ANALYSIS GROUP
ECONOMIC, FINANCIAL and STRATEGY CONSULTANTS

Linking Tradable Permit Systems: Opportunities, Challenges, and Implications

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Context

- Several GHG tradable permit systems have emerged
  - EU ETS
  - CDM
  - RGGI
  - Norway, Switzerland, and others
- Additional tradable permit systems are likely to emerge
  - Australia
  - Canada
  - United States: California AB 32, U.S. Congress
- Increasingly, attention has turned to linking such systems
- Indeed, linkage among systems may turn out to be the *de jure* or *de facto* post-2012 international architecture

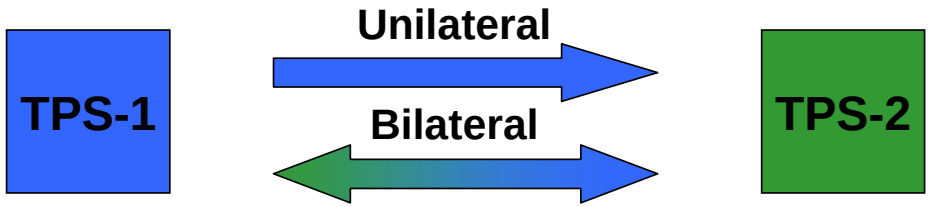
Questions for Today
(from paper with Judson Jaffe for IETA and EPRI)

- What is linkage?
- What are the major benefits of linkage?
- What are key concerns about linkage?
- How do the benefits and concerns depend on the type of linkage?
- What must be done to facilitate effective linkage?

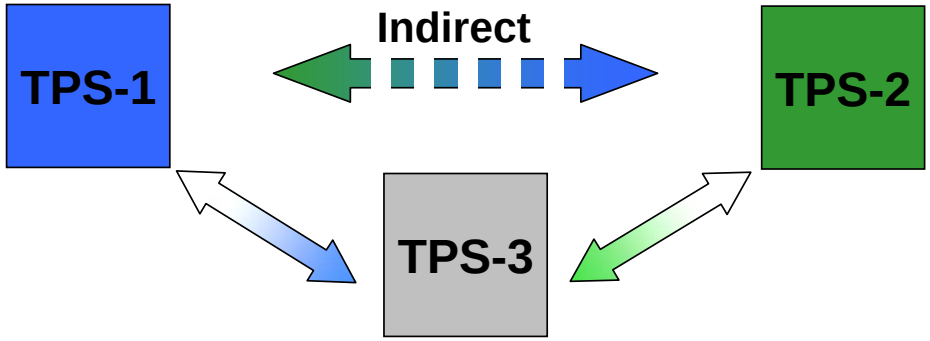
What is linkage?

- General definition: Direct or indirect connections among tradable permit systems that allow emission reduction efforts to be redistributed across systems

- Direct linkage: One or both systems recognize the other's allowances for compliance (can be unilateral/one-way or bilateral/two-way)



- Indirect linkage: Allowance supply and demand in one system affects S & D in another through direct links with a common system



What are the benefits of linkage?

- Larger, more liquid markets reduce transaction costs, reduce concerns about market power, and reduce total price volatility
- Linkages achieve cost savings if marginal costs of emission reductions vary across tradable permit systems
- Can allow for “common, but differentiated responsibilities” without sacrificing cost-effectiveness
- Can become the *de jure/de facto* post-2012 international policy architecture

What are concerns about linkage?

- Designs of tradable permit systems reflect a balance of multiple policy objectives, of which cost-reduction is just one
- Distributional impacts: Change in allowance prices can create both winners and losers within each system. Also, inter-system trading can lead to significant international capital flows
- Emissions: Linking typically redistributes emission reductions while maintaining overall achievement of emissions targets, but in some cases linking can increase *or decrease* overall emissions
- Reduced control over domestic tradable permit system: Other governments' decisions can affect domestic allowance price, emissions impacts, *etc*. But, complete control may be lacking even without linking (e.g., through emissions leakage)

On net, is linking desirable? In general, yes, but …

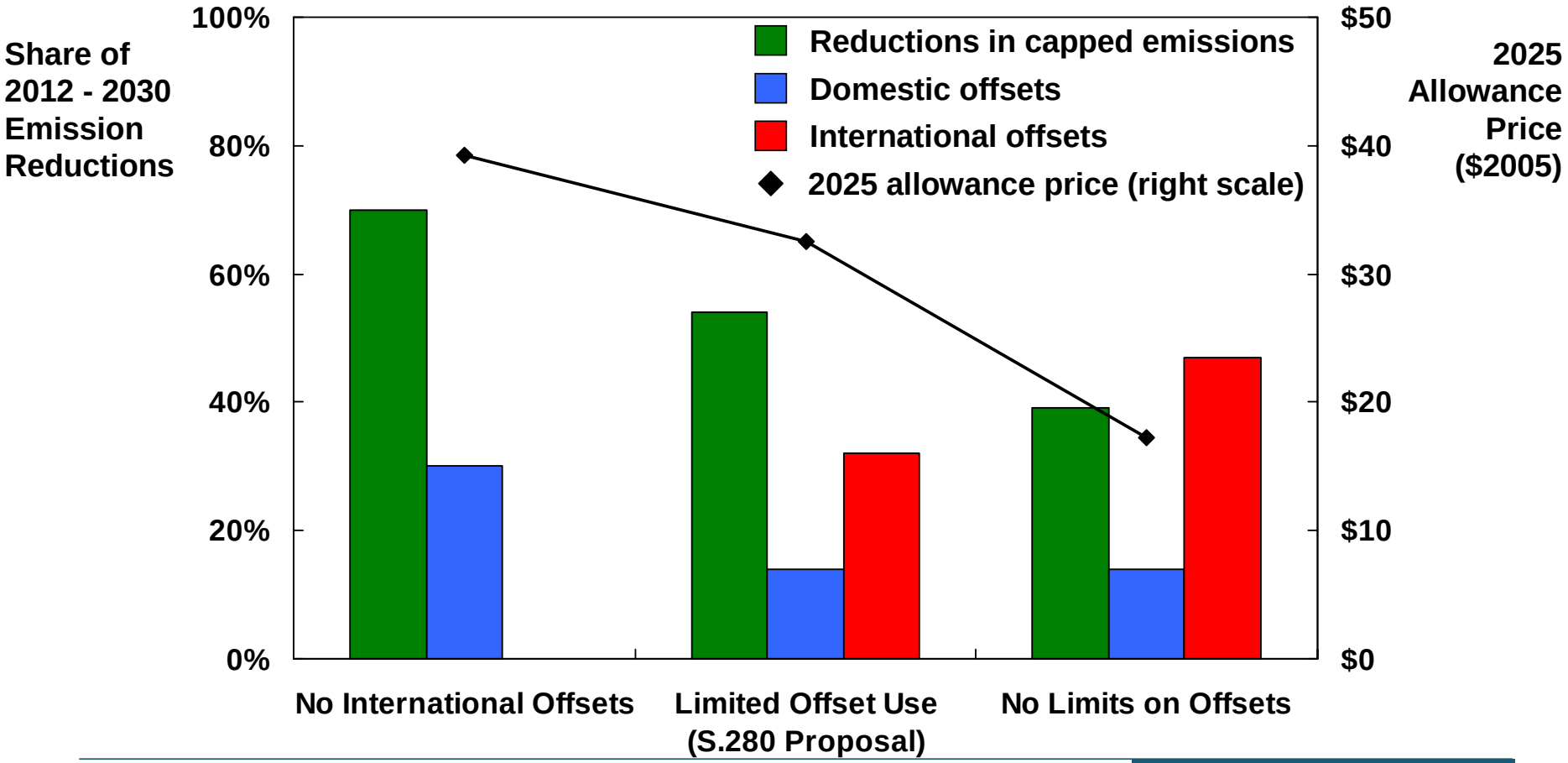
- It depends on:
  - Type of linkage (one-way or two-way)
  - Type of linking systems (emission reduction credit system or cap-and-trade)
  - Key design elements of linking systems
- Hence, gains from linking can be improved by understanding implications of linking and addressing them
- Issues and tradeoffs are revealed by examining two types of links:
  - One-way between cap-and-trade and emission reduction credit system
    - e.g., EU ETS link to CDM
  - Two-way between cap-and-trade systems
    - e.g., EU ETS link with an emerging cap-and-trade system

Implications of a one-way link between a cap-and-trade (CAT) system and an emission reduction credit (ERC) system

- Cost savings are potentially substantial
  - Emission reductions in developing world and sequestration/non-CO_2 GHG reductions are significant source of low-cost reductions
  - Introduces a price signal where one otherwise would not exist
- Few distributional concerns arise from increase in credit price and corresponding reduction in allowance price
  - Participants in ERC system benefit from higher price for credits
  - Those that lose from lower allowance price in CAT system are likely still better off than without CAT

Implications of a one-way link between a CAT system and an ERC system (cont.)

EIA Analysis of Climate Stewardship and Innovation Act (August 2007): Allowance Price and Distribution of Emission Reductions Under Three Offset Scenarios



Key concern about a one-way link between a CAT system and an ERC system

- Overall emissions under linked systems increase if credits traded to CAT system exceed actual reductions achieved in ERC system
  - Additionality problem; leakage in ERC system; question of permanence
- But emissions concerns can be mitigated by employing strict criteria to grant credits only to real, additional, verifiable, permanent, and enforceable reductions (not by quantity or geographic limits)
- Also, the net emissions effect of the link can still be neutral (or positive) even if the number of credits generated exceeds actual reductions in the ERC system if:
  - Emissions leakage in the CAT system is significant (e.g., RGGI)
  - The alternative to use of credits in CAT system is triggering a safety valve

Key tradeoff for one-way link from CAT to ERC system is between achieving cost savings and maintaining emissions objectives

Effect of new one-way link differs when pre-existing links are present: Example of CDM

- EU ETS and other systems have already linked with CDM
- Systems contemplating links to CDM need to take this into account
  - Cost savings from new link only achieved if allowance price is sufficiently high to bid certified emission reductions (CERs) away from use in other linked systems (as well as bring more CERs on to market)
  - For CERs that are bid away from other CAT systems, offsetting reductions occur in those CAT systems
  - Original reductions in ERC system will occur regardless
  - So, pre-existing links render additionality concerns moot for those CERs that would otherwise be used in another CAT system

Such indirect links among CATs via one-way links with a common ERC system affect remaining gains from two-way links among CATs

- Credits go to linked CAT system(s) with highest allowance price(s), reducing (possibly eliminating) differences in prices across systems

- Question: How large will *remaining* savings from direct two-way links among CAT systems be if systems are already indirectly linked through the CDM or other credit systems?
  - It depends on the supply of credits and pre-existing differences in allowance prices across CAT systems
  - At one end of the spectrum, indirect links via the CDM or other credit systems can achieve all of the savings that would be achieved through direct links among CAT systems

Implications of a two-way link between CAT systems

- Leads to harmonization of allowance price and reduces control over allowance price
  - Key to cost savings
  - But may raise concerns
- Leads to possibly unintentional harmonization of particular design features
  - Banking and borrowing
  - Safety valve
  - Linkages with other systems and offsets
- Desirability depends on perception of these effects, relative to alternative of not linking (or relative to indirect linking)

Harmonization of allowance prices under a two-way link

The greater the difference in (pre-linked) allowance prices …

- The greater the cost savings from linkage ...
- But also the greater the inter-system capital flows
  - Absent an international agreement on each cap-and-trade system's targets, capital flows will depend, in part, on each government's independent choice about the stringency of its own cap
  - Will such capital flows be publicly and politically acceptable?
- Also, the more allowance prices adjust as a result of linking, the greater the potential for positive or negative impacts on emissions and various distributional concerns …

Harmonization of allowance prices under a two-way link (cont.)

- Allowance prices prior to linking may serve particular objectives that are not achieved with harmonized price
  - For example, low allowance prices in RGGI are intended to limit leakage
  - Some have argued that high allowance prices in a California CAT system (under AB 32) are necessary to encourage technology innovation and diffusion

Harmonization of allowance prices under a two-way link (cont.)

- Many design elements of CAT systems do not need to be harmonized to facilitate linking, but influence emissions and distributional impacts that result from allowance price harmonization
  - Scope of coverage
  - Fixed versus intensity-based cap
  - Allocation mechanism
    - Auction versus free distribution
    - Historical versus updating
  - Monitoring, reporting, and enforcement
- In assessing the influence of design elements on the implications of linking, it is important to focus on the *incremental* effect of linking — some concerns may exist even without linking

Automatic harmonization of particular design features after linking

- Trading facilitated by linking leads to (possibly unintended) harmonization of:
  - Banking and borrowing
  - Safety valve
  - Linkages with other systems and offsets
- Pre-linking differences in these features can be political obstacles to linking
  - Example: Possible U.S. safety valve & EU views on linking

Summary

- Some direct and indirect linking is inevitable and has already occurred
- Assessments of new links need to focus on incremental effects, in light of pre-existing direct and indirect links
- One-way links between CAT systems and ERC systems offer significant cost-saving promise; some countries may decide to balance this with concerns about overall emissions impacts
- Two-way links between CAT systems will be more likely politically where there is:
  - Mutual recognition of respective targets
  - Harmonization of approach to cost uncertainty
  - Mechanisms for addressing future changes in targets and design
- Linkage may become the *de jure* or *de facto* post-2012 international policy architecture

HARVARD PROJECT ON INTERNATIONAL CLIMATE AGREEMENTS

To help identify key design elements of a scientifically sound, economically rational, and politically pragmatic post-2012 international policy architecture for global climate change, drawing upon leading thinkers from academia, private industry, government, and non-governmental organizations.