An Economist's Perspective on Alternative Policies to Control Greenhouse Gases

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GovEnergy Conference

Dallas, TX

August 18, 2010

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Approaches to be Reviewed

- Regulatory Initiatives
- Cap & Trade
- Carbon Tax
- Voluntary Programs
- Technological Fix

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Regulatory Initiatives

- Examples of current initiatives:
  - CAFE standards
    - Light vehicles to reach 35.5 mpg by MY2016
  - Biofuel mandates
    - 36 billion gallons of ethanol and advanced renewable fuels by 2022
  - Renewable Portfolio Standards
    - 24 states have some form of RPS policy in place
  - Low Carbon Fuel Standard
    - California instituted as part of AB32
    - Others considering
  - Building & Appliance Energy Efficiency Standards
    - Promulgated by DOE

Regulatory Initiatives – Economic Perspective

- Regulatory mandates may ‘work’, but they are an inefficient method of accomplishing the objective
  - Do not incentivize consumers or producers to economize on GHG emissions (other than non-compliance fines)
  - Relatively inflexible, and only cover emissions of those who are regulated
  - Can be costly to comply, and these costs will be passed on to consumers
    - E.g., Canes/Murphy estimated that a national LCFS would cost $65 billion/year and up to $1371/ton of carbon removed
  - Often are resisted by affected parties, resulting in long implementation delays

"It's the gazelles. They got a restraining order."

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Cap & Trade

- Government sets an annual cap on CO_2 emissions, allows those holding allowances to trade among themselves
- Sets a market price for emission allowances – which 'internalizes' the external costs of CO_2
- Has been done before
  - U.S. sulfur dioxide emission rights trading program
  - NOx emission trading program
  - European Trading System
  - Regional trading programs – e.g., RGGI
- Can add features like a price cap and/or floor, banking & borrowing, offsets

Cap & Trade – Economic Perspective

- Much less costly than a regulatory approach
  - SO_2 trading program is estimated to have saved $3.5 billion/year v. direct regulation of power plant emissions
- But, a national CO_2 Cap & Trade Program Would be Costly to Implement
  - Requires considerable monitoring and administration
    - Firms, federal government, international monitors
- And it attracts intense lobbying over who gets what
  - Very large amounts of money involved. Parties seek:
    - "Free" allowances
    - Offset eligibility
    - Revenues from auctioning
    - Import protection

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SCHWADRON
"I DON'T ACTUALLY DO EVIL ANY MORE. I LOBBY CONGRESSMEN."

Carbon Tax

- A tax on the carbon content of fossil fuels
  - Coal most heavily taxed, then oil, then natural gas
  - Need to set level and rate of change over time
- Would shift relative energy prices so as to favor non-carbon fuels – e.g., renewables, nuclear power
- A few carbon taxes already exist
  - British Columbia - $20/metric ton of carbon
  - Scandinavian countries – Denmark, Sweden, Norway & Finland all have carbon taxes
  - Some U.S. localities - Boulder, CO and San Francisco, CA have small carbon taxes
- International implementation is difficult but conceivable

Carbon Tax – Economic Perspective

- Advantages:
  - Direct means to internalize externalities associated with carbon emissions
  - Provides appropriate incentives to economize on carbon, expand production of non-fossil fuel energy sources
  - Can be combined with reductions in other taxes – tax bad things more, good things less
- However:
  - Uncertainty how high to set the tax and how much to increase it over time
  - Possible regional disparities which generate intense political opposition
  - Likely to attract lobbying over exemptions, use of revenues, import protection

Voluntary Programs

- Reporting programs
  - DOE 1605b climate registry program
- Private-public partnerships
  - EPA, DOE & DOA have such programs
- Various private sector programs
  - CCX, NGO's, trade associations, corporations
- Information provision
  - Energy Star labeling program
- Voluntary national goals
  - Bush Administration goal of 18% reduction in carbon intensity (CO_2/GDP) between 2002 and 2012

Voluntary Programs – an Economic Perspective

- Maximum flexibility to find ways to curb emissions
- Relatively low cost means to reduce GHGs
- Evidence that reductions occur
  - 1997 U.S. Climate Action Report to UNFCC estimated 9% reduction in U.S. GHGs by 2010 from voluntary actions
  - U.S. has reduced carbon intensity of GDP as fast or faster than most other OECD countries
- But does not internalize external costs of CO_2
  - Weak inducement to develop alternative technologies
  - Many entities do not participate
  - Some who do abandon or fall short of voluntary goals
  - Achieves limited reductions relative to international goals

Technological Fix

- Lower the cost of carbon abatement by investing in non-carbon energy production technologies, energy efficiency
  - Advanced nuclear technology
  - More efficient solar cells, windmills, etc.
  - 2nd and 3rd generation renewable fuels
  - High fuel efficiency vehicles
  - Advanced cogeneration
- DOE investing over $3 billion/yr in energy R&D
  - Supplemented by E-ARPA
  - Incremental funds from ARRA
- DoD also investing in advanced energy R&D, e.g., in fuel cells

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Technological Fix – an Economic Perspective

- Useful supplement to other policies, but not a GHG policy in itself
  - Creates new options to reduce GHGs and reduces costs of such reductions
    - These benefits should increase with time
  - But doesn't internalize the external costs of GHG emissions
    - Therefore doesn't necessarily induce use of the technological advances it creates
- Raises fundamental questions
  - How much should be invested in new GHG-reducing technology?
  - Which technologies should be invested in?

Conclusions

- From an economist's perspective:
  - Pricing of carbon is the most desirable means of dealing with climate change
    - Can be done through taxation or cap & trade
    - Sets up appropriate incentives to economize emissions, develop non-carbon intensive energy technologies
    - Ideally, would harmonize with carbon policies elsewhere
    - Politically difficult, but can be combined with tax reductions
- Voluntary Programs, Technological Fix are useful supplements, but do not properly incentivize behavior
- Regulatory initiatives – command & control – are the most costly means of controlling GHGs
- U.S. currently relying on VPs, TFs, but is moving to the next stage – hopefully, we will do the right thing!

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Questions?

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