RESOURCES *for the* FUTURE

# Carbon Border Measures: What Happens with Ambitious Climate Policies?

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(joint work with Joe Aldy, RITE, and EIEE)

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# If some countries pursue mitigation policies, and others do not, how much do competitiveness effects and emission leakage undermine those policies?

- 30+ years of research on whether emission reductions in some countries might lead to emission increases (leakage) in other countries
  - Lower fossil fuel prices
  - Relocation of manufacturing ("competitiveness" impacts)
- General result from older work:
  - Not much effect except in a few industries.
  - E.g., ~1% of production shifts abroad at $15 per ton $CO_2$ for most energy intensive (0.25 energy as a share of costs) industries.
  - *But* this research focused on policies equivalent to <$50 per ton $CO_2$.
  - EU prices now exceed that level and could go higher. Policies to reach net-zero by 2050 would require prices in excess of $100 per ton $CO_2$.

# What happens when some countries pursue ambitious, net-zero mitigation policies and others do not? Can BCAs help?

- Question: How much do ambitious, net-zero policies (>$100 ton) adversely drive production (and emissions) to less ambitious jurisdictions?
- Can border carbon adjustments (BCAs) attenuate these effects?

- Our effort: Model ambitious policies in EU + different assumptions in other countries (ranging from achieving Nationally Determined Contributions/NDCs to “0”).
- Examine leakage (emissions) and competitiveness (manufacturing) with and without border measures.
- Use two models EIEE-ICES & RITE-DEARS model. Multi-sector, multi-region models with considerable energy detail and international trade.

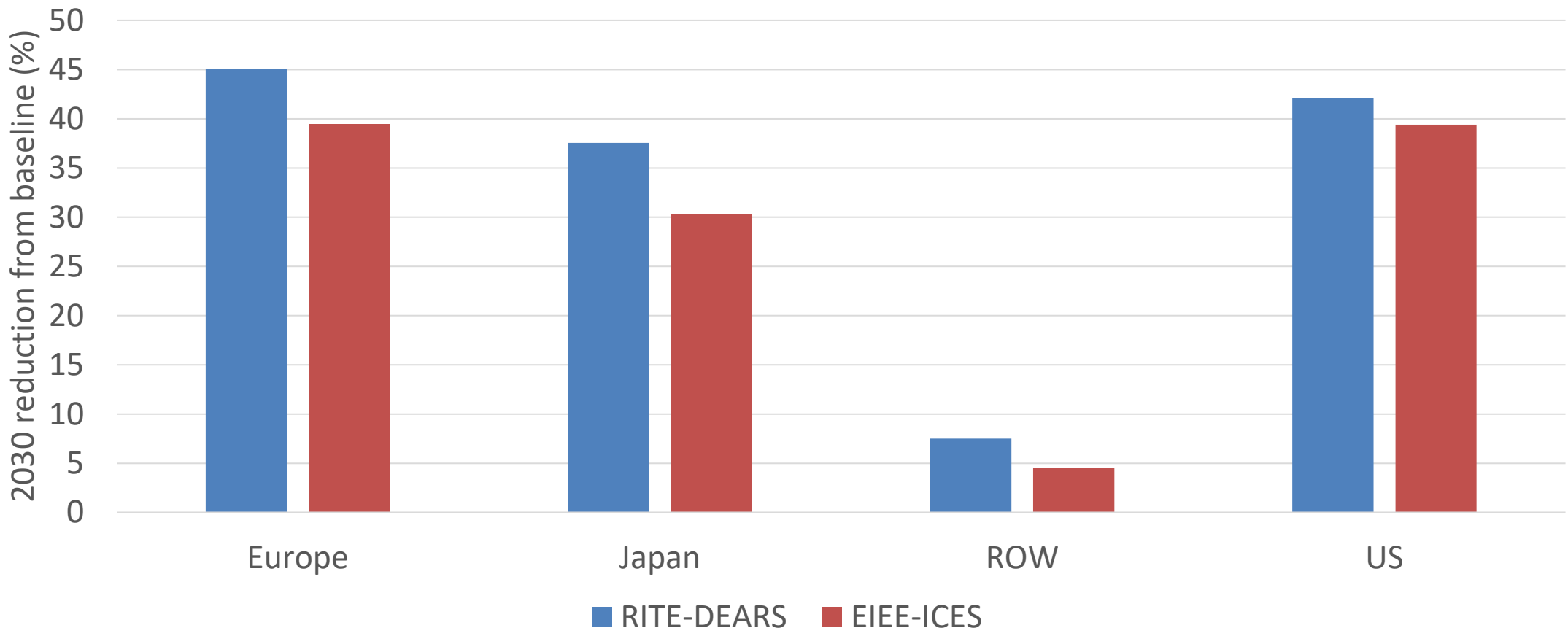
# Scenarios for analysis

| *Scenario* | *Club Members ("ambitious")* | *Description* |
|---|---|---|
| **Club1 (NDCs)** | Europe | Club1 with reduction target and RoW with Carbon prices from NDCs |
| **Club1-CTAX0** | Europe | Club1 with reduction target and RoW free rides / zero carbon price |
| **Club1-CTAX0 + BCA** | Europe | Club1 with reduction target and RoW with C.Price= 0 + BCA |
| **Club2-CTAX0 + BCA** | Europe, USA, Japan | Club2 with reduction target and RoW with C.Price = 0 + BCA |

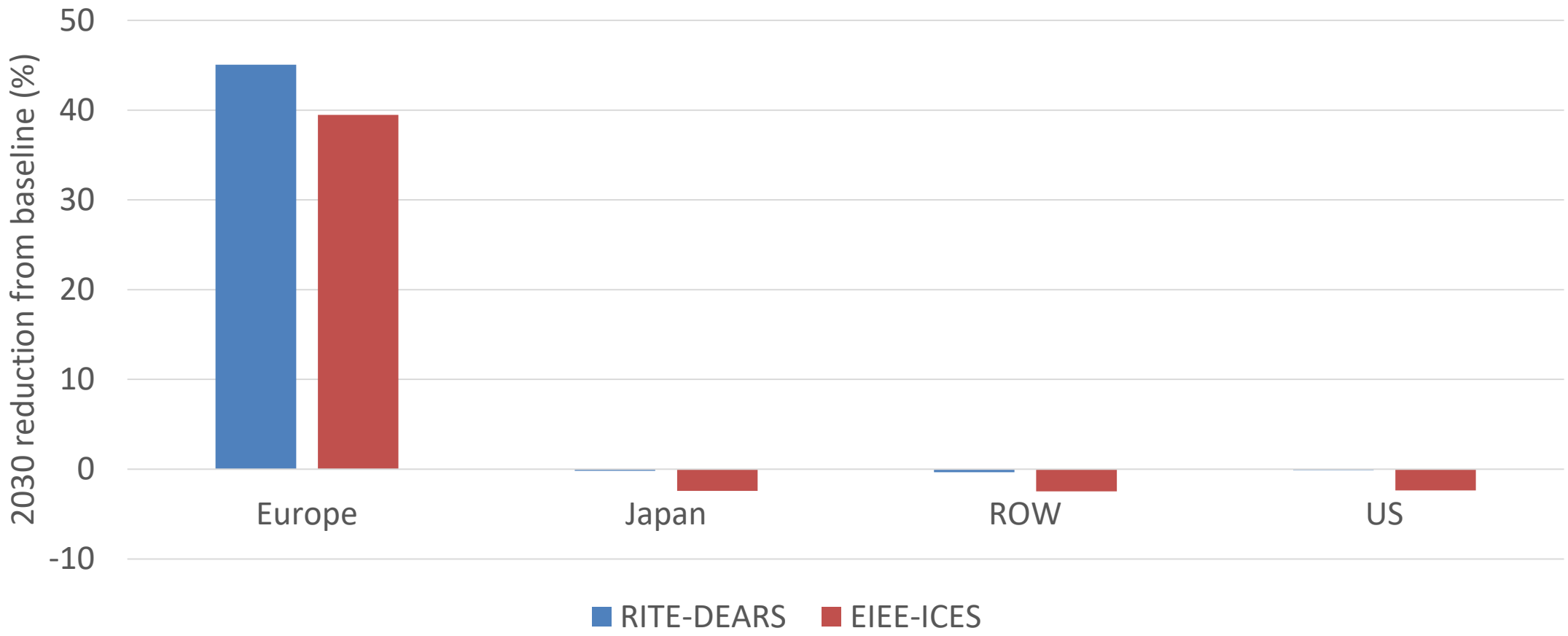
# Summary results

- When the rest of the world (ROW) meets their NDCs—which cap emissions–there is no leakage (in terms of emissions rising). There are still large competitiveness effects because of different carbon prices and shifting production patterns.
- When the ROW "free rides," there is significant leakage from EU emission reductions (up to 50%) and competitiveness effects (up to 5%).
- BCAs attenuate competitiveness effects, but not leakage (which is driven by lower fossil prices prices).
- A larger club attenuates leakage and—when carbon prices are equalized in the club—competitiveness.

# All Countries Implement NDCs -- "no leakage"



# EU implements NDCs, others “free ride”



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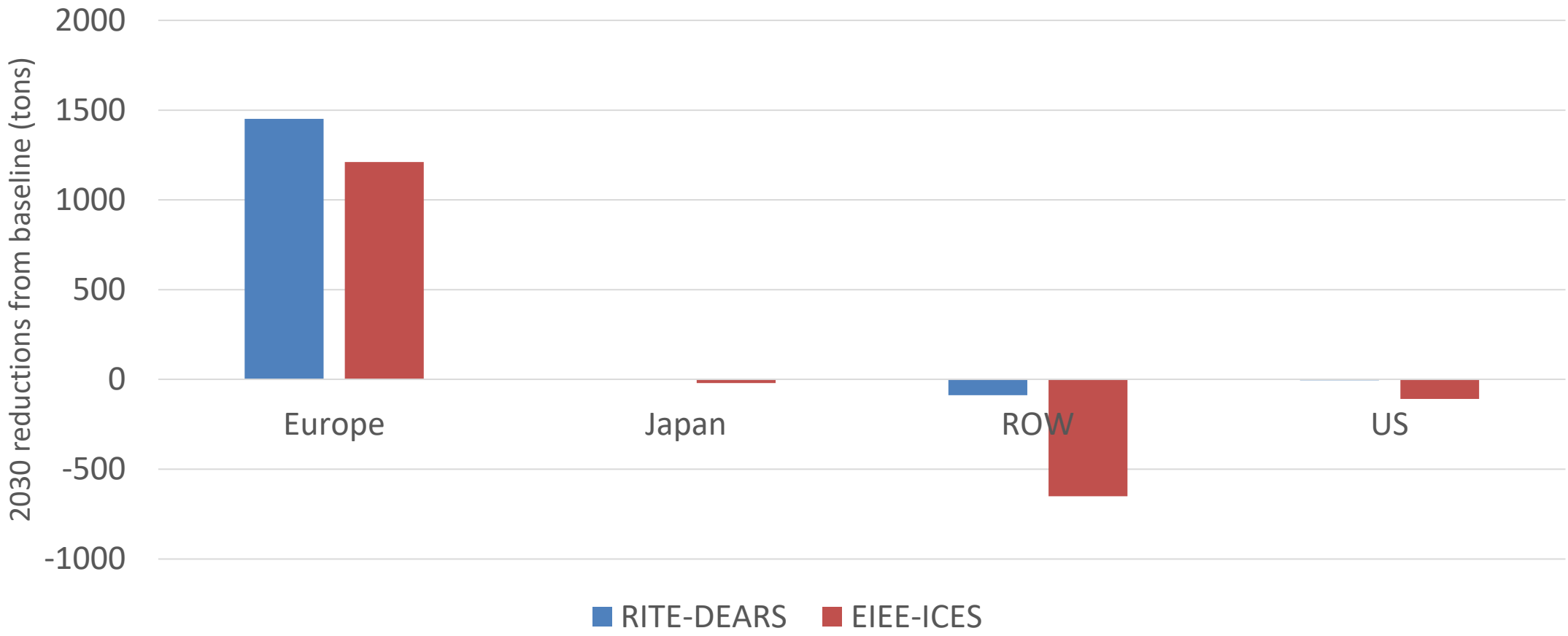
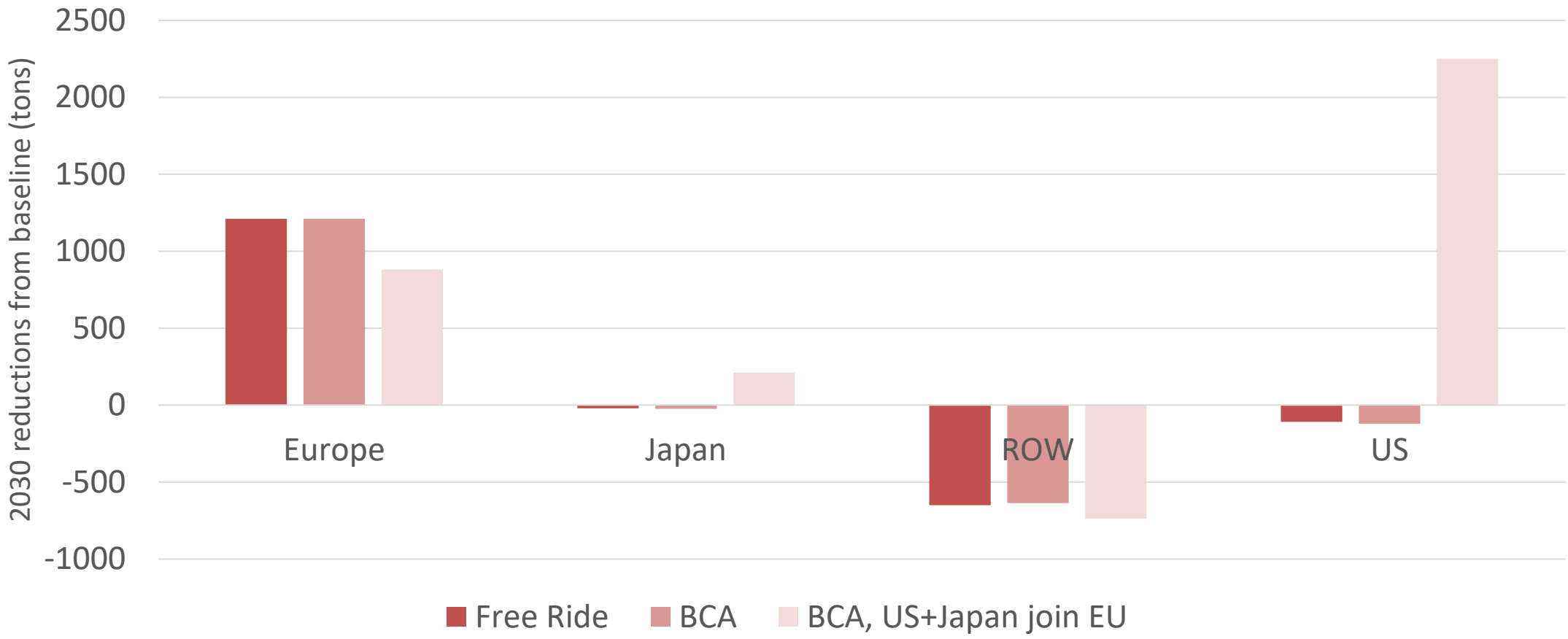
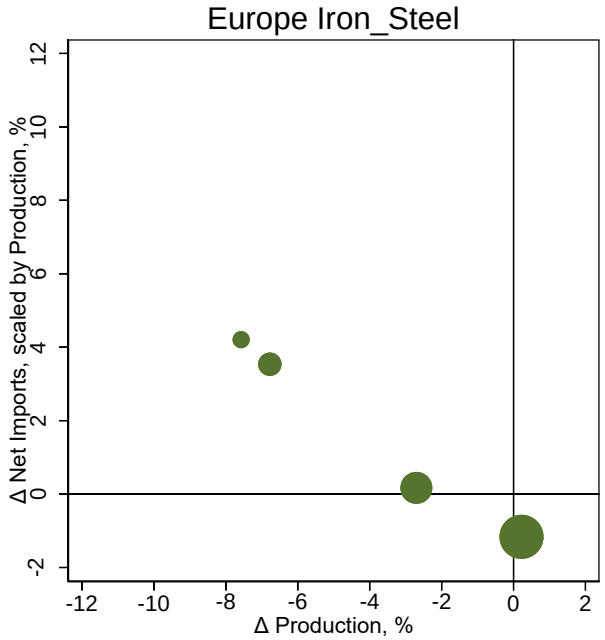
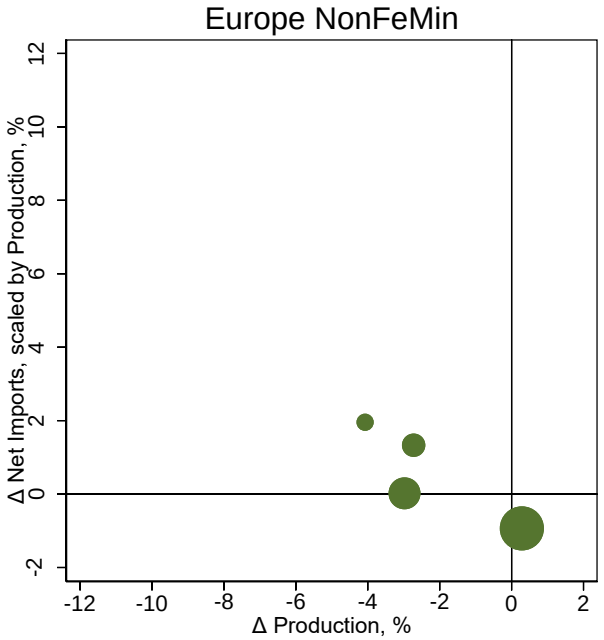


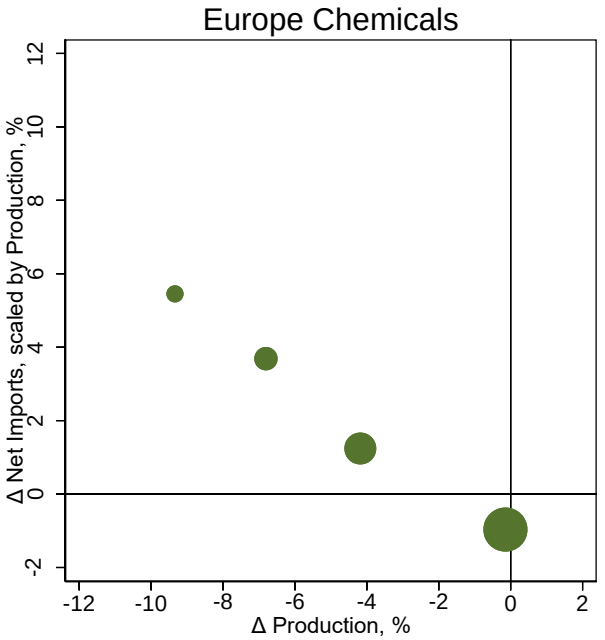
# BCA and expanded club—effect on leakage

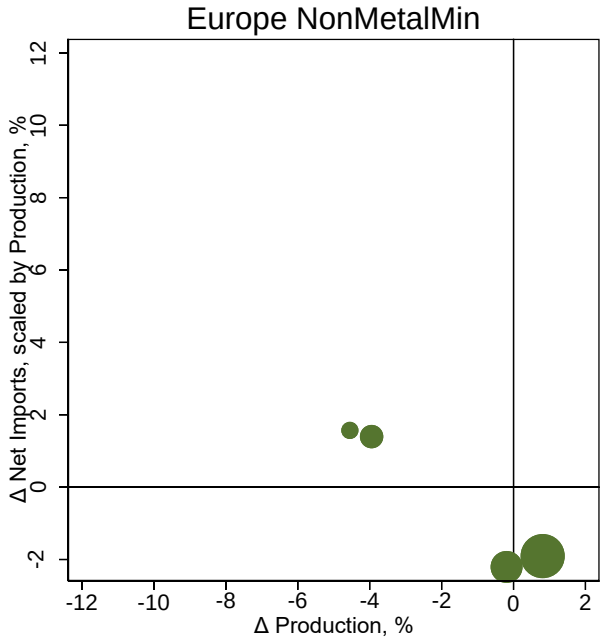


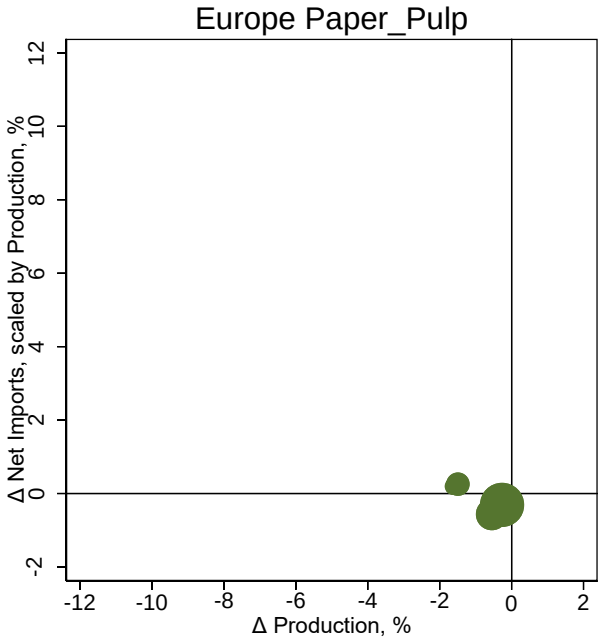
# BCA & expanded club—effect on competitiveness

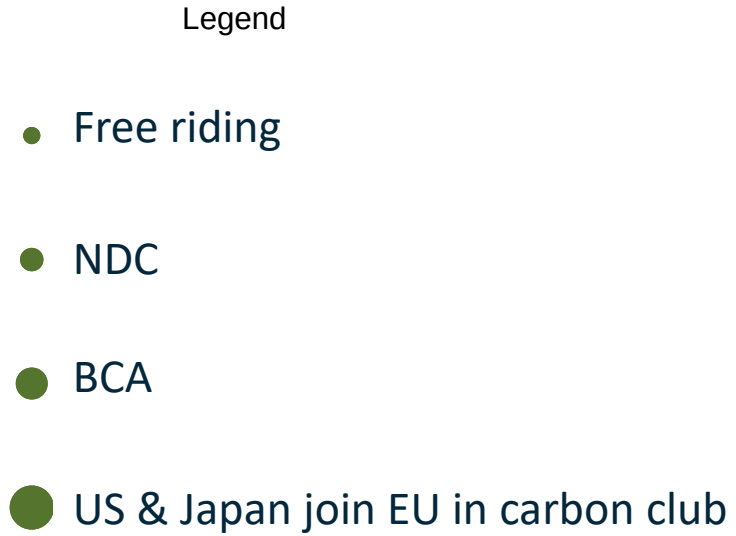


# Conclusions

- High ambition in the EU, with weak policies elsewhere, leads to significant leakage and competitiveness effects (though not much beyond extrapolation of earlier results).
- These are really two different problems with different solutions:
  - Leakage is reduced by having emission limits—however weak—in all key countries.
  - Competitiveness is reduced when carbon prices are equalized by a BCA or harmonized carbon prices.
- This suggests that high ambition in a small group of countries may be politically and practically limited without (a) BCAs and/or (b) minimal action in a larger group of countries.

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# Thanks!

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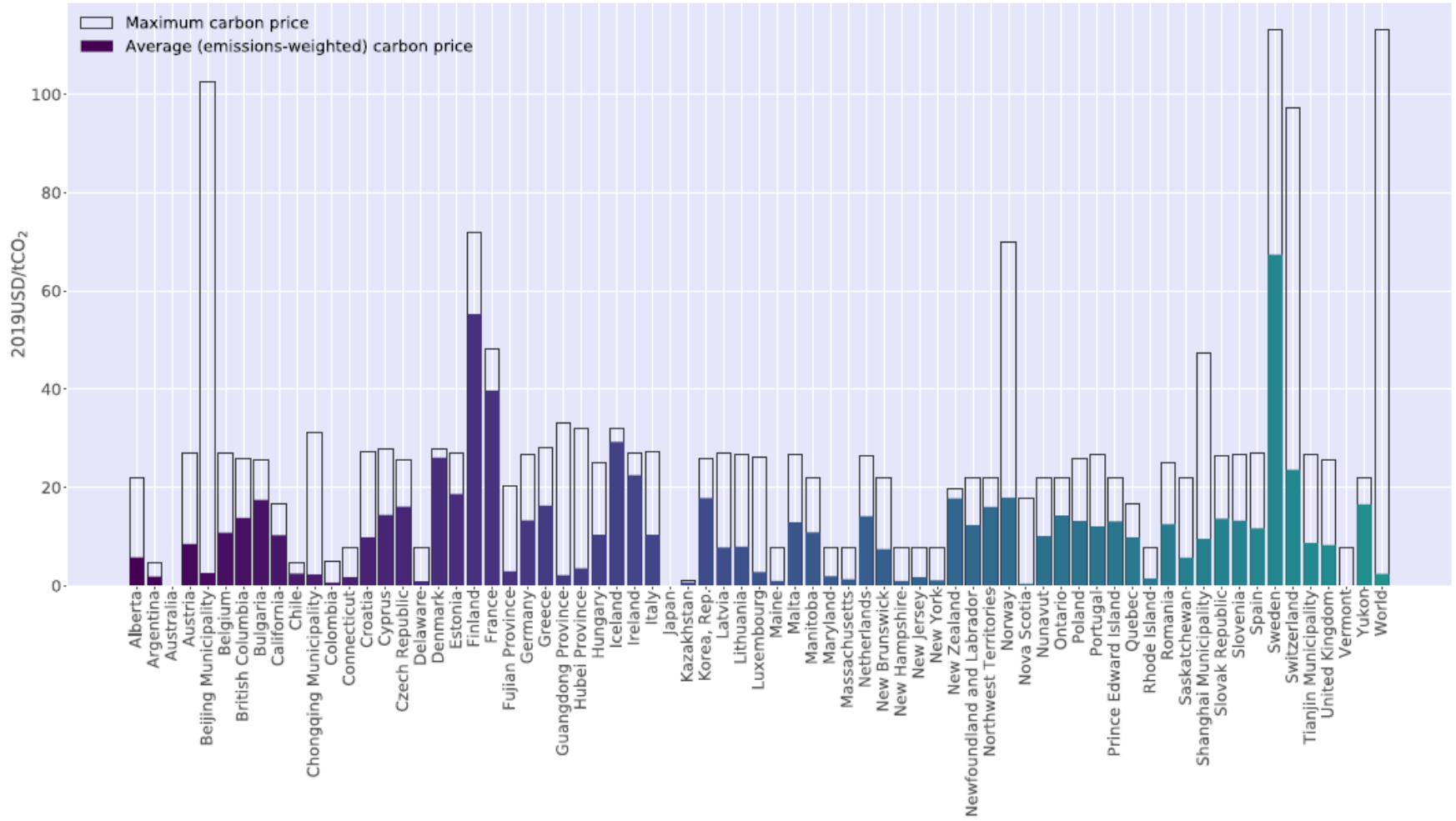
# Significant heterogeneity in carbon pricing

**Figure 4. Maximum and (emissions-weighted) average price on CO2 emissions in 2020, by jurisdiction**



# EU carbon price rose by 3-4x in the last year


source: tradingeconomics.com