Rethinking Energy Policies in Europe Following the Ukraine War: How to Support the Vulnerable and Speed up the Green Transition

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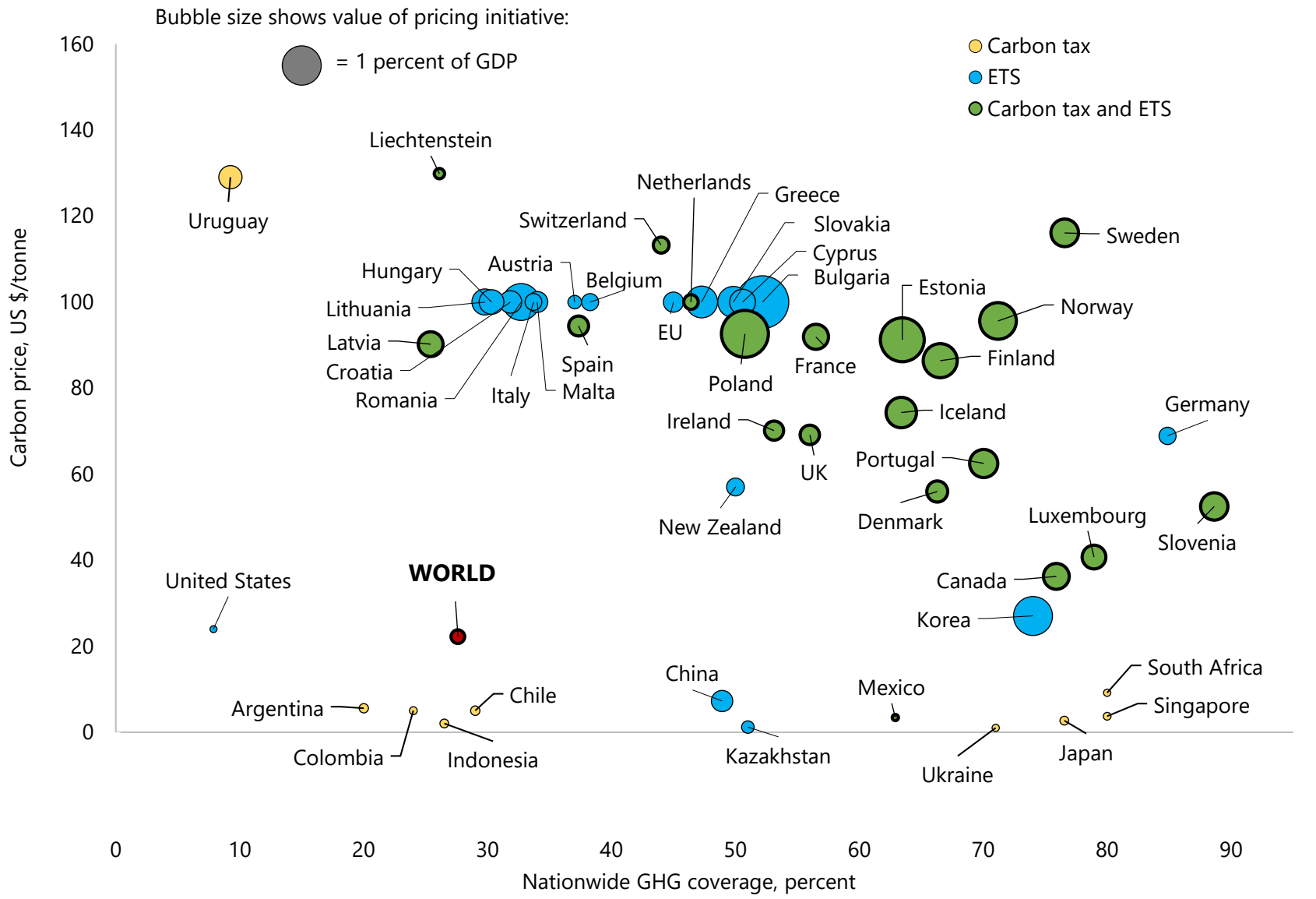
Contents

- Carbon pricing
- Reinforcing sectoral instruments
- International coordination
- Implications of energy price surge for mitigation
- Impacts of mitigation policies

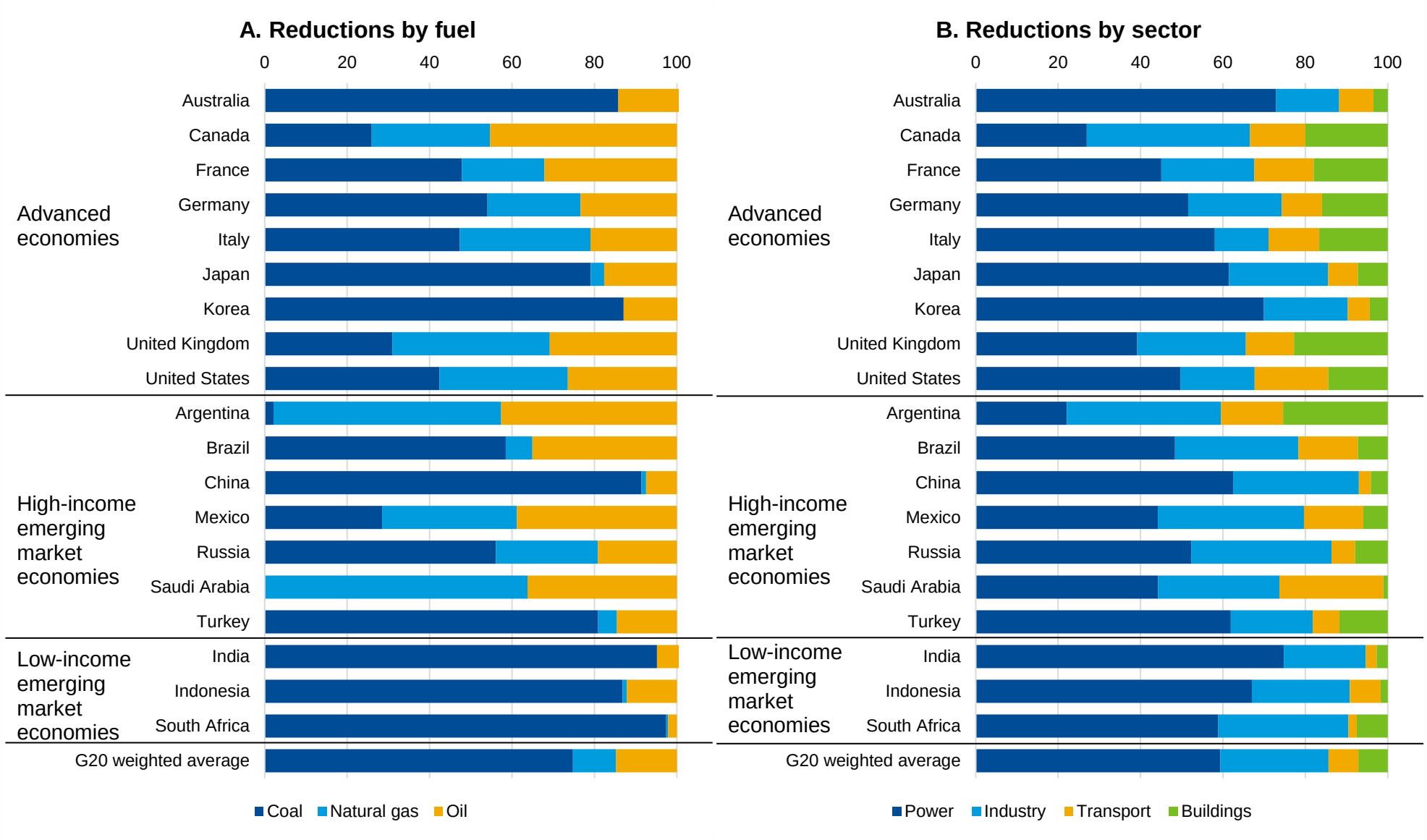
Carbon Pricing

Carbon Pricing Has Key Role and is Proliferating



Coverage: Coal or Power/Industry Most Important

Breakdown of CO_2 Reductions by Fuel/Sector under Carbon Pricing, 2030



Source. IMF staff from CPAT.

Note. Estimates are for a $75/50/25 carbon price for advanced/high-income emerging/low-income economies. Panel B is for direct emissions. Buildings includes fossil fuel CO2 emissions from residences, services, agriculture, and forestry but emissions from industrial buildings are included under industry.

Comparison of Carbon Taxes and Emissions Trading

Design issue	Instrument	
	Carbon tax	ETS
Administration	Administration is more straightforward (e.g. as extension of fuel taxes)	May not be practical for capacity constrained countries
Uncertainty: price	Price certainty can promote clean technology innovation and adoption	Price volatility can be problematic; price floors, and cap adjustments can limit price volatility
Uncertainty: emissions	Emissions uncertain but tax rate can be periodically adjusted	Certainty over emissions levels
Revenue: efficiency	Revenue usually accrues to finance ministry for general purposes (e.g., cutting other taxes, general investment)	Free permit allocation may help with acceptability but lowers revenue; tendency for auctioned revenues to be earmarked
Revenue: distribution	Revenues can be recycled to make overall policy distribution neutral or progressive	Free allowance allocation or earmarking may limit opportunity for desirable distributional outcomes
Political economy	Can be politically challenging to implement new taxes; use of revenues and communications critical	Can be more politically acceptable than taxes, especially under free allocation
Competitiveness	Border carbon adjustment more robust than other measures (e.g., threshold exemptions, output-based rebates)	Free allowances effective at modest abatement level; border adjustments (especially export rebate) subject to greater legal uncertainty
Price level and emissions alignment	Need to be estimated and adjusted periodically to align with emissions goals	Alignment of prices with targets is automatic if emissions caps consistent with mitigation goals
Compatibility with other instruments	Compatible with overlapping instruments (emissions decrease more with more policies)	Overlapping instruments reduce emissions price without affecting emissions though caps can be set or adjusted accordingly
Pricing broader GHGs	Amenable to tax or proxy taxes where they build off business tax regimes; feebate variants are sometimes appropriate (e.g., forestry, maritime)	Less amenable to ETS; incorporating other sectors through offsets may increase emissions and is not cost effective
Global coordination regimes	Most natural instrument for international carbon price floor	Can comply with international price floor; mutually advantageous trades from linking ETSs but does not meet global emissions

Source. IMF staff. Green indicates an advantage of the instrument; orange indicates neither an advantage nor disadvantage; red indicates a disadvantage of the instrument.

Reinforcing Sectoral Instruments

Pricing should be Complemented with Sectoral Instruments

- Due to acceptability constraints on pricing (especially when energy prices high)
- Regulations (e.g., renewable shares) and subsidies (e.g., electric vehicles) are common
- But feebates more flexible and cost effective
  - Revenue neutral sliding scale of fees/rebates for products/activities with >/< average CO_2 rates
  - Fiscal analogue of tradable emission rate standard (e.g., Canada)
- Attractions of feebates
  - Promote all responses for reducing emissions intensity (though no demand response)
  - Cost effective (regulations require fluid credit trading)
  - Avoid a fiscal cost (unlike subsidies)
  - No burden on average household/firm (unlike carbon pricing)

Applications of Feebates

Energy Sector

- Vehicles (commonly integrated into registration fees)
- Power generation/industry (limits increase in prices/production costs)
- Buildings (encourage renovations, clean heating, efficient appliances)
- Industry (limits competitiveness/leakage concerns)

Broader sectors

- Forestry
  - Landowners: fee = CO_2 price × (baseline carbon storage – current storage)
- Extractives (methane)
  - Revenue neutral shift of current fiscal regimes
  - Proxy pricing based on default emission rates with rebates for cleaner firms

International Coordination Mechanisms

Coordination Regimes to Reinforce Paris

2030 gaps to address

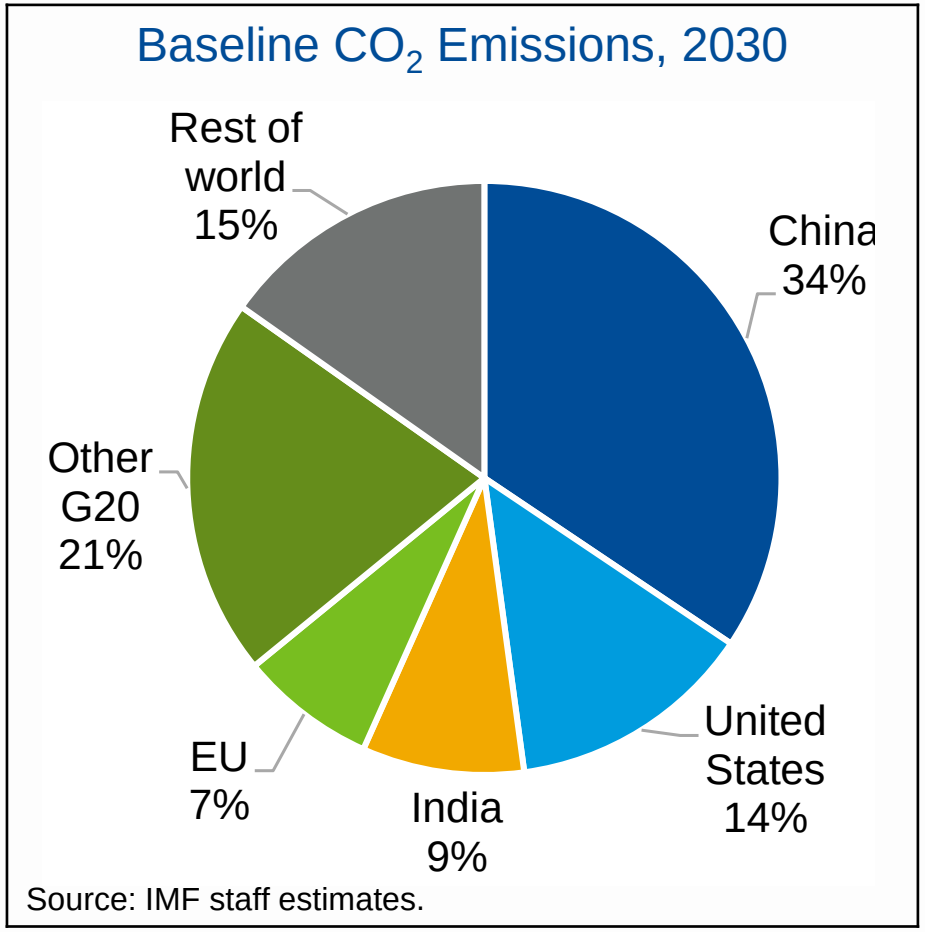
- *Ambition*: Pledged reductions only 1/3-2/3 of needed
- *Policy*: Global CO_2 price > $75 per tonne needed

Difficulties in Paris Agreement

- *Negotiation*: too many parties/parameters
- *Unilateral policy*: deterred by competitiveness

Elements of coordination regimes

- Small number of large emitters
- Minimum carbon price



Coordination Regimes to Reinforce Paris

Differentiated responsibilities

- Differentiated floors/support for low-income countries
- $75/50/25 floor price algins global emissions with <2C with 6 participants

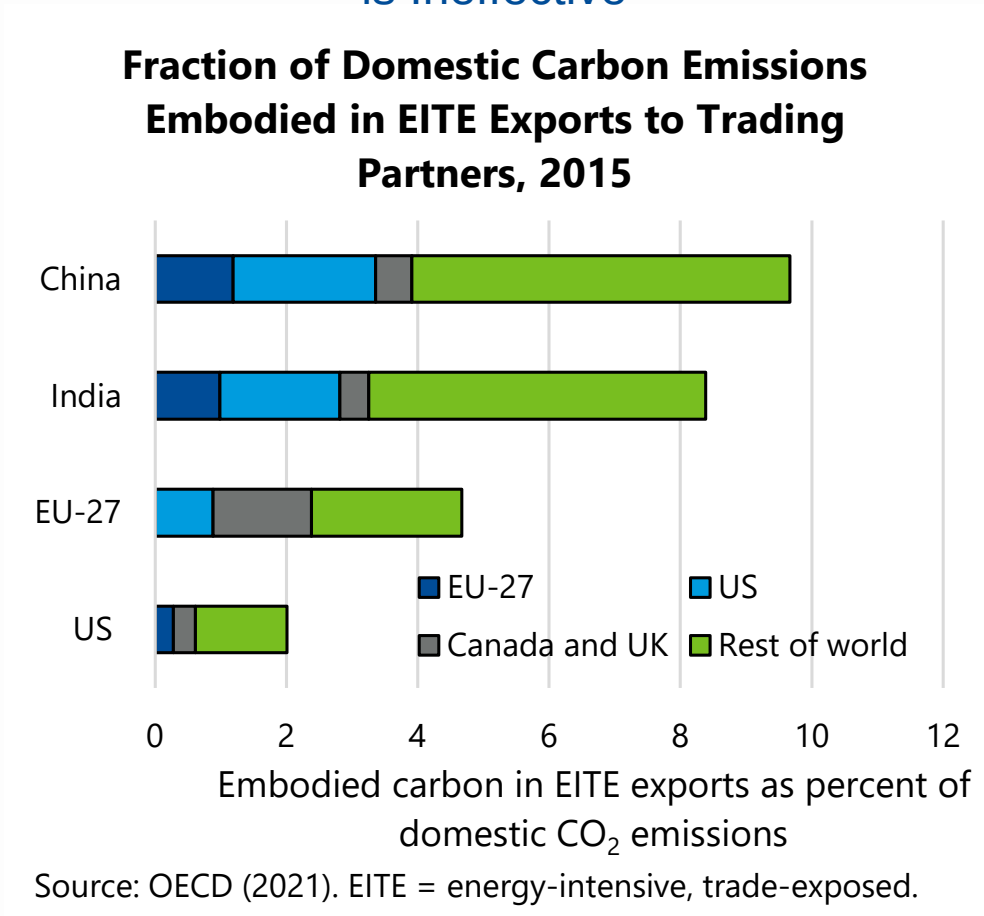
Accommodate non-pricing approaches

- CPAT maps other policies into CO_2 reductions/carbon price equivalent

Alternative coordination through carbon markets

- Must accommodate countries without ETS
- Address equity
- Needs prices/caps aligned with temp. goals

Unilateral Border Adjustment Regime is Ineffective



Source: OECD (2021). EITE = energy-intensive, trade-exposed.

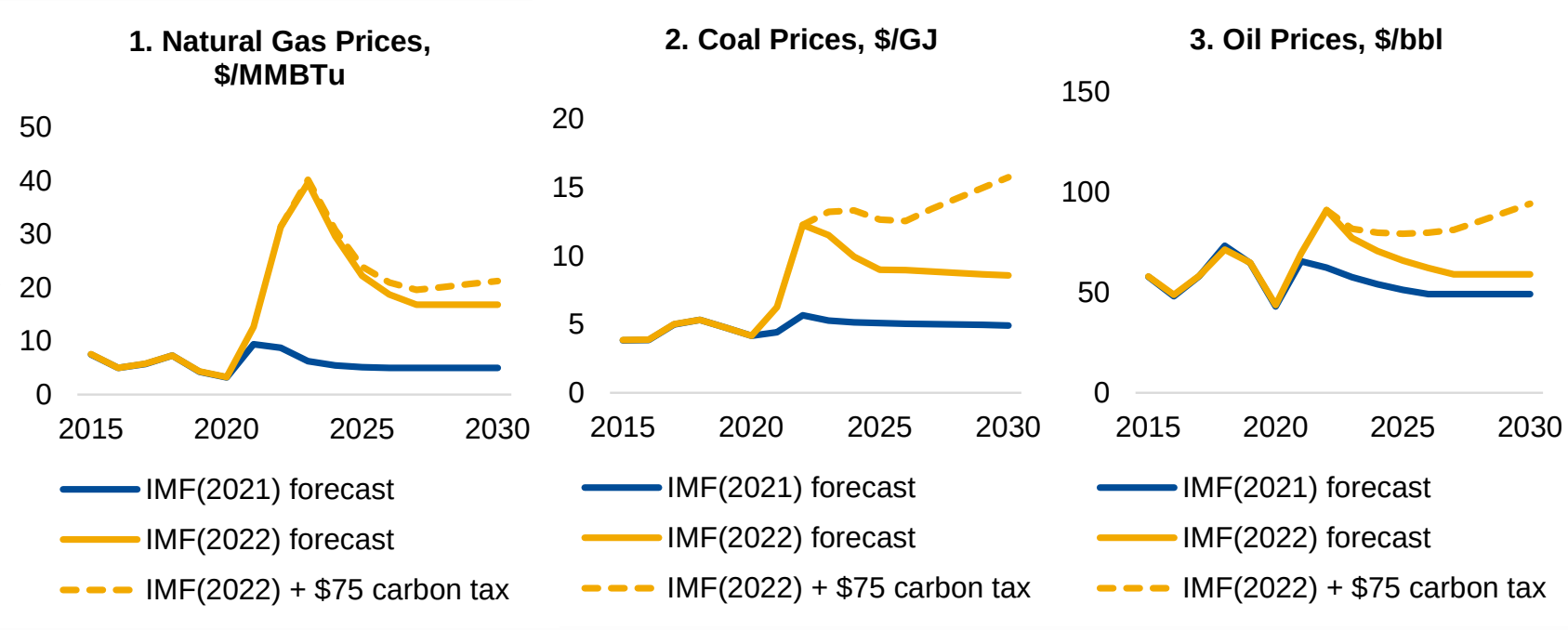
Implications of Price Surge

Implications of Energy Price Surge

- Underscores urgency of transition: to clean/secure energy
- Household assistance: targeted/unrelated to energy use
- Modest emissions impact: gas/coal price increased, surge is partially temporary

Carbon price signal needed

- Receding fuel prices → time to lock in pricing
- Affects pricing/non-pricing policy balance



Impacts of Mitigation Policies

The Climate Policy Assessment Tool (CPAT)

Helps policymakers design, compare, and implement policies to achieve NDCs and SDGs

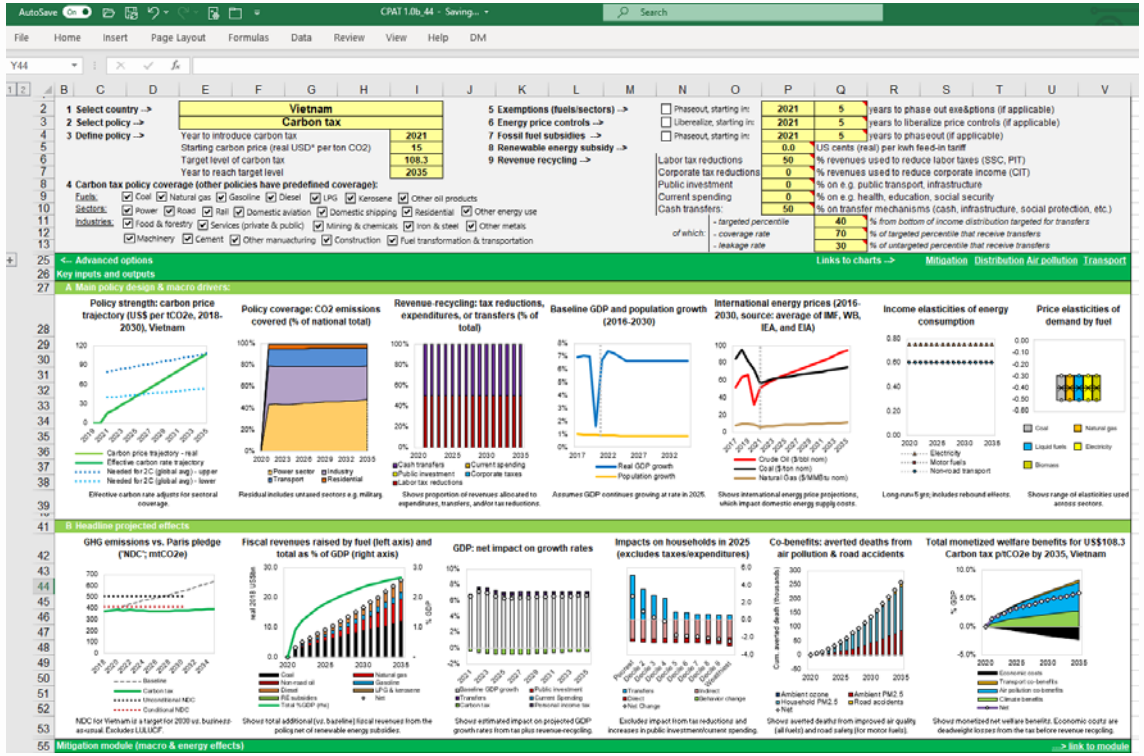
- Spreadsheet 'model of models' covering >**200 countries**
- **Developed jointly** by IMF (FAD) & World Bank (SD & EFI)
- Aimed at **economists** in IMF, WB; finance, planning & line ministries

Policies

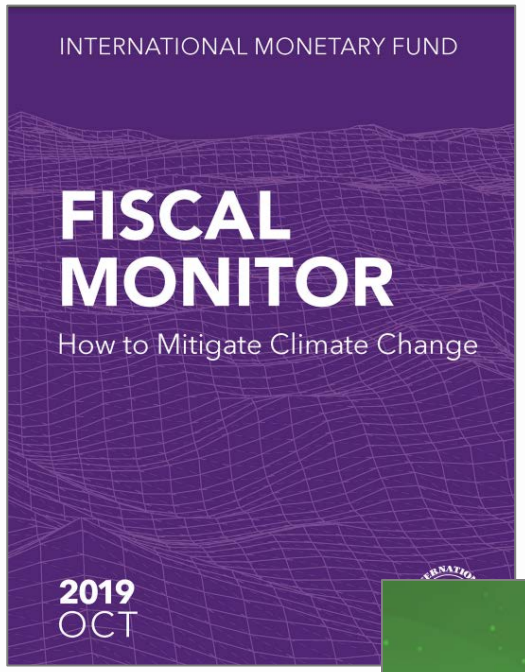
- Carbon pricing, fuel tax reform, performance standards, clean technology subsidies

Metrics

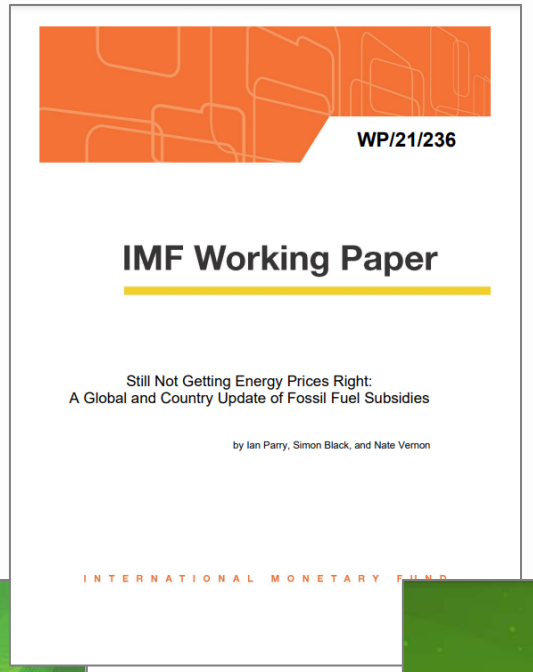
- **energy & emissions** – prices, consumption, fuel mix, global and local pollutants
- **macroeconomic** – GDP, revenues, welfare cost, trade balance
- **distributional** – by income group, region, industry
- **co-benefits** – pollution/mortality, road safety, congestio



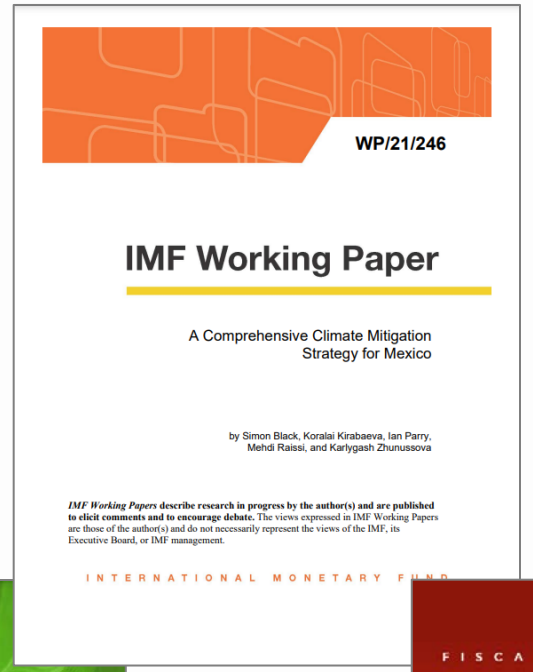
Recent reports using CPAT



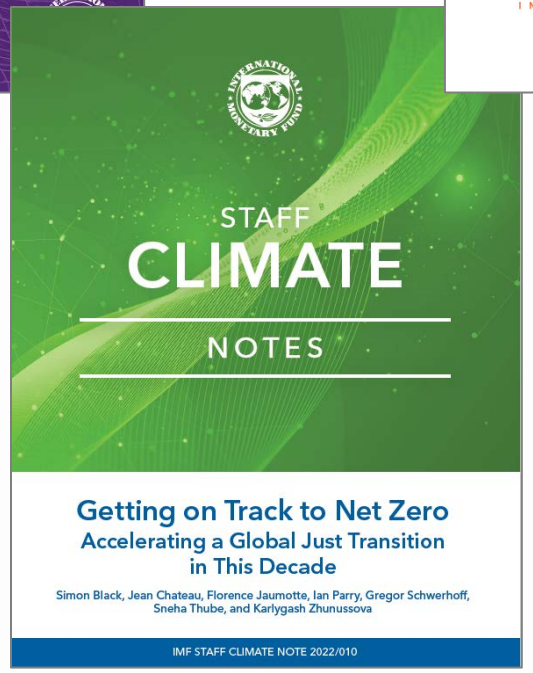
https://www.imf.org/en/Publications/FM/Issues/2019/09/12/fiscal-monitor-october-2019



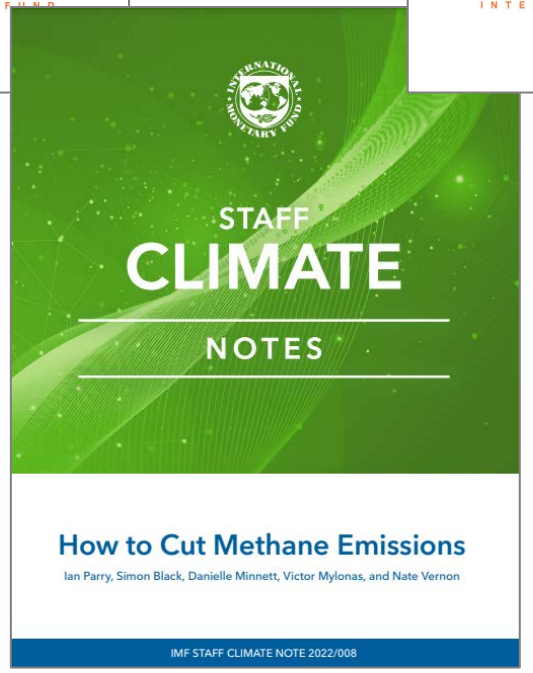
https://www.imf.org/en/Publications/WP/Issues/2021/09/23/Still-Not-Getting-Energy-Prices-Right-A-Global-and-Country-Update-of-Fossil-Fuel-Subsidies-466004



https://www.imf.org/en/Publications/staff-climate-notes/Issues/2022/10/31/Getting-on-Track-to-Net-Zero-Accelerating-a-Global-Just-Transition-in-This-Decade-525242



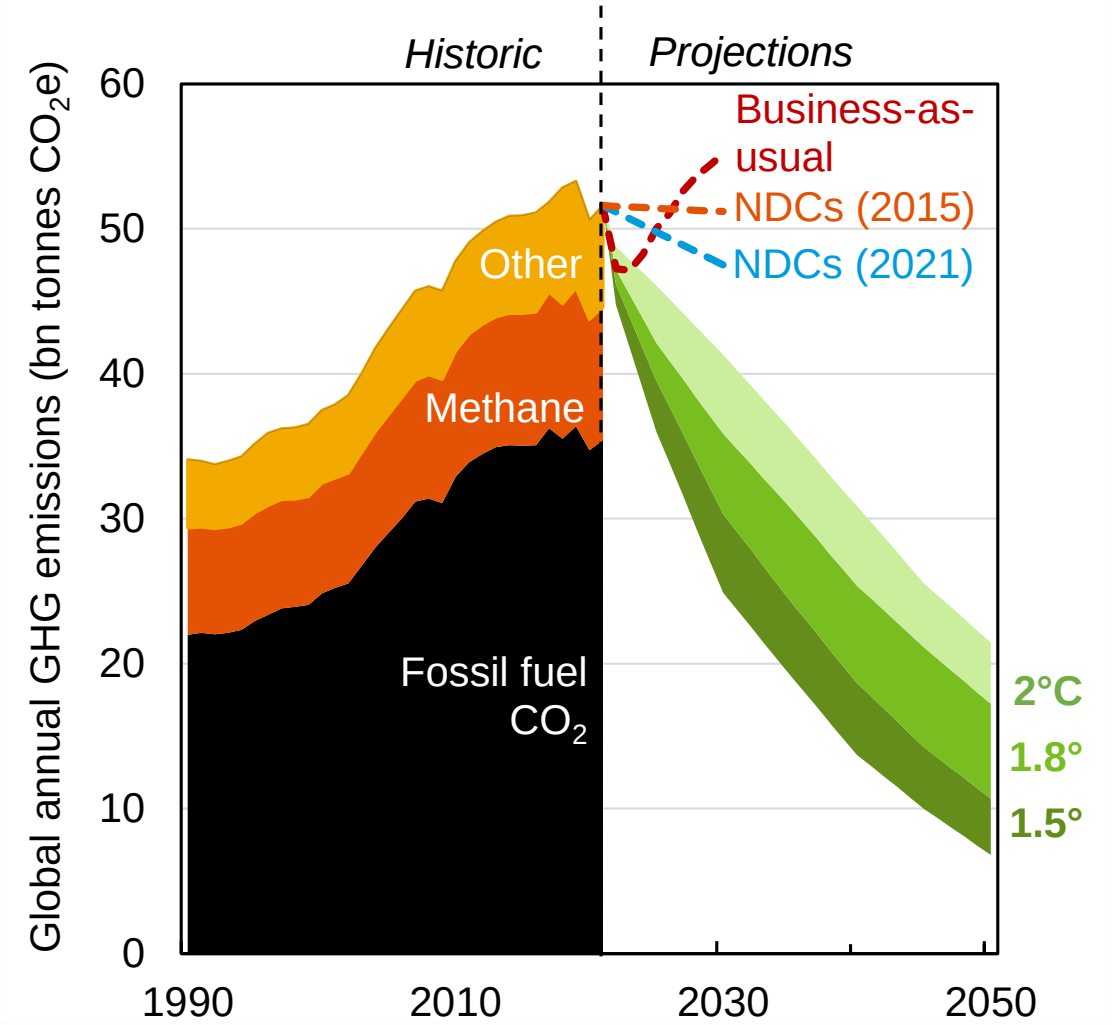
https://www.imf.org/en/Publications/staff-climate-notes/Issues/2022/10/28/How-to-Cut-Methane-Emissions-525188



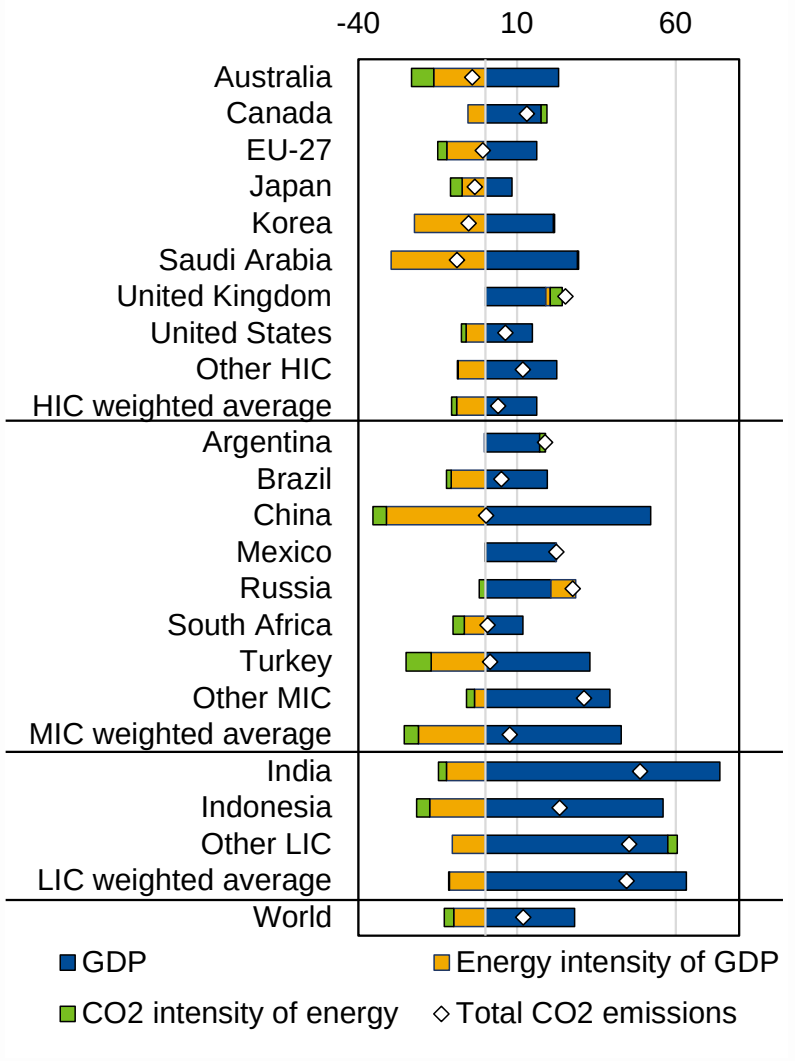
https://www.imf.org/en/Publications/WP/Issues/2021/10/18/A-Comprehensive-Climate-Mitigation-Strategy-for-Mexico-494708

If no action taken emissions will continue to grow

Global GHG Emissions, Nationally Determined Contributions (NDCs), and Temperature Targets



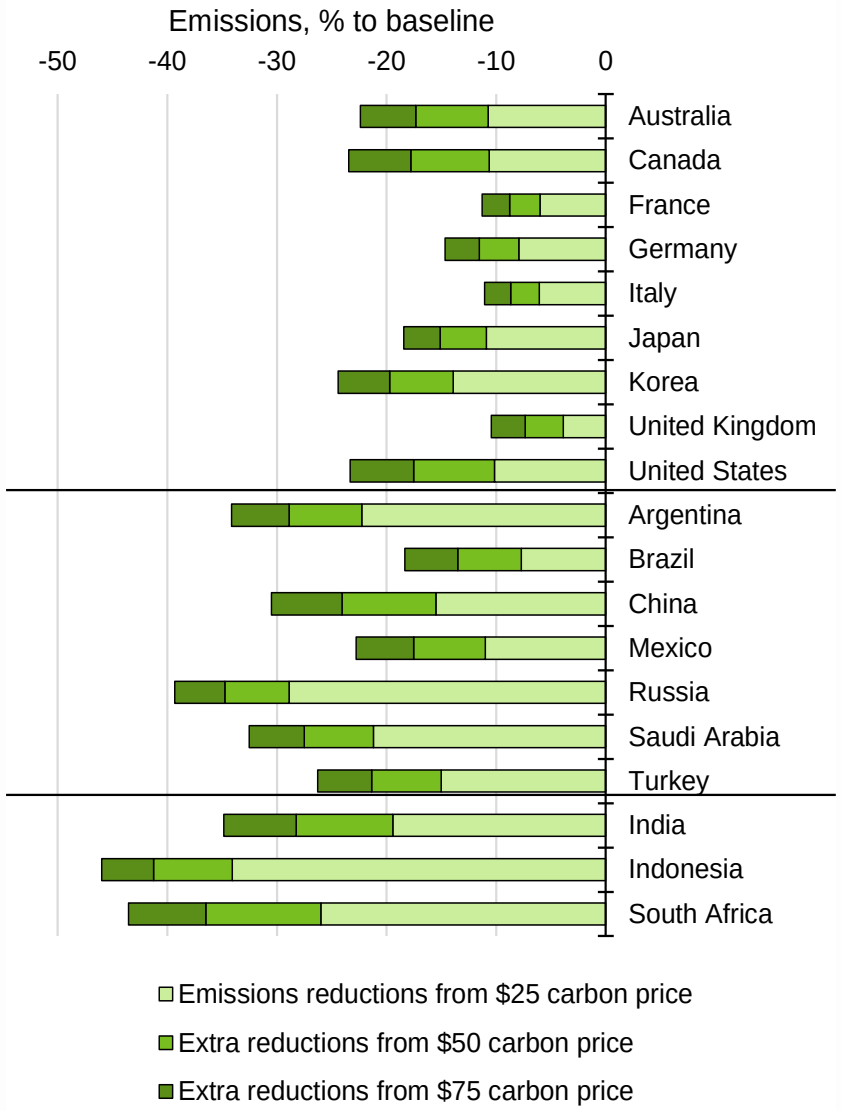
Drivers of CO_2 emissions growth



Carbon pricing can reduce emissions...

- Heterogeneous responsiveness to carbon pricing across countries:
  - $50/tonne in 2030 cuts some middle-income country emissions **up to 30%**
- A **$75+** carbon price is needed to reduce G20 emissions **consistent with 2ºC**

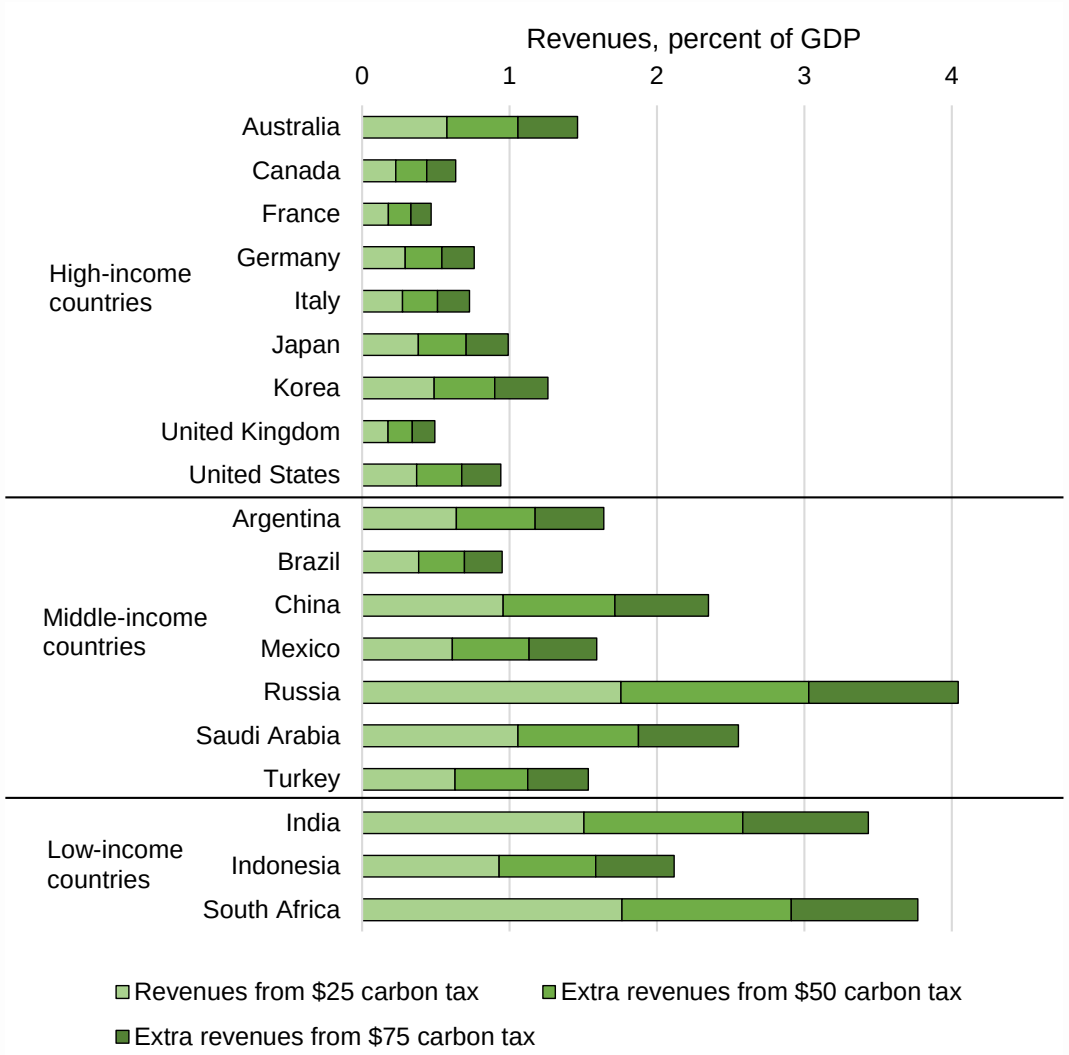
CO_2 Emissions Impacts from Carbon Pricing, G20 Countries, 2030



… while raising significant revenues

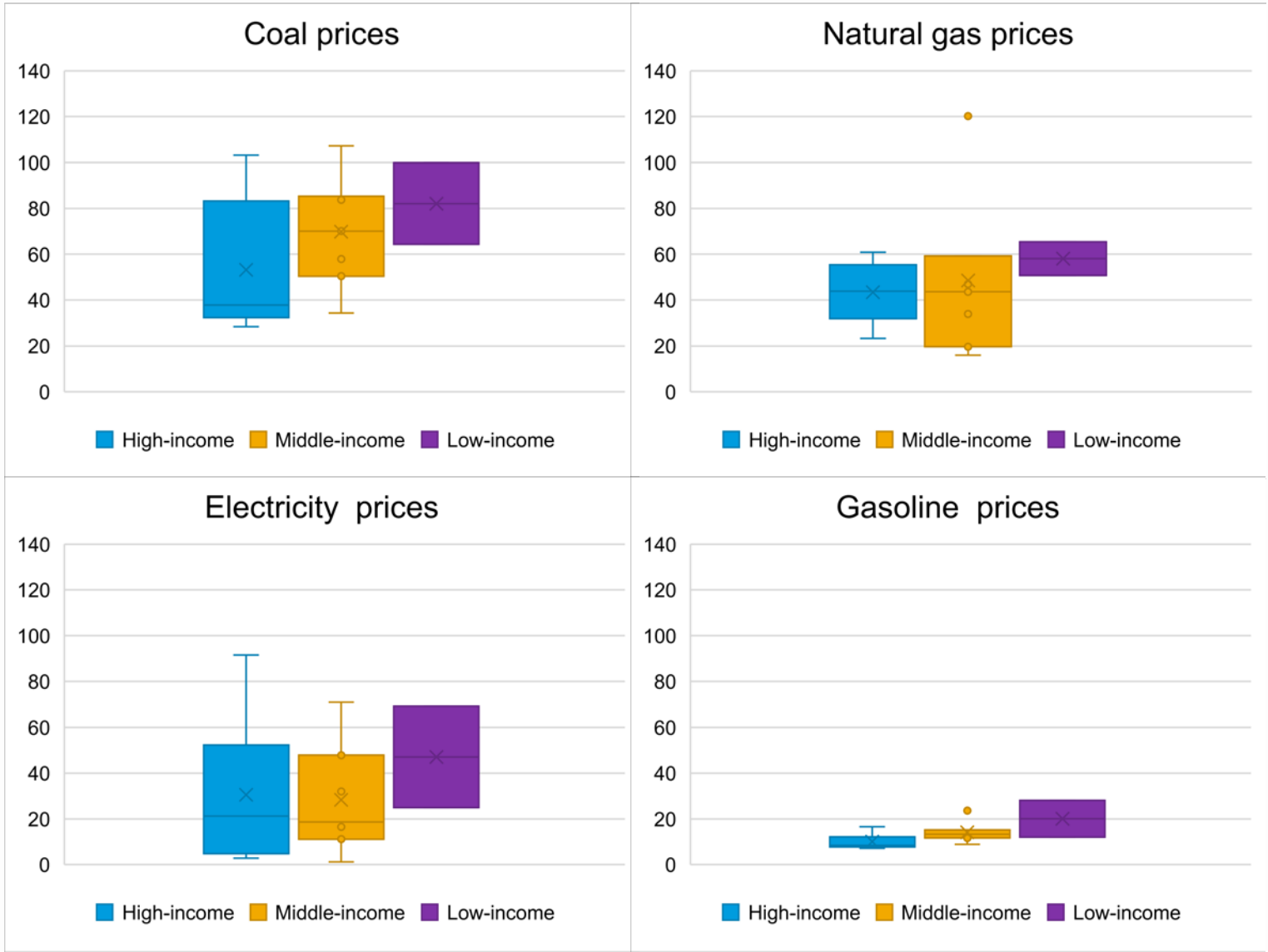
- Relatively higher revenue potential in middle/low-income countries:
  - Low-income: ~ **1.4%** for $25/tonne
  - Middle-income: ~**1%** for $50
  - Emission-intensive: **2-3%** for $50
- More moderate revenues in high-income
  - **0.5-1.5%** for $75

Revenues from carbon pricing, G20 countries, 2030



Carbon pricing schemes increase energy prices...

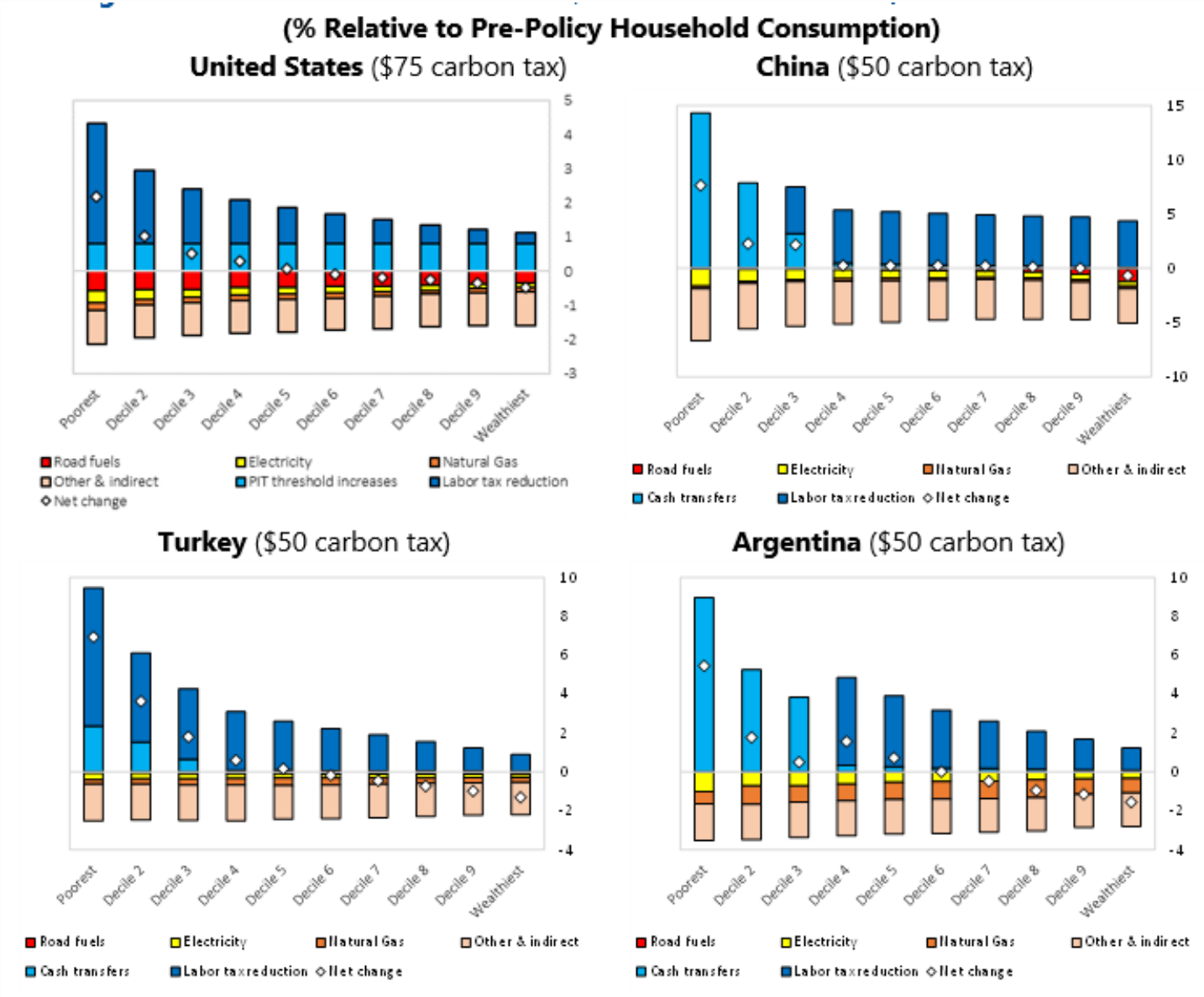
Impact of $50 carbon price on energy prices, 2030



Revenue recycling contains household burdens

- First-round impact on households is moderately regressive or neutral
- Revenue recycling could offset ~ 80-90% of average household burden
  - … and make the reform progressive and pro-poor

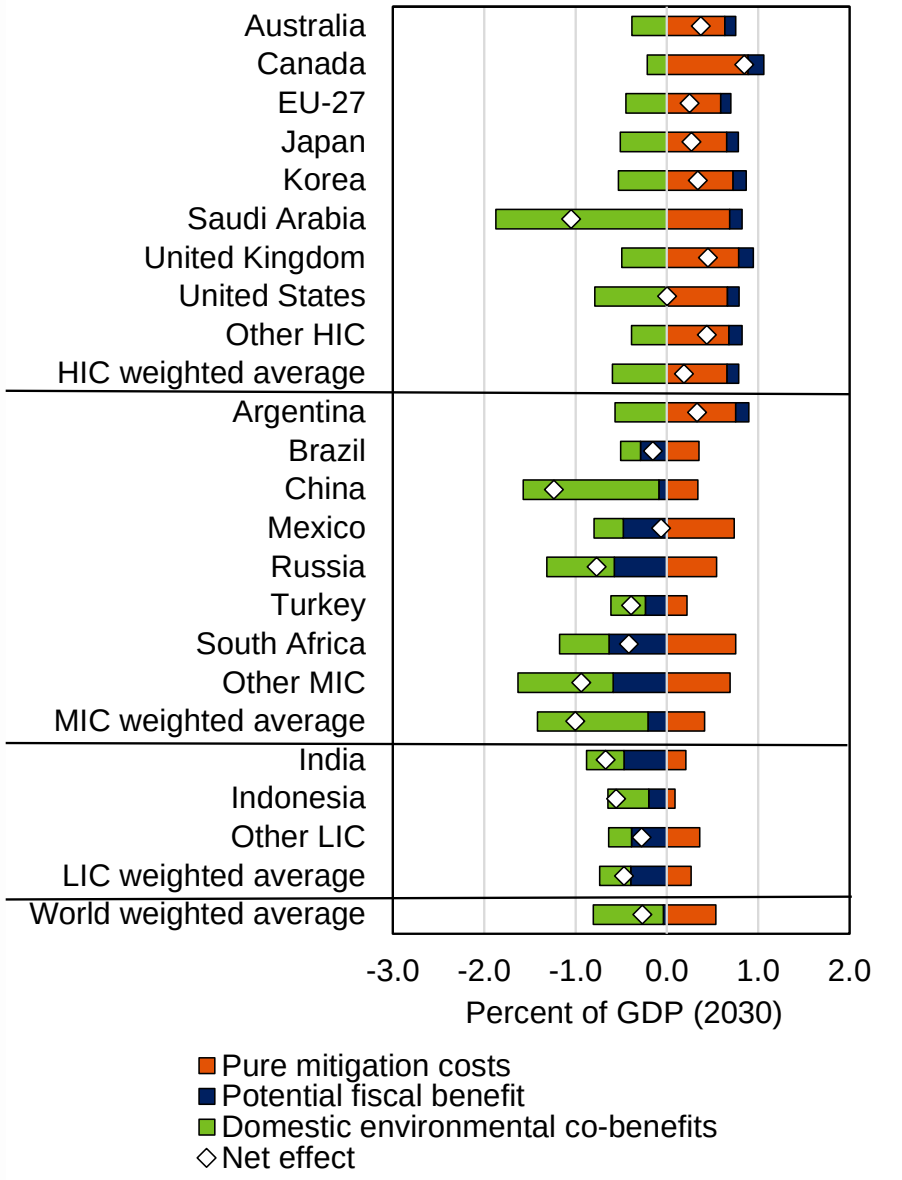
Household Burdens from Carbon Pricing, 2030



Domestic environmental co-benefits can outweigh costs

- Co-benefits include reductions in:
  - local air pollution mortality,
  - road congestion,
  - accident externalities

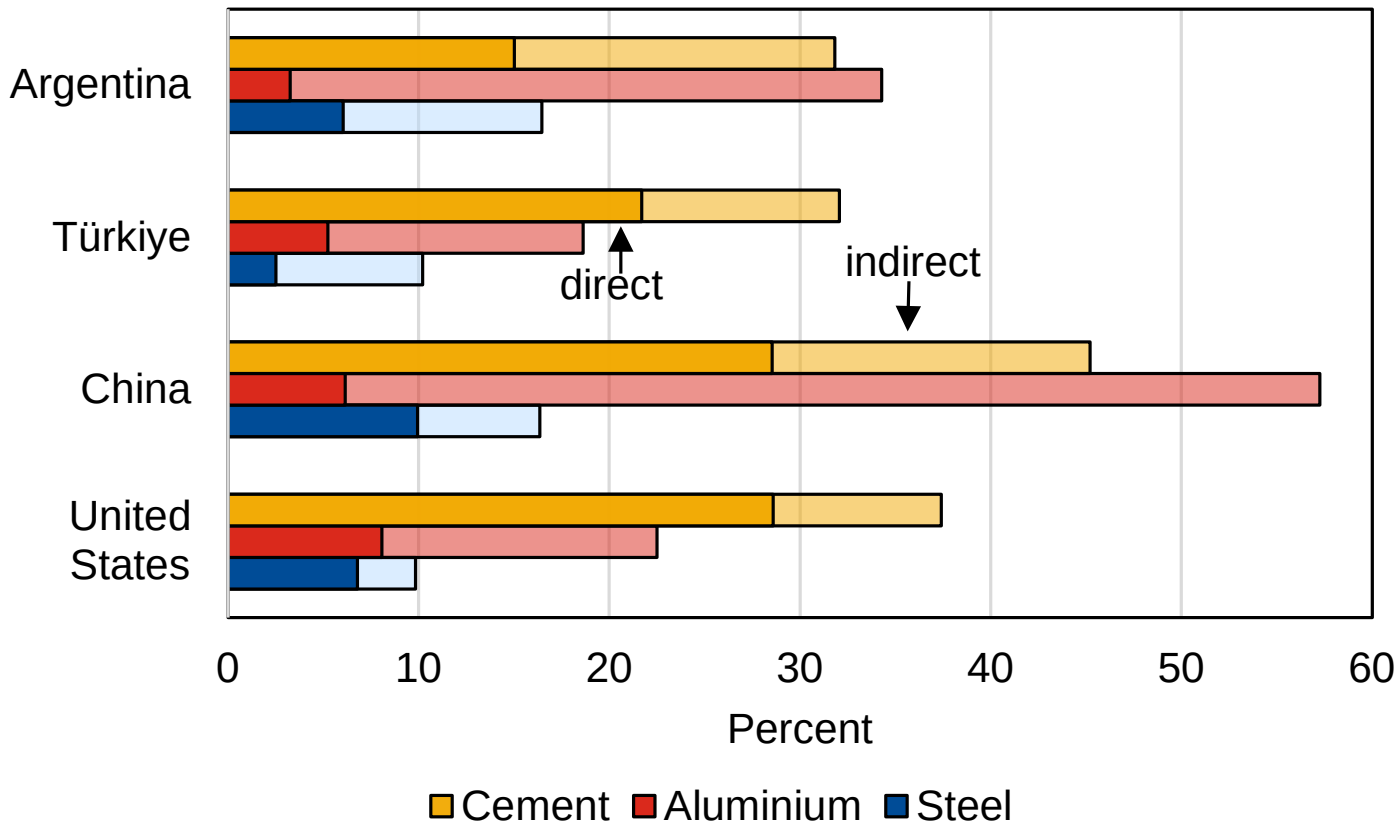
Abatement Costs/Co-Benefits from Carbon Pricing, 2030



Energy-intensive, trade-exposed (EITE) industries

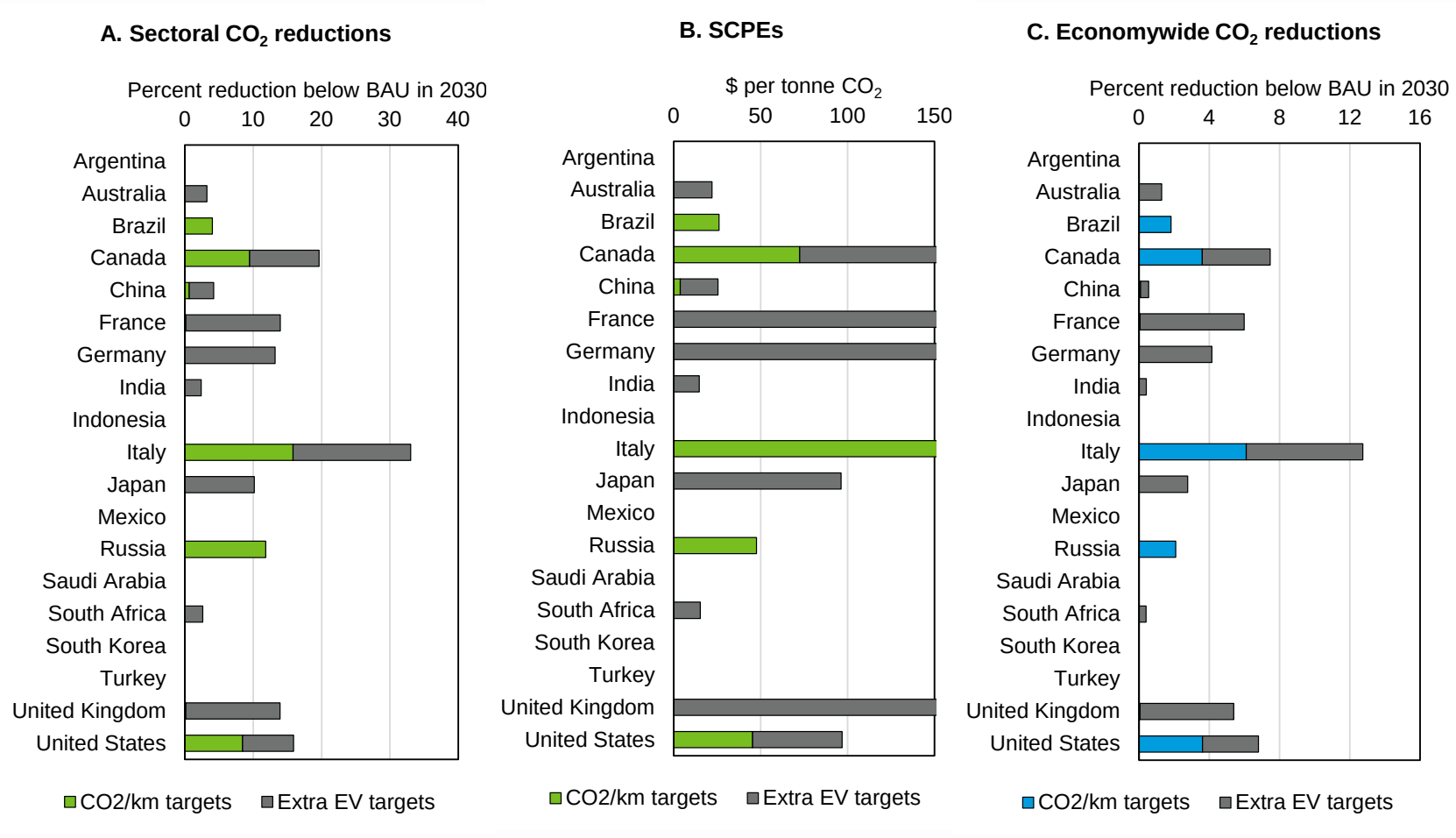
- Mainly these industries have
  - high embodied carbon
  - limited ability to pass production cost increases forward into higher consumer prices
- Direct cost increases 5-10% percent for aluminum/steel but ≤ 30% for cement
- Relatively large indirect cost increases (carbon embodied in electricity inputs)

Production Cost Increases for Selected EITE Industries from $75/50 Carbon Price, 2019



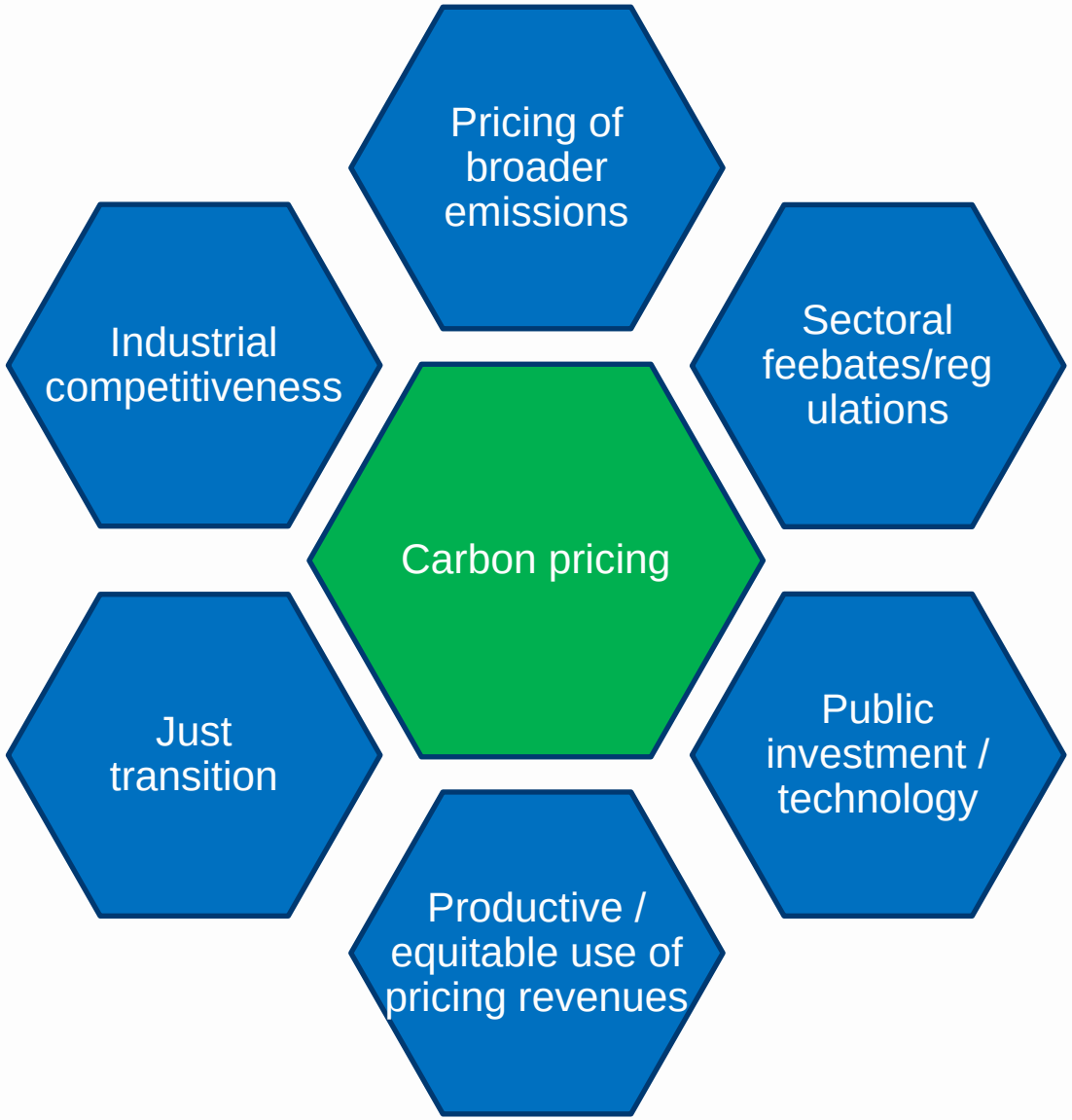
Other mitigation policies at the sectoral level can be effective at reducing emissions

Transport Sector Targets



SCPEs = sectoral carbon price equivalents

Supporting Policies Needed to Enhance Effectiveness and Acceptability of Mitigation Strategy



Thank you