

CO₂ Pricing in Sectoral Trade

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****** DRAFT Concept Paper ******

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Summary

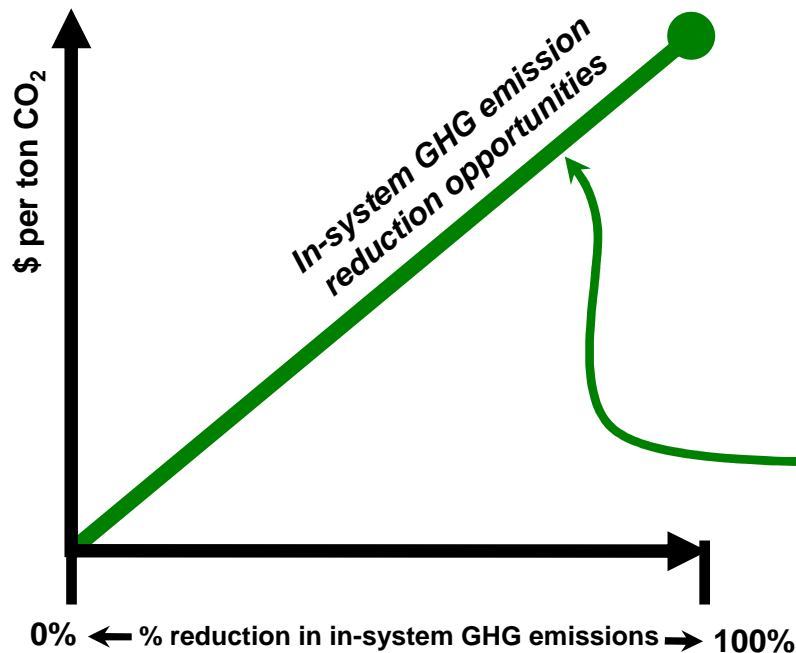
- ❖ **Direct costs of GHG policies have 2 primary forms:**
 1. Cost of mitigation actions taken to reduce emissions
 2. Cost of allowances to cover remaining emissions
- ❖ **For facilities with CO₂ prices on emissions, cost of allowances is likely the bigger cost component**
- ❖ **Facilities without CO₂ prices could see a cost advantage, even if the actual CO₂ mitigation actions are comparable**
- ❖ **For all but a few industries, the effects are modest**
- ❖ **Potential remedies where trade impacts might be substantial**
 - Global uniformity in emissions *and* allowance pricing
 - Actions by developing countries
 - Grandfathered allowances
 - Output-based rebates
 - Border tax adjustments

All have certain problems; no “perfect” fix

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Why Carbon Pricing Matters (1)

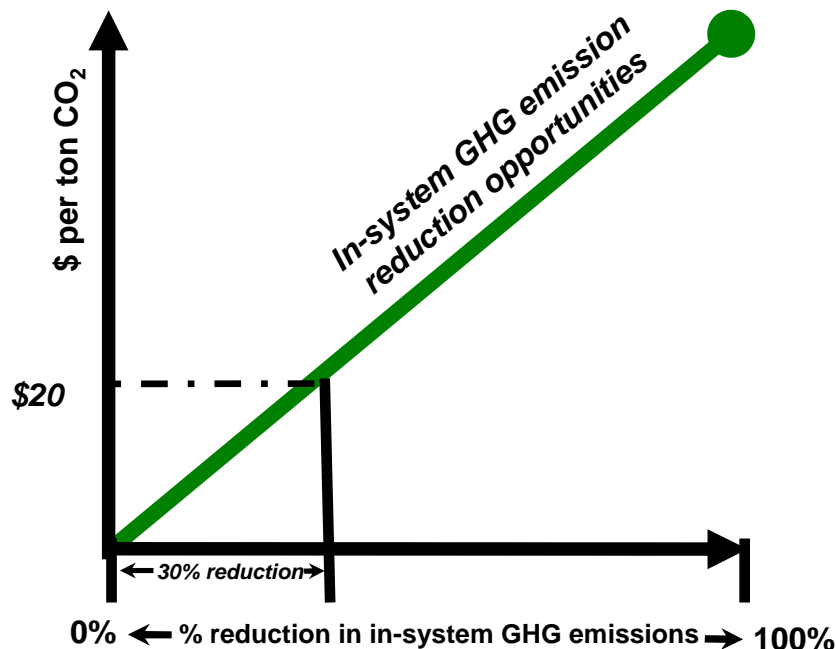
Effects of CO₂ Pricing



- ❖ Consider an “emissions reduction supply curve,” also known as a “marginal abatement cost” (MAC) curve.
- ❖ X-axis denotes the percent of the facility’s CO₂ reductions
- ❖ Y-axis denotes the marginal cost per ton for these reductions
- ❖ The sloped line (shown here in green) is the cost of in-system GHG reductions
 - Does not include reductions from offsets or out-of-system allowances or offsets
 - Shape is specific to each facility and industry

Why Carbon Pricing Matters (2)

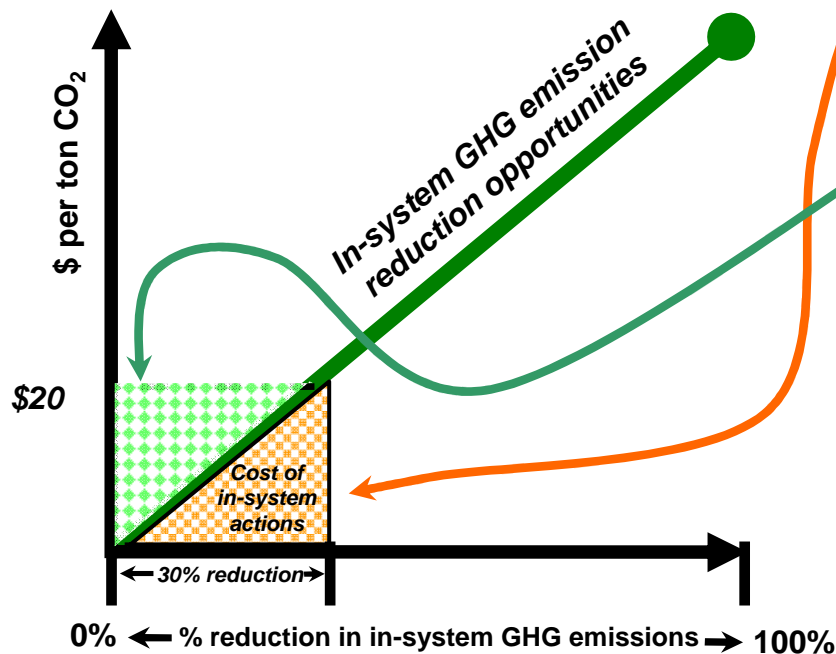
Effects of CO₂ Pricing



- ❖ Now consider a GHG reduction requirement, such as a carbon tax or cap-and-trade program
- ❖ Assume the program results in a market price of \$20 per ton for CO₂ emissions
- ❖ In this example, 30% of the emissions could be reduced for under \$20/ton
- ❖ In a CO₂ market system, it'd make sense for the facility to reduce up to the \$20 price
 - If more reductions than needed, then extra allowances for sale
 - If not enough, cheaper to buy additional allowances on the market than do so in-system

Why Carbon Pricing Matters (3)

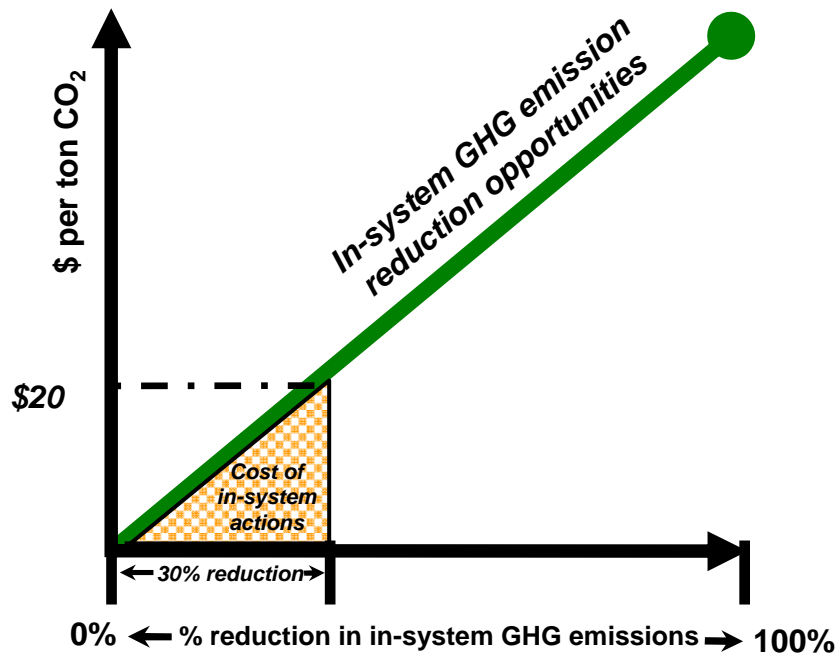
Effects of CO₂ Pricing



- ❖ The facility's cost for undertaking in-system actions is shown in the orange area under the MAC curve
- ❖ The facility's savings, relative to sole reliance on allowance purchases, is the light green area. This is also known as the "producer surplus."
- ❖ The sum of the areas of the 2 blocks equals what the allowance cost for that level of reductions would have been, had in-system actions not been undertaken
- ❖ The relative proportions of the 2 blocks depends on the shape of the specific MAC curve

Why Carbon Pricing Matters (4)

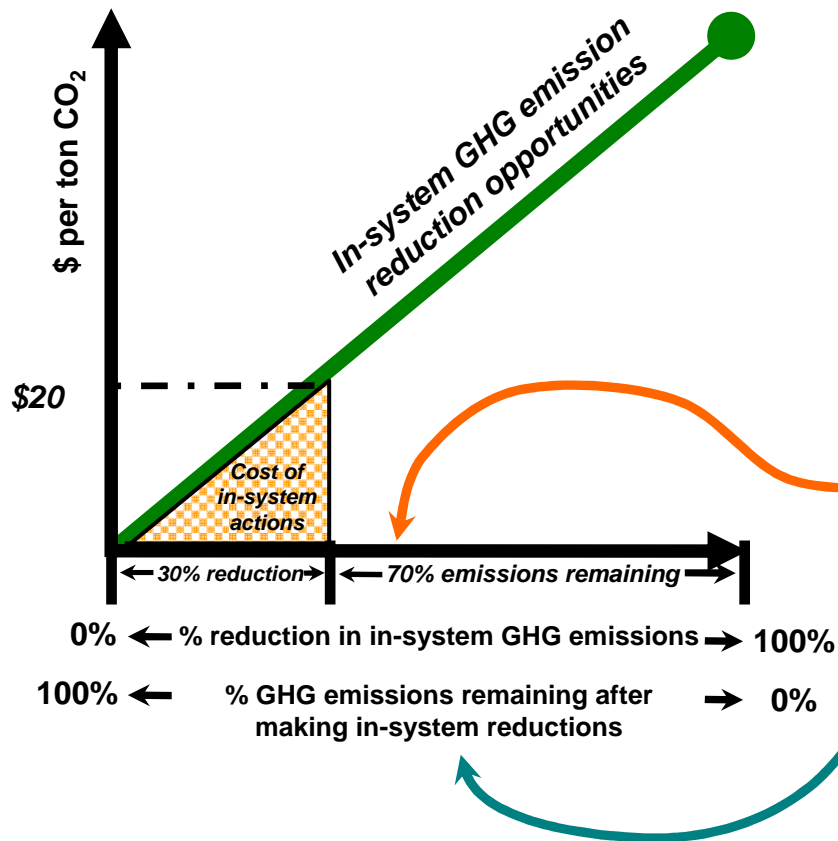
Effects of CO₂ Pricing



- ❖ For this example, the CO₂ price was assumed to result from a cap-and-trade program. It in turn drove the extent and cost of the facility's in-system reductions.
- ❖ The same result would occur if a carbon tax were set at the CO₂ market price.
- ❖ For a facility in a country *not* subject to CO₂ pricing, but participating in a comparably stringent GHG reduction program:
 - In-system reductions are comparable – same environmental benefits
 - Comparable costs for these in-system reductions.

Why Carbon Pricing Matters (5)

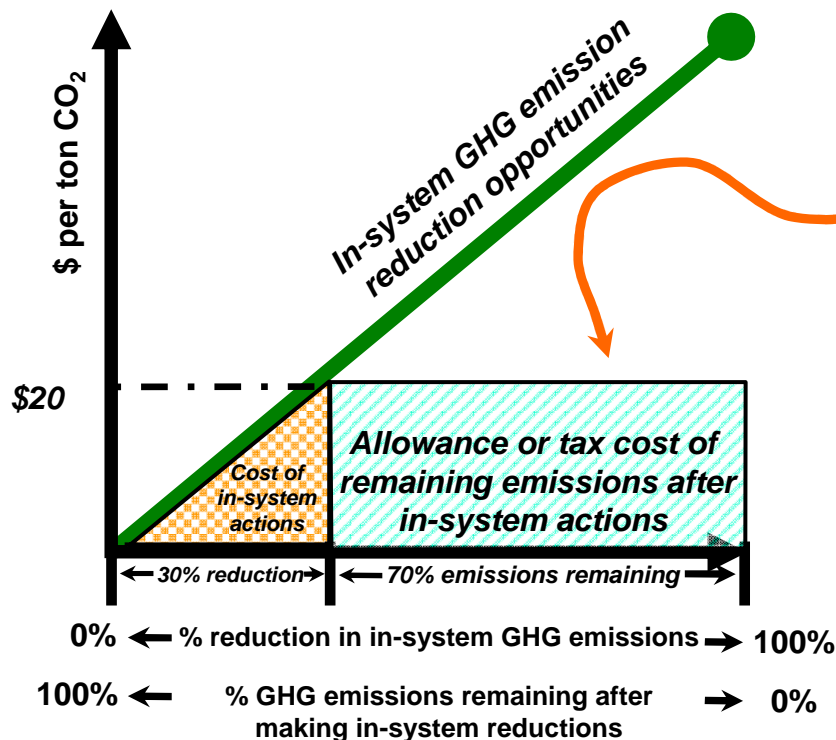
Effects of CO₂ Pricing



- ❖ But what's not comparable is the treatment of the GHG emissions remaining after the in-system actions have been taken.
- ❖ Reading left to right, the X-axis shows percent of CO₂ reductions, ranging from 0 to 100%.
- ❖ But read right to left, the X-axis also describes the CO₂ emissions remaining after reductions have been made.
 - In this example, a 30% reduction leaves 70% of emissions remaining
 - 100% at origin, decreasing to 0% at the far right
 - At any point along the x-axis:
 $\% \text{ reduced} + \% \text{ remaining} = 100\%$

Why Carbon Pricing Matters (6)

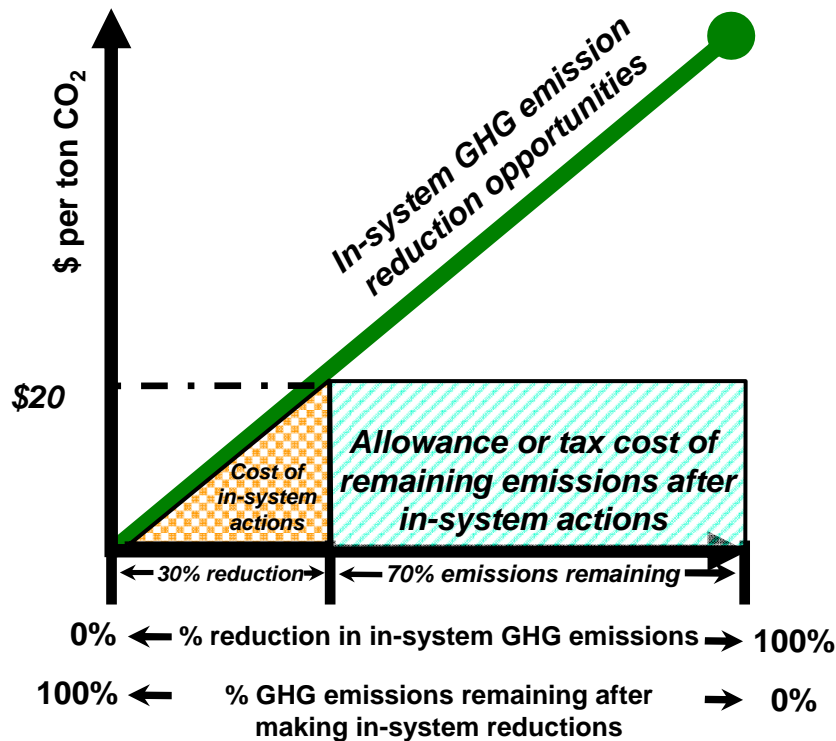
Effects of CO₂ Pricing



- ❖ When facilities undertake comparable levels of CO₂ reductions, it's the in-system emissions remaining that may be treated differently.
- ❖ For a facility with a CO₂ price on emissions, the remaining emissions (70% in this example) require allowances at a market-clearing price, or carbon tax rate.
- ❖ Facilities not facing a CO₂ price on emissions would not be burdened with this extra cost.
- ❖ *It is the cost of allowances for remaining emissions that creates the biggest cost disparity.*

Why Carbon Pricing Matters (7)

Effects of CO₂ Pricing



- ❖ Likely extent of GHG reductions, coupled with geometry, make it probable that the cost of the remaining GHG emissions will be more than in-system costs.

% GHG Reduction	In-system cost **	Allowance cost	Ratio, Allowance to in-system
10%	1.0	18.0	18.0 to 1
20%	2.0	16.0	8.0 to 1
30%	3.0	14.0	4.7 to 1
40%	4.0	12.0	3.0 to 1
50%	5.0	10.0	2.0 to 1

** Assumes a straight-sloping MAC curve

❖ **Environmental comparability does not necessarily mean economic and trade comparability!!!**

These carbon pricing differences could have potential trade implications

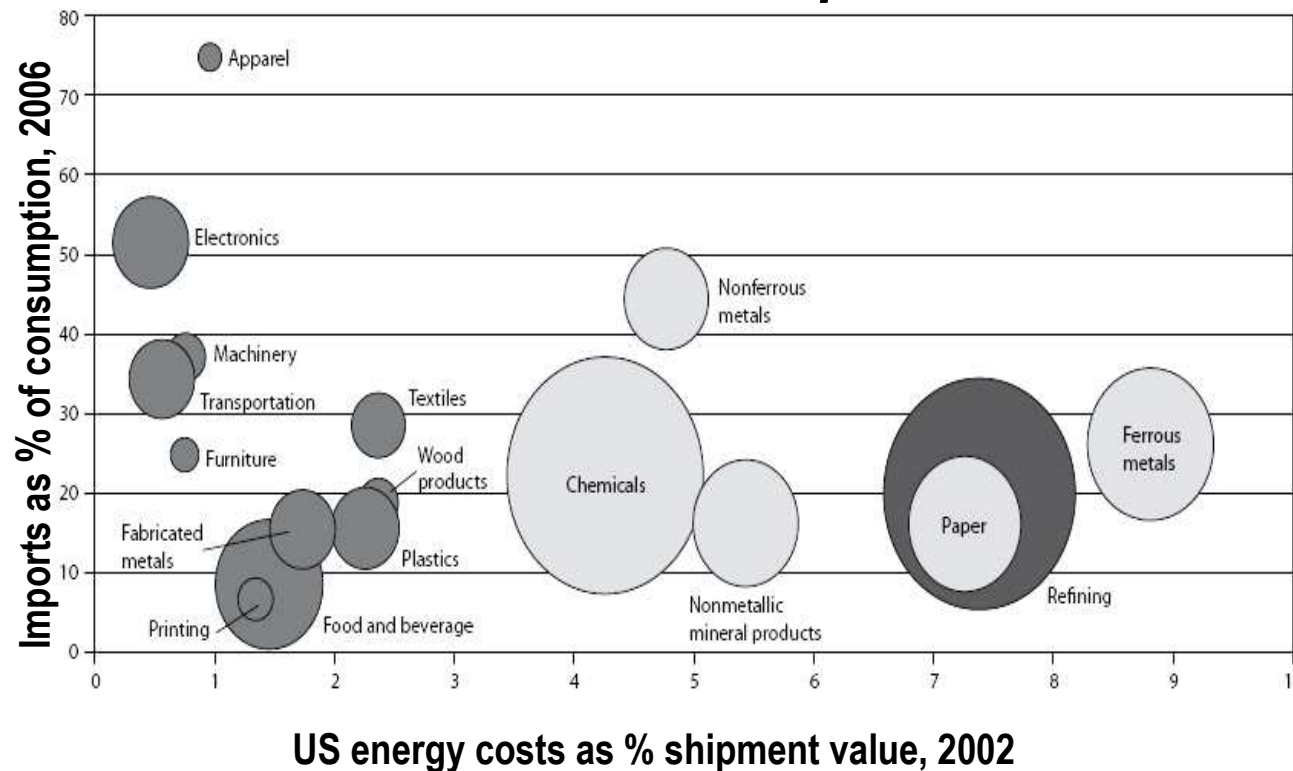
- ❖ **More so than the cost on in-system reductions, the cost of the remaining GHG emissions can create a competitive difference**
 - Higher cost for facilities subject to CO₂ pricing
 - Generally not present for facilities not facing CO₂ pricing
- ❖ **Can this affect trade? *Maybe ... depends upon:***
 - GHG intensity of the product
 - Cost for CO₂ allowances
 - CO₂ costs relative to product value and transport costs
 - Other policies & measures
- ❖ **If trade is affected, what are the consequences?**
 - Shifts in production and employment away from capped countries
 - GHG leakage as uncapped countries gain market share
 - Possible net losses in energy & transport efficiency, with further GHG effects

These carbon pricing differences are not the result of sectoral programs

- ❖ **This is a potential side effect of differences in GHG pricing. It is not the result of sectoral programs**
- ❖ **The question then becomes: “*In a world with differential GHG pricing, can sectoral programs help address the side effects?*”**
 - Certainly don't want to make it worse
 - If concerns can be tempered, then sectoral programs become more acceptable, helping in overall climate negotiations

Limited number of internationally competitive industries at risk

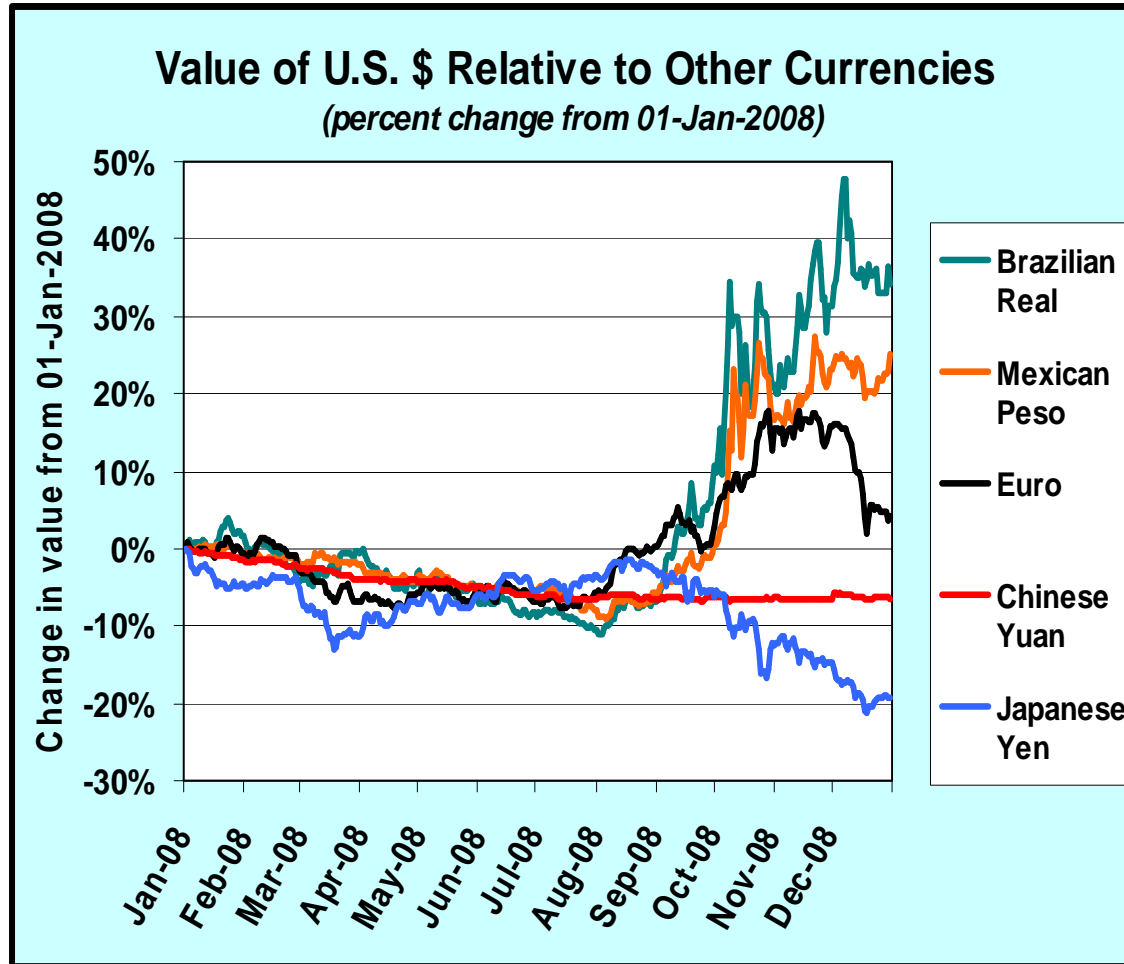
US industry energy intensity and imports as a share of consumption



Source: Peterson Institute and WRI, *Leveling the Carbon Playing Field*, May 2008, p. 9.

- ❖ For most industries, energy costs are *not* the dominant factor
- ❖ But in some energy & carbon-intensive industries, carbon pricing could potentially lead to GHG leakage
- ❖ If GHG leakage can be addressed, it will be easier for Annex I countries to set aggressive national reduction targets

But many other factors also affect trade



- ❖ Long-term global trends in energy-intensive industries
- ❖ Many factors at play:
 - Resource endowment
 - Labor costs
 - Taxes, etc.
 - Currency exchange rates
- ❖ Developing country production is mostly meeting growing domestic demands
- ❖ CO₂ goals should *not* be a basis for redressing other trade concerns

Source: FXHistory®: historical currency exchange rates, Oanda.com, <http://www.oanda.com/convert/fxhistory>

Potential remedies to mitigate trade impacts from these carbon pricing differences (1)

1. Try to harmonize carbon price signals

- ❖ **Global uniformity in emissions *and* carbon pricing**
 - Both are needed; GHG performance standard alone won't do it
 - Complex to harmonize across and within nations, esp. on the carbon pricing.
 - Including some industries, but not others, creates competitive effects between industries.

- ❖ **Developing country actions to create a carbon price signal**
 - Cap-and-trade for select sectors
 - Export fees in the developing countries
 - CDM programs, if based on absolute levels rather than intensities
 - Requires comparable effects from countries having various approaches

None are perfect!

Potential remedies to mitigate trade impacts from these carbon pricing differences (2)

2. Deal with concerns narrowly

❖ Grandfathered allowances

- If based on historic levels, allowances provide a cash payment equivalent
- Allowances can compensate for lost profits & declines in asset values
- Unless the historic baseline is periodically updated, allowances won't affect variable costs, so trade differences may remain

❖ Output-based rebates

- Payments to producers based on future production
- Also levels the playing field with respect to carbon price
- But carbon price signal is reduced, esp at the end-user
- Potential distortions among competing carbon-intensive products

❖ Border Tax Adjustments

- Importers have to acquire allowances
- Can level import playing field & maintain a carbon price signal
- Export disadvantages remain
- WTO & other trade concerns: difficult and contentious to administer

None are perfect!

Questions?

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