



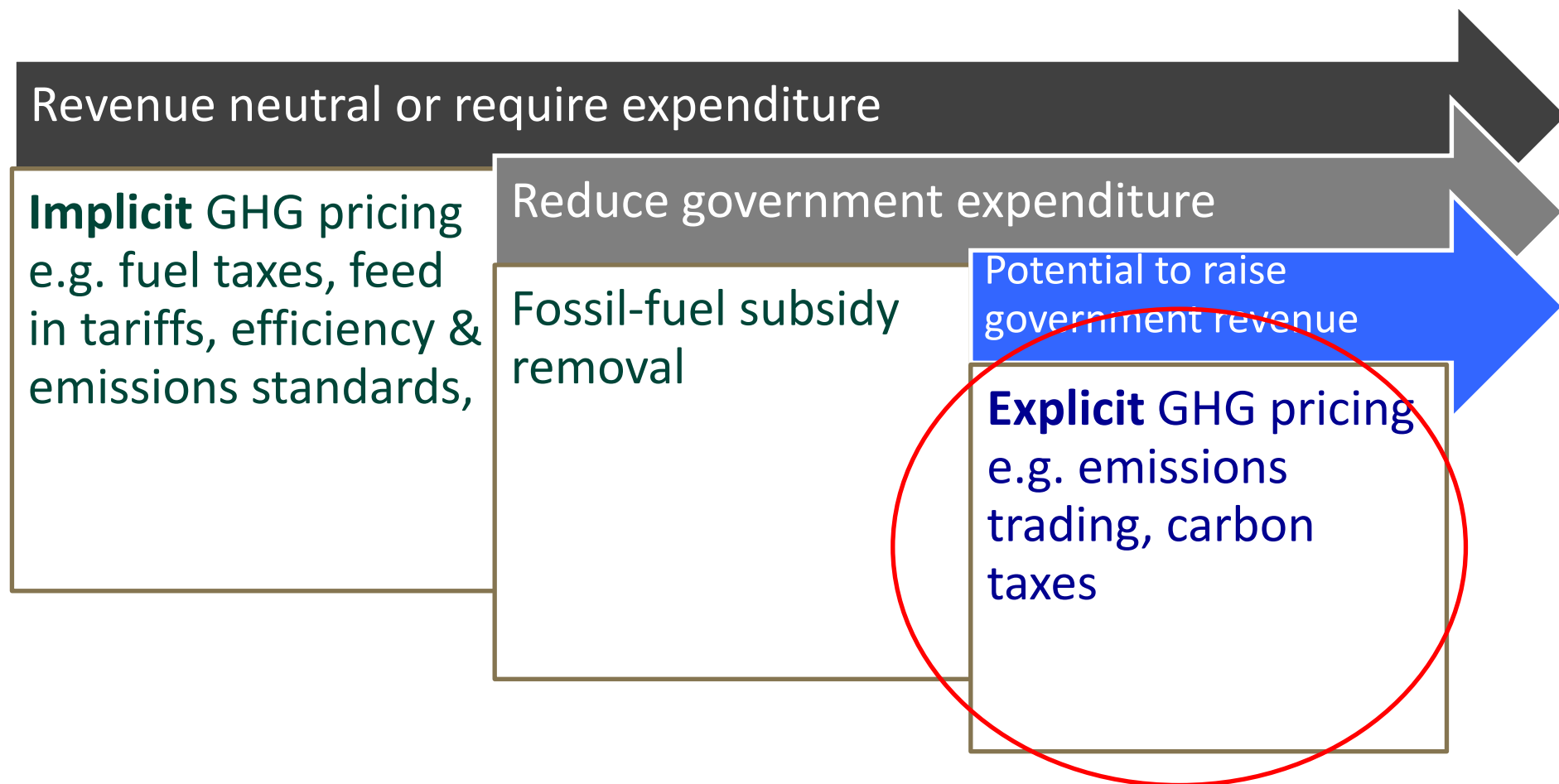
Carbon pricing, Competitiveness and Carbon Leakage:

THEORY, EVIDENCE AND POLICY DESIGN

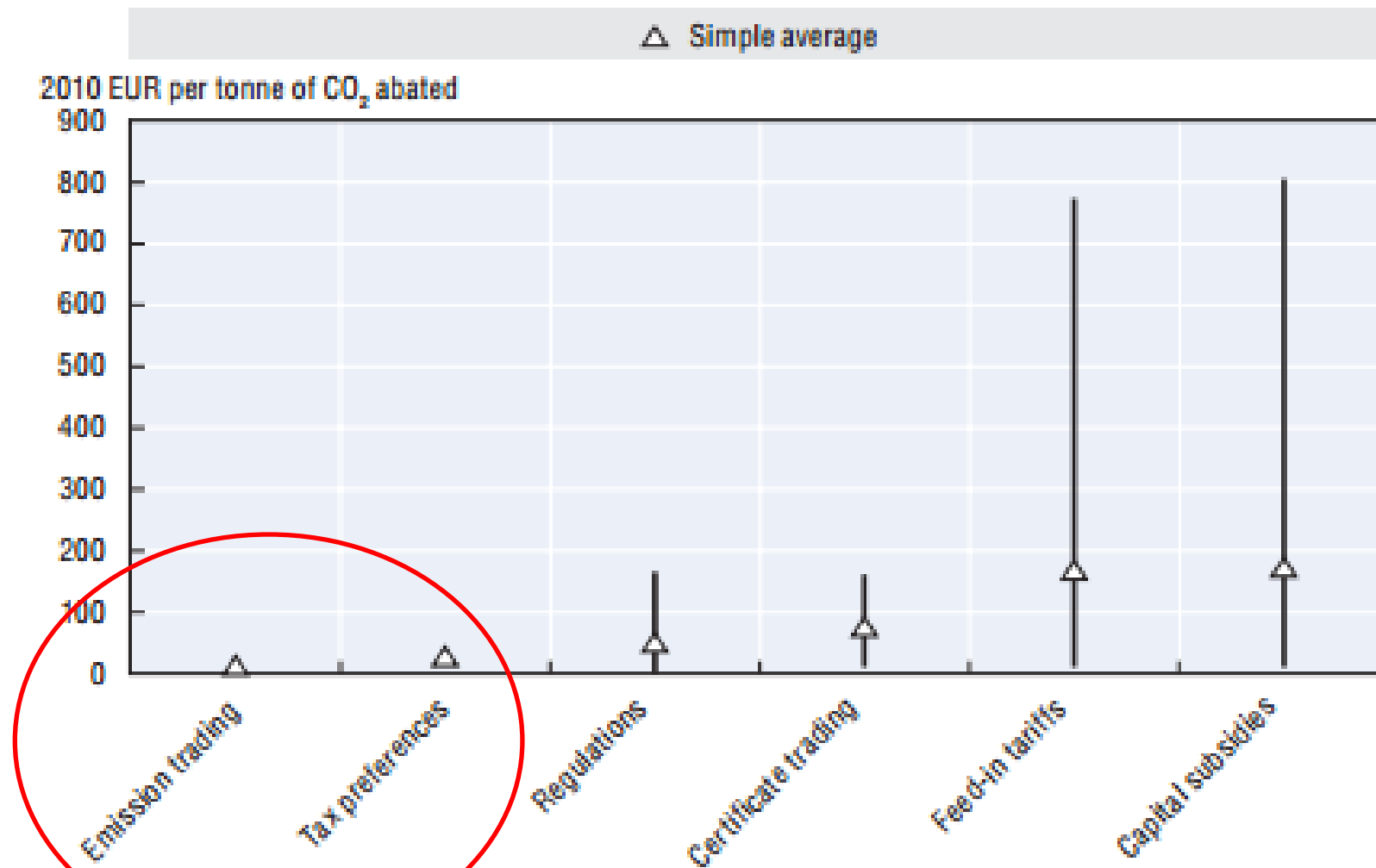
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9 Nov 2015

Explicit and Implicit Pricing of GHG Emissions



Explicit carbon prices dwarfed by implicit ones



Note: The height of the bars represents the range of effective carbon price estimates found for the different instrument categories; the triangles represent a simple average of these estimates. "Regulations" refers to renewable portfolio standards.

Carbon leakage risk: potential, contained and manageable



Carbon prices are intended to cause structural transformations and benefit low-emission, efficient firms

Carbon prices may distort competition between firms when they differ between jurisdictions

Risk of carbon leakage - emission reductions in one country is (partly) offset by increases in emissions elsewhere

The risk has not yet materialized on scale, but remains real, though contained to relatively few vulnerable sectors

Evidence shows it can be managed with policy design (integrated and complementary leakage prevention measures)

Leakage risk decreases as global coverage increases

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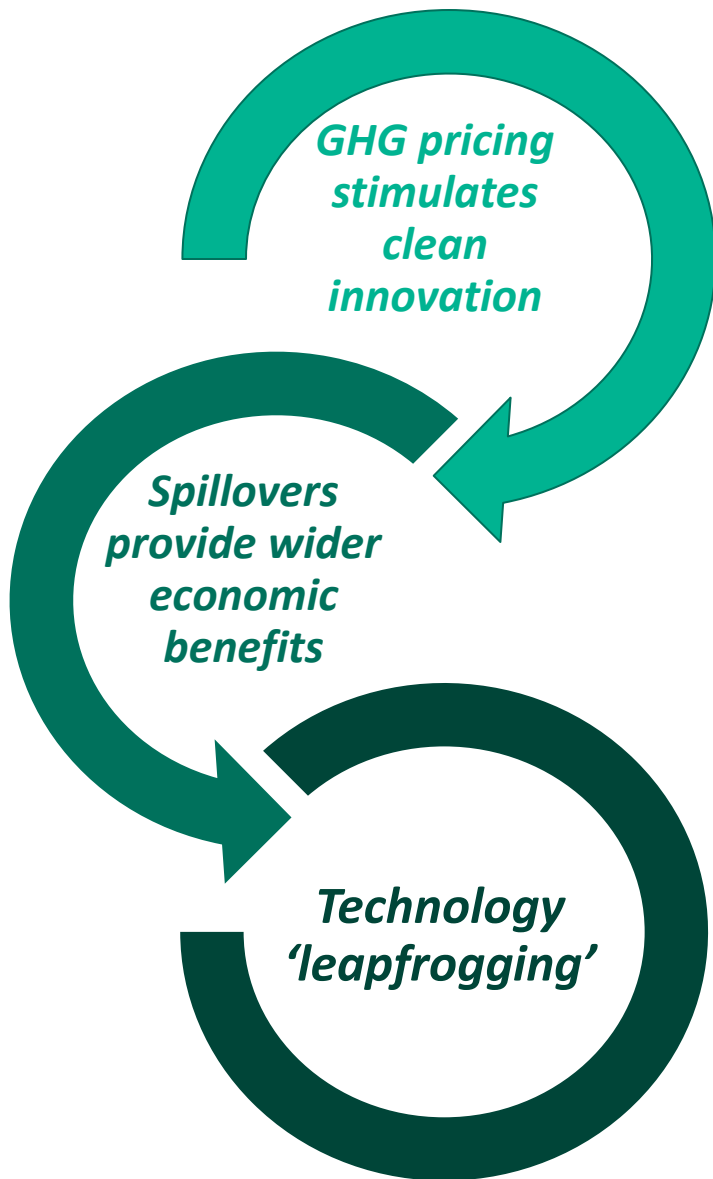
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GHG Pricing Instruments: Rationale

- ✓ **Improve economic efficiency by pricing true economic costs, including costs imposed on others**
- ✓ **Level the playing field between polluting activities that impose climate change damages and others that do not**
- ✓ **Should promote substitution from high to low-carbon products, increase the competitiveness of more carbon efficient producers, and encourage firms to reduce their emissions intensity**
- ✓ **Mobilize financial flows between firms/countries or efficiently raise additional government revenues**
- ✓ **Lower costs of emissions reduction compared to alternative policies**
 - Flexibility where, when and how to reduce emission
 - Discover unknown low-emission opportunities
- ✓ **Stimulate green technology innovation and diversification**

GHG pricing encourages innovation and modernization



- evidence shows that carbon and energy pricing drive innovation in green technologies
- Economy-wide spillover benefits similar to nanotechnologies and robotics: 40 per cent greater than in conventional technologies
- Reduced technology cost; industry more competitive; global leaders in new “green” technologies

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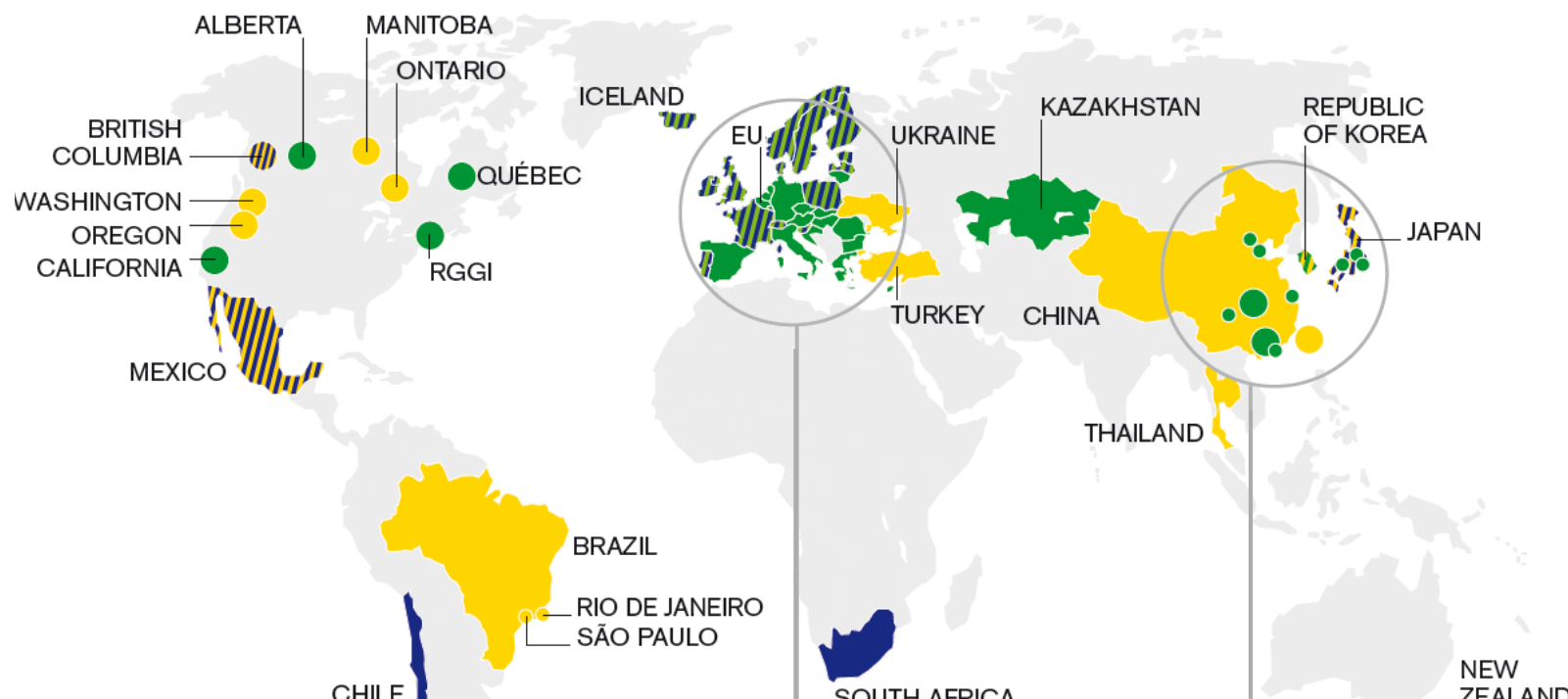
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Coverage of
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39
NATIONAL
JURISDICTIONS

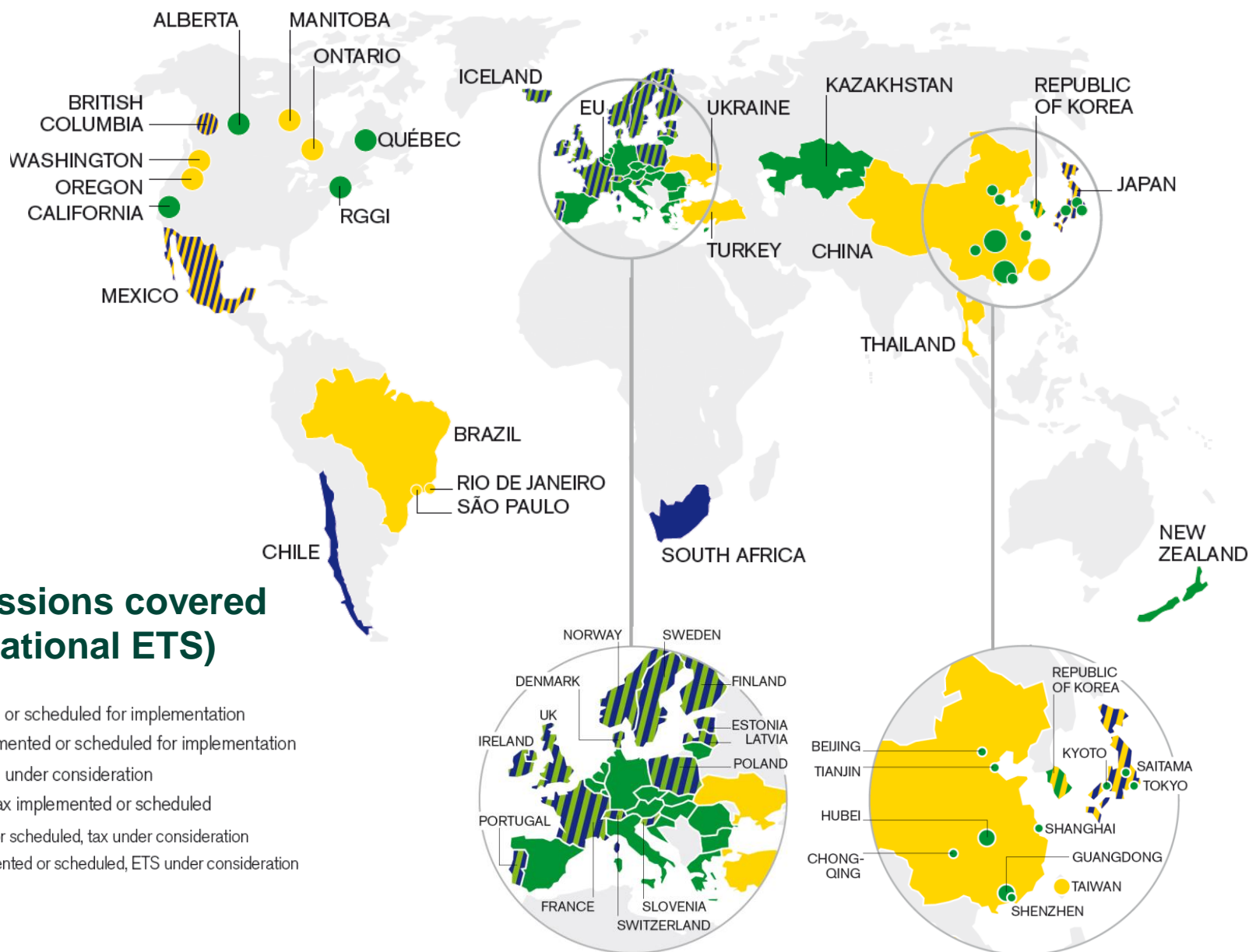
23
SUBNATIONAL
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with carbon pricing instruments

Coverage of explicit carbon pricing instruments remains fragmented

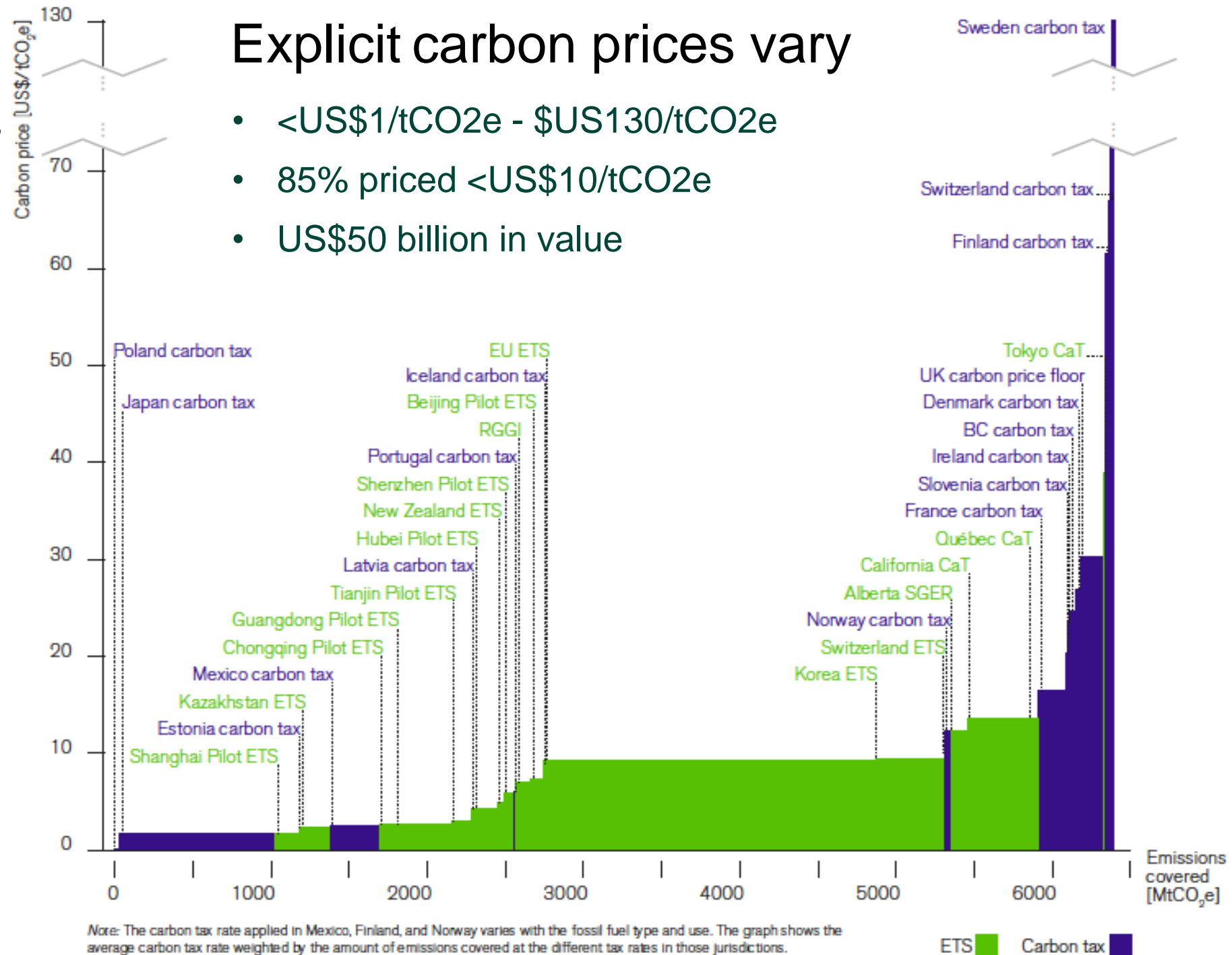
12% of global emissions covered (25% with China national ETS)

- ETS implemented or scheduled for implementation
- Carbon tax implemented or scheduled for implementation
- ETS or carbon tax under consideration
- ETS and carbon tax implemented or scheduled
- ETS implemented or scheduled, tax under consideration
- Carbon tax implemented or scheduled, ETS under consideration



Explicit carbon prices vary

- <US\$1/tCO₂e - \$US130/tCO₂e
- 85% priced <US\$10/tCO₂e
- US\$50 billion in value

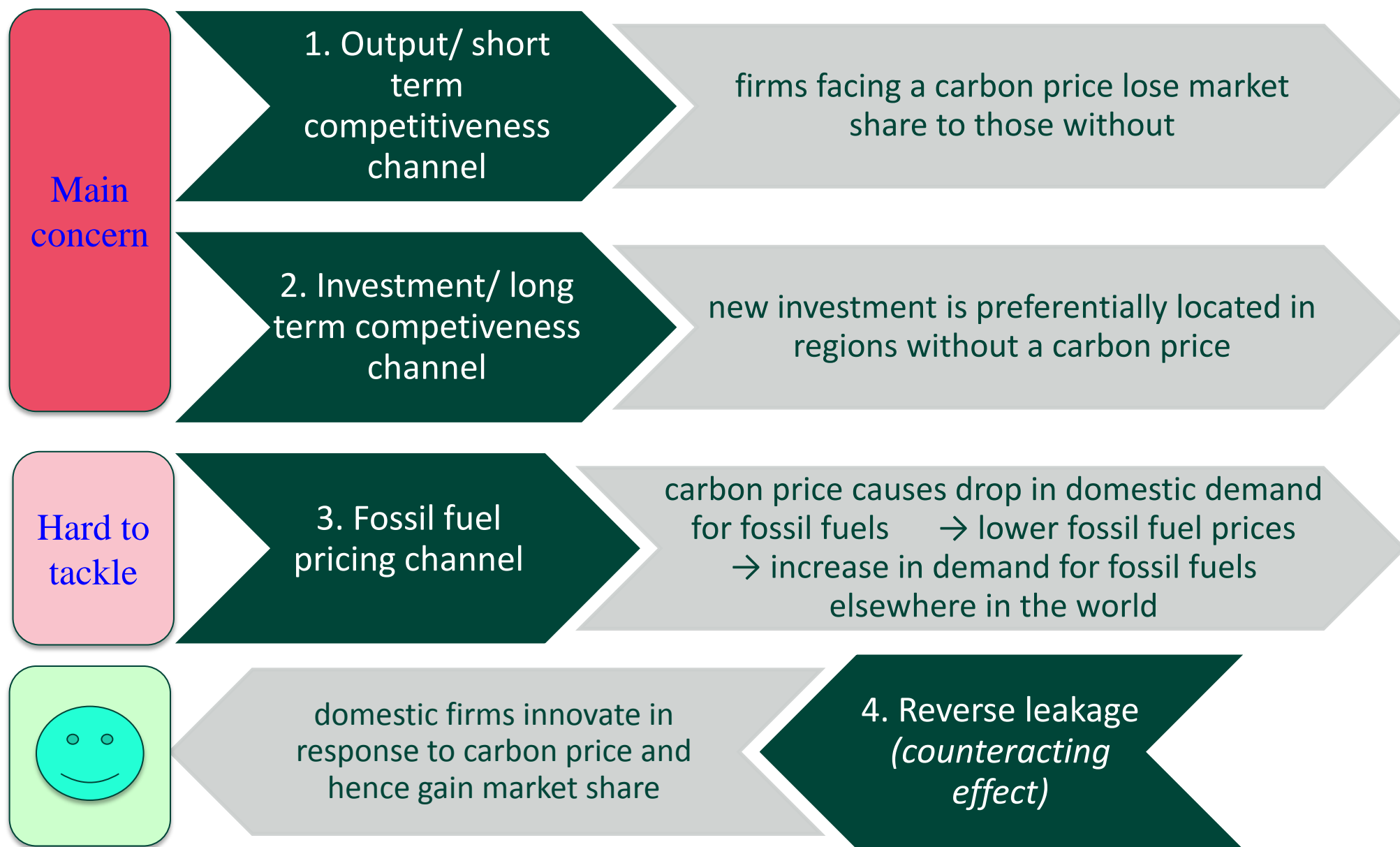


Inefficient competitiveness impact and risk of leakage

Carbon leakage: the transfer of production (and hence emissions) from one jurisdiction to another as a result of differences ('asymmetries') in the stringency of carbon regulation, hence different carbon emissions costs

- **Direct and indirect impact** (e.g. through electricity prices)
- **Unpleasant consequences:**
 - ***Distorted competition:*** loss of market share to firms not facing comparable costs
 - ***Environmental integrity:*** Carbon leakage would lower environmental effect & increase the cost of climate stabilization targets
- **Proof of attribution:** A robust assessment of carbon leakage must take into account what would have happened under symmetric regulation
- **Comparing carbon prices** across jurisdictions should also include implicit and indirect carbon prices embedded in other policies, e.g. energy taxes
- **In most sectors firms compete on productivity** rather than costs only, but for commodities and homogenous products cost-competition crucial

4 channels of carbon leakage



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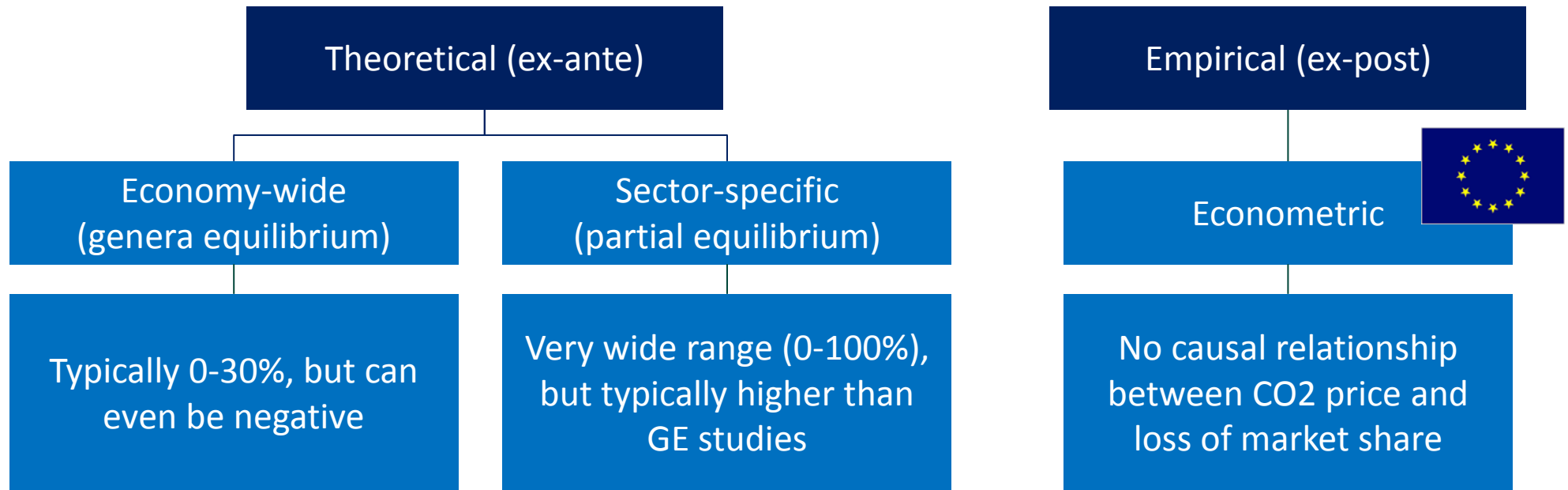
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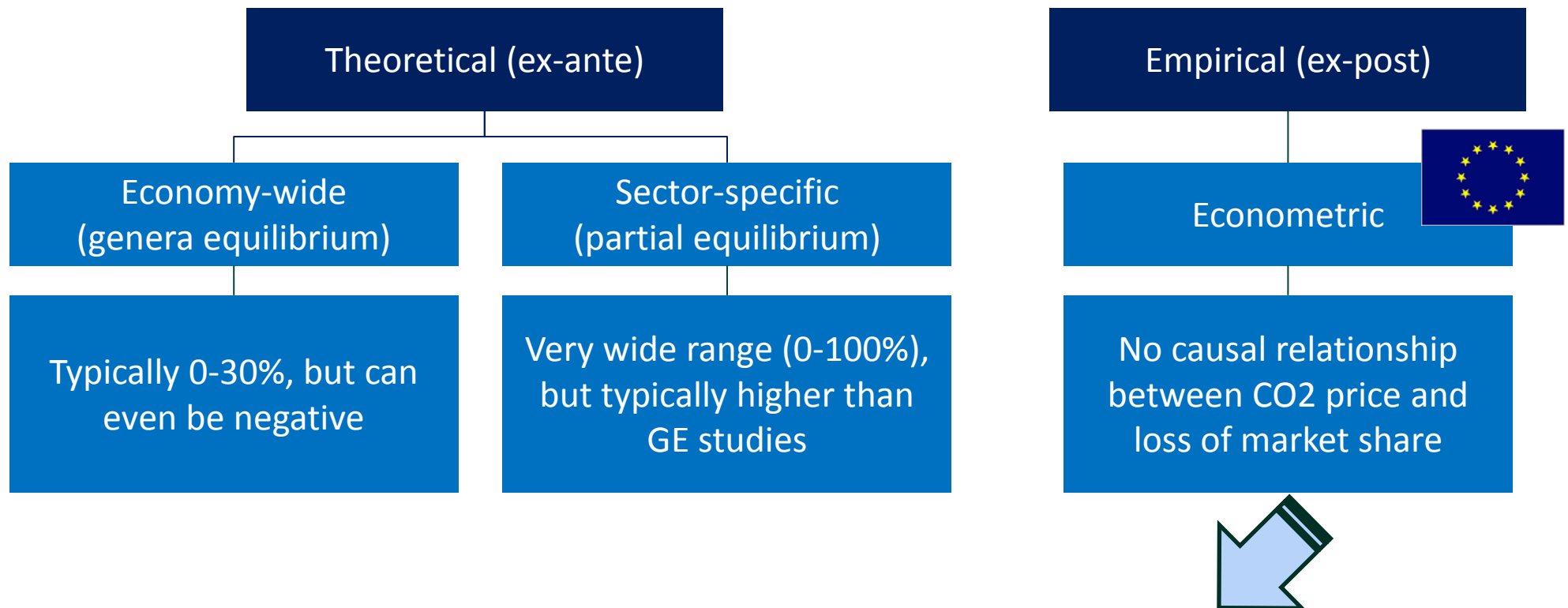
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Leakage risk decrease as global coverage increases

Many ways of measuring the scale of carbon leakage risk



Many ways of measuring the scale of carbon leakage risk



- The impact of carbon pricing relative to other factors has indeed been small?
- Carbon prices in many schemes have been low?
- Mitigation measures, for example free allowances, have successfully dampened leakage risk?
- Methodological challenges: short time periods and focus on EU?
- **Mixed evidence requires policy judgement, with pressure for action likely to remain**

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Assistance can be limited to few sectors

- **Broad support to all sectors may be necessary to generate sufficient support for carbon pricing**
 - But it has high fiscal cost and may introduce distortion
 - Ideally, support limited to those likely to be at risk of carbon leakage
- **2 key criteria are typically used identify carbon leakage risk**
 - **Cost increase** (capturing *impact* of carbon prices) - including indirect emissions where relevant
 - **Trade intensity** (capturing *exposure* to carbon price) – proxy for ability to pass-through cost of carbon price
- **More robust when considered together rather than each in isolation**
- **Assessment is less distortive if carried out at sector rather than firm level**

Risk of leakage mitigated by policy design

Integrated measures (designed within the scheme)

- Free allowances
 - Based on historical emissions
 - Based on industry performance benchmarks (Fixed Sector Benchmarks or Output Based Allocation)
- Exemptions, tax free thresholds
- Output based rebates
- Border carbon adjustments

Complementary measures

- Subsidies to affected sectors to improve technologies
- Support for R&D
- Adjustment of other taxes

Pros and cons of different options (ctd.)

	Grandfathering	FSB	OBA	Exemptions	Rebates	BCA
Leakage prevention	Weak, unless closure rules and updating included	Weak, unless closure rules and updating included	Strong	Strong	Depends on design	Strong
Incentives to improve emissions intensity	In principle strong, but diluted when updating included	Preserved	Preserved	Removed	Preserved	Preserved
Demand-side abatement incentives	Preserved	Preserved	Dulled, especially if applied too broadly	Removed	Depends on design	Preserved
Administrative complexity	Easy to implement	Some complexity in establishing benchmarks	Complexity in establishing benchmarks, collating output data	Easy to implement	Some complexity	Very complex
Risk of windfall profits	Some risk	No	No	No	No	No
Risk to environmental outcome	No	No	Yes, depending on design	Yes, exempt emissions uncapped	Depends on design	No
Political and legal challenges	No	No	No	No	No	Yes

Recent WBG publications on leakage

Technical note

High level summary



PARTNERSHIP FOR
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TECHNICAL NOTE 11 | OCTOBER 2015

Carbon Leakage

Theory, Evidence and Policy Design

Summary for
policy makers

State and Trends of Carbon Pricing

Washington DC
October 2015

2015

The FASTER Principles
for Successful
Carbon Pricing:
An approach based on
initial experience

