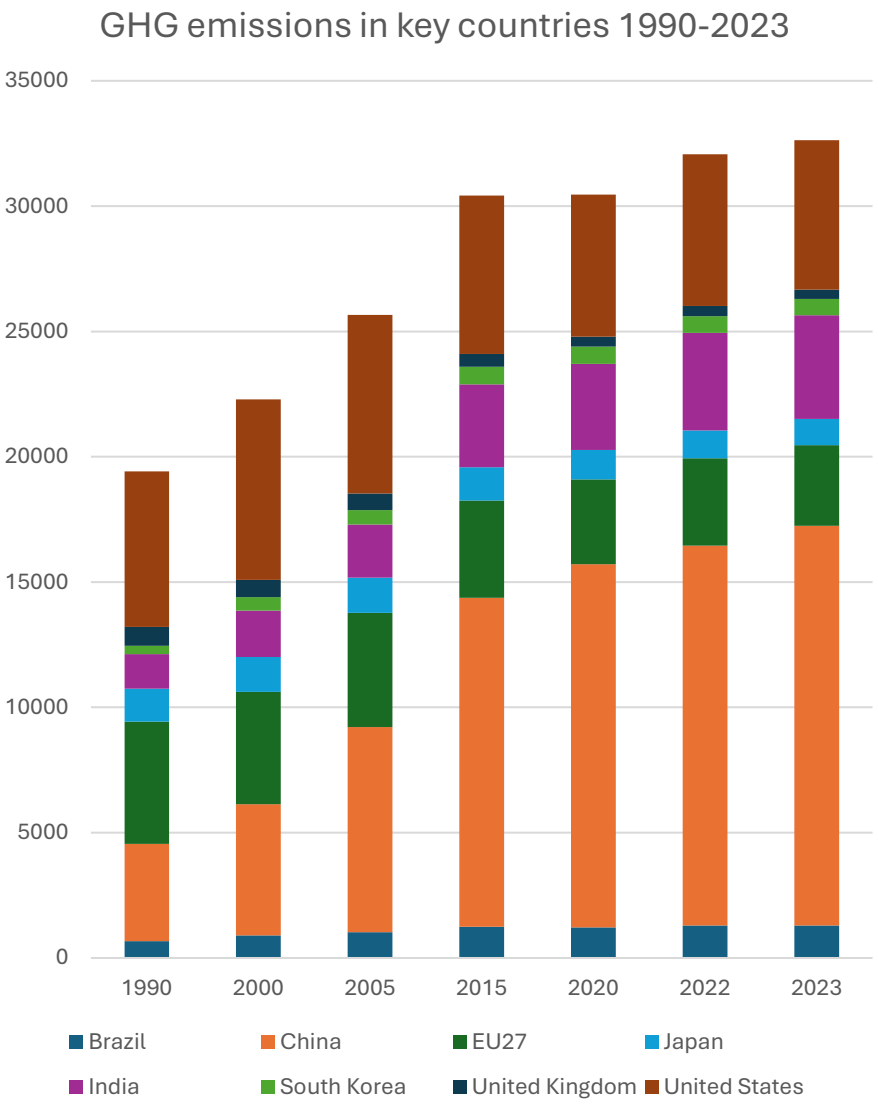
Conventional producers:

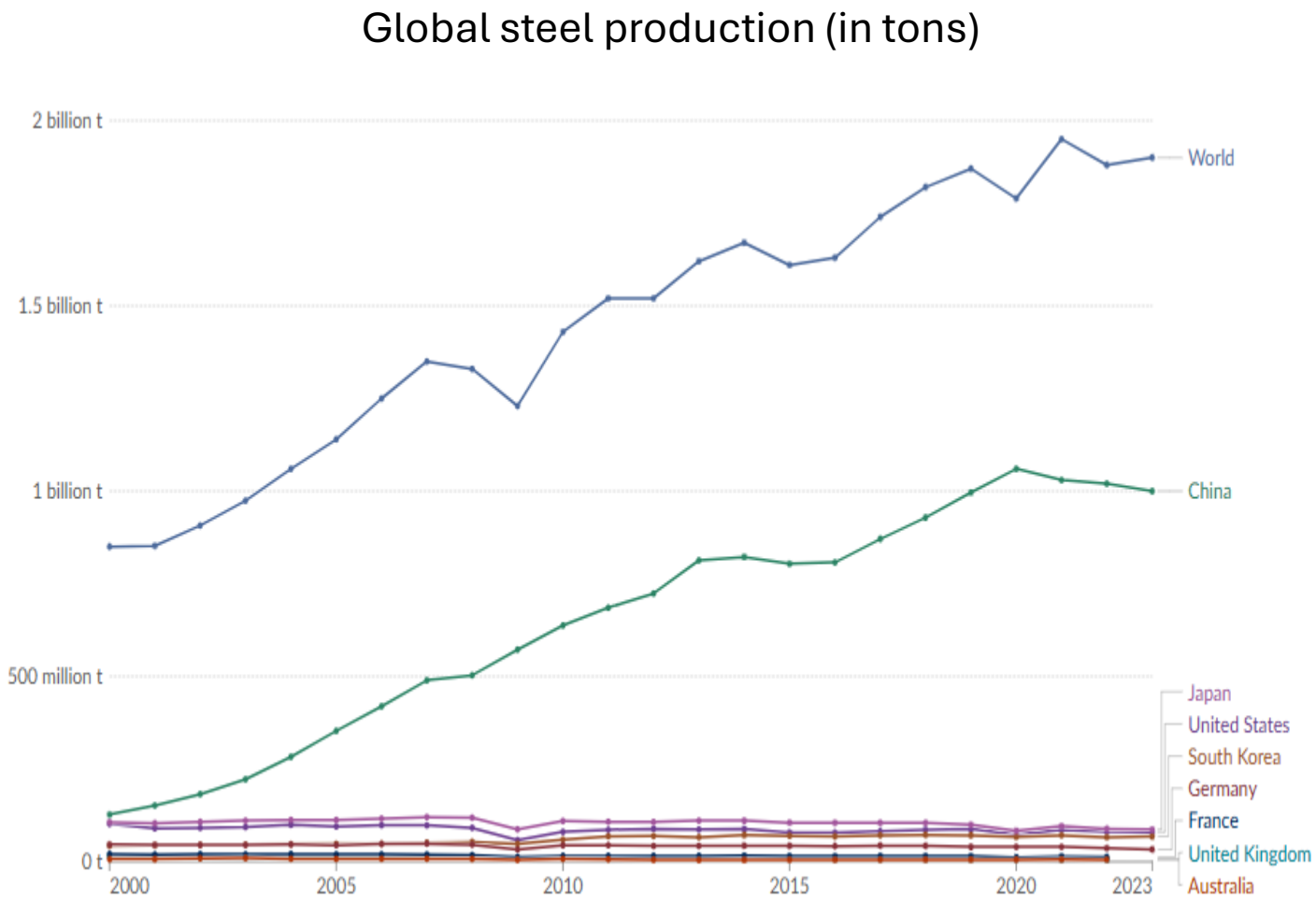
- Competitiveness
- Leakage (risks)
  - Carbon
  - Production
  - Investment
- Carbon border adjustments
- Free allowances
- Tariffs
- Critical minerals

Geopolitical competition and fragmentation:

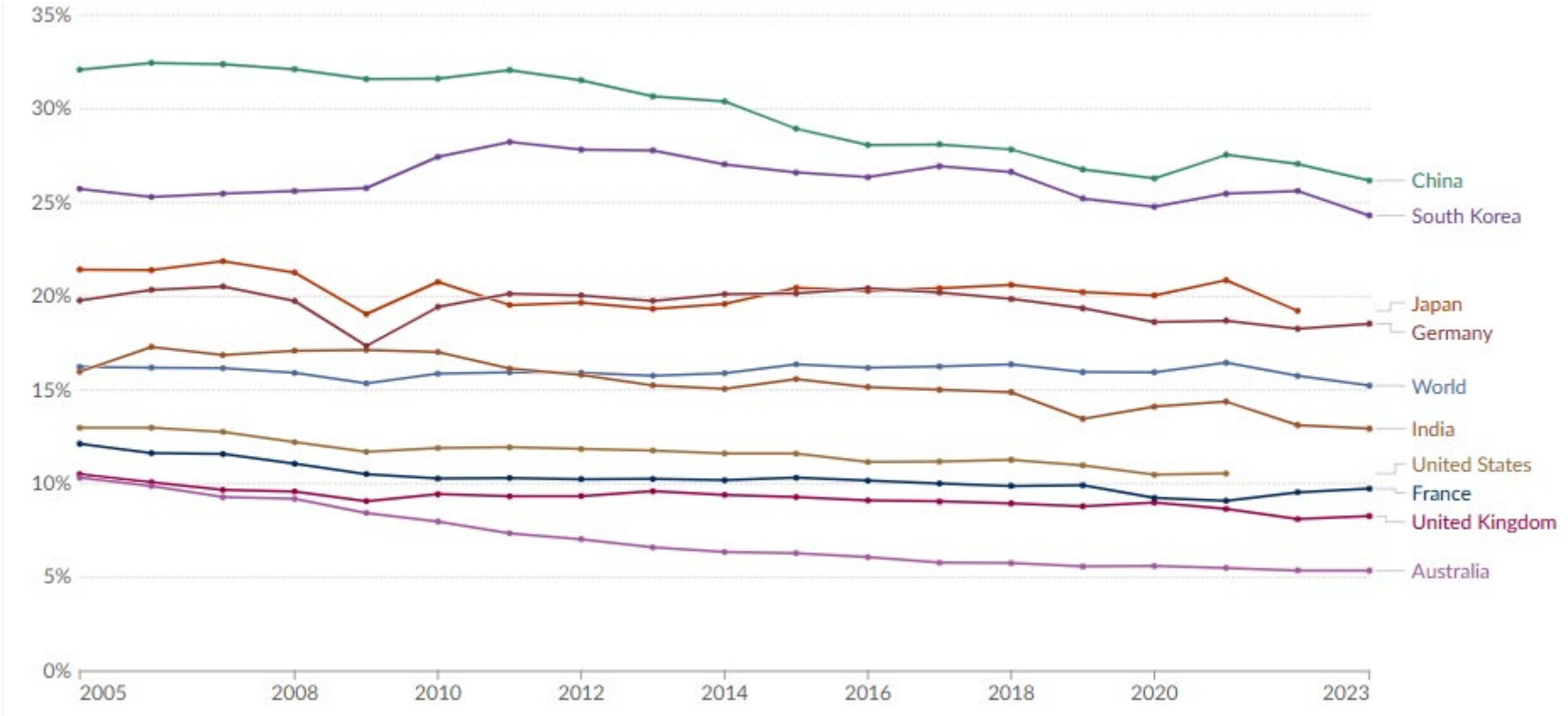
- Multipolarity and/or the return of great power competition leads to more fractious, contentious global trade relations
- Some long-held consensus on climate and trade policy is fraying:
  - Primacy of carbon pricing
  - Desirability of industrial policy
  - Benefits of free trade, or even trade in general
  - Degree of support to / protection of domestic manufacturing
- Momentous shifts in the world economy:
  - Share of manufacturing
  - Emissions trajectories
  - Persistent trade imbalances
  - Sovereign debt levels and fiscal spending
- Weaker global institutions (WTO, UN, etc.)

Geopolitical competition and fragmentation:





Share of manufacturing in GDP – select countries



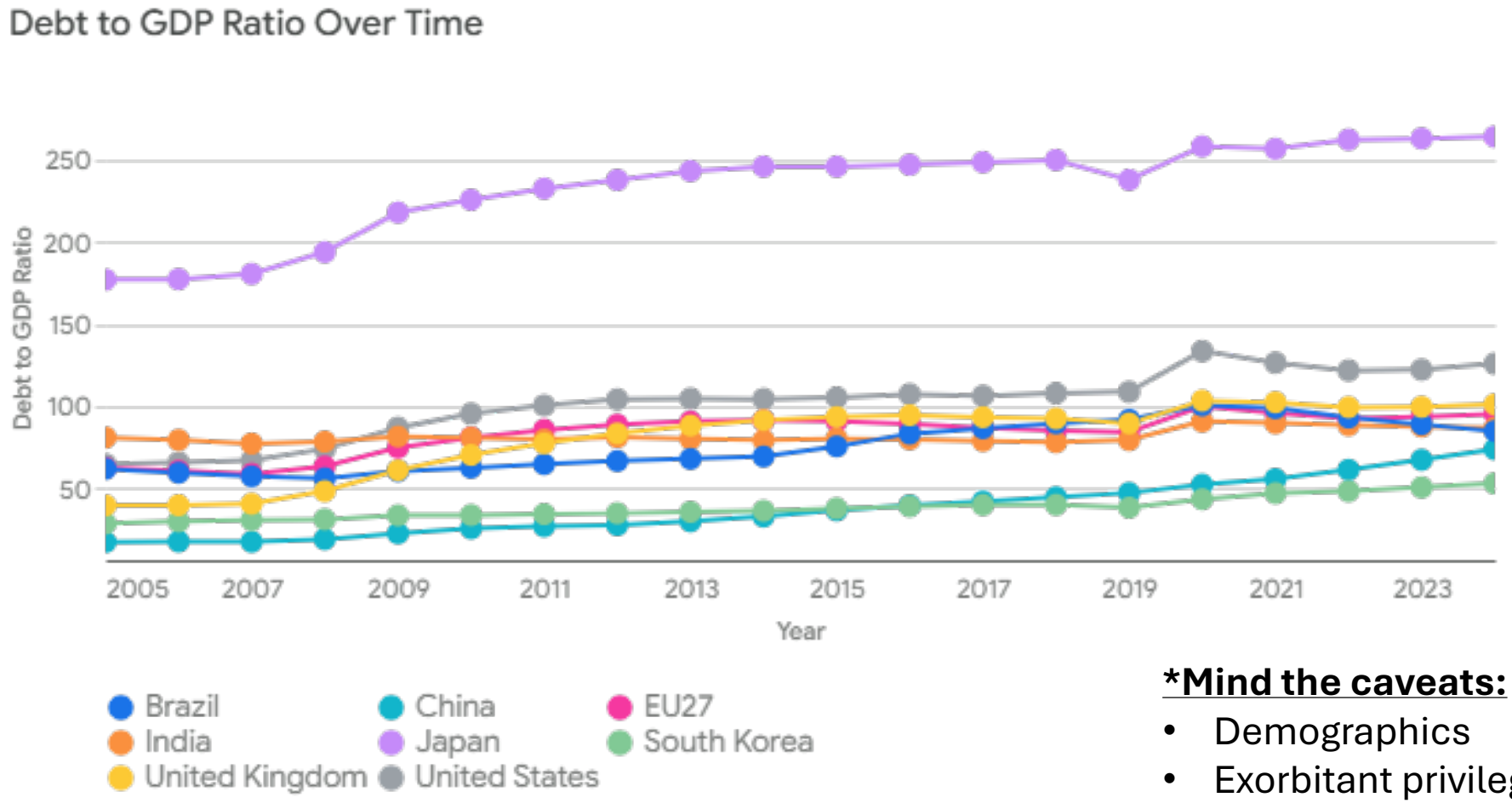
Geopolitical competition: some underlying trends

Table 2. Manufacturing and Consumption as Shares of GDP

	Average Manufacturing Share of GDP (2012–2022, %)	Average Consumption Share of GDP (2012–2022, %)	Trade Balance Historically
United States	11.00	82.00	Deficit
Japan	20.00	76.00	Deficit
United Kingdom	9.00	83.00	Deficit
Canada	10.00	78.00	Deficit
World	16.00	73.00	N/A
South Korea	26.00	65.00	Surplus
Germany	20.00	73.00	Surplus
China	28.00	54.00	Surplus

Source: Carnegie, 2025

Debt-to-GDP levels* are increasing everywhere



<u>*Mind the caveats:</u>

- Demographics
- Exorbitant privilege
- Interest rates

Source: Gemini-generated using World Bank data

Carbon border adjustments

- Carbon border adjustments and similar have a long academic, but not practical history
- “Adjustment” can mean different things:
  - Adjust for carbon cost differences domestic vs importers
  - Adjust for carbon intensity differences domestic vs importers
  - Adjust for implicit costs of policies/regulations
- Export competitiveness and country differentiation pose challenges
- Economic spillovers:
  - Direct costs and transaction/administration costs
  - Reshuffling of trade
  - Impacts on consumers of commodities (inc. other industries)
- Policy spillovers:
  - Incentive to adopt carbon pricing
  - Retaliation?
  - Data?

EU CBAM: implementing a world-first policy

- Trial/implementation period until end of 2025 – extension?
- Based on EU ETS and replacing – gradually! – free allocation
- Specific implementation challenges:
  - Problem of export competitiveness still exists
  - Crediting for carbon prices already paid
  - How to deal with sub-national jurisdictions
  - Lots and lots of administrative complexity
- WTO compatibility: blessing and a curse
- Spirit of Paris/UNFCCC CBDR? Depends on which side you're on
- Paying new fees != losing competitiveness (others might pay more)

US Carbon border adjustment: carbon tariffs?

- Two proposals have been extensively discussed:
  - D: Clean Competition Act – a performance standard for both domestic producers and imports
  - R: Foreign Pollution Fee Act – i.e. carbon tariffs
- "Carbon advantage" underpins desire for a US CBAM: US carbon intensity in industry is pretty good
- Carbon intensity ideally expressed in CO2/ton of product, not value of product
- Carbon intensities should change rapidly over time, as a result of climate policy and other drivers
- Questions about partnerships and policy responses from other countries
- A carbon tariff might not matter that much if it comes on top of other tariffs

GHG Intensities of Covered Sectors for the BRICS Countries in 2017 (tons/$mil) from GTAP

	US	Brazil	China	India	Russia	South Africa
Refining	515	367	728	287	599	5175
Paper & publishing	310	168	336	1222	1725	346
Chemicals	369	159	566	551	1999	952
Cement	556	705	1055	2797	2203	2407
Iron and Steel	626	663	2028	7152	3921	3016
Aluminum	265	834	960	1168	1324	760

Carbon Tariff Rates (ad valorem, percent) on US imports for year 1 of the policy

	US equiv. tax on output	Brazil	China	India	Russia	South Africa	Canada	Mexico	Japan	France	Germany	Italy	South Korea	UK	Rest of Western EU
Refining		0.0	1.2	0.0	0.5	25.6									
Paper & publishing		0.0	0.1	5.0	7.8	0.2									
Chemicals		0.0	1.1	1.0	9.0	3.2									
Cement		0.8	2.7	12.3	9.1	10.2									
Iron and Steel		0.2	7.7	35.9	18.1	13.1									
Aluminum		3.1	3.8	5.0	5.8	2.7									

Carbon Tariff Rates (ad valorem, percent) on US for the first year of the policy

	US equiv. tax on output	Brazil	China	India	Russia	South Africa	Canada	Mexico	Japan	France	Germany	Italy	South Korea	UK	Rest of Western EU
Refining		0.0	1.2	0.0	0.5	25.6	**0.0**	**3.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Paper & publishing		0.0	0.1	5.0	7.8	0.2	**1.1**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Chemicals		0.0	1.1	1.0	9.0	3.2	**0.0**	**1.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cement		0.8	2.7	12.3	9.1	10.2	**0.0**	**5.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Iron and Steel		0.2	7.7	35.9	18.1	13.1	**1.2**	**1.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**
Aluminum		3.1	3.8	5.0	5.8	2.7	**0.8**	**0.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Tariffs under both policies shift annual US imports to lower carbon intensity producers ($ millions)

	Brazil	China	India	Russia	South Africa	Canada	Mexico	Japan	France	Germany	Italy	South Korea	UK	Rest of Western EU
Refining	12	-90	25	-87	-42	269	-225	5	6	1	2	16	7	36
Paper & publishing	22	43	-38	-8	0	-335	-19	7	7	17	5	10	15	31
Chemicals	30	-559	-127	-665	-99	749	-272	121	77	141	35	63	65	248
Cement	28	-539	-274	-4	-27	217	-612	94	38	96	128	27	28	124
Iron and Steel	281	-573	-927	-1632	-467	345	2	203	64	190	105	316	75	300
Aluminum	-195	-600	-168	-919	-343	336	8	89	59	211	35	68	104	106

Green industrial policy

- Green industrial policy has merits…
- …but also creates externalities and spillovers
  - Local content requirements as a trade barrier
  - Subsidy race
  - Technology neutrality

Data & methodology challenges for climate-and-trade

Sector aggregation:
NAICS vs HS vs others

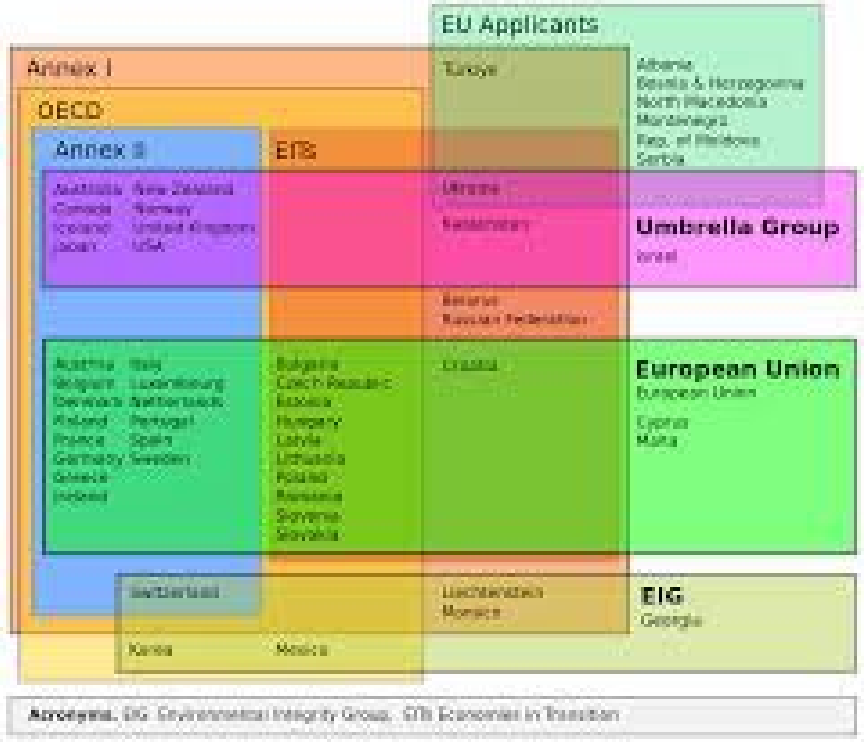
▼ 3311	**Iron and Steel Mills and Ferroalloy Manufacturing**	**2,602**
331110	Iron and Steel Mills and Ferroalloy Manufacturing	2,602
▼ 3312	**Steel Product Manufacturing from Purchased Steel**	**1,573**
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	622
331221	Rolled Steel Shape Manufacturing	511
331222	Steel Wire Drawing	440
▼ 3313	**Alumina and Aluminum Production and Processing**	**1,274**
331313	Alumina Refining and Primary Aluminum Production	238
331314	Secondary Smelting and Alloying of Aluminum	68
331315	Aluminum Sheet, Plate, and Foil Manufacturing	292
331318	Other Aluminum Rolling, Drawing, and Extruding	676

7306.11.0000	- - - Welded, of stainless steel	kg
7306.19	- - - Other:	
7306.19.1000	- - - - Of iron or nonalloy steel	kg
7306.19.5000	- - - - Of alloy steel	kg
	- - Casing and tubing of a kind used in drilling for oil or gas:	
7306.21	- - - Welded, of stainless steel:	
7306.21.3500	- - - - Casing	kg
7306.21.8000	- - - - Tubing	kg
7306.29	- - - Other:	
	- - - - Casing:	
7306.29.1500	- - - - - Of iron or nonalloy steel	kg
7306.29.3000	- - - - - Other	kg
	- - - - Tubing:	
7306.29.6000	- - - - - Of iron or nonalloy steel	kg
7306.29.8100	- - - - - Other	kg
7306.30	- - Other, welded, of circular cross section, of iron or non-alloy steel:	
7306.30.1000	- - - Having a wall thickness of less than 1.65 mm (0.065 in.)	kg
	- - - Having a wall thickness of 1.65 mm (0.065 in.) or more:	
7306.30.1550	- - - - The following pipes and tubes: tapered, principally used as parts of illuminating articles; cold-drawn; cold-rolled with a wall thickness not exceeding 2.54 mm (0.10 in.); or suitable for use in boilers, superheaters, or other gas or liquid pressure applications	kg
	- - - - Other:	
	- - - - - With an outside diameter not exceeding 114.3 mm (4.5 in.):	
7306.30.2000	- - - - - - Galvanized	kg
7306.30.4000	- - - - - - Other	kg
7306.30.6000	- - - - - With an outside diameter exceeding 114.3 mm (4.5 in.) but not exceeding 406.4 mm (16 in.)	kg
7306.40	- - Other, welded, of circular cross section, of stainless steel:	
7306.40.1000	- - - Having a wall thickness of less than 1.65mm (0.065 in.)	kg

Data & methodology challenges for climate-and-trade

Country groupings: climate vs trade

- UNFCCC groups (G77, BASIC etc)
- Developing/emerging/industrialized
- Market vs non-market economies
- Customs unions, FTAs



Output vs value-added

- Output can be measures in $ value or volume
- Output reductions can occur for many reasons:
  - Loss of competitiveness – high input prices
  - Lower demand because of circularity/material efficiency
  - Lower demand because of substitution
  - Greater demand elsewhere
  - Capital cycle, assets end of life
- Value added does not always go up/down with output
- If GHG metrics get combined with value added = strange conclusions can be drawn

Future policy scenarios: United States

- Some Biden admin policies (IRA) have supported domestic manufacturing; Trump purports similar desire, without carbon/climate focus
- Protectionism might intensify (but already exists)
  - Tariffs beyond steel/aluminum
  - Merger blockings (NipponSteel)
  - Local content rules
- Transactional/adversarial approach to international trade (e.g. LNG)
  - Surplus vs deficit countries
- Some low-carbon technologies might be favored under Trump, but hard to see greener industry: GHG emissions decline, but no transformative change
- Wild card: permitting reform; grid investment; mineral processing
- Fiscal capacity a greater concern (spending + revenues)

Future policy scenarios: EU/Europe

- Risk of decarbonization with deindustrialization
- Shifts in technology implies shifting comparative advantage: challenging political economy
  - Car industry, steel industry
  - Wind, advanced materials & chemicals
- Climate policy framework is extensive, but flexibility might be sought
- CBAM diplomacy & ease of implementation needs to improve
- New strategies are being developed, but no radical new ideas
  - Fiscal capacity constrained – no new budget
  - Competitiveness compass; Clean Industrial Deal
- Europe outside of EU:
  - UK: CBAM planned; interest in linking EU/UK ETS
  - Switzerland/Norway: similar as EU, but more fiscal space
  - Balkans + Turkey: direct impact of CBAM
  - Ukraine: gradual integration with EU, despite war

Future policy scenarios: other regions

- Climate-and-trade policy leads to a desire for interoperability – but this is even more difficult when everyone is playing defense
- Subsidy race: smaller economies face higher risks, but could also depend on successful policy elsewhere
- “Friendshoring”: difficult to design climate and trade policies that align well with geopolitics, but not impossible if you accept some collateral damage
- Climate clubs and alliances:
  - More difficult if everyone is focused on domestic competitiveness
  - Minilateralism/Plurilateralist blocks more likely?
- Developing countries perspectives
  - … are reaching given levels of GDP with lower levels of GHGs
  - Have widely divergent levels of GHG intensity in industry (especially due to indirect emissions)
  - Share of manufacturing in GDP ranges from very low (1-2%) to very high (25%)

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