Climate Policy and Fiscal Constraints:
Do Tax Interactions Outweigh Carbon Leakage?

Carolyn Fischer and Alan K. Fox

Resources for the Future and *U.S. International Trade Commission*

September 5, 2012

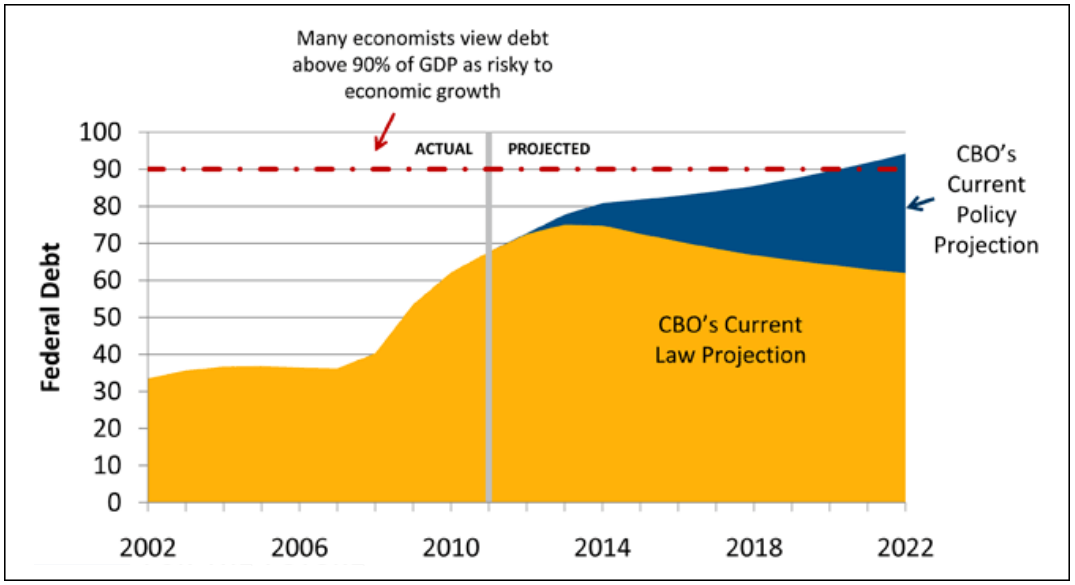
entwined

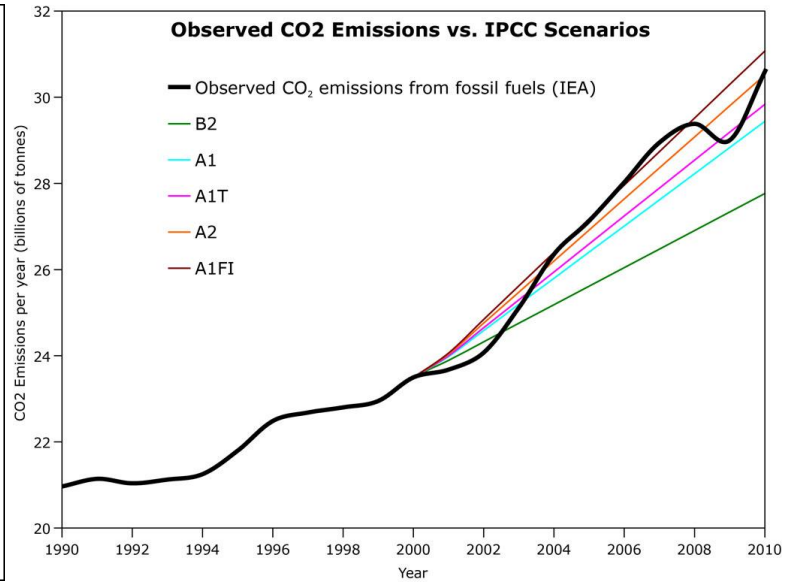
RESOURCES FOR THE FUTURE

UNITED STATES INTERNATIONAL TRADE COMMISSION

Challenges to Sustainable Development

- Public sector deficits associated with current recessions and looming demographic changes.
- Emissions associated with global climate change
- Each has such large economic implications, they should not be considered separately





Challenges for Carbon Pricing

- Pre-existing taxes distort labor (and capital) markets
  - Higher prices from regulation lower real wage, reducing labor supply and tax revenue: **"Tax Interaction"**
  - *It matters how we use the revenues*
- Incomplete regulatory coverage
  - Higher product prices can cause substitution towards unregulated goods or imports: **"Carbon leakage"**
  - *It matters how we treat energy-intensive trade-exposed (EITE) sectors*
- Other market failures
  - Imperfect competition, technology spillovers, barriers…

Revenue Potential of Climate Policy

- EIA estimated allowance values under ACESA at $160 billion in 2020 (~20% of CBO-projected budget deficit)
- In 2020, the projected EU ETS value represents roughly 0.2% of GDP
- In California, budget deficit is now $16 billion; allowance values could represent half or more of that

Main Options for Dealing with Leakage in EITE Sectors

- Output-based rebates
  - Tradeoff: less incentive for conservation, but also less tax interaction
- Border carbon adjustments
  - Give consumers consistent price signals, but may further lower the real wage
- Exemption
  - Fewer incentives for reducing emissions intensity, not only conservation, in those sectors

This Paper

- With tax interactions *and* leakage
- What are the implications for the relative efficiency gains of antileakage measures?
- How does the scope for cost savings from addressing leakage compare with those from reducing tax distortions?

Policy Options

- **REF**: emissions price alone
- **Tariff (Imp.)**: BCA for imported goods in the EIT and OIL sectors, based on embodied direct and indirect (electricity) emissions, with revenues retained by the coalition countries;
- **Tariff (Exp.)**: same but revenues retained by the countries of export;
- **OBR**: for EIT sectors, benchmarked to sector average direct and indirect emissions; and
- **Exempt**: EIT sectors are exempt from the carbon pricing policy.

Scenarios

- Global emissions reductions of 20% of coalition emissions (2004 base year)
- 2 default uses of revenues (after allocations)
  1. Revenue recycling
  2. Grandfathering
- Sensitivity analysis
  - 2020 projected base year
  - Global energy price response
  - Labor-leisure tradeoff

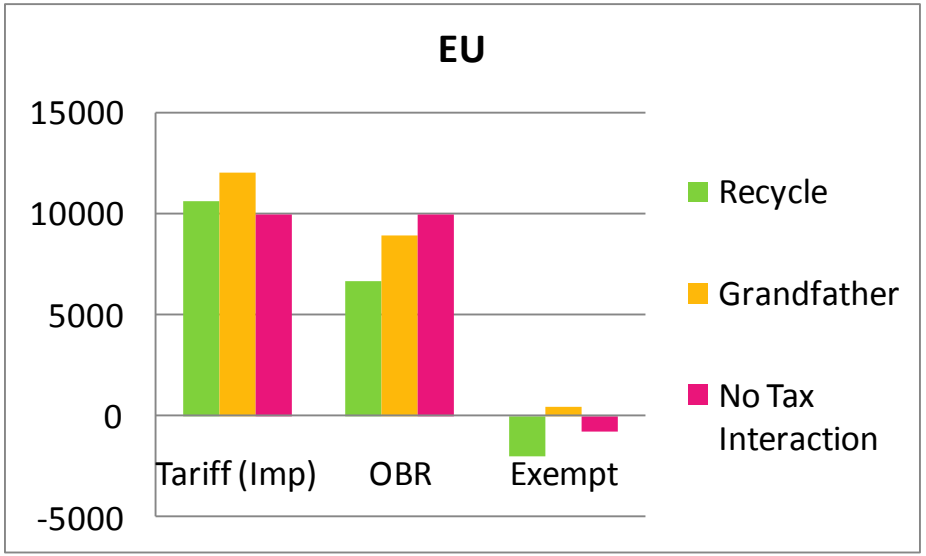
RESOURCES FOR THE FUTURE

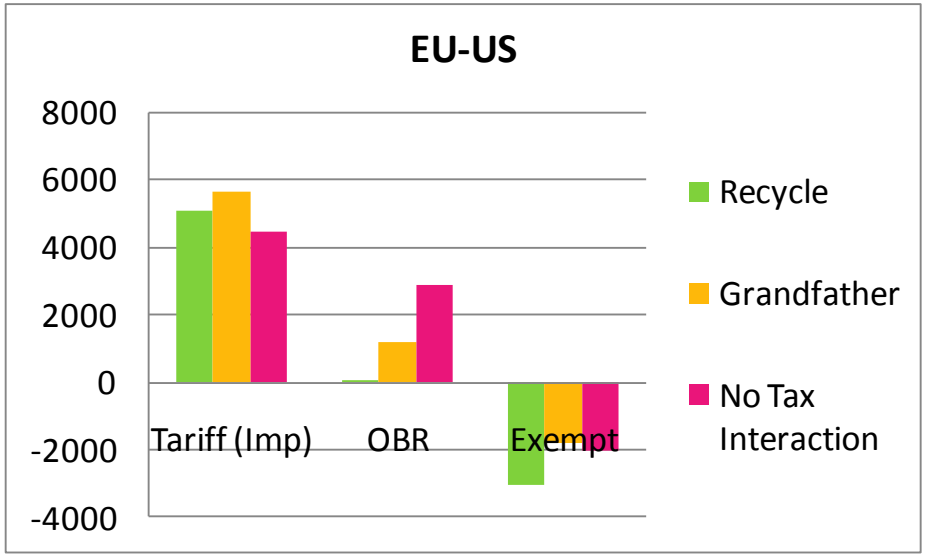
entwined

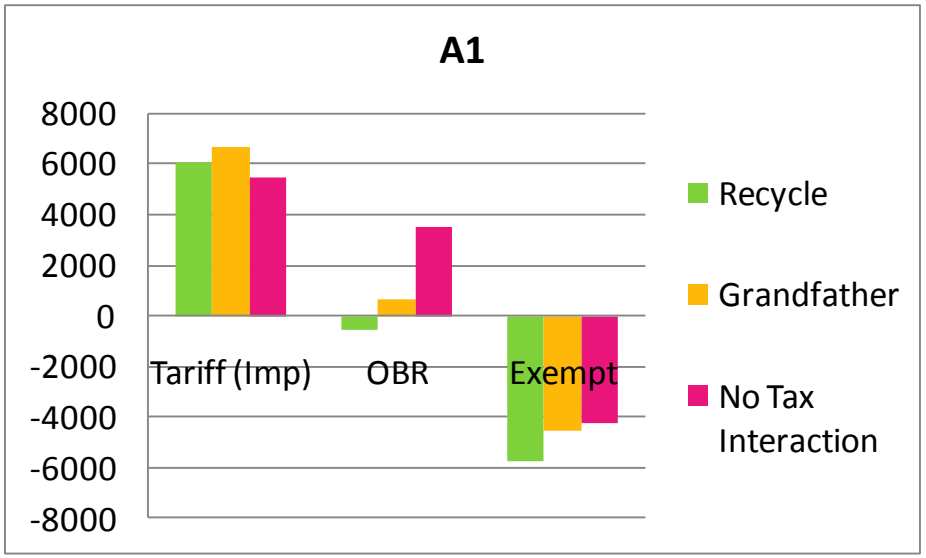
Weighted-Average Labor Tax Rates for Model Regions

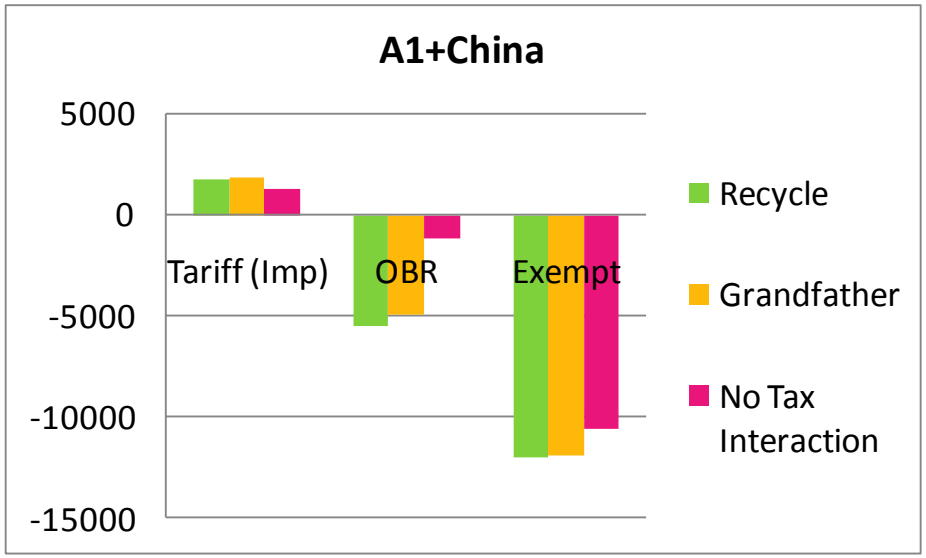
Country or region	Labor tax (%)
Europe	42.9
United States	29.8
Other Annex I countries	28.6
Russia	32.6
China	31.3
India	29.7
Energy-exporting countries	17.8
Middle-income countries	17.2
Low-income countries	12.4

Cost Savings from Anti-Leakage Measures by Coalition (in Millions of 2004 $)

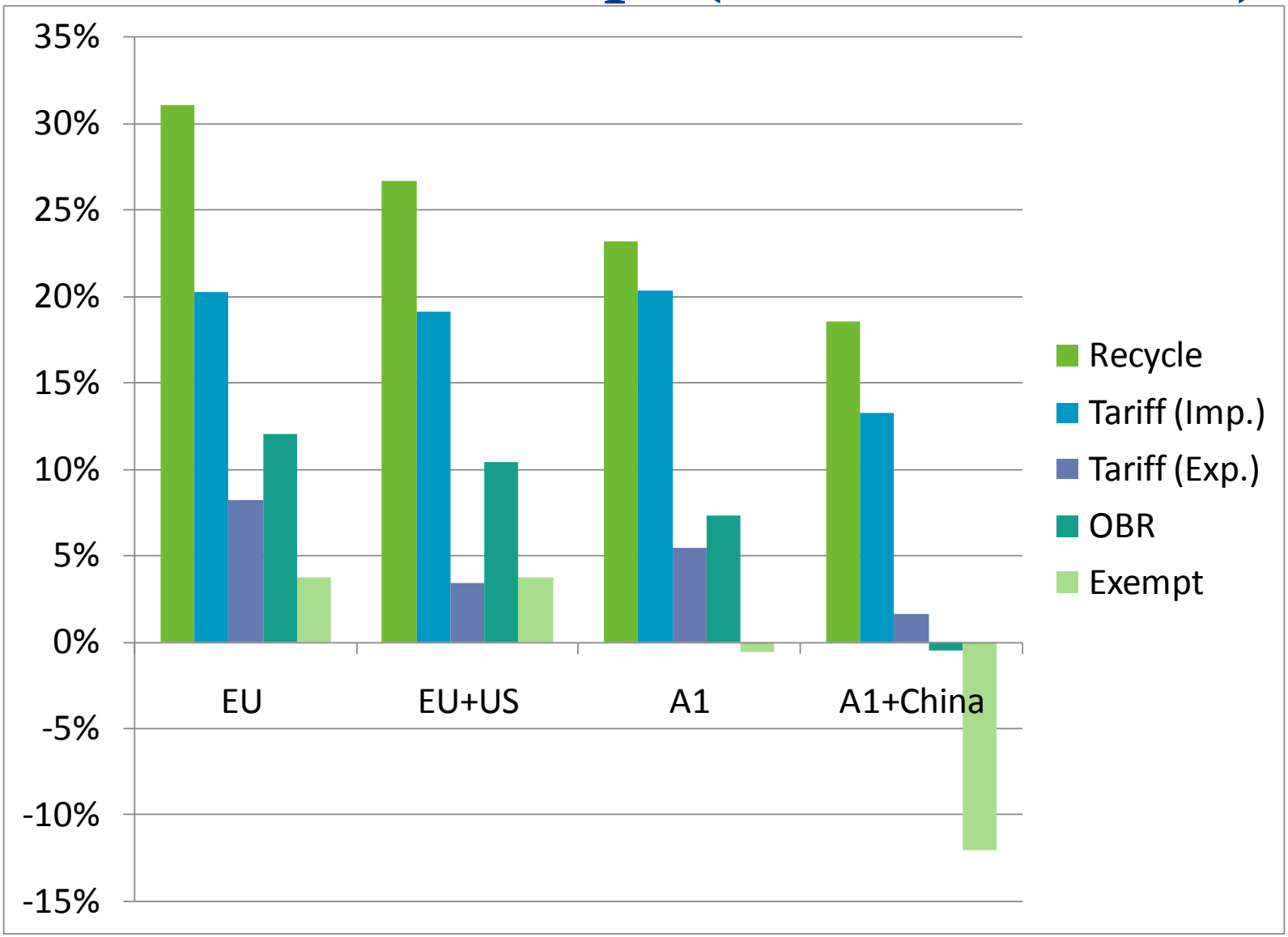




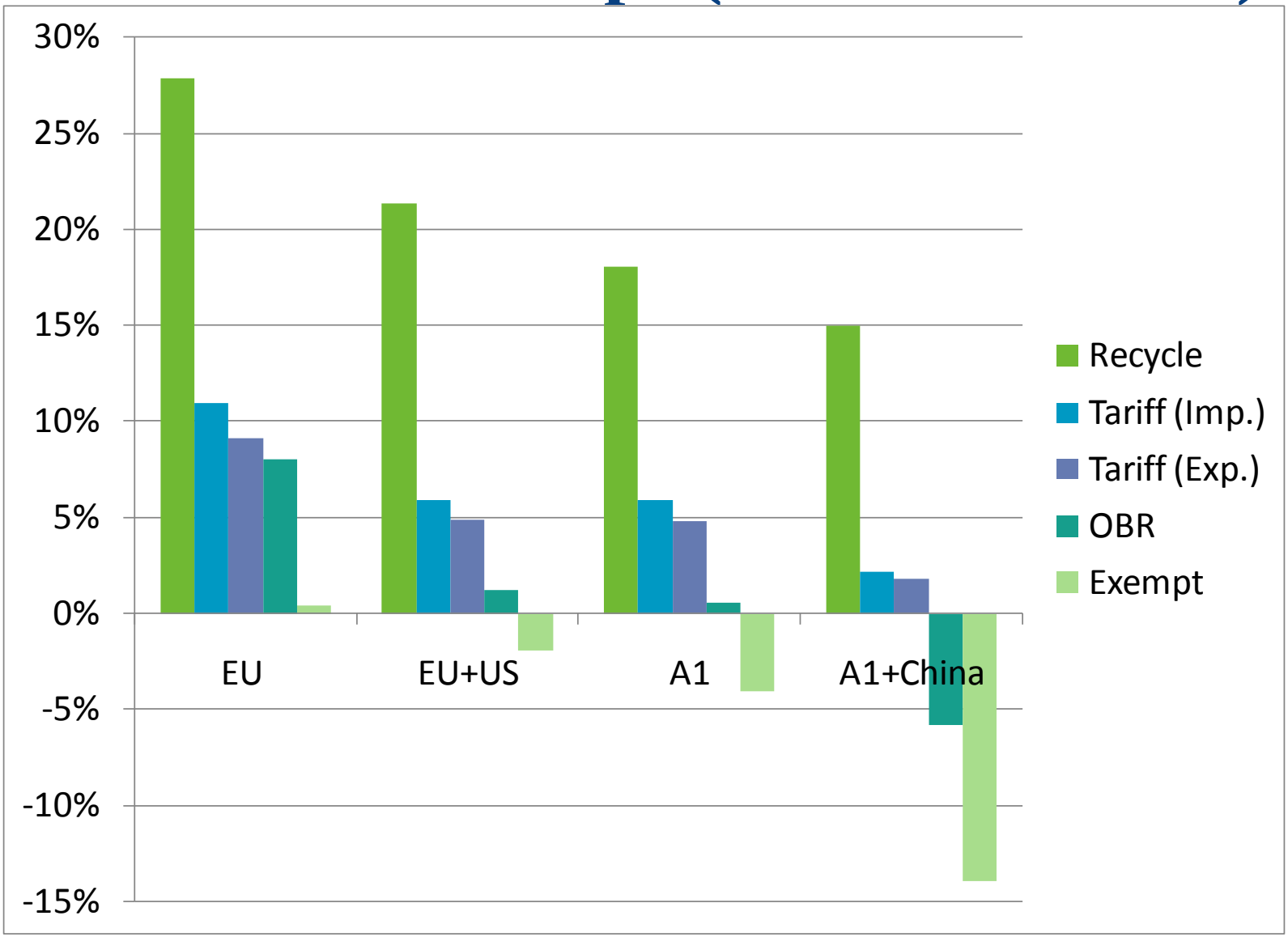




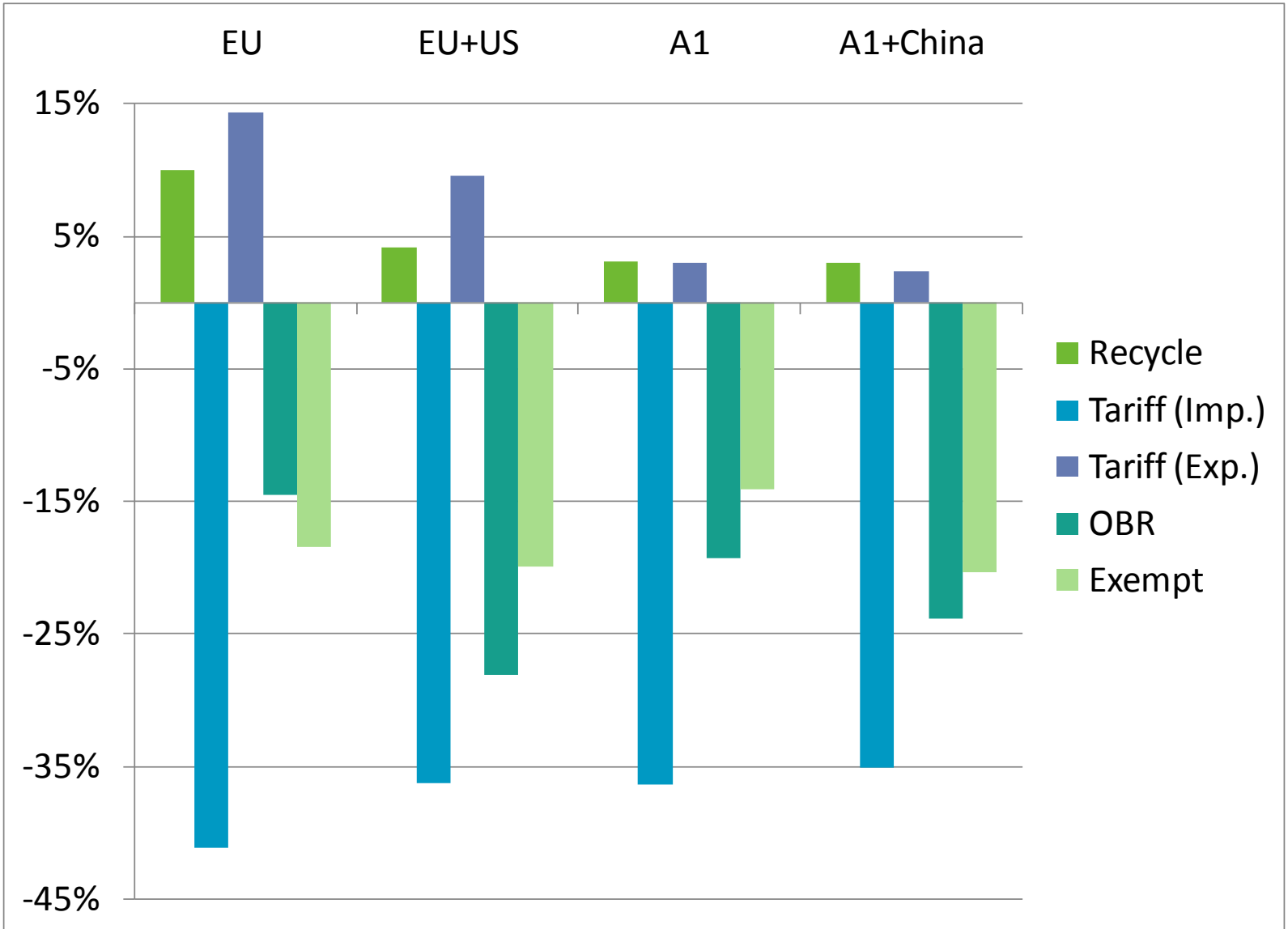
Coalition Cost Savings Relative to Grandfathered Caps (2004 Base Year)



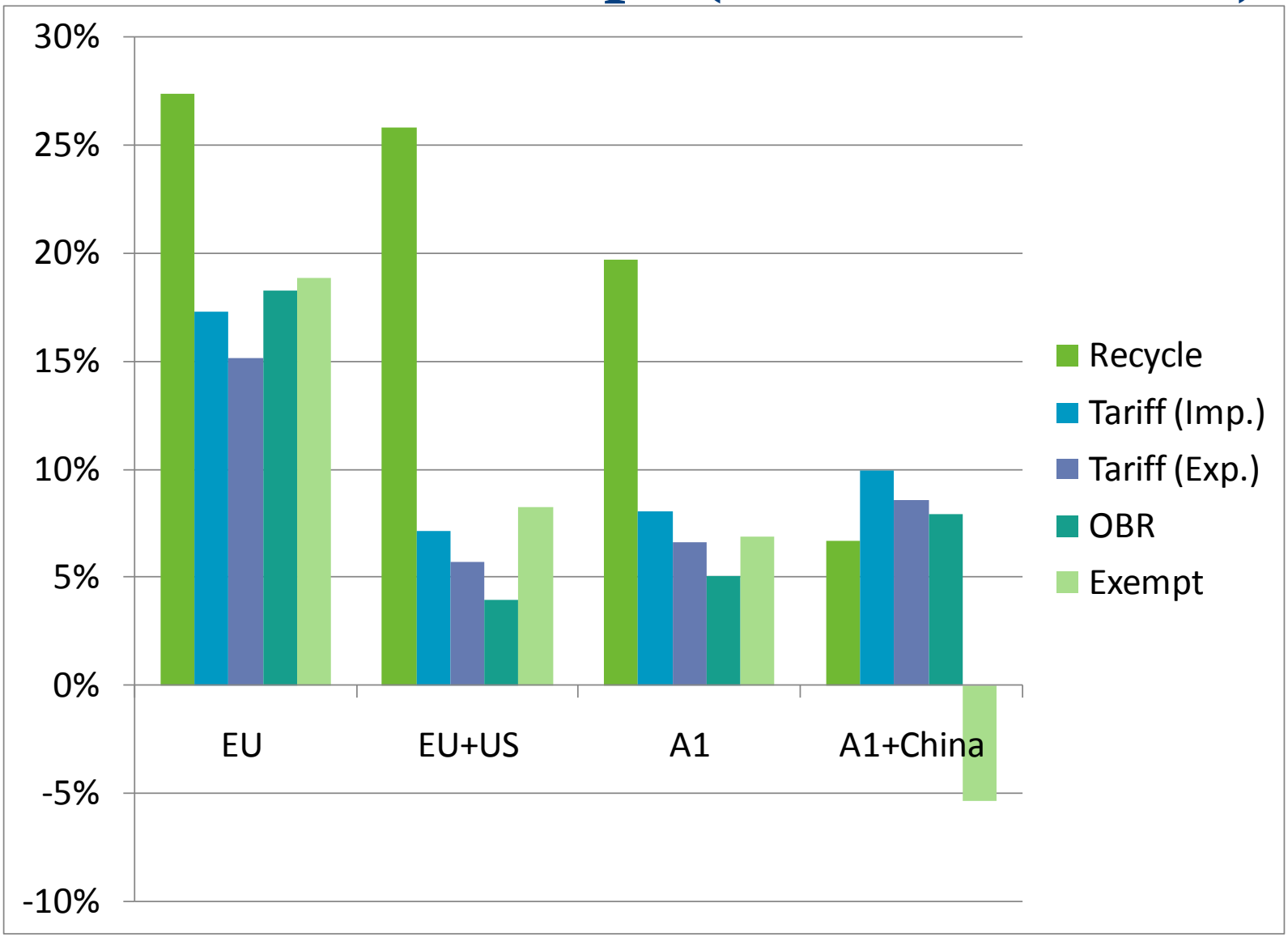
Global Cost Savings Relative to Grandfathered Caps (2004 Base Year)



Noncoalition Cost Savings Relative to Grandfathered Caps (2004 Base Year)



Global Cost Savings Relative to Grandfathered Caps (2020 Base Year)



Conclusions

- Tax interactions enhance the cost savings from border adjustments, while other measures like rebates or exemptions become less attractive.
- Cost savings from using emissions revenues to lower distorting taxes are significant (15% to 25%)
- Cost savings from dealing with leakage are generally smaller but also significant
  - Esp. when coalitions are small or reduction targets more binding
- Noncoalition and coalition countries both benefit:
  - Revenue recycling
  - BCA when revenues returned to exporting countries

Not so Noncontroversial

- BCAs highly contentious in trade circles
  - Hard to implement by a single region.
- Tax reform is difficult
  - Pressure to distribute emissions revenues among to gain acceptance for the policy
  - heightened if competitiveness / leakage concerns not addressed.
- In the absence of some global agreement to manage leakage arising from differentiated responsibilities, the outcome of unilateral policies may be costlier for all.

Thanks!

- For more info, see www.rff.org/fischer.cfm

- Funding from the ENTWINED Program of the Mistra Foundation gratefully acknowledged.

Numerical Model

- CGE model based on GTAPinGAMS-EG
  - Static, 2004 base year
- Key modifications
  - Labor-leisure tradeoff
  - Improvements in emissions data
    - Process emissions for energy intensive manufacturing
      - Based on U.S. EPA data; assume same intensity for RoW
    - Feedstock use of fossil fuels in chemicals, refining
    - Adjust baseline emissions to more closely match overall EIA reported levels
  - Calibrated global fuel supply elasticities
    - Crude oil is slightly inelastic, while coal and now gas are elastic

Leakage Rates with and without Global Energy Price Adjustments
(2004 Base Year; Percentage of Coalition Reductions)

	EU	*EU+US*	*A1*	*A1+China*
Global energy markets adjusting	23.9	12.9	12.3	6.7
Global energy prices fixed	8.8	1.3	2.3	2.1

RESOURCES FOR THE FUTURE

entwined

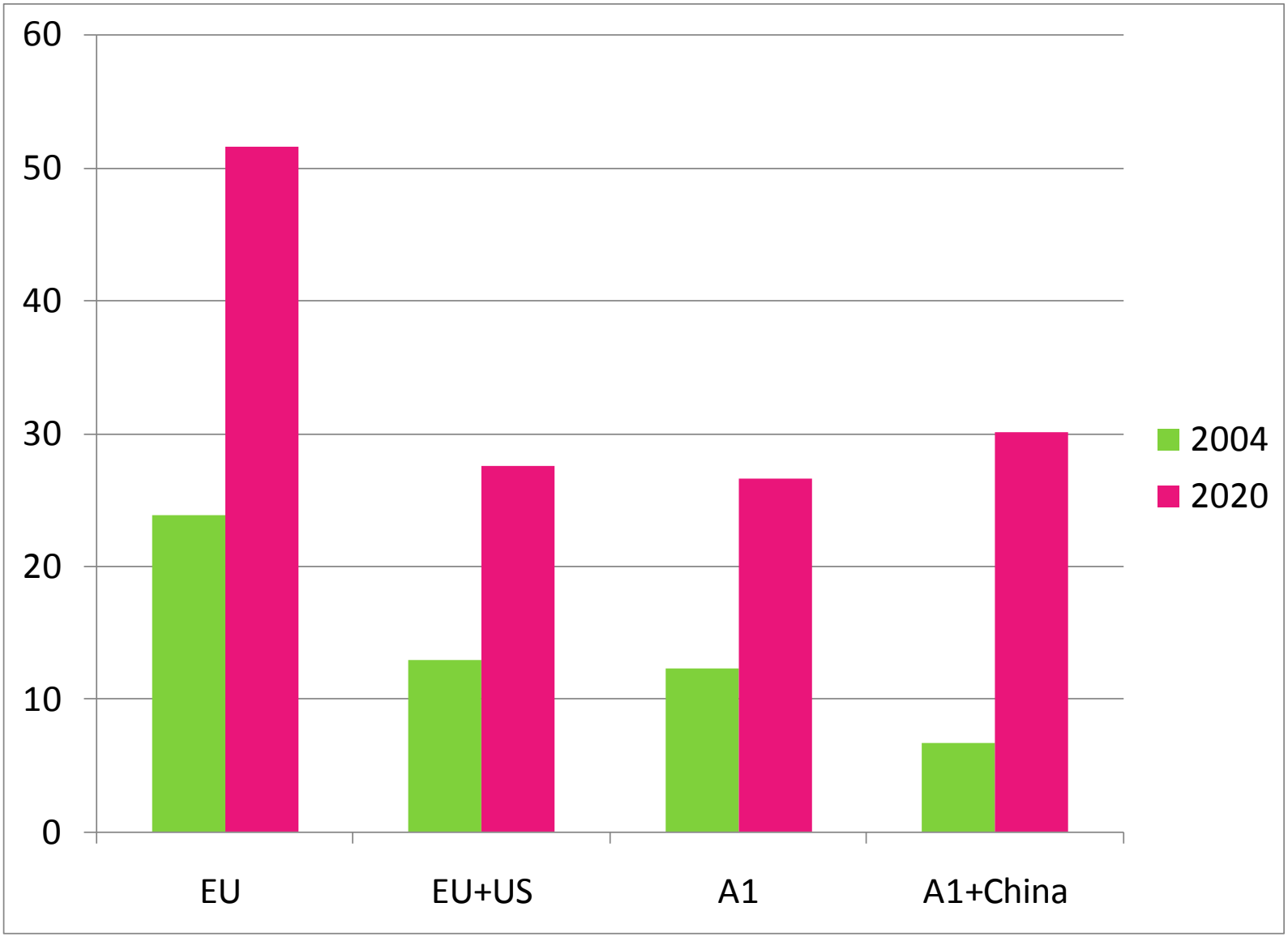
Percentage Growth in Baseline, 2004–2020

	EUR	USA	RUS	CHN	IND	RA1	EEX	MIC	LIC
Total emissions	–11.9	–6.2	34.9	127.4	130.9	4.5	107.8	55.1	144.2
Total output	14.0	21.0	79.9	300.0	233.2	21.2	94.9	85.6	145.5
EIT output	21.1	28.4	–7.1	390.7	327.8	27.8	2.8	100.4	135.7
EIT intensity (kg/$)	–25.5	–27.9	–28.4	–43.9	–34.0	–20.8	–9.2	–22.5	17.5

RESOURCES FOR THE FUTURE

entwined

Leakage Rates



CO2 Prices by Coalition and Base Year (2004 $ per ton)