

How can capitalism save us? Put a price on pollution!

Three possible solutions

- Voluntary approaches: “Give a hoot, don’t pollute.”
- Mandatory “command-and-control” approaches: Fuel economy standards, government-funded R&D (research and development), etc.
- Mandatory “market-based” approaches: Make polluting expensive.

Three possible solutions

- Voluntary approaches: “Give a hoot, don’t pollute.”
- Problem: Voluntary approaches often don’t work very well because of the Tragedy of the Commons.

	Clean	Dirty
Clean	(Good, Good)	(Worst, Best)
Dirty	(Best, Worst)	(Bad, Bad)

Three possible solutions

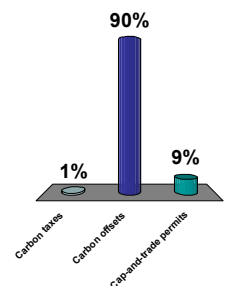
- Mandatory “command-and-control” approaches: Fuel economy standards, government-funded R&D (research and development), etc.
- Problem: These can work, but often they are unnecessarily costly (i.e., inefficient). And do you really want the government picking winners? (Consider corn ethanol.)

Three possible solutions

- Voluntary approaches: “Give a hoot, don’t pollute.”
- Mandatory “command-and-control” approaches: Fuel economy standards, government-funded R&D (research and development), etc.
- Mandatory “market-based” approaches: Make polluting expensive.

Which idea was *not* discussed in the reading?

1. Carbon taxes
2. Carbon offsets
3. Cap-and-trade permits

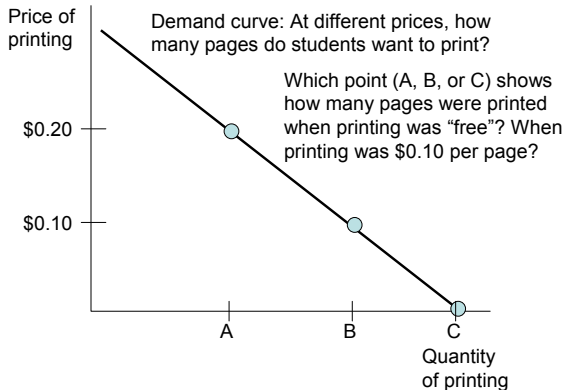


Three possible solutions

- Mandatory “market-based” approaches: Make polluting expensive.
- This is the best idea since sliced bread.
- Market approaches use the power of the free market to protect the environment.
- Two varieties of sliced bread:
 - Taxes
 - Cap-and-trade permits

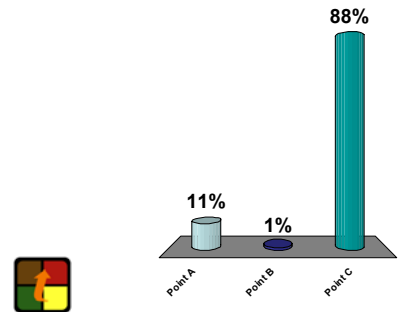
Story #1: Paper

- Before 1998, it was free for students to print at the computer labs on campus.
- More correctly, it was “free”: the money came from student tech fees rather than individual students.
- The result: 35,000 pages printed per day, 1000s of those pages unclaimed, \$25,000 per month for paper and toner...



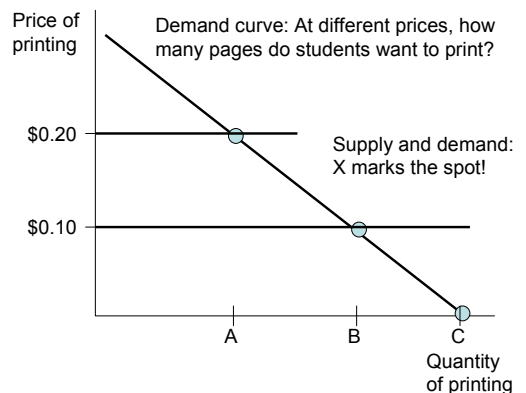
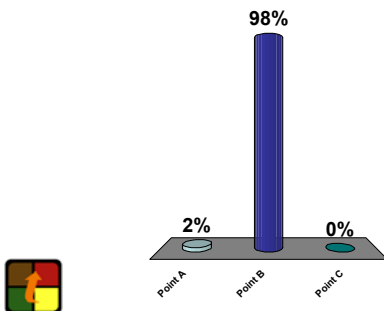
Which point shows how many pages were printed when printing was “free”?

1. Point A
2. Point B
3. Point C



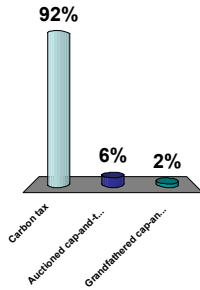
Which point shows how many pages were printed when printing was \$0.10?

1. Point A
2. Point B
3. Point C



Charging for printing is most similar to which idea from the reading?

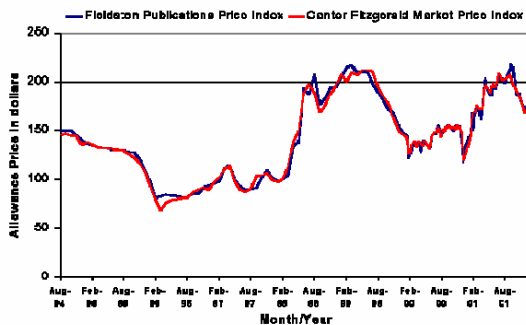
1. Carbon tax
2. Auctioned cap-and-trade
3. Grandfathered cap-and-trade



Story #2: Sulfur dioxide (SO₂)

- Under Title IV of the 1990 Clean Air Act Amendments, a “cap and trade” program was created for SO₂ from power plants.
- Any firm wanting to emit SO₂ needed to turn in 1 permit for each ton of emissions.
- In 1980, emissions were 20m tons, but by 2000 the government only gave out 10m tons’ worth of permits. (Cut pollution in 1/2!)
- Allocations based on historic emissions.

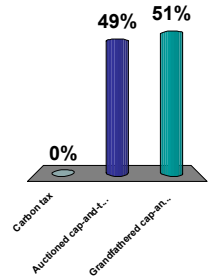
Figure 3. SO₂ Allowance Prices, 1994-2001



Source: U.S. EPA, <http://www.epa.gov/airmarkt/trading/so2market/prices.html> (accessed February 3, 2003).

This example is most similar to which idea from the reading?

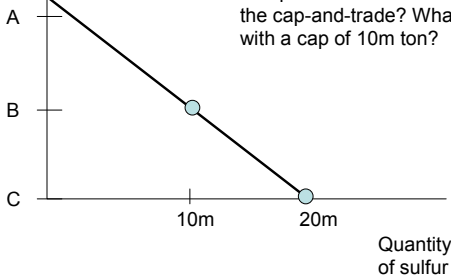
1. Carbon tax
2. Auctioned cap-and-trade
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Price of sulfur

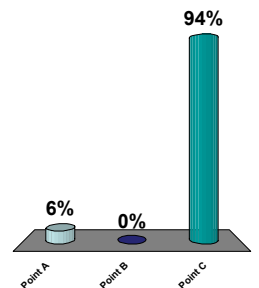
Demand curve: At different prices, how much sulfur do utilities want to emit?

Which point (A, B, or C) shows the “price” of emissions before the cap-and-trade? What about with a cap of 10m ton?



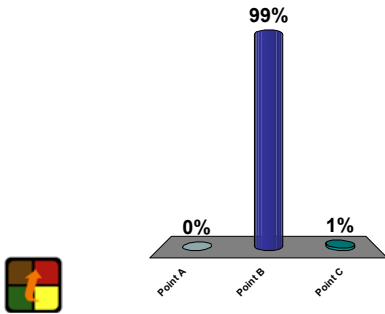
Which point (A, B, or C) shows the “price” of emissions before the cap-and-trade?

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3. Point C



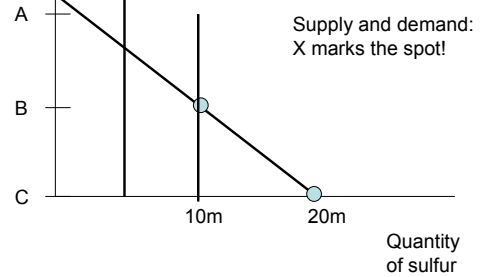
Which point (A, B, or C) shows the “price” of emissions with a cap of 10m tons?

1. Point A
2. Point B
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Price of sulfur

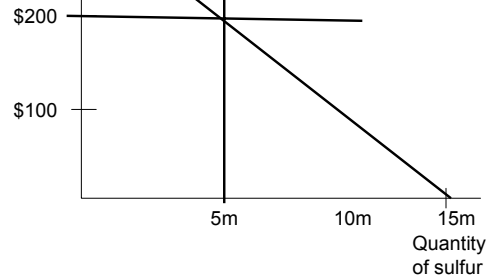
Demand curve: At different prices, how much sulfur do utilities want to emit?



Lesson #1: Taxes and cap-and-trade systems are very similar

- A tax is a “price” instrument and cap-and-trade is a “quantity” instrument, but the demand curve tells us that price and quantity are related to each other!

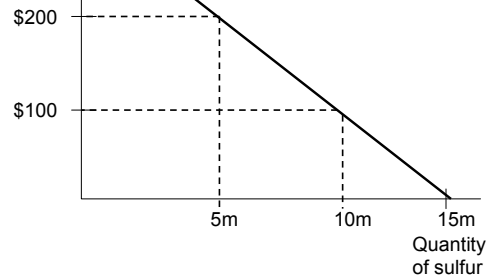
Price of sulfur

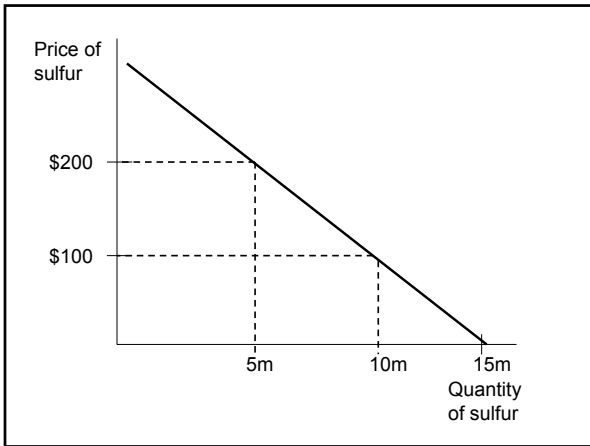


Lesson #1: Taxes and cap-and-trade systems are very similar

- A tax is a “price” instrument and cap-and-trade is a “quantity” instrument, but the demand curve tells us that price and quantity are related to each other!
- If we know what the demand curve looks like, I can tell you the quantity of emissions from a given tax, or I can tell you the “price” of emissions from a given cap.

Price of sulfur




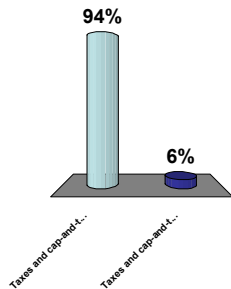


Complication #1: We don't know what the demand curve looks like exactly.

- So we can't say exactly how much carbon reductions will come from a \$100/ton tax on CO₂.
- And we can't say exactly what the "price" of carbon will be with a cap-and-trade that reduces carbon emissions to 1990 levels by 2020 and 50% below 1990 by 2050.
- Still, don't forget Lesson #1.

What is Lesson #1?

1. Taxes and cap-and-trade are very similar.
2. Taxes and cap-and-trade are totally different.

Lesson #2: It's all about the money.

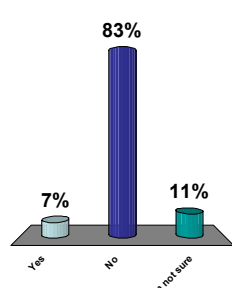
- The best way to think about cap-and-trade is to think about its price equivalent, even if we don't know exactly what that price equivalent will be.
- Example: Any auctioned cap-and-trade system is equivalent to *some* tax.
- What about *grandfathered* cap-and-trade?

Lesson #2: It's all about the money.

- Grandfathering permits to existing firms is *equivalent* to giving them money.
- Exactly equivalent.
- Give them permits, and they can sell them for money.
- Give them money, and they can buy permits.

Is it a good idea to give companies a bunch of money?

1. Yes
2. No
3. I'm not sure



What else could we do with money from a carbon tax or auctioned cap-and-trade?

- Fund R&D into clean energy.
- Give rebates for energy efficient appliances.
- Reduce existing taxes.
- BC just proposed a revenue-neutral tax shift that will generate \$600 million per year from a carbon tax and use the revenue to reduce existing taxes.

What's so great about a tax shift?

- Right now we tax "goods" (things we want more of: employment, saving, investment) and don't tax "bads" (things we want less of: carbon, pollution, traffic congestion).
- This is like pouring your wine out on the carpet and drinking out of the toilet bowl.
- Taxing "bads" instead of "goods" is smart economics and smart environmental policy

Taxes act as a surrogate for missing market prices/incentives

- Pollution creates negative externalities.
- The resulting "external costs" are not included in market prices.
- The invisible hand breaks down, leading to the tragedy of the commons.
- We can use pollution taxes to "internalize" those external costs.
- Pollution taxes "heal" the invisible hand!