

The challenges of climate for energy markets

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transition – Breakout session 1: Energy**

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By way of introduction

- **Working on electricity markets since 1995**
- **Hiatus to work on antitrust from about 2003-06**
- **When getting back into electricity work, discovered
“It’s all climate”**
- **Climate becoming even more dominant**
 - **New administrations in Australia, US**
 - **New forms of generation to replace climate controls**
 - **Policies targeted at electricity, fuels sectors**
 - **Even smart grids**

Today's perspective

- **Approach as an outsider**
 - No comment on the science; will take climate change as coming, if uncertain in scale and scope
 - Academic, not utility executive or regulator
- **Not a climate or environmental policy expert**
 - Especially when compared to RFF colleagues
- **Perspective that of an industrial organization economist**
 - “Outsider” status to climate debates
 - Apply general perspective; reveal implicit presumptions
- **Also interested effect of non-economic, ethical climate policy norms on energy markets**

Specific challenges to be considered

- **Six on implementation from an economic perspective**
 - Cap-and-trade vs. taxes
 - Non-price regulations
 - Energy efficiency policies
 - Mitigation vs. adaptation
 - Trade effects
 - Transmission planning
- **Three raising questions about scale of obligation**
 - The “fat tails” problem
 - Discounting
 - Evaluating environmental policies by willingness to pay

But first, a quiz

1. A common saying among energy conservation advocates is “The cheapest power plant is the one you don’t build.” Would you similarly infer that:
 - a) The cheapest school is the one you don’t build?
 - b) The cheapest vaccine is the one you don’t administer?
 - c) The cheapest regulatory conference is the one you don’t hold?

Answer: “No” I hope!

- No one would evaluate costs without looking at benefits
- Yet, benefits commonly disregarded in energy policy

Continuing the quiz

2. What do you call someone who sees the Al Gore movie and runs to Home Depot to load up on compact fluorescent lights to save the planet?

Answer: A “free rider”

3. What do you call two policies both directed at reducing fossil fuel use?

Answer: “Complementary”

4. What do you call paying politically powerful industry groups not to block climate policy?

Answer: “Competitiveness”

- Prior examples: “stranded costs”; “taking compensation”

Implementation challenge #1: CAT vs. taxes

- Debate in US over two main types of incentive-based controls
- Carbon (equivalent) taxes
 - Internalise emissions cost
 - Incentive to abate comes from reducing tax payment
- Cap-and-trade (CAT) emissions trading, like the CPRS ETS proposed for Australia
 - Internalise emission cost by paying for a permit to pollute
 - Incentive to abate comes from reducing need for permits
 - Opportunity to sell them
- Ignore important variations: (banking, safety valve)

What difference does it make? Theory

- With perfect information, nothing
 - Choose tax to induce abatement to get emissions to a target
 - Choose permit at level where permit price equals desired tax
- Matters if the cost of abatement (including reduced output itself) is uncertain
 - Tax may not hit desired target, and *vice versa*
- Weitzman (1974): Instrument should match harm
 - ETS when harm large only beyond critical value
 - Tax when harm from each additional ton relatively constant
- Both involve monitoring, compliance challenges
- This argument plays little if any role in US policy

Another theoretical concern

- Optimal policy affected by presence of other taxes
- E.g., if income taxes reduce investment and environmental taxes reduce it even more, could do more harm than good
 - “Theory of second best” for economists
- To avoid this outcome, may need to recycle revenues so government can reduce prior taxes
- Support taxes or auctioning permits; argument against giving permits away
- Application in actual policy debate limited at best

Politics in, of energy markets

- Free permits purchase/broaden political support
 - Success of US SO₂ trading program
 - ETS now the norm, even among environmentalists
 - Not necessarily bad: Help make policy better for everyone
- Tax aversion in the US
 - Almost impossible to discuss taxation in US since 1980
 - Broader public finance consequences; huge debt
 - Failure of “starve the beast”
- Why not call it an “atmosphere dumping fee”?
 - No difference in principle with a landfill
 - Only that there’s no market in the atmosphere to set price

Challenge #2: Need for other policies?

- **Other energy policy programs before US legislature**
 - Automobile fuel economy requirements
 - EPA “Energy Star” certifications
 - (Tradable) Renewable Energy Target
- **Why have these if other policy sets the right price?**
 - Market can determine mix of new fuels, reduced consumption
 - Special interest reward?
 - Rebound effect
- **Substitute if taxes, permits too weak**
- **Externalities apart from GHGs?**
 - Underpriced water? National/military security arising from oil markets?

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Challenge #3: Role of energy efficiency policy

- **Definition: energy services per energy unit**
- **Why have efficiency policy with the right prices?**
 - Needed if GHG costs not counted right
 - Also, in electricity, peak period pricing problem
- **Widespread belief that consumers are irrational**
 - “Negative cost” carbon mitigation
 - How to do policy if consumer behaviour unreliable
- **Does “decoupling” make sense?**
 - Utility might not provide info that reduces demand
 - Or just keep utilities whole so they do not oppose policy?
- **Energy efficiency as regulatory monopsony?**

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Challenge #4: Mitigation vs. adaptation

- **Should we try to stop climate change, or adapt to it?**
- **Right combination a matter of science and cost**
- **One might think the policy would be biased toward adaptation**
- **Mitigation efforts have global benefit**
 - Need for international agreement or altruism
- **Adaptation efforts have local benefit, country can gain**
 - E.g., coastline reinforcement
- **What about geo-engineering?**
 - Given its environmental risk, is it too cheap?

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Challenge #5: “Competitiveness” vs. “leakage”

- **Suppose some countries mitigate, others don’t**
 - Free riding
 - Preclude growth in developing economies
 - Let the industrialized world pay
- **Trade distortions, as imports from non-adopting countries price below real marginal cost (incl. GHGs)**
- **“Second best” responses may be justified**
 - “Border tax adjustments” based on carbon content
 - Subsidize domestic production at the margin
- **But not compensation for lost business**
 - Carbon-intensive producers may not be able to compete
 - Political compensation, not economically justified?

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Challenge #6: Transmission planning

- If climate policy just reduced use, need less transmission
- But major fuel substitution issues: Wind, passive solar
- Not where the people, current generators are
- Challenges beyond sheer expense
- Multi-jurisdictional coordination; NIMBY
- Coordinating with all generators: Subvert competition?
- New sources variable, negatively correlated w/ demand
- Climate change itself makes investments risky
 - Will wind be there? Will storms take down lines?

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Turning to obligation issues #1: “Fat tails”

- Again, Marty Weitzman: Claim that the obligation to invest now to avoid climate change is infinite
- First, claim that empirical statistical measures from finite data have “fat tails”
- Combined with standard “constant relative risk aversion” utility measures, get $-\infty$ expected value
- I can’t challenge the first statistical assertion
- But the second is extrapolation out of application range
- Would imply infinite effort to reduce risk, which isn’t observed
- Still, getting a lot of attention

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Obligation issue #2: Discounting

- **How do we value future gains against present losses**
 - At 0%, \$1000 loss in 100 years worth \$1000 today
 - At 5%, \$1000 loss in 100 years worth \$6.74 today, \approx 150th size
- **Stern vs. Nordhaus: All about the discount rate**
 - Appropriate rate “time preference” plus discounting utility for added per capita wealth over time
 - Stern assume zero time discount on ethical grounds; gets 1.4%, => major climate effort
 - Nordhaus argues discount should be inferred from market behaviour, gets 4% real rate
- **For Stern, \$1000 in a century worth about \$246 today; for Nordhaus, \$18.30 – different by a factor of over 13**

Separating opportunity cost from ethics

- **Nordhaus is right in comparing investments**
- **We should help future generations by investing in climate change mitigation only if return higher than from other investments**
 - Medical research?
 - Basic science?
- **But obligation is a matter of ethics, not market rate**
 - Imagine generations didn't overlap; no personal ties to progeny
 - Market: Very high discount rate for each generation
 - Rawls's “veil of ignorance” – equalize wealth
- **Recent US poll: Climate ranked 20th out of 20 concerns**

Obligation issue #3: Dollar reductionism

- **Should issue be reduced to cost-benefit analysis?**
- **Measurement difficult in best of circumstances**
 - Scientific uncertainty
 - Non-incremental effects impede analysis at the margin
 - No behaviour trail: contingent valuation; stated preference
- **CBA defence: Reproduce decisions people would make on their own if market functioned**
- **Should environmental benefits be cashed out that way?**
 - Require moral reflection, not just market preferences?
 - Deep ecology: Environment has standing apart from WTP
- **Mention not to endorse these, but need to be aware**

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Conclusion: Challenges from climate

- **How climate policy is implemented matters on numerous dimensions, including six mentioned here**
- **How the public frames the ethical debate influences size of obligations and thus the intensity of the challenge**
- **No endorsement implied, but need to understand the terms and nature of the debate**
- **I hope the perspective of an outsider to that debate helps clarify how to predict and cope with challenges**

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