Climate Change: Is Economics the Source of the Problem or the Key to the Solution?

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Climate Change has been in the news....
But now it’s MAINSTREAM!
Economics is in the eye of this storm

• Economics as the problem…
  – Consumption is the root cause of climate problem
  – And for economists, consumption is good and the more the better
  – Economists thinking about what is socially valuable is flawed
  – Cost-benefit analysis always comes out anti-environment
  – Economists always dampening aggressive action on anything (no one-handed economists)

• Economics as the solution
  – Kludgy regulations ineffective or very costly for what is gained
  – Costs of poorly designed regulations will really bite
  – Experience with economic regulation shows big environmental payoffs at low cost compared to traditional methods
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Are these valid criticisms?
First…Three Key Elements of Economics Paradigm

• Consumer sovereignty – economists take individual choice as given even if maleable, shortsighted, etc. We can deal with…
  – An economy of deep ecologists
  – An economy of couch potatoes
  – A mixed economy

• Resources are scarce and there are many noble and deserving causes – education, health, environment, shelter, food, art. Tradeoffs are inevitable

• Efficiency allows us to have more of everything we want—inefficiency is the enemy of solving society’s problems

TEMPERED WITH HUMILITY:
Economics not paramount -- other societal goals and issues, outside the economics paradigm, are also important.
  – Justice, equity, envy, poverty, corruption, power, irrationality
  – Markets don’t always work the way they should
Take a closer look at these issues

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Automobiles: About 2/3; 20mpg
Our “own” Direct Consumption

U.S. GHG Emissions Flow Chart 2003

End Use/Activity

- Road 21.6%
- Rail, Ship, & Other Transport 2.3%
- Residential Buildings 15.3%
- Commercial Buildings 12.0%
- Unallocated Fuel Combustion 4.5%
- Iron & Steel 2.2%
- Machinery 1.5%
- Pulp, Paper & Printing 2.3%
- Food & Tobacco 1.7%
- Chemicals 8.6%
- Cement 2.3%
- Other Industry 5.9%
- T&D Losses 2.6%
- Oil/Gas Extraction, Refining & Processing 3.3%
- Agriculture Soils 3.6%
- Livestock & Manure 2.5%
- Landfills 1.9%
- Non-CO₂ Other 3.2%

WORLD RESOURCES INSTITUTE
The rest is Derived from Our purchases Of goods & Services
The bad news about US consumption

• Consumers directly emit (and thus directly control) the minority of greenhouse gas emissions
  – If we all traded in our 20mpg car on a Prius (45mpg), US energy consumption would drop 8% (no change in VMT)
    • Savings less because vehicle miles traveled would go up
  – Residential energy consumption difficult to dramatically reduce, particularly for existing housing stock [new housing easier]
    • Lighting uses varied and CFL/LED imperfect substitute for incandescent
    • Insulating existing housing stock difficult and marginally effective

• Consumption of goods and services responsible for most emissions
  – What happens when you buy a cup of Starbucks coffee?
  – Who is responsible for the University’s emissions?
  – Why didn’t you choose the University of Hawaii?
  – Effective way of cutting back on GHG emissions is to flush half of your salary down the toilet (or do so when you graduate!)

• Moving production of GHG intensive goods to China and then importing those goods doesn’t really solve anything.
But consumption is complex

• Consumption to an economist includes
  – Buying TV’s, cars, boats, junk [normal stuff]
  – Enjoying a restaurant meal
  – Appreciating art
  – Reading Books
  – Building national parks
  – Traveling
  – Walking in the woods

• Consumption need not be greenhouse gas intensive

• The problem is not consumption per se but the nature and composition of consumption
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What do we mean by “more is better”?

- Not more tons of material goods but more well-being
- Increased overall and individual well-being
  - What generates well-being is still somewhat elusive
  - Clear that quality of life has improved for many people over the 20th century
- Economic growth need not involve a growth in the physical mass of consumption
- Reality is that there are still many, many people in the world who have very little and who could benefit from a bigger pie
A thought experiment

- What would the US look like if it were like
  - Berklicut: A hypothetical green city
  - Houstichusetts: A hypothetical brown town
  - Goldilocksville: A hypothetical town that is a mix of greens & browns
- Preferences would be different
- Consumption would be different
- Greenhouse gas emissions would be different
  - Berklicut—Consumption significant but of different sort;
  - Houstichusetts – Material consumption important, energy intensive
  - Goldilocksville – something like Europe today
- All three would emit greenhouse gases; further cuts would require policies in all three
- Economic analysis of problem would be different but perfectly doable
  - Different consumers, preferences, geographies
- Individual preferences are really responsible for the consumption we see
- Different preferences increase or decrease severity of problem but do not eliminate it
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The arguments/claims: economics as the problem....

- Economic theory flawed; eg, Paul Hawken (Natural Capitalism):
  - “contemporary business economics is pre-Copernican”
  - “You can win a Nobel Prize in economics ... believing that ancient forests are more valuable in liquidation -- as fruit crates and Yellow Pages -- than as a going and growing concern”
  - “Historians will show, perhaps, how politics, the media, economics, and commerce created an industrial regime that wasted our social and natural environment and called it growth.”
  - “Economists make no distinctions when reporting growth -- whether we've invested in new schools or paid to clean up a toxic waste spill.”
These claims are simply false

- Economists has argued for decades that unpriced environmental goods should be priced
- Burning the furniture to keep warm is no more good practice in economics than everyday life
- Blaming economics for what people value is blaming the messenger for the message
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Does environment always get the short end of the stick?

• Costs of action always seem to trump environmental concerns
  • GW Bush (3/13/2001): “I oppose the Kyoto Protocol…because it would cause serious harm to the US economy.”

• Cost-benefit analysis typically calls for modest action
  – Nordhaus: $30/t tax on carbon (= 8¢/gallon gasoline)
  – Stern review call for ten-fold higher taxes -- roundly criticized by economists
Efficient Carbon Tax (US$/t C)
Conventional (Nordhaus) vs. Unconventional (Stern)

Realities of cost-benefit analysis

- Environmental (nonmarket) costs are more difficult to quantify than market costs
- Intergenerational issues raise philosophical issues in cost-benefit framework
- Difficult to treat future technologies and preferences
- Cost-benefit analysis is subject to subjectivity and manipulation
- Cost-benefit analysis often used by vested interests to push agendas
- Cost-benefit analysis is only a supplement to other considerations that are part of political process
But...

- Cost-benefit analysis does serve as a disciplining device, laying out the pluses and minuses
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- Government has used CBA to accelerate action
  - Removing lead from gasoline
  - Action on CFC’s
  - Shaping Acid Rain legislation (cost-effectiveness analysis)
  - Retrospective and prospective CBA on CAAA
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  – EDF and Tuolumne River Dams
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• BUT, it doesn’t always come out that way
  – There is not an unlimited pot of money for societal problems and CBA does help rank priorities
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• If you don’t believe the results of a CBA, figure out which assumptions are the problem and justify changing them.
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Two views of influencing climate policy

• Litigation model
  – Everyone takes an extreme view and the truth is victorious somewhere in the middle

• Rational analyst model
  – Analyst tries to sift through claims and seek a balance among conflicting objectives
  – A marginalist approach
Economist typically the marginalist in the middle

• Claims
  – Sky is falling
  – Carbon control involves “no regrets”
  – Climate change is a hoax
  – Carbon control costs negative
  – GHG regulation will bring economy to knees

• Non-climate claims on nation’s resources
  – Education
  – Poverty
  – Infrastructure

• Economist in the middle – friend of no one

• Is this wrong? Is this undesirable? Isn’t this scientific?
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Two general approaches

• Command and control
  – Appliance standards
  – CAFE standards
  – Labeling requirements
  – Renewable portfolio standards
  – Car pooling requirements

• Big missing ingredient in command-and-control
  – Behavioral standards
  – Behavioral modification
  – Incentives for creativity
Role of Economics

• Goals:
  – obtain maximum reduction in greenhouse gas emissions per dollar of cost to US consumers
  – Reduce emissions to level consistent with environmental objectives
  – Smooth incentives over time
  – Provide incentives for innovation

• Problem too complex and expensive for a technology-based command and control approach

• Cap and trade broadly embraced in US, Europe and elsewhere
Sucesses (and some failures) of Cap and Trade

- Sulfur allowance market – big success
- RECLAIM in LA – mixed
- European ETS (for carbon) – so far fairly positive
- Phase out of lead in gas – big success
- Northeast NOx trading for ozone (OTC)
EU ETS has been sending strong signal regarding conserving carbon

- Plagued by experimental nature of market
- Real market (Kyoto period) yet to start (2008+)

Source: www.co2prices.eu
Should Cap and Trade be Everything?

• Still role for standards
  – Particularly for long-lived capital:
    • Buildings, appliances, automobiles

• Role for information programs
  – So people are aware of implications of actions
A Picture of a Lowish Carbon Economy (US or EU)

• High carbon prices induce conservation and innovation. Over time, makes a big difference
  – Cap and trade allows plenty of flexibility for individuals and firms
• Electricity replaces fossil fuels in most stationary applications
• Electricity generation moves away from fossil to nuclear and renewables [though perhaps CCS works]
• Technology increases our ability to do more with less
• In automobile transportation, two innovations lead to dramatic change
  – Full road pricing
  – Hybrid vehicles
• WHEN?
  – 2050 is very soon – time from the 1950’s to the 1990’s
  – 2100?
The California Example
California Policies

- California – a big player
  - Tenth biggest emitter of GHG in the world
  - Seventh biggest economy in the world (after US, Japan, France, Germany, Italy, UK)
- 2002: GHG emissions standards for new cars (AB 1493)
- Emission standards for new power plants
- 2005: Executive order
  - 2020 emissions to 1990 levels
  - 2050 emissions 80% below 1990
- 2006: Assembly Bill 32: State must reduce GHG emissions to 1990 levels by 2020 (a “cap” on GHG emissions)
  - By 2008: establish reporting scheme and identify 1990 emissions
  - By 2009: plan from regulators for implementing cap
  - By 2011: Specific regulations for implementing cap
  - By 2012: Regs go into effect
  - Big loophole: if things get tough, the Governor has the authority to suspend regulations
- What is likely: California’s actions will ultimately be pre-empted by Feds.
The Players and the Politics

• Political wrangling over what agency should be in charge
  – PUC— in charge of electric utilities
  – California Air Resources Board (CARB) – traditional foe of the automobile – dates from 1960’s – fan of command and control
  – California Energy Commission (CEC) – responsibility for much of the energy efficiency initiatives in the state – dates from mid-1970’s
• California electricity crisis made politicians (particularly dems) very wary about market solutions (like cap and trade)
• Very intense lobbying in August 2006 – threatened to derail bill
• Resolution: CARB put in charge but language in bill allows cap and trade
• Dec 2006: Form high level nonpartisan Market Advisory Committee
• 2007: Swarzenegger fires head of CARB in part for appearing to short-circuit market approaches—put Dem in charge
Members, Market Advisory Committee

- Winston Hickox, Chair (Former Head of Cal EPA)
- Larry Goulder, Vice-Chair (Prof. of Env. Econ at Stanford)
- Dale Bryk (NRDC)
- Dallas Burtraw (RFF)
- Dan Dudek (Environmental Defense)
- Paul Ezekiel (Credit Suisse Global Carbon Trading)
- Judi Greenwald (Pew Center on Climate)
- Steve Koonin (Chief Scientist, BP)
- Franz Litz (NY Climate Czar)
- Joe Nation (former Assembly member)
- Martin Nesbit (UK Climate Czar)
- Jonathan Pershing (WRI)
- Nancy Sutley (City of LA)
- Peter Zapfel (Architect of EU ETS)
How tough is the task?

- Much pain by 2020?
- What about after 2020?
California annual CO$_2$ emissions by sector.
AB32 Objectives Easy to Meet

• Eliminate emissions from out-of-state sources of electricity
  – Sell generating sources and purchase renewable/hydro electricity

• Cost to consumers modest – slightly higher electricity bills

• Benefit to environment
  – Direct benefit negligible. Divested coal plants will just be used in other states
  – Action as a first step towards GHG control may be more significant – prods Feds or other states sign on
Per Capita Electricity Sales (not including self-generation)

(kWh/person)

Source: Mark Levine, LBL

Cal Population
1980: 24 million
2004: 36 million

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What about more aggressive action? ie, further reductions beyond 2020

• Most sectors should be involved
• Cap and trade needs breadth
  – Electricity vs industry vs transportation
• Where will reductions come from?
  – Transportation
  – Residential/commercial lighting and space
  – Electricity sector
  – Leakage
• Signals of carbon scarcity must be transmitted among sectors
• Aggressive action in California probably not warranted in isolation
Summary

• **Is economics to blame for climate problems?**
  – No – though our economy as it currently functions does need changing
  – NOT the same as the economists should change tune
  – Carbon needs to become more important in our consumption and production decisions

• **Is economics a key to the solution?**
  – It has become apparent that market solutions (cap and trade) must be big part of solution
  – Incentives must be transmitted throughout economy