

Carbon Markets, Linking and Cost Containment



How to achieve gains from linking carbon markets when some schemes attempt to contain cost impacts

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IEA-IETA-EPRI Emissions Trading Workshop

Paris, 27 September 2006

Agenda

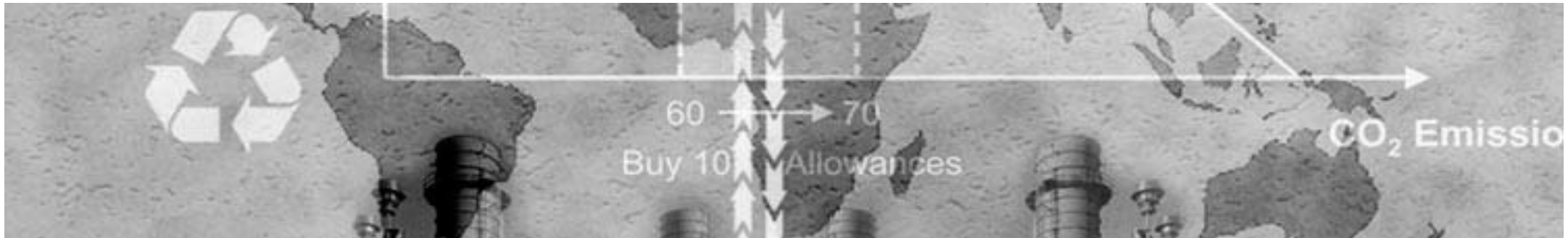


- Overview
- Two objectives: (1) scheme linkage; and (2) cost containment
- Cost-containment measures
- Impacts of cost-containment measures on gains from linking
- Restrictions on linking to reduce impacts
- Concluding remarks
- Appendix: detailed results

Overview



- Many “cost-containment” measures enacted/proposed
 - E.g., offsets, “safety valve, others
- Linking provides cost savings but also makes cost-containment measures uniform across programs
 - E.g., banking and offsets available across linked scheme
- “Safety valve” could *increase* overall emissions (relative to sum of linked programs)
- “Partial” or “restricted” linking cannot *both* counter effect of safety-valve and preserve cost-saving gains from linking
- Cost-containment measures highlight the usefulness of harmonisation of key elements in trading schemes



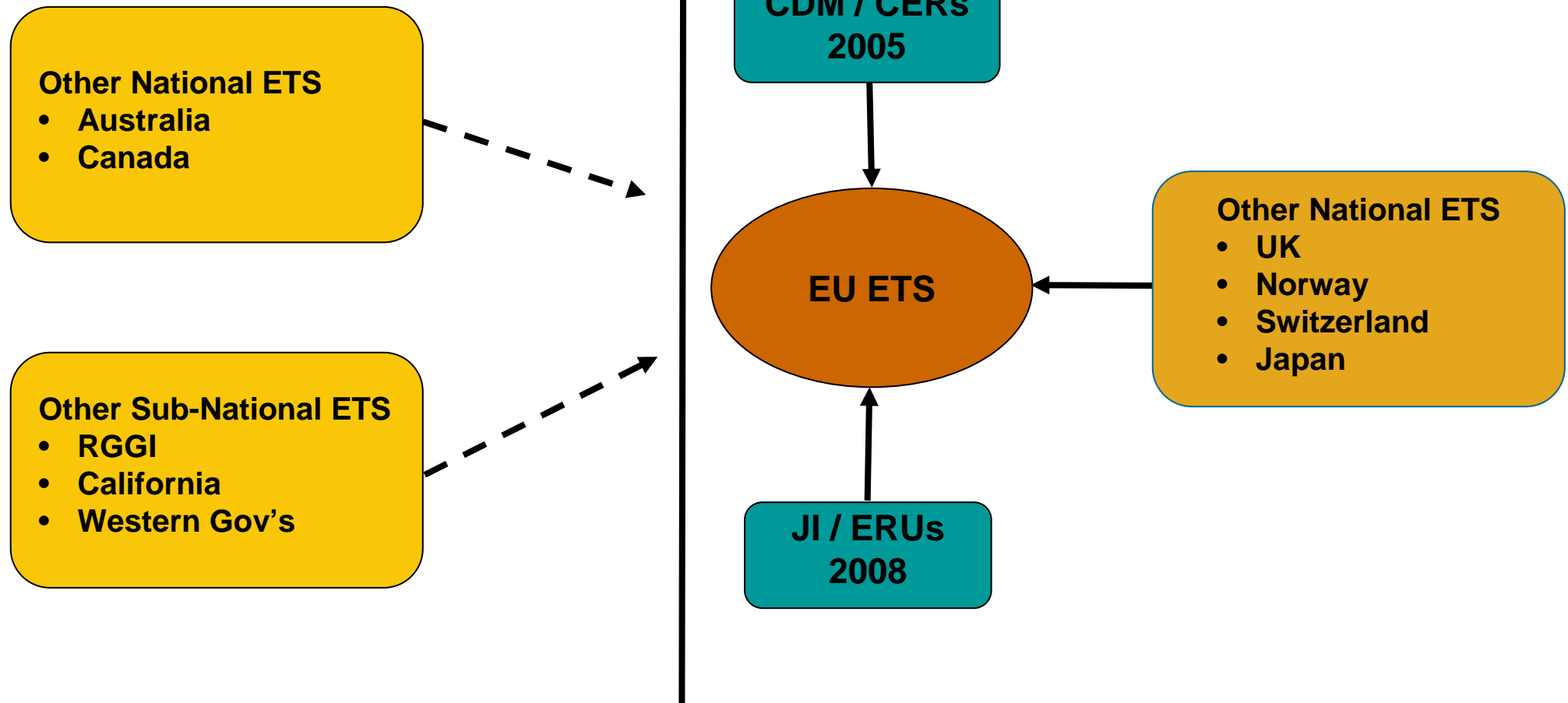
Two Objectives: Linking and Cost Containment

Proliferation of Carbon Programs Puts Linking on the Agenda

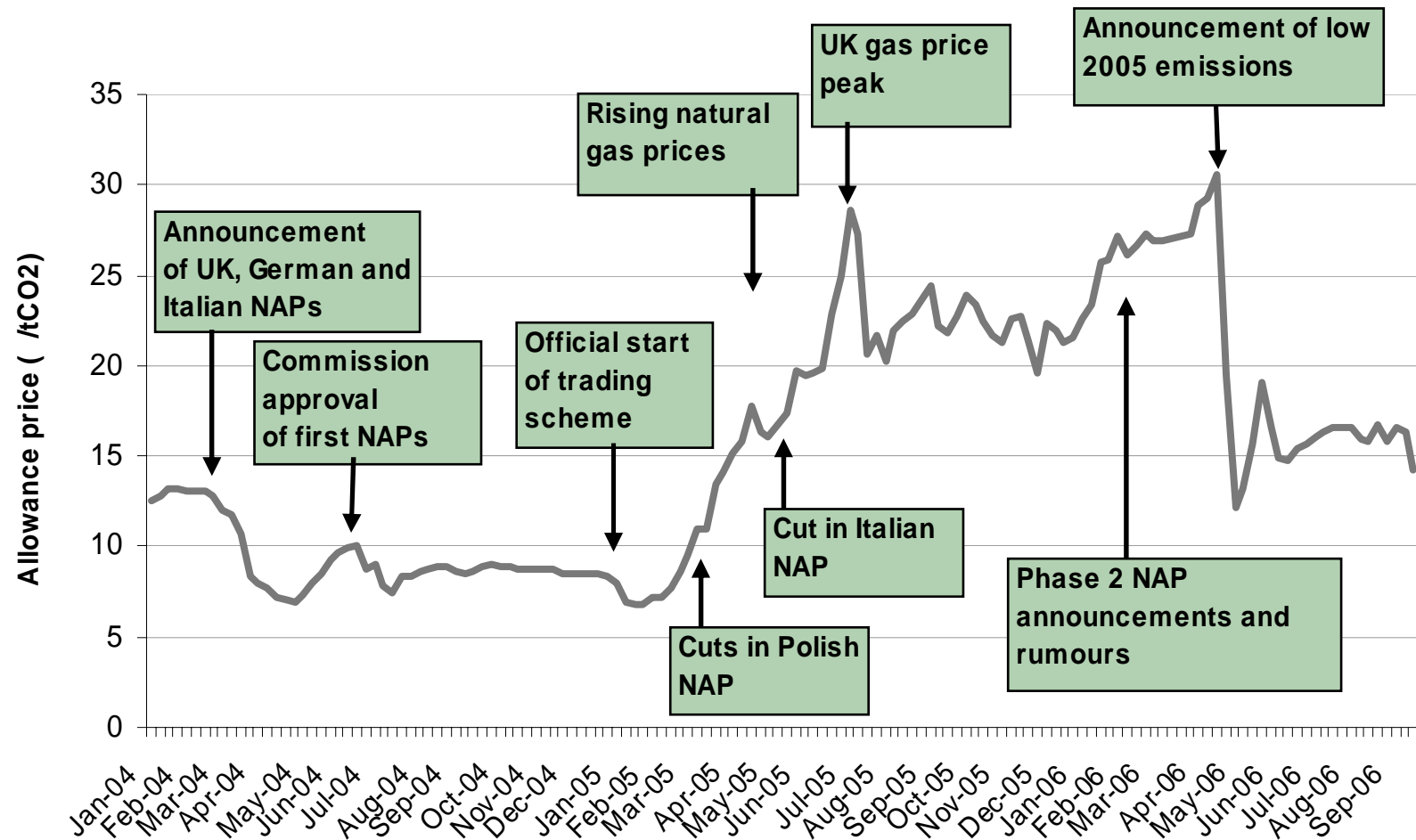


“Non-Kyoto” Parties

“Kyoto” Parties



EU ETS Allowance Price Development Puts “Cost Containment” on the Agenda

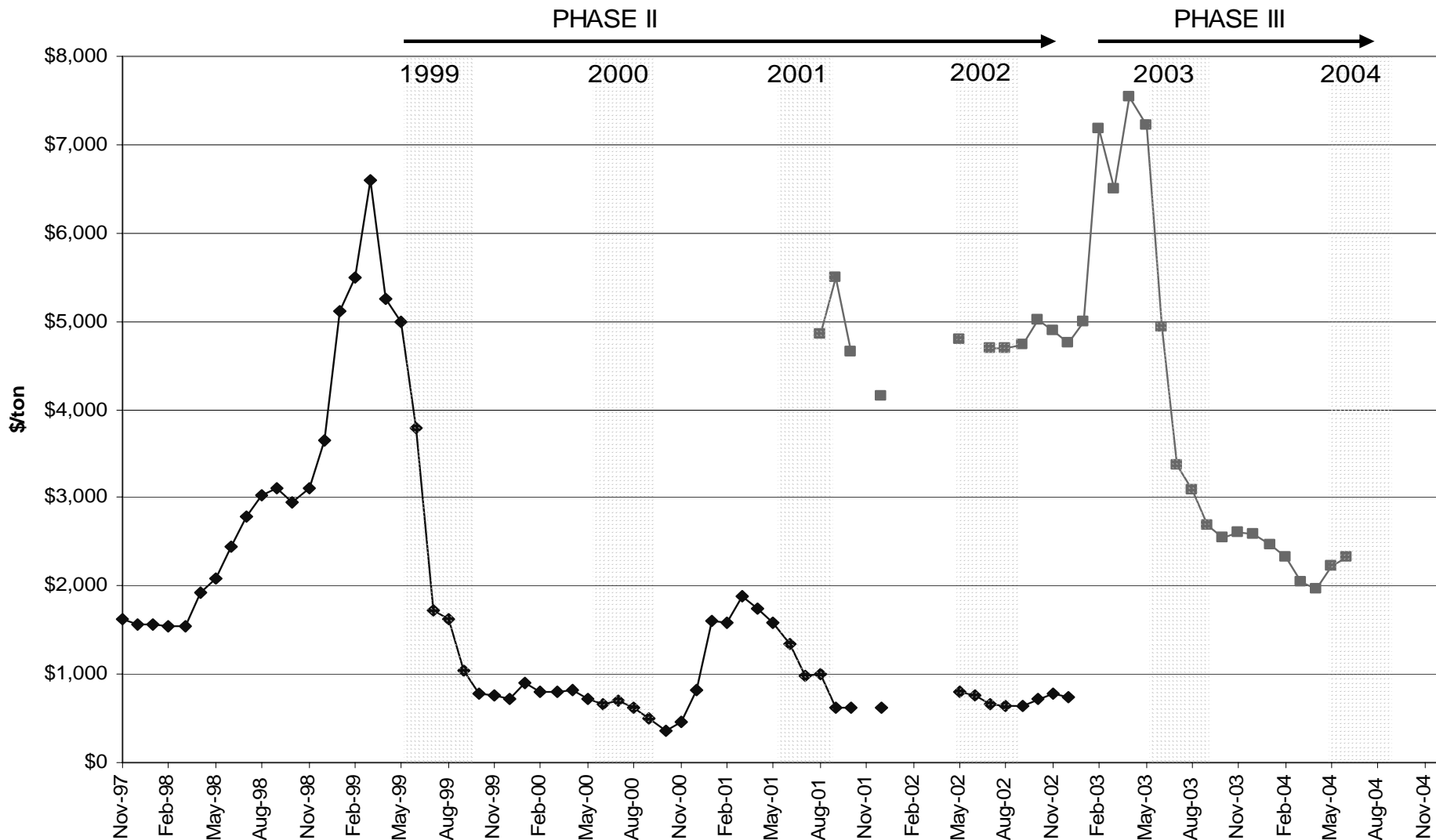


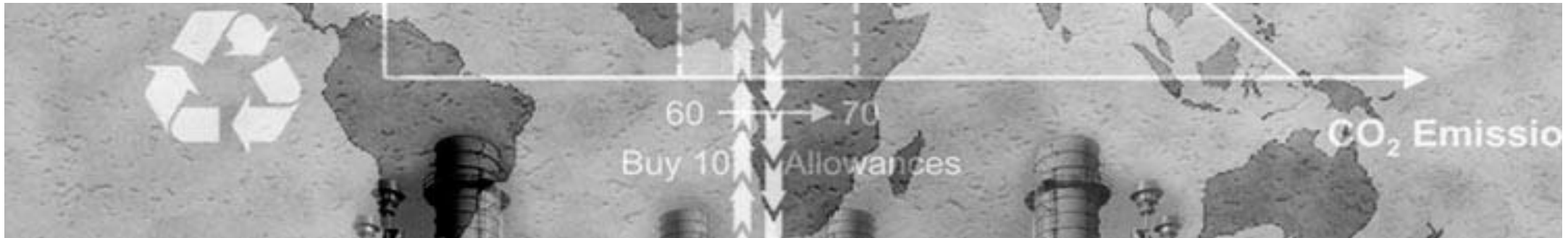
EU ETS prices have been higher than many expected and very volatile

Similar Price Volatility Has Been Evident in US NO_x Market



OTC NO_x Prices, Current Vintage, 1999-2003





Cost-Containment Measures

Overview of Cost-Containment Measures



Categories of cost-containment measures

Cap Level

- Set level of cap to obtain “acceptable” allowance price

Safety-Valve

- Safety-valve price ceiling to limit allowance price

Offsets

- Allow import of credits from non-capped sources

Banking/ Borrowing

- Allow use of allowances for compliance in future/prior periods

Relative Targets

- Define target in terms of emissions per unit output

*Primarily contain
“expected” price*

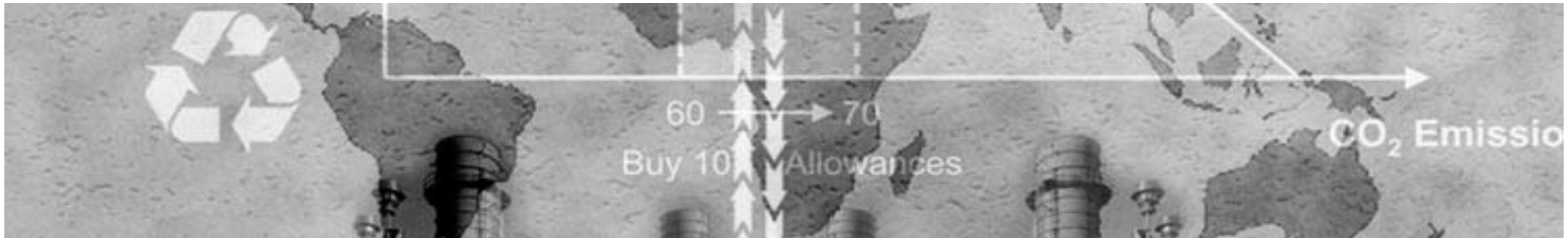
*Primarily limit
“price spikes”*

Evaluating Linking to a Program with Cost-Containment Measures



- For illustrative purposes, consider the possibility of linking the EU ETS to a hypothetical US program (“US ETS”)
- Two potentially competing EU ETS objectives
 1. Minimize abatement costs (linking can reduce costs)
 2. Ensure emissions reductions
- Framework to assess whether (and how) to link:
 - Identification of ways “Other” region (US) might contain costs
 - Influence of each cost-containment method on EU ETS objectives
 - If adverse effects, evaluate possible restrictions on linking

How would the “other” program’s cost-containment measures affect objectives? What restrictions can/should apply?



Effects of Linking to a Program with Various Cost Containment Measures

Evaluation of Linking to Scheme with a Cost-Containment Measure



- A key concern for the linking region (EU) is how emissions will be affected
 - Increased emissions in one region are not necessarily a concern if emissions decline elsewhere
 - There is greater concern if **overall** or **global** emissions increase
- Criteria for evaluating the effects of linking:

	GHG Emissions	GHG Compliance Costs
EU	↑ or ↓	↑ or ↓
Global	↑ or ↓	↑ or ↓

Notes: ↑ = increased; ↓ = decreased; green = “desirable” change; red = “undesirable” change

- Key comparison:
 - Case with two “non-linked schemes” vs. case with “linked schemes”
 - Consider **overall** emissions and costs compared to linking scenario

Other Potential Concerns

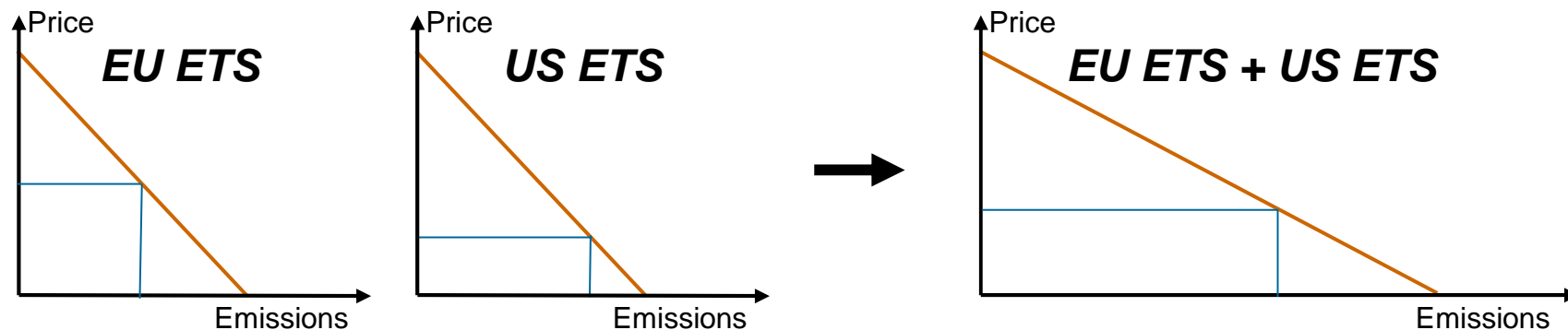


- Lower prices reduce incentives to invest in low-emission technologies
 - Some advocates of such technologies argue that higher prices are desirable to provide “technology-forcing”
- Linking has distributional implications
 - Non-linked schemes have higher overall costs
 - However, linking can cause higher prices for participants in region with cheaper abatement (exports allowances)
 - Buyers in net exporting region stand to lose out but sellers gain (and *vice versa* in net importing region)

Linking to Scheme with “Less Stringent” Cap



- Scenario: EU ETS with “stringent” cap linked to US ETS with “loose” cap
 - Assume “loose” cap is still below BAU emissions of US ETS participants
- Relevant cap under linking is sum of two caps
 - No reduction in total emissions with linking
- Price with linking is between EU ETS price and US ETS price (in isolation)
 - Price in EU ETS decreases
 - Costs for participants in EU ETS (and overall costs) decrease

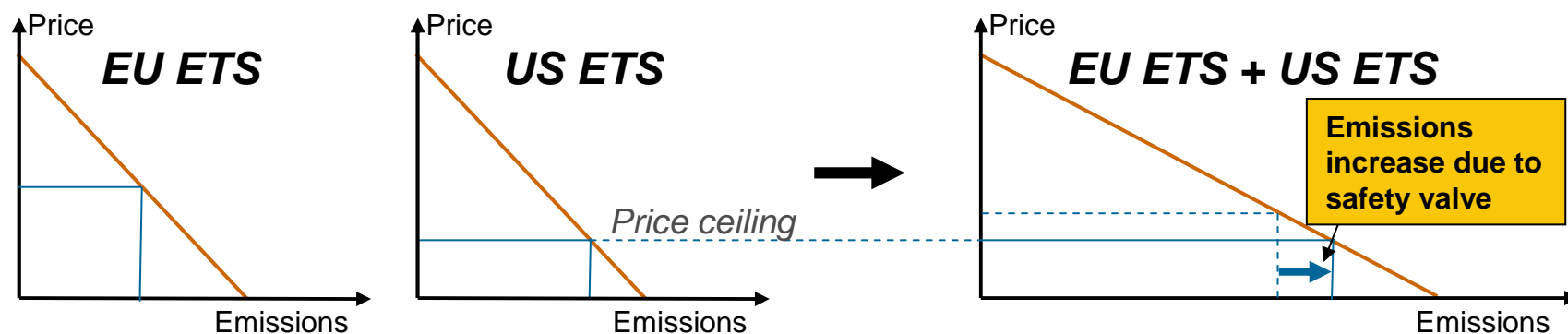


Linking retains environmental benefit and yields cost savings, provided “loose” cap is below BAU

Linking to Scheme with Price Ceiling (“Safety Valve”)



- Scenario: US ETS has buy-out/safety valve, EU ETS does not
 - Alternatively, EU ETS has a higher buy-out price
- With linking, participants in US ETS can buy unlimited additional allowances at buy-out price and sell on to participants in EU ETS
- The price of allowances in the EU ETS therefore will not rise above the buy-out price in US ETS, and **total** emissions can increase

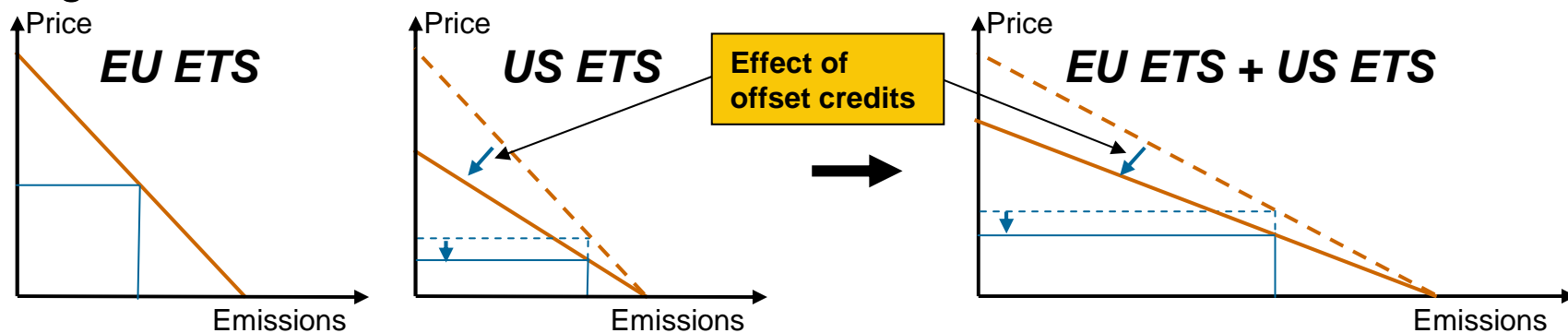


Linking means accepting the safety value in all linked schemes, and payments to the “other” government

Linking to Schemes with Offset Provision



- Scenario: US ETS allows certain offset credits for compliance, EU ETS does not
- Results in indirect acceptance of offset credits in EU ETS and expanded joint set of abatement options
 - Participants in US ETS can use offset credits and sell ordinary US ETS allowances to EU ETS
- Prices decrease but global emissions do not increase provided offsets are “genuine”



Linking to a scheme with offsetting entails (indirect) acceptance of offset credits

Linking to Scheme with Banking/Borrowing Provision



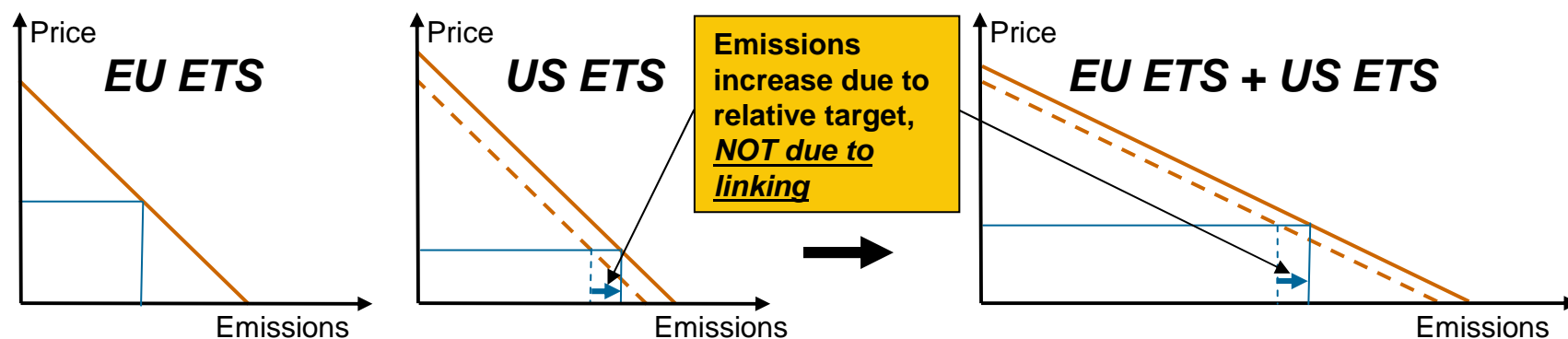
- Scenario: US ETS allows banking/borrowing, EU ETS does not
- Companies can enter into a swap contract to make banking available to participants in EU ETS:
 1. EU company delivers current-period EU ETS allowances to US company, enabling the US company to bank “freed-up” US ETS allowances
 2. US company undertakes to deliver allowances to EU company in a future compliance period (can use banked allowances for own compliance but deliver future-period US ETS allowances)
- Trading across schemes thus enables trading across time periods

Linking makes banking provisions in one scheme indirectly available in all linked schemes

Linking to Scheme with Relative Target



- Scenario: US ETS has relative targets, EU ETS has absolute targets
 - Assume relative target is below BAU intensity of US ETS participants
- Higher output in US leads to higher emissions so joint emissions are not fixed absolutely
- Global emissions do not increase with linking (provided targets are binding)



Linking schemes with relative and absolute targets does not increase overall emissions

Summary of Implications of Linking with Scheme with Cost-Containment



Categories of cost-containment measures

Cap Level	Safety-Valve	Offsets	Banking	Relative Targets
<ul style="list-style-type: none">▪ Set level of cap to obtain acceptable allowance price	<ul style="list-style-type: none">▪ Buy-out provisions to cap allowance prices	<ul style="list-style-type: none">▪ Import credits from non-capped sources	<ul style="list-style-type: none">▪ Allowances carried over for compliance in future periods	<ul style="list-style-type: none">▪ Define obligations in terms of emissions per unit output

Implications of unrestricted linking for program without cost containment

<ul style="list-style-type: none">▪ Allowance price decreases (but not to level of “contained” scheme)	<ul style="list-style-type: none">▪ Allowance price decreases to ceiling	<ul style="list-style-type: none">▪ Imported credits implicitly accepted	<ul style="list-style-type: none">▪ Banking indirectly available	<ul style="list-style-type: none">▪ Allowance price lower in case of higher output in other program
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Unrestricted linking results in de facto harmonisation of rules regarding cost-containment provisions

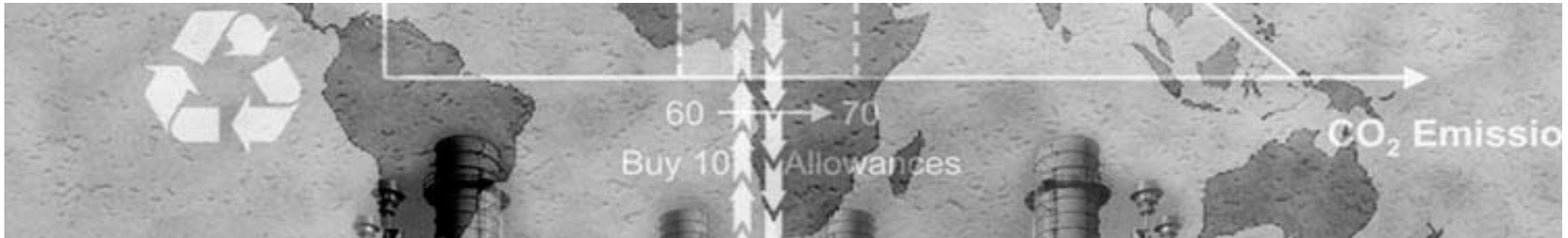
Summary of Effects of Linked Cost-Containment on Program Goals



Measure	Emissions relative to no link		Compliance costs relative to no link	
	EU	Global	EU	Global
Cap level	↑	NC	↓	↓
Safety-valve	↑	↑	↓	↓
Offsets <i>(Assuming "additionality")</i>	↑	NC	↓	↓
Banking/Borrowing	NC	NC	↓	↓
Relative targets	↑	NC	↓	↓

Notes: ↑ = increased; ↓ = decreased; NC = no change;
 green = "desirable" change; red = "undesirable" change

**Only safety-valve leads to increased total emissions
 (provided US cap level and relative targets do not exceed BAU)**



Potential Restrictions on Linking

Question: Can Disadvantages of Linking with “Safety Valve” be Avoided?



Do potential restrictions on linking avoid GHG increases, preserve gains from linking, and operate with acceptable administrative costs?

Potential restrictions

1. **Categories:** Restrict types of participants or allowances tradable
2. **Direction:** Only one scheme allows import of allowances
3. **Quantity:** Restrict amount of allowances tradable
4. **Price:** Set minimum price level for linked transactions
5. **Trigger events:** Restrict linking if “trigger” event occurs
6. **“Exchange rate”:** Discount compliance value of traded allowances
7. **Government mediation:** Centralized control of linking

No Restriction Avoids GHG Increases with Safety Valve *and* Keeps Full Gains from Linking



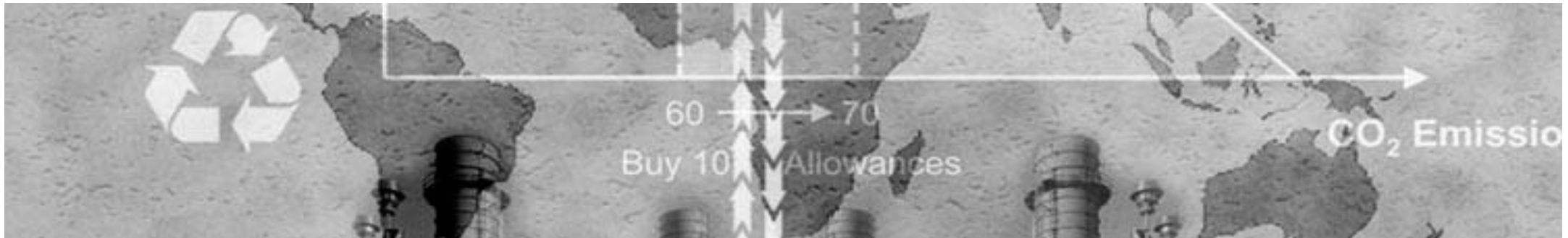
Restriction on Linking	Prevents GHG Increase?	Preserves Gains from Linking?	Feasibility / Cost
Category of allowances / participant	No (trade between participants restores linking)	Partially , but creates uncertainty and complicates trade	Complex / costly
Direction / one-way gateway	Yes , but only by eliminating linking	No , eliminates linking for one scheme	Feasible
Quantity limit	Partially , can reduce extent of problem but not “solve” it	Partially , but eliminates linking when binding	Feasible
Minimum price on linked trades	Partially , prevents drop in prices	Partially , but leads to different prices in the two schemes	Complex, requires government intermediation
Trigger events	Partially , but makes linking mutually exclusive with buy-out	Partially , but linking eliminated once trigger reached	Risk of instability Open to manipulation
“Exchange rate”	Partially , can reduce extent of “hot air” if present	Partially , some cost savings preserved	Feasible
Centralization	Yes , government discretion gives more control	No , linking not available to individual companies	Feasible

Effects of Linking Restrictions with Other Cost-Containment Provisions



- Many of the conclusions also apply to other categories of cost-containment measures (e.g., offset credits, banking/borrowing):
 - **Category restrictions** to prevent import into EU ETS of US ETS offset credits / banked allowances are ineffective given trade within schemes
 - **Quantity / price / trigger restrictions** can limit EU ETS import of offset credits / banked allowances but eliminates linking when binding
 - **Exchange rate restrictions** can address perceived “devalued” US ETS offset credits or banked allowances, but leaves unrealized gains from linking trades
- In general, restrictions to limit influence of others schemes’ cost-containment mechanisms tend to reduce the benefits of linking
- Some restrictions nonetheless may offer an appropriate trade-off between conflicting objectives, making linking feasible

Restrictions to counter cost-containment measures generally also limit benefits of linking



Concluding Remarks

Concluding Remarks



- Linking means *de-facto* acceptance of the cost-containment provisions of the “other” trading scheme
- If implemented “correctly,” cost-containment mechanisms other than the “safety valve” would *not* compromise climate change objectives
 - Other mechanisms still have distributional impacts on buyers/sellers
 - Motivation for restrictions may be fear that cost-containment measures are *not* implemented “correctly” or not in line with local preferences
- “Safety valve” in linked scheme could create concerns
 - Increase in global greenhouse gas emissions
 - Payments to “foreign government” (but savings to “local” businesses)
- Restrictions on linking are hard to implement and would likely reduce cost-saving gains
- Cost-containment measures and proliferating “local” schemes highlight the need for international harmonization in climate change policy

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Option 1: Restrict Categories of Allowances or Participants



- Disallow cross-scheme trade:
 - *in allowances* purchased through safety-valve; or
 - *by participants* who purchase under safety-valve
- Does not solve problem of increased CO₂ cap
 - Trade still can take place within schemes to overcome restrictions
 - US company **A** purchases safety-valve allowances;
 - US company **A** trades with US company **B**; and
 - US company **B** in turn trades with EU company
- Also would be complex to implement
 - Requires official “tracking” of allowances / participants
 - Restricts / complicates trades and so decreases benefit of linking

***Disallowing safety-valve trades or traders
would not eliminate increased CO₂ emissions***

Option 2: Restrict Direction of Linking



- One-way “gateway” restricts direction of linking
 - If US ETS has safety-valve, allow sale of EU ETS allowances to US ETS, but not *vice versa*
- Reduces/removes increase in global CO₂ emissions but only by eliminating linking
- Caps US ETS price at EU ETS level (when EUA price is below the safety valve) but EU ETS prices can still rise
 - Participants in EU ETS are deprived of opportunity to purchase allowances from other schemes and gain cost savings

One-way linking can address CO₂ concerns only by depriving some participants of linking benefits

Option 3: Restrict the Quantity of Linked Allowances



- Restrict quantity of imported allowances
 - E.g., no more than X% of US ETS allowances can be used for compliance by EU ETS companies (*cf.* current CER restrictions)
- Reduces but does not remove concern that “excess tons” created by US ETS safety-valve could enter EU ETS
- Limits CO₂ concern only by limiting linking
 - “Safety-valve allowances” still enter up to quantity limit

Quantity restrictions do not eliminate problem, but reduce potential “excess tons”

Option 4: Restrict the Price of Linked Allowances



- Impose minimum price on US ETS allowances imported into EU ETS
- Minimum price restriction can partially address safety-valve concerns:
 - If minimum price is *lower* than safety-valve, unlimited safety-valve allowances can enter EU ETS (so problem is unsolved)
 - If minimum price is *higher* safety-valve allowances can still enter but EU ETS demand is reduced
 - EU ETS price higher, leading to more abatement
 - Prices in two schemes differ
- Potentially complex to implement
 - Likely to require government intermediation to enforce (see below)

Price restrictions may reduce extent problem but do not remove all potential “excess tons”

Option 5: Restrict Linking Based on “Trigger” Events



- “Trigger” rule restricts linking if safety-valve is used in the US ETS
 - E.g., “Participants in US ETS use safety-valve corresponding to more than X% of allowances” → disallow further linking
- Does not eliminate CO₂ cap increase but provides protection against large increases in emissions (similar to quantity restriction)
- Banking in the US ETS would make restriction difficult to enforce
 - If link re-opens in next compliance period, banked US ETS allowances could be sold to EU ETS
- Potentially complex to implement
 - Difficult to agree objective and unambiguous definition of trigger
 - Speculation could lead to instability (*cf.* currency speculation)

“Triggers” for linking function similar to price/quantity restrictions but may be complex and unstable

Option 6: Restrict Linking through Allowance “Exchange Rate”



- “Exchange rate” applied to allowances imported into EU ETS
 - E.g., two US ETS allowances correspond to one EU ETS allowance for compliance (similar to “flow control” or “tax” on imported allowances)
- Can address concern that allowances in US ETS are devalued by use of safety valve
 - Theoretically can fully address problem through “dynamic” exchange rate that changes with proportion of allowances bought through safety-valve (but complex to implement)
- Benefits of linking reduced as marginal costs not equalized
 - Different allowance prices can persist in trading schemes

“Exchange rates” for linking trades can help address concerns but also reduces benefits of linking

Option 7: Linking through Government Mediation



- Import of allowances into EU ETS only through government trades in US ETS market
- Government discretion can help ensure environmental objectives are preserved
 - E.g., can limit quantity if safety-valve is used, or if US ETS allowance price falls outside “desired” range
- Reduced benefit, as individual participants cannot directly take advantage of provisions
 - Unrealized gains from trade remain
 - Unclear why government should not adjust own scheme instead of importing allowances created by regulator of other scheme

Government-mediated linking can help preserve environmental objectives but limits availability of linking