Setting a Price for Carbon:
Options for Climate Policy in the United States

Robert N. Stavins
Albert Pratt Professor of Business and Government
John F. Kennedy School of Government, Harvard University
Director, Harvard Environmental Economics Program

Climate Policy Instruments in the Real World
Program on Energy and Sustainable Development
Stanford University
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Carbon Pricing

- **Why is there so much talk about carbon-pricing (in the real world)?**
  1. No other feasible approach can provide meaningful emissions reductions (such as 80% cut in national CO_2 emissions by 2050)
  2. Carbon pricing is the least costly approach in short term
     - Because emissions sources are numerous, and diverse in terms of abatement cost
       - Carbon-pricing provides incentives for reductions by all sources ...
       - … in proportion to how costly the reductions are.
  3. Carbon pricing is the least costly approach in the long term
     - Because effective carbon pricing provides incentives for carbon-friendly technological change: invention, innovation, diffusion (& utilization)
  4. And it's a hot-button political issue: carbon pricing makes the costs somewhat or fully transparent (unlike conventional policy instruments)

1

Two Principal Approaches to Carbon Pricing

- **Carbon Tax**
  - Directly places a price on *carbon* (or CO_2 emissions)
  - Quantities (of carbon and CO_2 emissions) adjust in response
- **Cap-and-Trade**
  - Quantities (of *carbon*) constrained by allowances, which can be traded
  - Price emerges indirectly from market for allowances
- **Symmetric policy instruments**
  - They have much in common
  - But some key differences
- **In keeping with the "real world" theme of this conference, I'll start with cap-and-trade ……**

2

Cap-and-Trade

- **Merits**
  - Cost-effective – short and long term (like tax)
  - Allowance allocation can be used to build constituency
  - Experience with well-designed systems
    - Leaded gasoline phaseout (1980s) – saved $250 million/year
    - SO_2 allowance trading (1995-) – saves $1 billion/year (33%)
  - Can be linked internationally
- **Concerns**
  - Uncertain costs (contrast w/tax, but cost-containment mechanisms)
  - Fears of market manipulation
  - Politically demonized (as "cap-and-tax")

3

Cap-and-Trade Design Issues

- The cap: scope, ambition, and timing
- Point of regulation (upstream, midstream, downstream)
- Allocation (auction or free, who gets free allowances?). Possible *criteria*:
  - Cost: auctioning *can* lower social cost *with very specific use of revenue*
  - Fairness: compensate regulated industry with free allocation (15% of allowances – in perpetuity – *on average* across all sectors)
  - Performance: use free allocation that builds political constituency (importance of the "independence property")
  - A Populist Approach: 100% auction; revenue to "the people" (cap-and-dividend)
- Offsets (can lower costs, but raise additionality question)
- Cost-containment mechanisms: banking, borrowing, safety-valve, price collar
- Leakage & international competition (free allocation?, output-based updating allocation)
- Regulatory oversight

4

Carbon Taxes

- Similar in Design to Upstream Cap-and-Trade
- Some real interest (mainly academics) and some phony interest
- Merits (compared with Cap-and-Trade)
  - Cost uncertainty eliminated (but no emissions cap)
    - Note: cost uncertainty in C-a-T reduced/eliminated w/price collar
  - Generates revenue (like auctioned allowances)
  - (Perceived to be) Simple
- Concerns
  - Potentially more costly to regulated sector
  - Lack of benign mechanism for building political constituency leads to requests for exemptions, and hence less ambitious policy
  - Challenges to linking internationally (for cost containment)
  - Political infeasibility: political opposition is to "carbon pricing"

5

Carbon Taxes vs. Cap-and-Trade

- More similar than different
  - Either instrument can be designed to be somewhat equivalent to other
    - Auction allowances, and cap-and-trade looks like carbon tax (to regulated firms)
    - Refund tax revenues (in particular ways), and carbon tax can look like cap-and-trade
    - Hybrid instruments (e.g., price collar) contains elements of both
- Differences (in "the real world")
  - Politics: cap-and-trade provides mechanism for building political support *without* driving up costs or reducing environmental performance
  - Linkage with policies in other jurisdictions easier with cap-and-trade
- But recent Washington opposition is to *any kind of carbon pricing*. So, what are the alternatives?

6

Options for Climate Policy in the United States

- **Federal Policy**
  - Pricing Instruments
    - Cap-and-Trade, Cap-and-Dividend
    - Carbon Taxes, *Subsidies*
  - Other Instruments
    - Regulation Under the Clean Air Act
    - Energy Policies Not Targeted Exclusively at Climate Change
    - Public Nuisance Litigation
    - NIMBY and Other Interventions to Block Permits
- **Sub-National Policy**
  - Regional, State, & Local Policies
  - National Linkage of Sub-National Policies

7

Subsidies

- **Climate-friendly subsidies**
  - Stimulus package subsidies (& tax credits) for renewables & efficiency upgrades -- $80 billion
  - Biofuels?
- **Problematic subsidies**
  - US. fossil-fuel subsidies (& tax breaks) = $8-10 billion/year (ELI)
  - Global fossil-fuel subsidies > $550 billion/year (IEA)
  - G20 proposed/planned phase-out
- **Merits**: Subsidies affect relative prices (like taxes), but more politically attractive; eliminating "bad" ones economically efficient
- **Concerns**: "good" subsidies go to infra-marginal units (costly); abatement subsidies encourage entry in emission-intensive sectors; removing fossil-fuel subsidies works against "energy security"

8

Regulation under the Clean Air Act

- **U.S. Supreme Court decision, EPA endangerment finding**
  - Mobile source standards
  - Stationary sources (January 1, 2011, with or without tailoring rule)
  - Merits
    - Effective in some sectors
    - Inducement for Congress to take action with better approach?
  - Concerns
    - Accomplishes *relatively* little at *relatively* high cost
    - Really force hand of Congress? A credible threat or counter-productive?
    - Preemption? (Murkowski resolution, Rockefeller bill, others?)

9

Regulation under the Clean Air Act (continued)

- **Air pollution policies for correlated pollutants**
  - SO_x, NO_x, and Hg – 3P legislation
  - Could shut inefficient coal plants (w/o any CO_2 requirements)

- **Key pending question** regarding EPA's use of the Clean Air Act
  - May EPA (*legally*) create (CO_2) cap-and-trade or offset markets under existing Clean Air Act authority?
    - Probably. There is positive precedent (1970s emissions trading, 1980s lead phasedown, etc.); but there's also court decision on Bush CAIR rule.
  - But can EPA (*politically*) create *significant* CO_2 markets?
    - Less clear

10

Energy Policies (not targeted exclusively at climate change)

- **Possible components (variety of standards & subsidies)**
  - National renewable electricity standard
  - Federal financing for "clean energy" projects
  - Energy efficiency measures
    - Building, appliance, & industrial efficiency standards
    - Home retrofit subsidies
    - Smart grid standards, subsidies, dynamic pricing, etc.
  - New federal electricity-transmission siting authority
- **Bottom Line**
  - Some of these could help, because although carbon-pricing is *necessary*, it is *not sufficient* (other market failures can reduce effects of prices)
  - *But* as substitute for carbon-pricing, these are *less effective* & *more costly*

11

Other Legal Mechanisms

- **Public Nuisance Litigation**
  - Lawsuits pursuing injunctive relief and/or damages
  - In flux – recent court decisions
- **Other Interventions**
  - Intended to block permits for new fossil energy investments
    - Power plants
    - Transmission lines
  - Some NIMBY, some strategic

12

Sub-National Climate Policies

- Regional, state, & local policies continue to emerge
  - Regional Greenhouse Gas Initiative (RGGI)
  - California's Global Warming Solutions Act (AB 32)
  - Western Climate Initiative, and others
- Interactions with Federal policy
  - Some problematic (AB 32 & Federal cap-and-trade)
  - Some benign (RGGI becomes irrelevant; interaction with carbon tax)
- Question: Can there be sensible sub-national policies with an economy-wide Federal carbon-pricing policy in place?
  - Yes, other market failures not addressed by national "pricing" policy
    - Example: principal-agent problem re. energy-efficiency investments in renter-occupied properties → building codes

13

Sub-National Climate Policies (continued)

- But in the *absence* of meaningful Federal action, sub-national climate policies could become the *core* of *national action*
- Problems
  - Legal obstacles: possible preemption
  - Not national in scope
  - Not cost-effective (if there are different carbon shadow-prices)
- Is there a (*partial*) solution?
  - Yes, state & regional carbon markets can be linked
  - Linkage reduces costs, price volatility, leakage, and market power
  - A possible future for U.S. climate policy: linkage of state & regional cap-and-trade becomes the *de facto* post-2012 national climate policy
- So, Sacramento may take the place of Washington as the center of national climate policy

14

For More Information

Harvard Project on International Climate Agreements

www.belfercenter.org/climate

Harvard Environmental Economics Program

www.hks.harvard.edu/m-rcbg/heep/

www.stavins.com