

# LECTURE 4: COST- BENEFIT ANALYSIS AND PUBLIC GOODS

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Lecture 4

14.42/14.420

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# Plan for Today

1. Cost-Benefit Analysis
  2. Public Goods and Externalities
- Up to \$10 will be distributed in class today.

# Cost-Benefit Analysis

## Current Policy:

- Concern over NO<sub>x</sub> pollution in Eastern U.S.
  - Respiratory problems (asthma, lost work, death)
  - Reduced visibility
  - Acid rain
- New power plants must meet BACT (Best Available Control Technology)
  - Selective Catalytic Reduction. Fixed cost + marginal cost/kWh
- Cap-and-Trade regulation on all plants (CAIR/NO<sub>x</sub> SIP Call)



Image by bob august on [Flickr](#).

**Potential New Policy:** *Require all power plants to meet BACT*

**Question:** *Is this a good policy?*

What does economics say?

Discounting the Future

Critiquing Cost-Benefit Analysis

# Cost-Benefit Analysis: Takeaways

- We can modify CBA to address many concerns
  - Weighted social welfare functions to address “environmental justice.”
  - Improve measurement of costs and benefits
  - Incorporate uncertainty to address precautionary principle
- CBA forces us to make assumptions explicit instead of implicit
- Not really any better alternatives
- My opinion: should be an integral part of social decision making processes

# Externalities and Public Goods

- Externality:

*An externality exists when the consumption or production choices of one person or firm enter the utility or production function of another entity without that entity's permission or compensation.*

- Two firm example: Electricity and Tourism

# Public Goods

- Excludability

*A good is excludable if it is feasible and practical to selectively allow consumers to consume the good.*

*A bad is excludable if it is feasible and practical to selectively allow consumers to avoid consumption of the bad.*

- Examples?

# Public Goods

- Rivalry:

*A bad (good) is rival if one person's consumption of a unit of the bad (good) diminishes the amount of the bad (good) available for others to consume,*

*i.e., there is a social opportunity benefit (cost) to others associated with consumption.*

*A bad (good) is non-rival otherwise.*

- Examples?
- How to get aggregate MWTP curve for rival vs. non-rival goods?



# Public Goods Game

- Choose four people
- I give everyone \$1
- Each person privately chooses how much to contribute:  $c_i$
- I take the “pot” and double it.  $P_{\text{total}} = 2 \cdot \sum_i c_i$
- I then distribute the pot equally.
  
- What do you contribute?
  
- “Free rider problem”: People consume more of a public good than they contribute.

# Free Rider Problem

- “Free rider problem”: People want to consume a public good, but they don’t want to contribute.
  - Everybody hopes that someone else will contribute, and they’ll consume that other person’s contribution.
  - I don’t want to contribute, because other people benefit from my contribution
  - Analogy: Team production problem.
  - Cleaning my house
- How do we solve this?

# For Next Class

- We have now completed Kolstad Chapter 1-6
  - Chapter 5 was public goods and externalities.

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