

Carbon Tariffs in Climate Policy – A Critical Appraisal

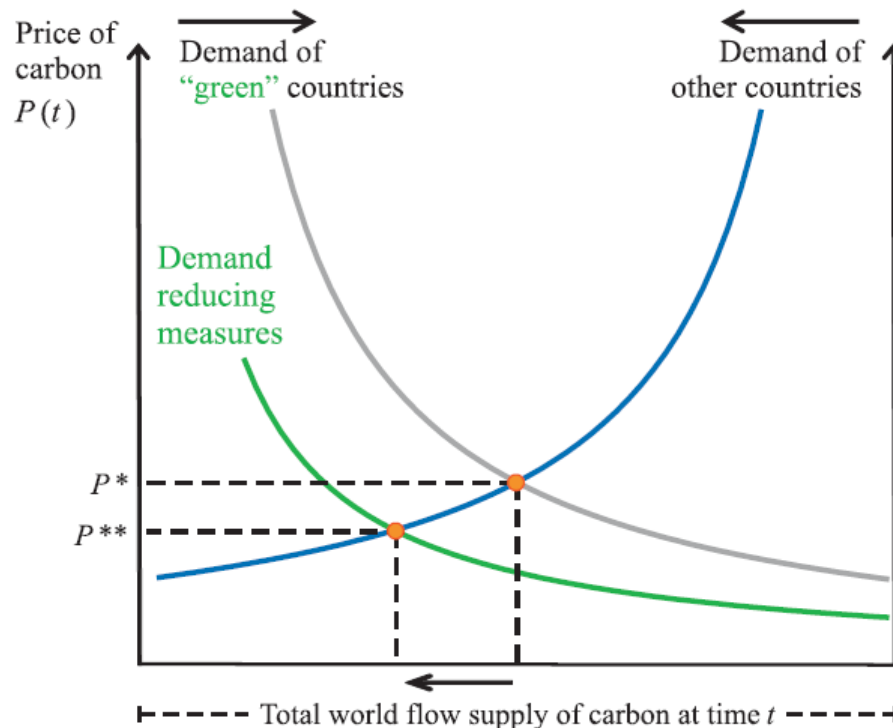
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Why is This Important?

- Paris INDCs: Global emission cap remains elusive.
- Developing-world emissions are large and growing rapidly.
- **Carbon leakage** and **industry competitiveness** are at the heart of the climate policy debate.



Carbon leakage:

- Energy channel
- Trade channel

Embodied Carbon Tariffs

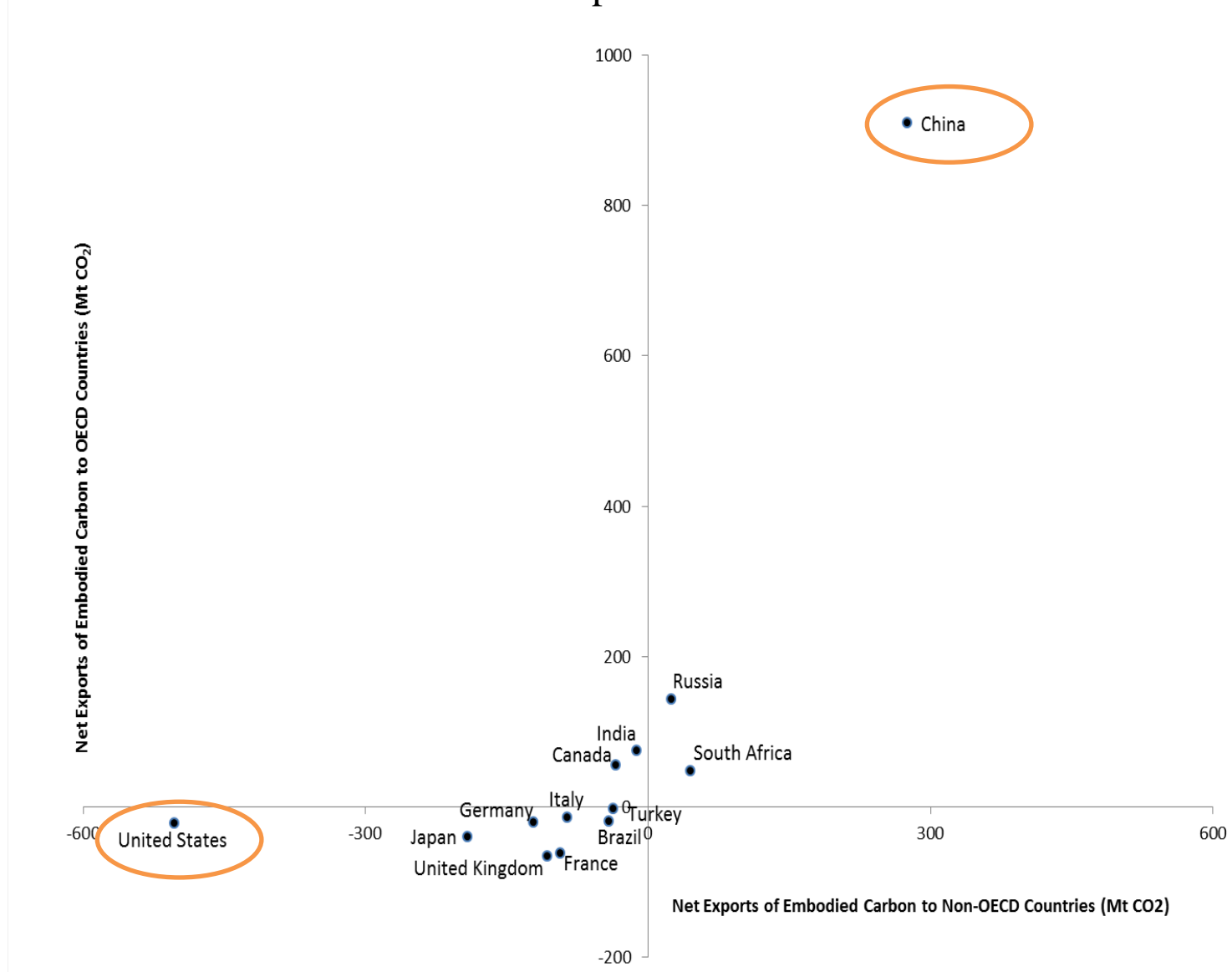
- **Embodied carbon intensity** (carbon footprint) is a measure of the average emissions generated directly and indirectly in production.
 - Direct - combustion of fossil fuels in production
 - Indirect - combustion of fossil fuels required to produce electricity (or any other good) that is used as an input in production
- **Carbon tariffs** discourage foreign emissions by pricing the emissions generated in the production of imported goods.

PROs and CONs

- The case for tariffs:
 - Support from literature on 2nd-best environmental policy
 - Marginal abatement costs are zero in unregulated countries.
 - **Empirically, emissions embodied in exports from non-OECD to OECD are large and indirect.**
 - A useful stick in policy negotiations
- The case against tariffs:
 - Blunt instruments when based on industry-average emissions
 - Re-routing of emission-intensive goods
 - “Back-door” trade policy

MRIO Analysis

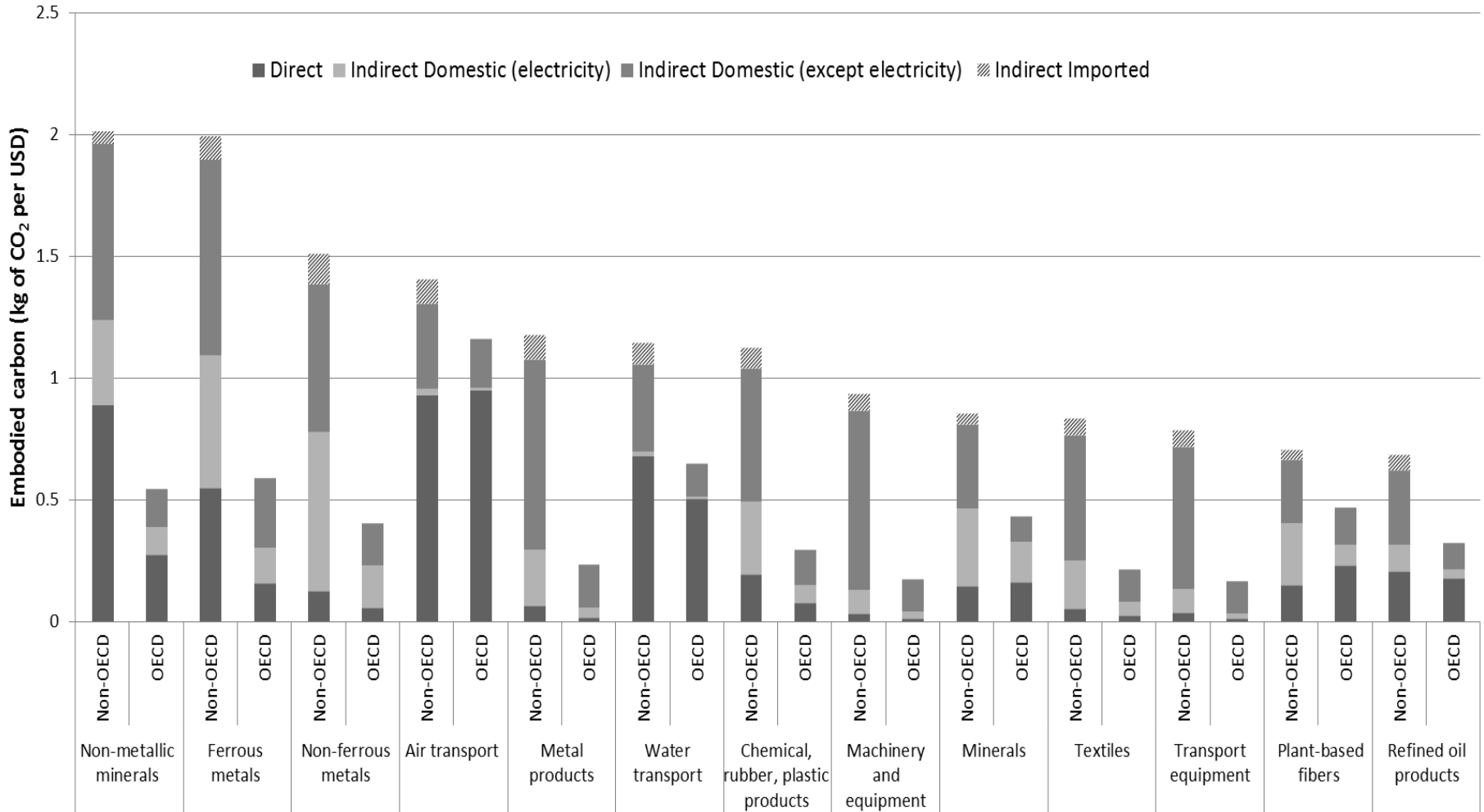
2011: Emissions embodied in non-OECD exports to OECD = 13 % of all OECD emissions



Source: Böhringer, Carbone, Rutherford (forthcoming), *Scand. J. Econ.*

MRIO Analysis

Indirect emissions – in particular from electricity – are substantial.



Global Cost-Effectiveness

The scope for efficiency gains is limited.

Abatement coalition size	EU	Annex1&Russia
Leakage (%) without tariffs / with tariffs	23.9 / 18.1	11.8 / 8.1
Global cost savings with tariffs (%)	11.8	6.4

Source: Böhringer, Balistreri, Rutherford (2012), *Energy Econ.*

- Industry-level tariffs do not provide direct incentives for emissions abatement at the firm level.
- Re-routing to countries outside the abatement coalition

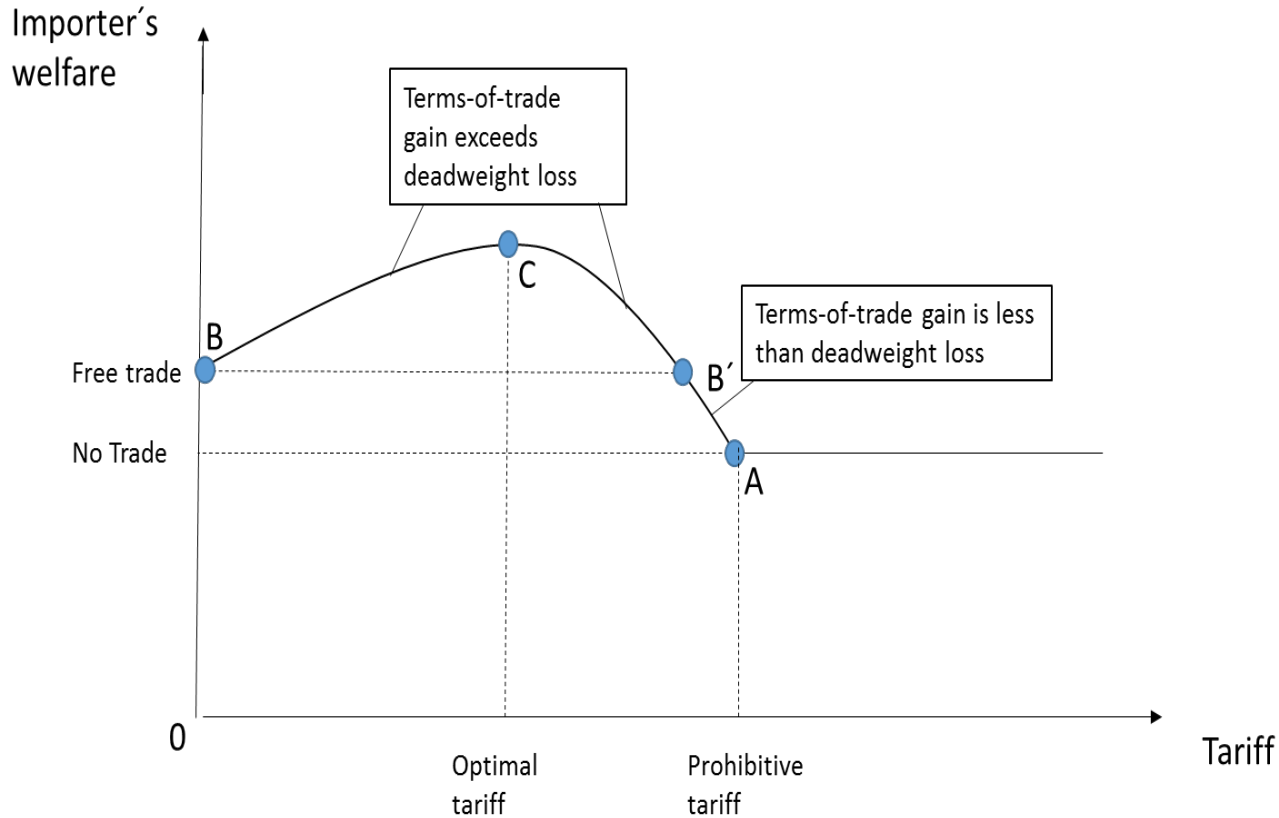
Global Cost-Effectiveness

Can we improve substantially on global cost-effectiveness?

- **Firm-level tariffs** (Böhringer, Bye, Faehn, Rosendahl (2015), SSB DP 805): **No**
 - Re-routing remains a key problem.
 - Potentially large monitoring cost
- **“Optimized” tariffs** (Böhringer, Carbone, Rutherford (forthcoming), *Scand. J. Econ.*) **No**
 - Tariff rates must account for re-routing.
 - Tariffs on full carbon content can even induce global excess costs.
- **Strategic tariffs** (Böhringer, Carbone, Rutherford (2016), *Am. Econ. J. Econ. Policy*): **Yes/No**
 - Credible sanction for larger polluters such as China
 - But: Risk of detrimental trade war

Cost Incidence

Tariffs shift the burden of abatement to the developing world.



- Conflicts with Articles 4.8 / 4.9 of UNFCCC
- Scope for beggar-thy-neighbor policies (Böhringer, Lange, Rutherford (2014), *J. Public Econ.*)

Cost Incidence

Can we attenuate the burden shifting?

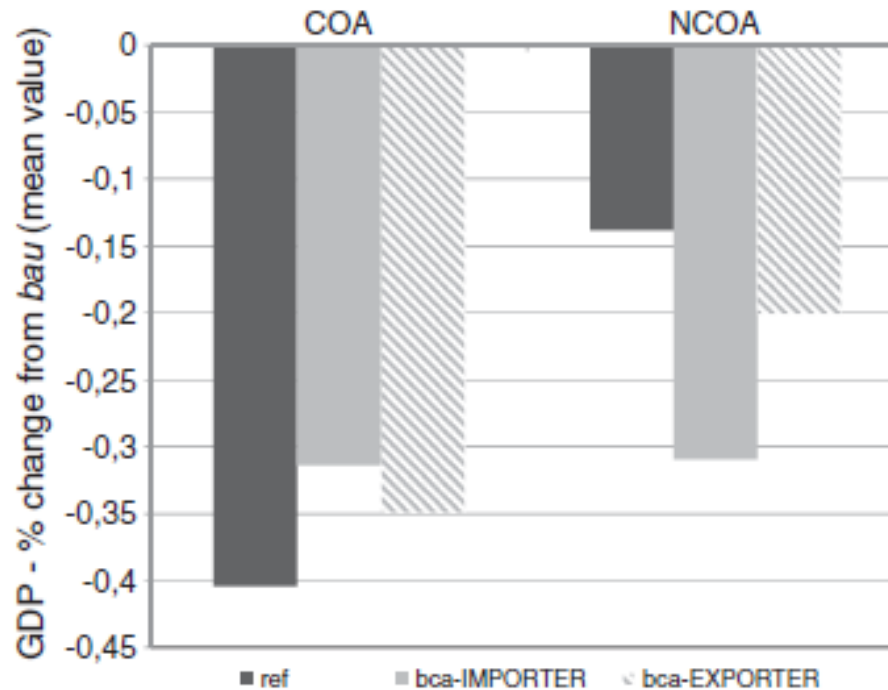
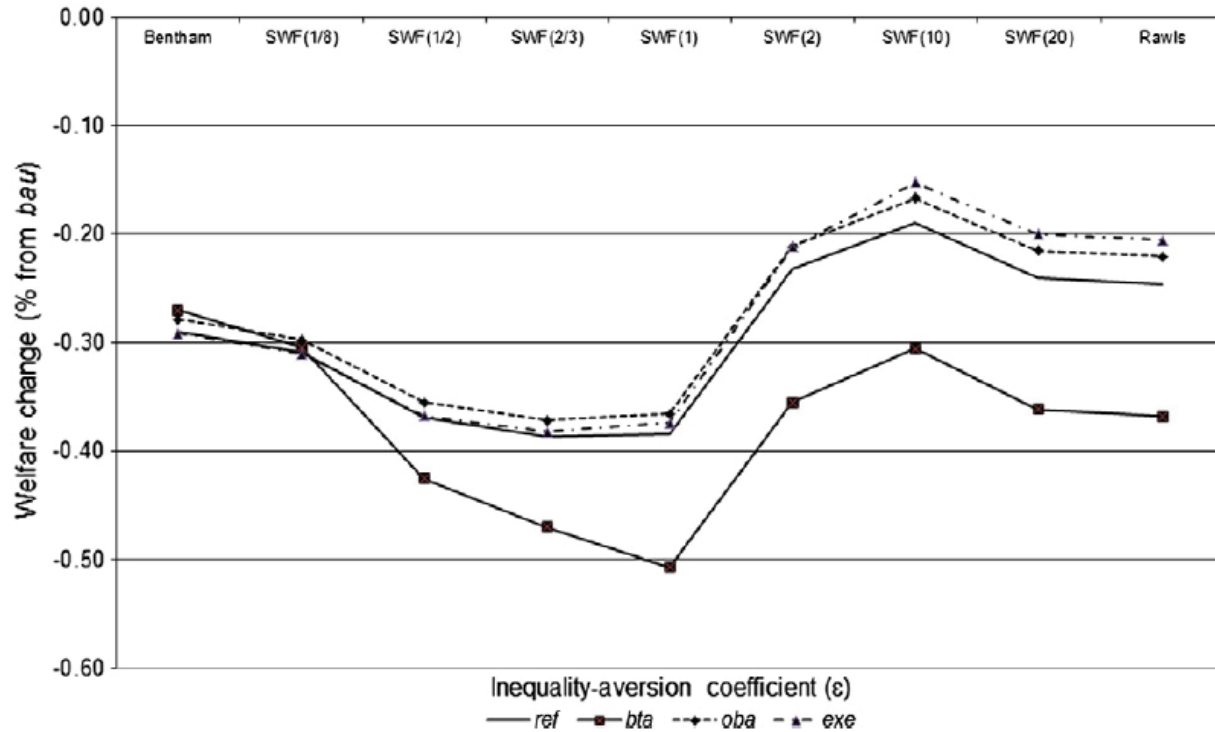


Fig. 8. Global economic impacts (in % GDP change from bau) for alternative uses of tariff revenues. IMPORTER: abating countries (COA) get tariff revenues; EXPORTER: non-abating countries (NCOA) get revenues.

Source: Böhringer, Balistreri, Rutherford (2012), *Energy Econ.*

- Transfer of tariff revenues to exporters reduces cost shifting.
- Yet – there remains a net cost burden to non-abating regions.

Industrial Competitiveness



ref:: Uniform emission pricing stand-alone

Protective measures for energy-intensive and trade-exposed industries:

bta: border tax adjustment

exe: exemptions

oba: output-based allocation

Fig. 2. Global welfare changes for 20% emission reduction and coalition size A1xR.

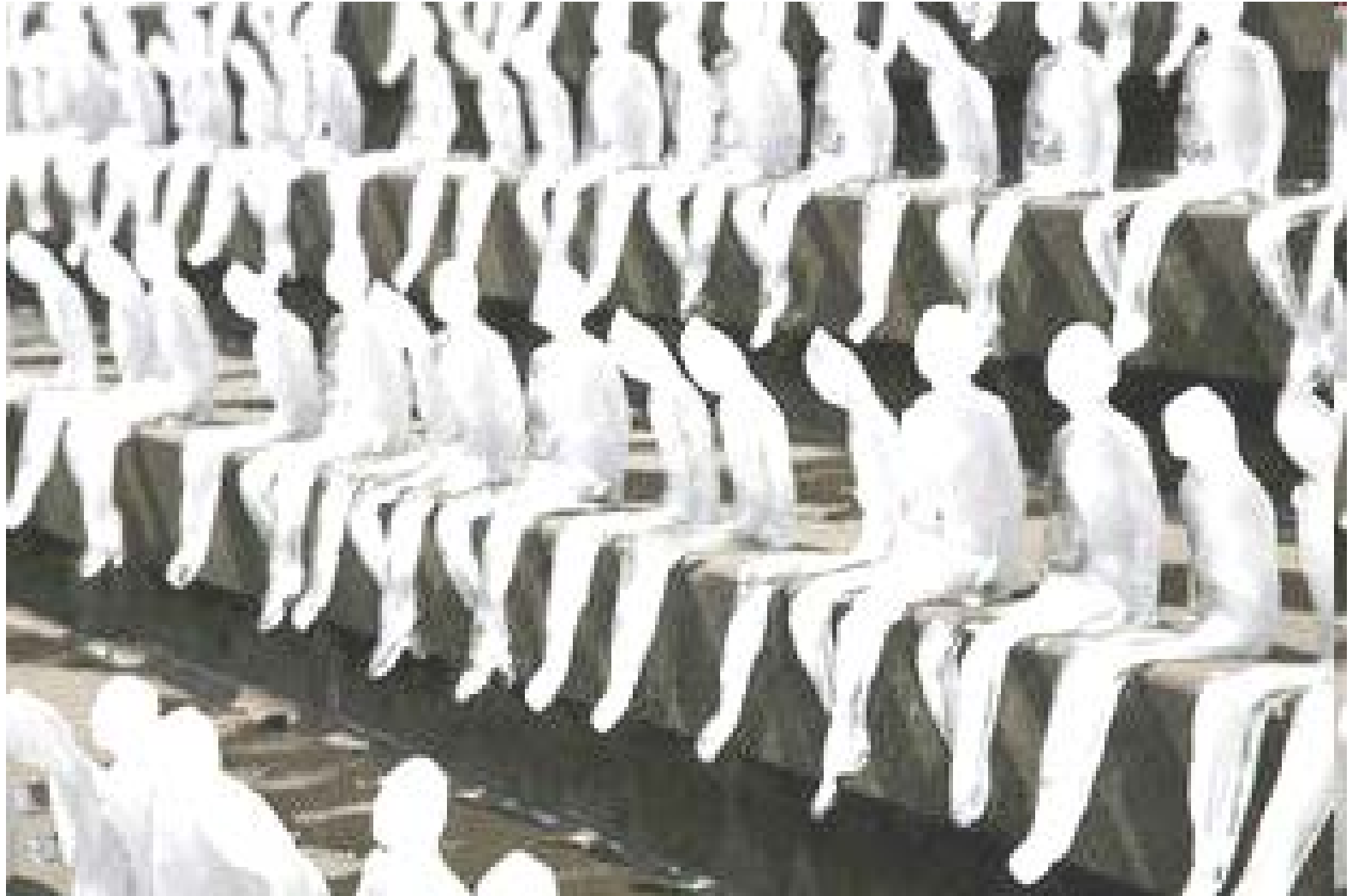
Source: Böhringer, Carbone, Rutherford (2012), *Energy Econ.*

- Among protective measures output-based allocation best reconciles global cost-effectiveness motive with competitiveness concerns and burden shifting fears.

Outlook: Post-Paris

- Carbon tariffs could do more harm than good.
- Some reasons to be more optimistic after Paris:
 - Climate action by **all** countries (INDCs)
 - Climate finance
 - Review and ratchet mechanism (“naming and shaming”)
 - Local air pollution and environmental Kuznets curve

Thank You For Your Attention!



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