Mistra Indigo
Instrument Design for Global Climate Mitigation

Linking By Degrees: Prelude to Broader Implementation of Carbon Pricing

Dallas Burtraw
Resources for the Future
Center for European Policy Studies
Brussels

October 19, 2012

Mistra Indigo
Instrument Design for Global Climate Mitigation

Linking By Degrees

Roadmap

1. Experience
2. California's Wedding Day Jitters
3. Winners, Losers, and the Logic of Collective Action
4. Measuring Level of Effort as a Basis for Linking
5. Policy Design Strategies
6. Concrete Steps to Broader Implementation of Carbon Pricing

Mistra Indigo
Instrument Design for Global Climate Mitigation

1. Examples of Bilateral Linking

EU ETS

- Coalesced very fast
- Part of emerging continental identity
- History of cooperation (e.g. Convention on Long-range Transboundary Air Pollution)

Regional Greenhouse Gas Initiative (RGGI)

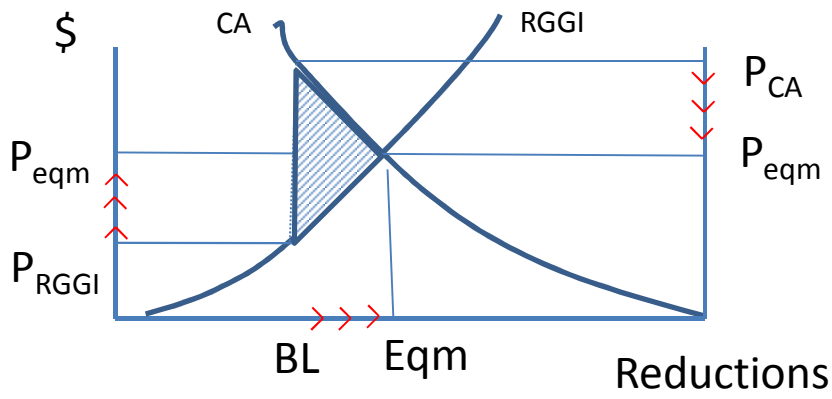
- Coalesced very slowly
- Recent history of electricity deregulation
- History of cooperation (e.g. Ozone Transport Assessment Group)

Mistra Indigo
Instrument Design for Global Climate Mitigation

2. California's Experience a More General Case?

- Western Climate Initiative initially comprised of 7 states and 4 Canadian provinces
  - Easily upended in state-level elections
- Intended "reciprocal unilateral linking w/ Quebec"
- Linking "night terrors"; California legislature wakes up to impose constraints
- CA Emissions Market Assessment Committee
  - Fear of market disruption, loss of control

Mistra Indigo
Instrument Design for Global Climate Mitigation



Simple Theory

Outcome depends on program rules:

Allowance value to energy efficiency, government

RGGI	Consumers	Government	Fossil Generators	Renewable Generators
Allowance Value/Cost ↑	++	++	---	
Resource Cost ↑			--	+
Electricity Price ↑	-	-	+	+
REC Price ↓			+	-
Net Effect	+	+	---	+

http://indigo.ivl.se

Mistra Indigo
Instrument Design for Global Climate Mitigation

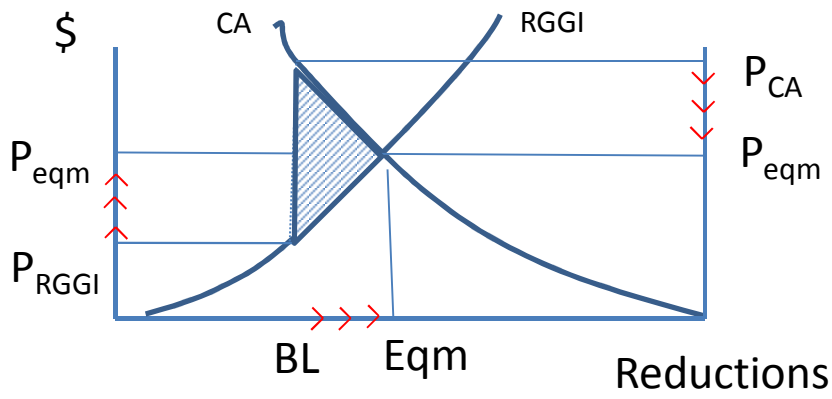
RGGI Perspective:

- If selling into higher priced market, merchant generators are big losers.
- Conversely, if RGGE were buying from lower priced market then energy efficiency investments & jobs leave states.

➢ Linking may concentrate the interests of the losers

Mistra Indigo

Instrument Design for Global Climate Mitigation



Simple Theory

Outcome depends on program rules:

Allowance value to local distribution companies

California	Consumers	Government	Merchant Fossil Gen	Merchant Ren Generators
Allowance Value/Cost ↓			+++	
Resource Cost/Flow ↓	-	--	++	-
Electricity Price ↓	+		-	-
REC Price ↑			-	+
Net Effect	?	--	+++	-

http://indigo.ivl.se

Mistra Indigo
Instrument Design for Global Climate Mitigation

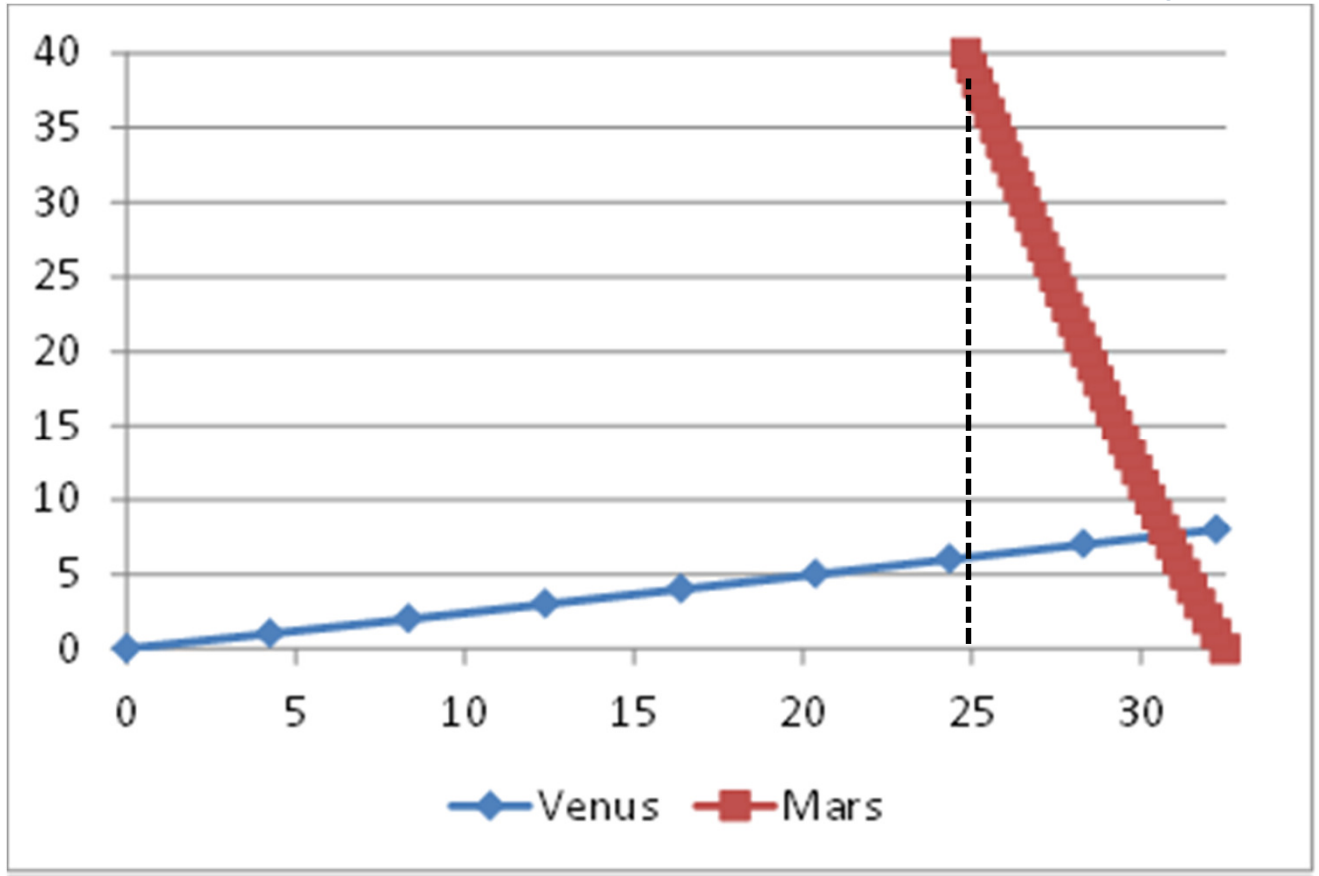
4. Measuring Level of Effort

- Basis for calibrating linkage among programs.
- Challenging for many reasons. Will have to be subject of detailed negotiations and may be hard to solve. For example:
  - Feed-In Tariff / Renewable Portfolio Standard
    - Lowers price of allowances
    - Leads to allowance exports and additional revenue for investments in renewables
    - ➢ Out-of-country subsidy to renewables

Mistra Indigo
Instrument Design for Global Climate Mitigation

Comparing Level of Effort

Simulations with Two Real Planets – Electricity Sector Only



$39

No Linking

$6.20

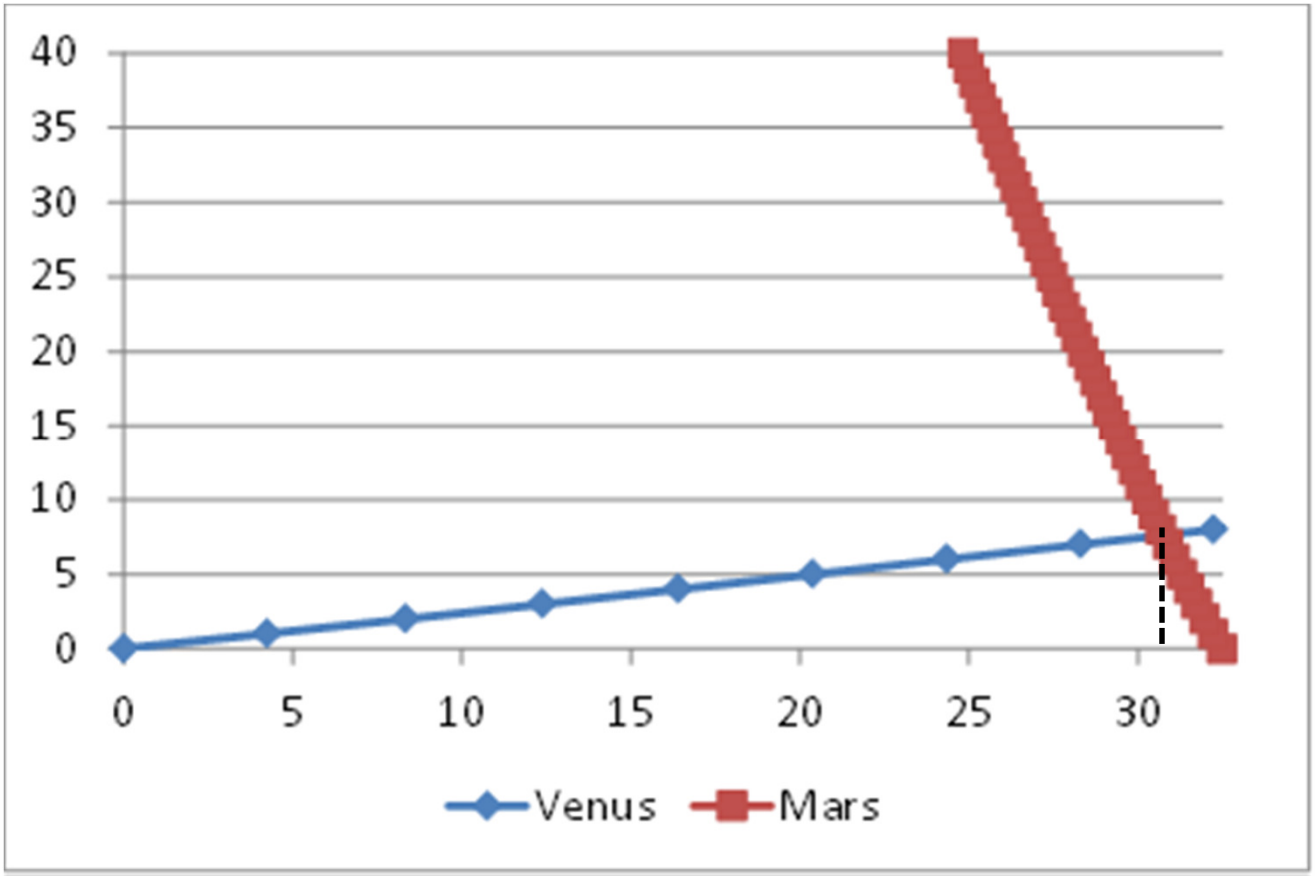
32.5 million short tons of reductions

Mistra Indigo

Instrument Design for Global Climate Mitigation

Benefit of Linking

$/ton



With 1:1 Linking

$7.60

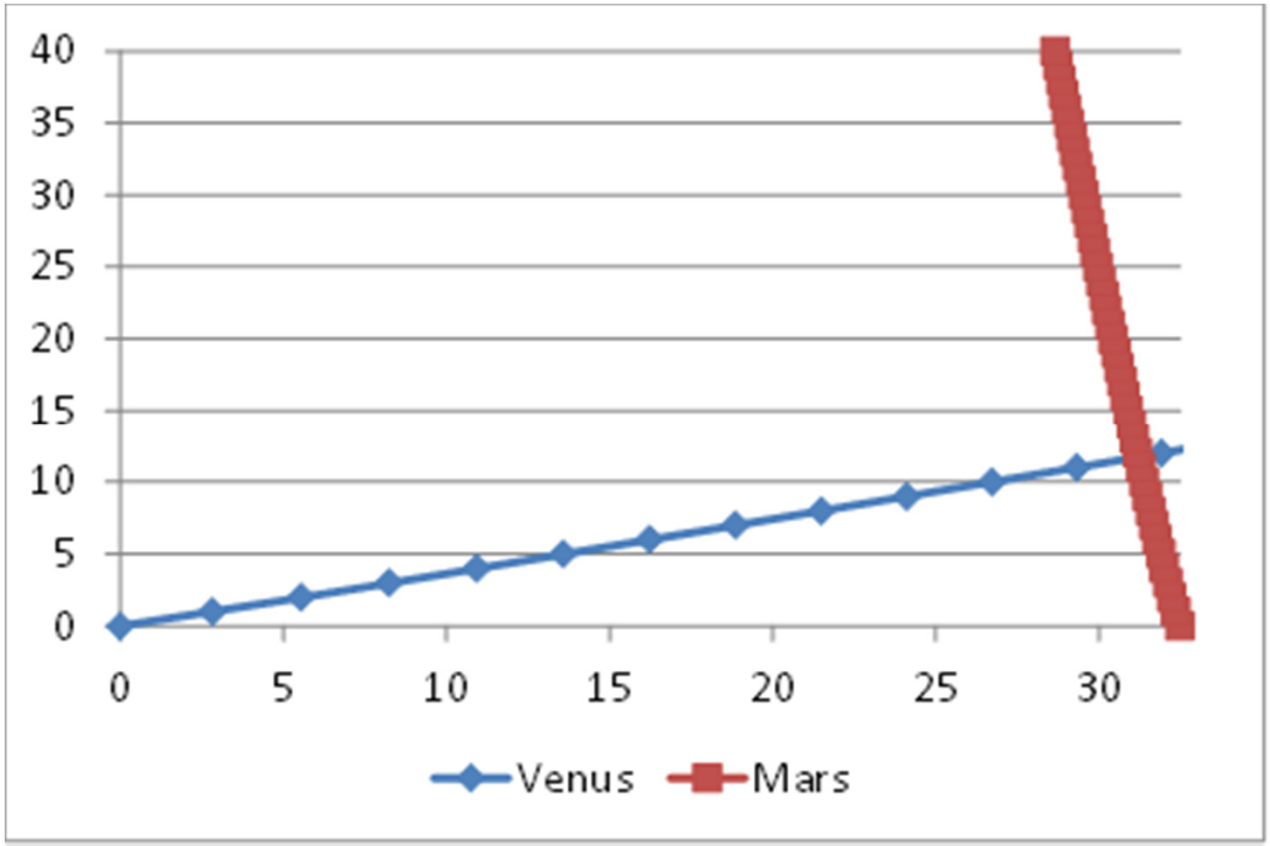
32.5 million short tons of reductions

Mistra Indigo
Instrument Design for Global Climate Mitigation

Resilience to Economic Surprise: Gas Prices in 2009

$/ton

Mars' MAC affected more than Venus' MAC



With 1:1 Linking

$11.70

32.5 million metric tons of reductions

Mistra Indigo
Instrument Design for Global Climate Mitigation

5. Policy Design Strategies

- Exchange rates
  - Lose predictability of environmental outcome (similar to U.S. Cross State Interstate Rule or taxes)
- Anticipate further nonconventional program designs
  - Linking across markets, with regulatory approaches and emissions fees

Mistra Indigo
Instrument Design for Global Climate Mitigation

3:1 Exchange Rate Linking

To respect political willingness to pay in the separate programs (i.e. maintain price of carbon on Mars), Mars must buy **3 allowances** from Venus **to emit 1 additional ton**.

We still get Venus selling allowances to Mars, and actually more than occurs under 1:1 trade. Venus will reduce 32.7 M tons, Mars will reduce 4.9 M tons, and the allowance price is $8.1/allowance, which is **$8.1/ton** on Venus and **$24.2/ton** on Mars.

- Total emissions are not determined by the cap. Because of the exchange ratio, **total reductions are now 37.7 M tons**.

Mistra Indigo
Instrument Design for Global Climate Mitigation

3:1 Exchange Rate Linking with Gas Price Shock

To respect political willingness to pay in the separate programs (i.e. maintain price of carbon on Mars), Mars must buy **3 allowances** from Venus **to emit 1 additional ton**.

With the gas shock, Venus reduces 35.9 M tons, Mars reduces 3.9 M tons, and the price is $13.5/allowance, which is **$13.5/ton** on Venus, **$40.6/ton** on Mars.

- Total emissions are not determined by the cap. Mars bought more allowances from Venus, **total reductions increase to 39.7 M tons.**

Mistra Indigo
Instrument Design for Global Climate Mitigation

6. Concrete Steps

- Emergence of global carbon pricing requires deep sense of cooperation and momentum
- To date, approaches to linking have been one step forward, nine steps back

➢ We propose to flip this by initially emphasizing collaborative program development and technical sharing, rather than market size

Mistra Indigo
Instrument Design for Global Climate Mitigation

Example of linking by degrees

	Fragmented Markets			Integrated Market	
	A	B	C	D	E
Point of Regulation & Sector Coverage	○ No communication regarding harmonization	• **Discussion on leakage and cap stringency** • **Rules defining new entrants/exit discussed**	• **Rules defining covered entity thresholds discussed**	• **Rules defining new entrants/exit harmonized**	• **Regulated sectors harmonized**

There are many opportunities to mark and signal progress…

	Fragmented Markets			Integrated Market	
	A	B	C	D	E
1. Products	○ Two non-currencies; ○ Separate offset protocol	○ Two non- currencies; • **Offset protocols (liability, accounting) harmonized**	• **Fungible currencies for allowances with exchange ratio** • **Offset credit eligibility and verification, harmonized**	• **One fungible allowance currency with exchange ratio** • **Offset usage limits harmonized**	• **One fungible currency s with one for one value;** • **Regulatory rules harmonized**
2. Cap	○ Caps for each region; ○ Separate methodology and stringency	○ Caps for each region; • **Methodology harmonized**	○ Caps for each region • **Stringency harmonized**	• **Caps for each region targeting one common aggregate cap** • **Cap methodology and stringency harmonized**	• **One aggregate cap**
3. Governance:	○ Separate governance bodies	○ Separate governance bodies • **Joint regulatory structure as information clearinghouse**	○ Separate governance bodies • **Joint governance structure with regulatory authority (e.g. offset verification, emission reporting)**	○ Domestic governance bodies retain some regulatory and legal authority • **One governance body with authority over linked programs**	• **Domestic governance bodies surrender all regulatory and legal authority**
4. Market Design:	○ No communication regarding harmonization	• **Administrative features harmonized (contracts, language, auction timing**	• **Holding limits, purchase limits, compliance timing harmonized**	• **Enforcement provisions harmonized**	• **All design features harmonized (price floor, price ceiling/reserve)**
5. Point of Regulation & Sector Coverage	○ No communication regarding harmonization	• **Discussion on leakage and cap stringency** • **Rules defining new entrants/exit discussed**	• **Rules defining covered entity thresholds discussed**	• **Rules defining new entrants/exit harmonized**	• **Regulated sectors harmonized**
6. Process	○ Separate registries, ○ Separate auction platform; ○ Separate reporting process	○ Separate registries ○ Separate auction platform • **Harmonized reporting process and database**	○ Separate registries • **Harmonized auction timing and process** • **Harmonized reporting process and database**	○ Separate registries • **One auction platform** • **Harmonized reporting process in one database**	• **One registry** • **One auction** • **Harmonized reporting process in one database**
7. Other Policy	○ No communication regarding harmonization	• **Other policy in respective markets discussed**	• **Renewable Energy Credit trading oversight to avoid double counting**	• **Common policy measures adopted with divergence stringency (e.g. RPS energy efficiency etc.)**	• **Other policy harmonized (sub-nationally or via federal/international policy) with common**

Mistra Indigo
Instrument Design for Global Climate Mitigation

Conclusion

- Bilateral linking may be hard; reciprocal unilateral may be more practical
- In a world with bottom-up policy development, the goal of parallel market structure perhaps should be secondary to collaborative efforts and incremental victories