OLD DOMINION UNIVERSITY

# Externalities and Public Goods

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# The Magic of Markets

- Why do we trade?
- **Resources are in the wrong place!**
- People have better uses of resources than they are currently being used!

# The Magic of Markets

- Why are resources in the wrong place?
- **We have different stuff and different preferences**

# Costs to trade

Transaction costs

Information / Search costs

Contracting / Bargaining costs

Enforcement / Policing costs

# Costs to trade

- With high transaction costs, resources cannot be traded
- Resources cannot be switched to higher- valued uses
- If others value goods higher than their current owners, resources are inefficiently allocated!

# Markets

- **Markets** are institutions
  - facilitate voluntary impersonal exchange
  - reduce transaction costs

- Prices, profits and losses, property rights, rule of law, contract enforcement, dispute resolution, protection, trust

# Social problems markets solve

- **Problem 1**: Resources have multiple uses and are rivalrous
- **Problem 2**: People have different subjective valuations for uses of resources

# Social problems markets solve

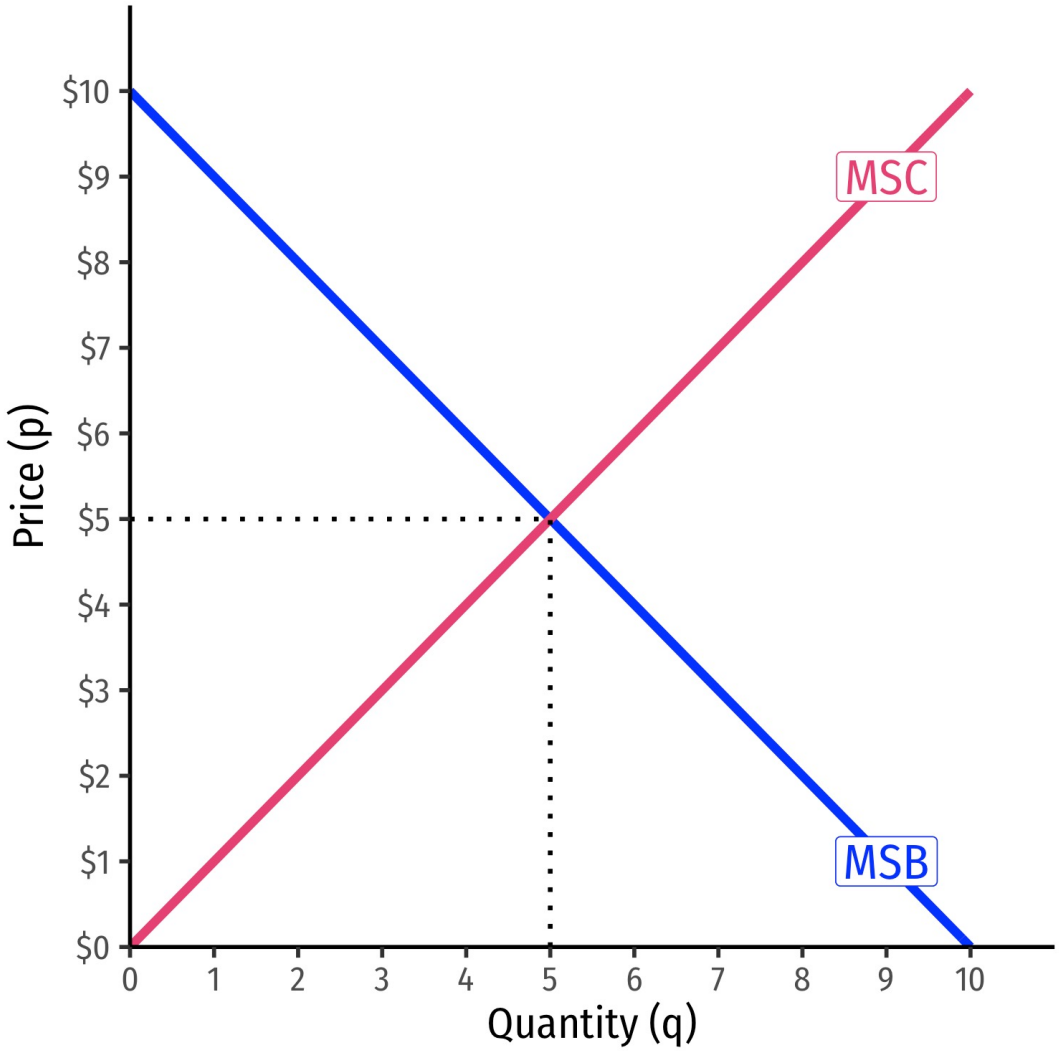
- **Problem 1**: Resources have multiple uses and are rivalrous
- **Problem 2**: People have different subjective valuations for uses of resources
- **It is inefficient to use a resource in a way that prevents someone else who values it more from using it!**

# Social problems markets solve

- **Solution**: Prices in a functioning market accurately measure **opportunity cost** of using resources in a particular way

- **The price of a resource is the amount someone else is willing to pay to acquire it from its current use/owner**

# Supply and Demand: Social Costs & Benefits




**Demand: marginal social benefit (MSB)**

- value to consumers of consuming output

**Supply: marginal social cost (MSC)**

- opportunity cost of pulling resources out of other uses

**Equilibrium**: MSB=MSC

- using resources efficiently, no *better* alternative uses

# Negative Externality

**Externality**: an action that incurs a cost or a benefit not compensated via prices

Often interpreted as an action that affects (benefits or harms) a third party not privy to the action

# Negative Externality

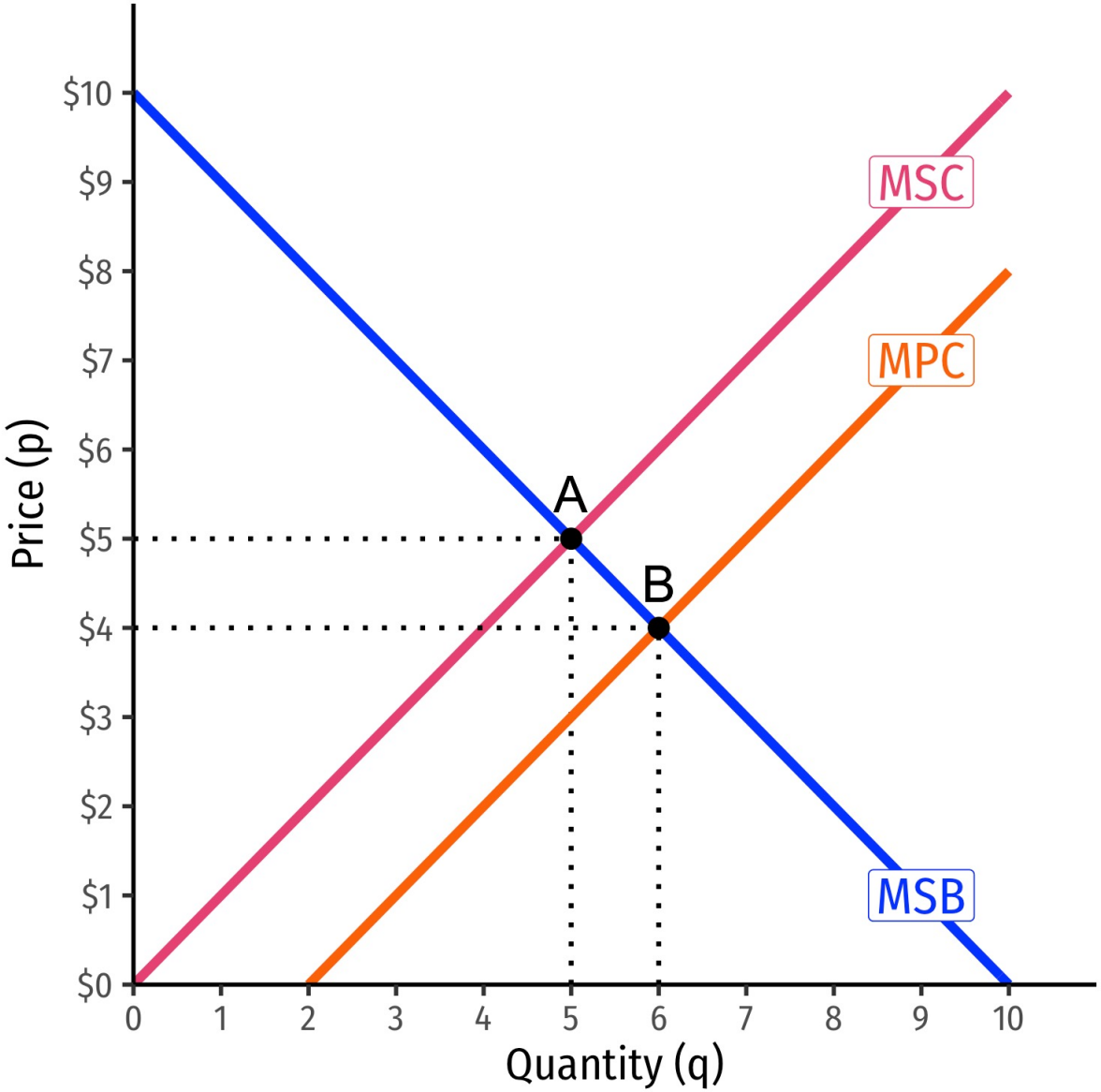
The real problem is that it is **external** to the price system!

Prices properly negotiate the opportunity costs

Provide information to people

But without price, decisions do not **internalize** those effects!

# Negative Externality




**Marginal *Private* Cost** to producer is less than **Marginal *Social* Cost** to society

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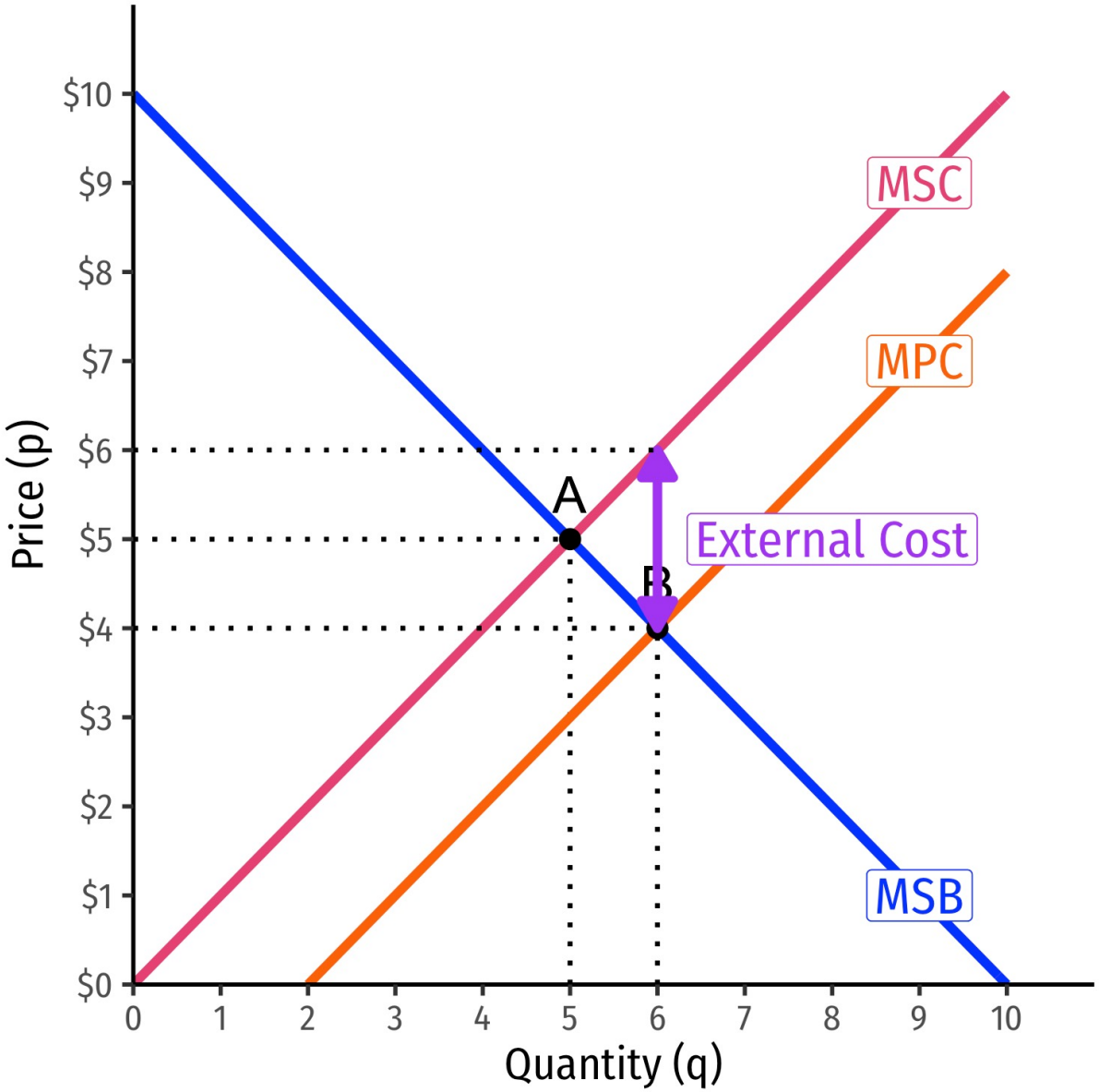


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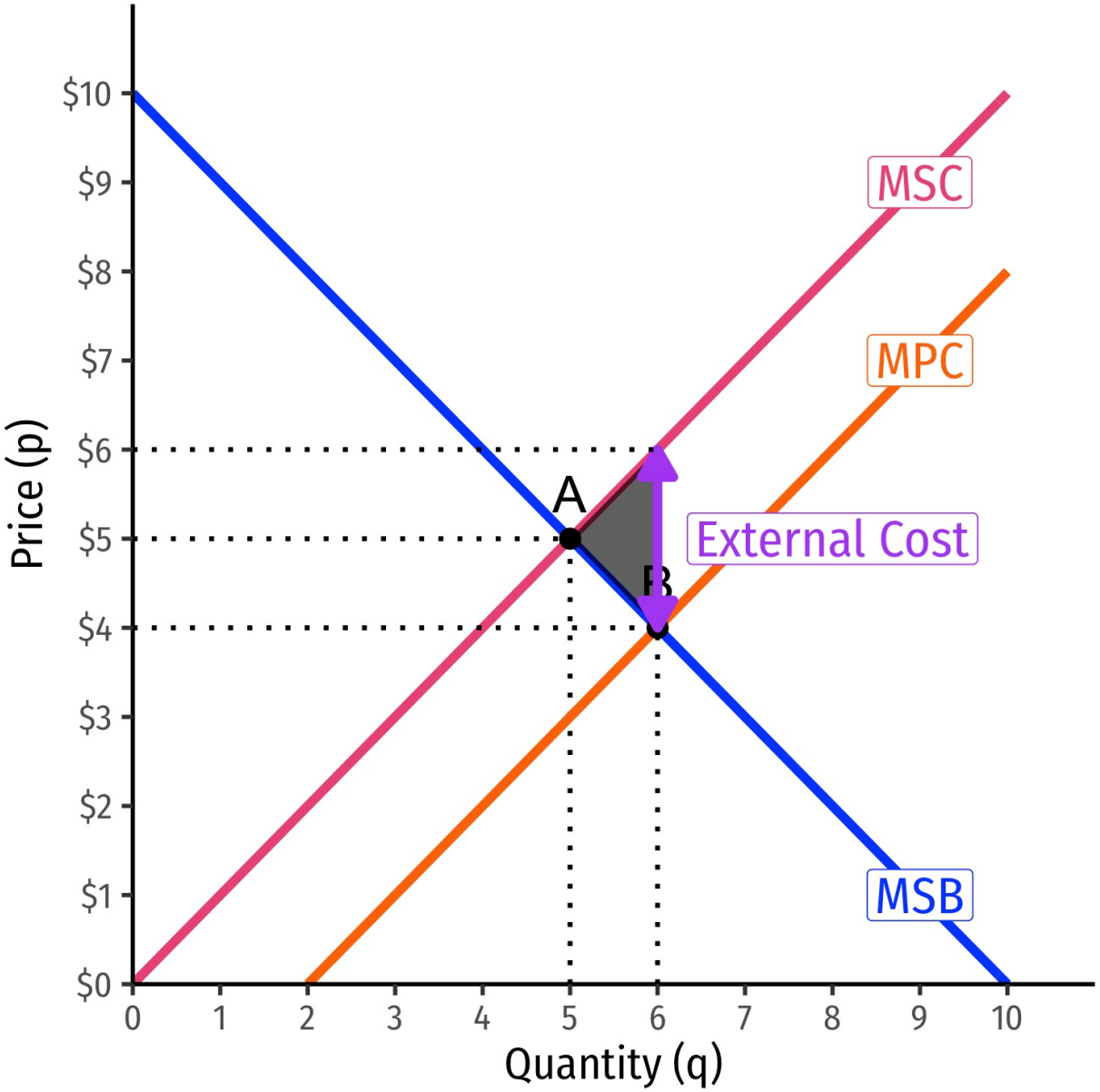


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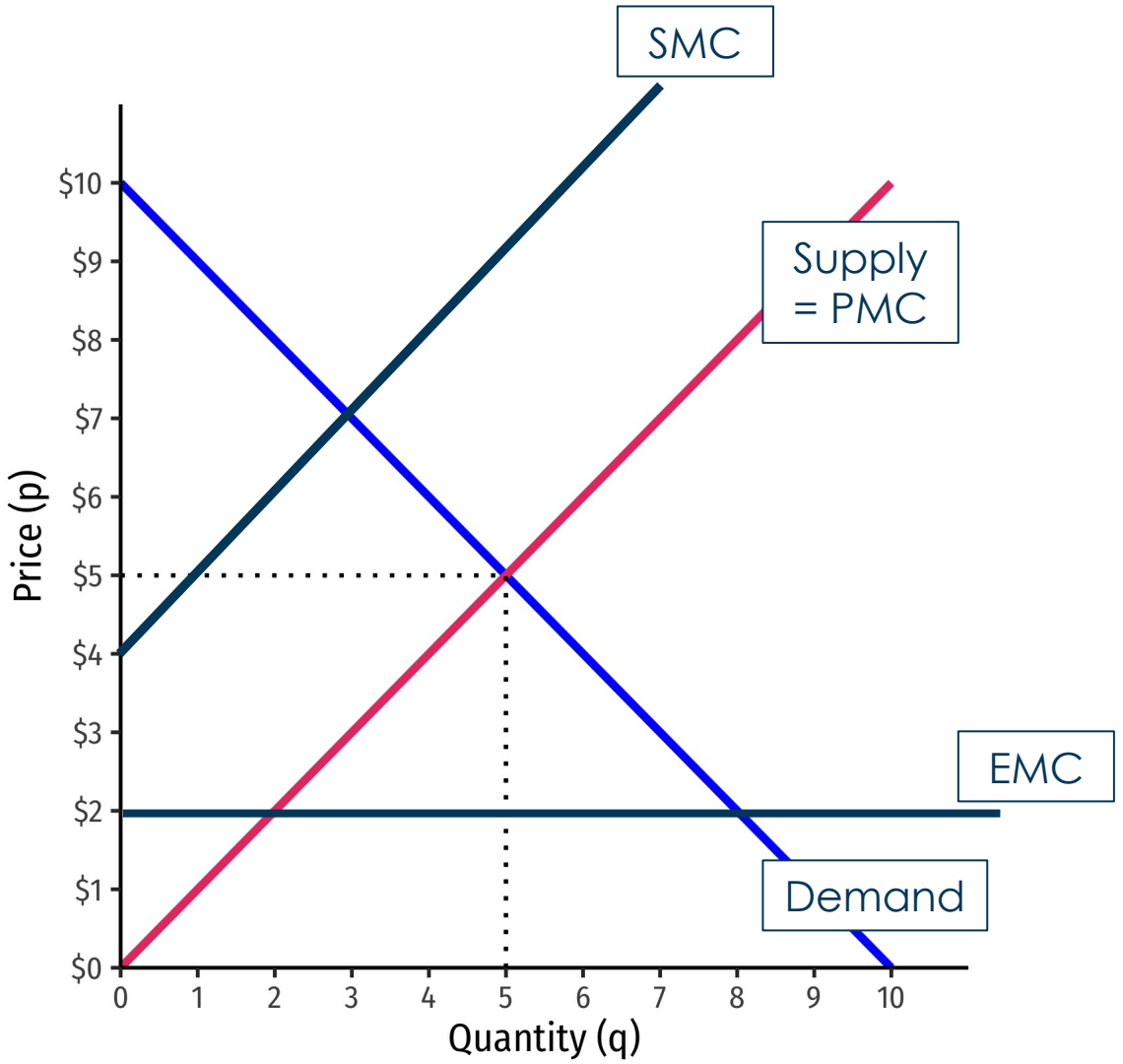
- Overproduction due to external cost

- A **deadweight loss** from overproduction

# Externalities, Markets, Supply and Demand

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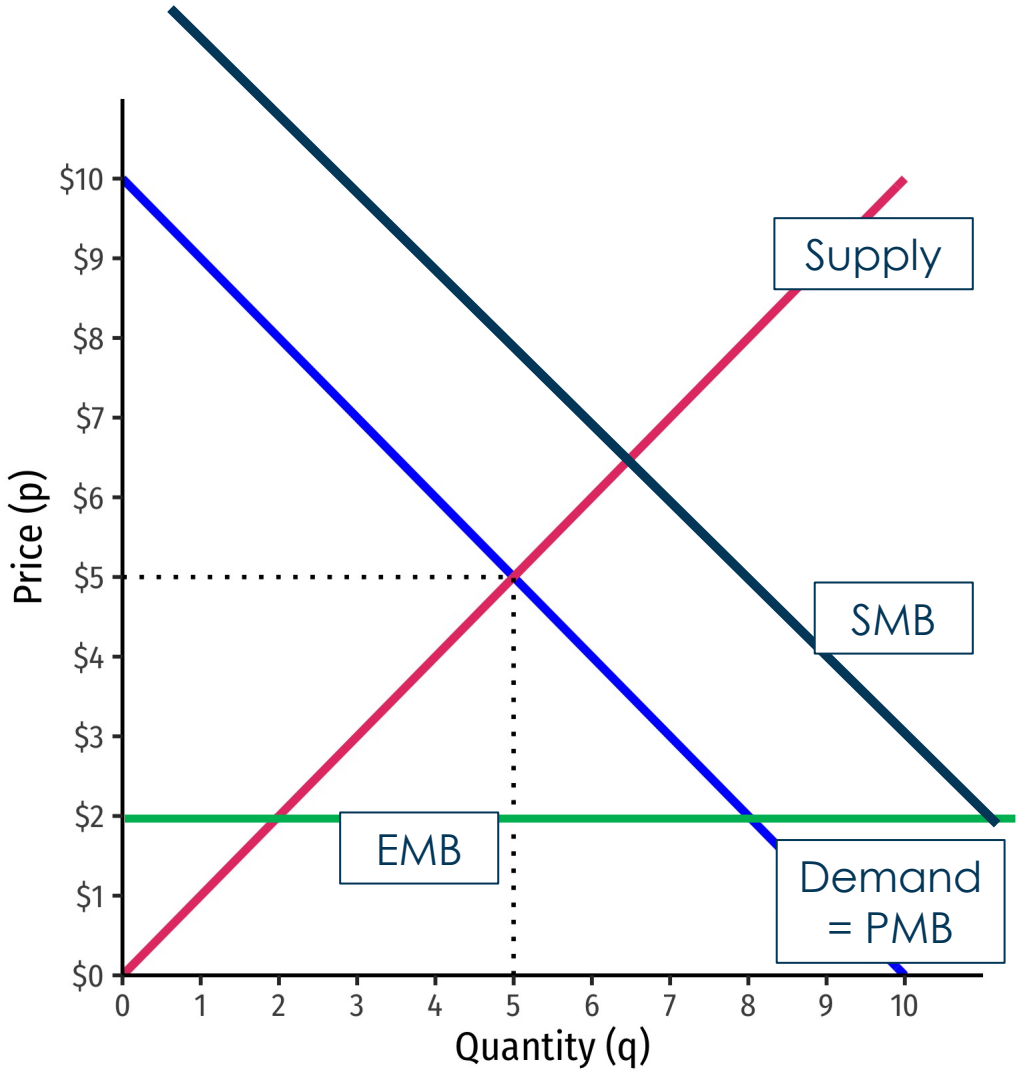


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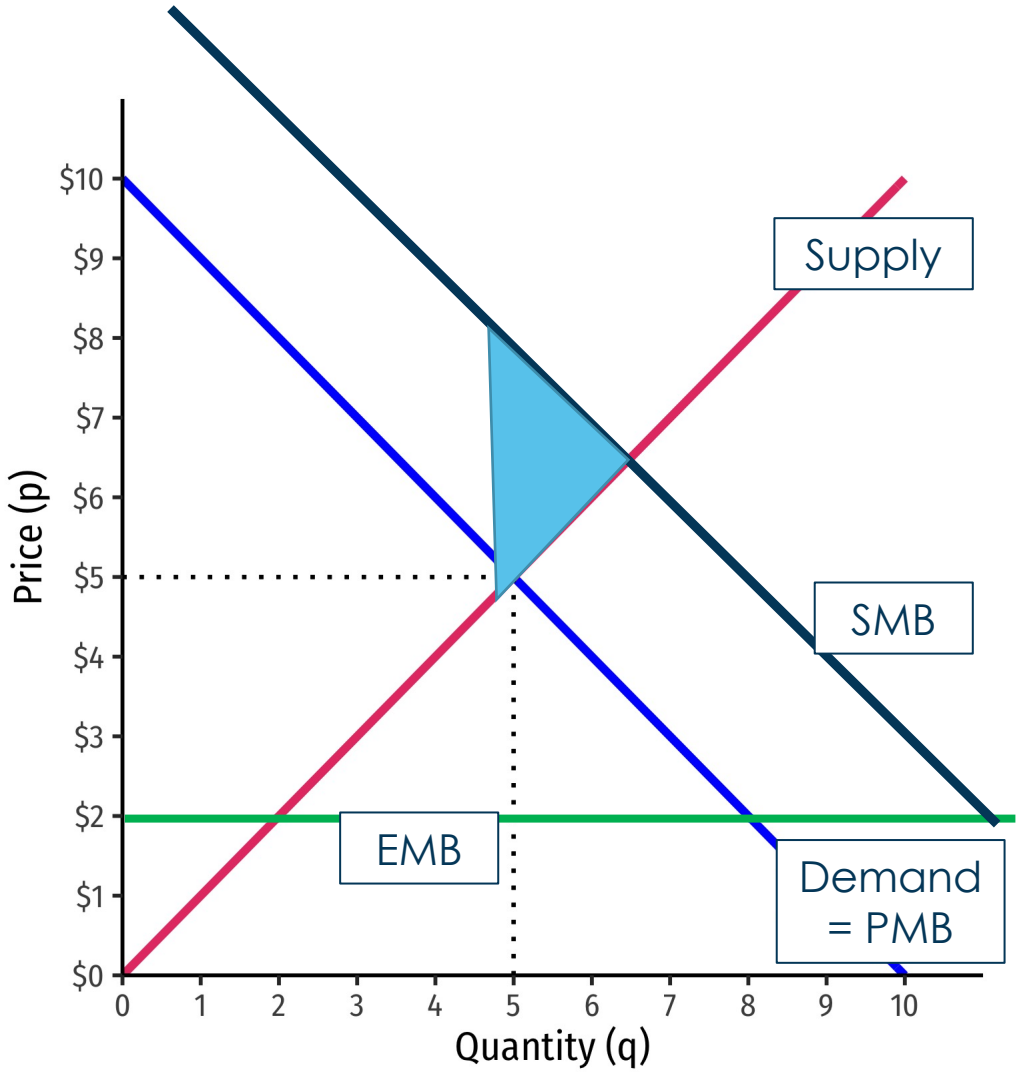



- **Deadweight loss from underproduction**

# Externality Solutions

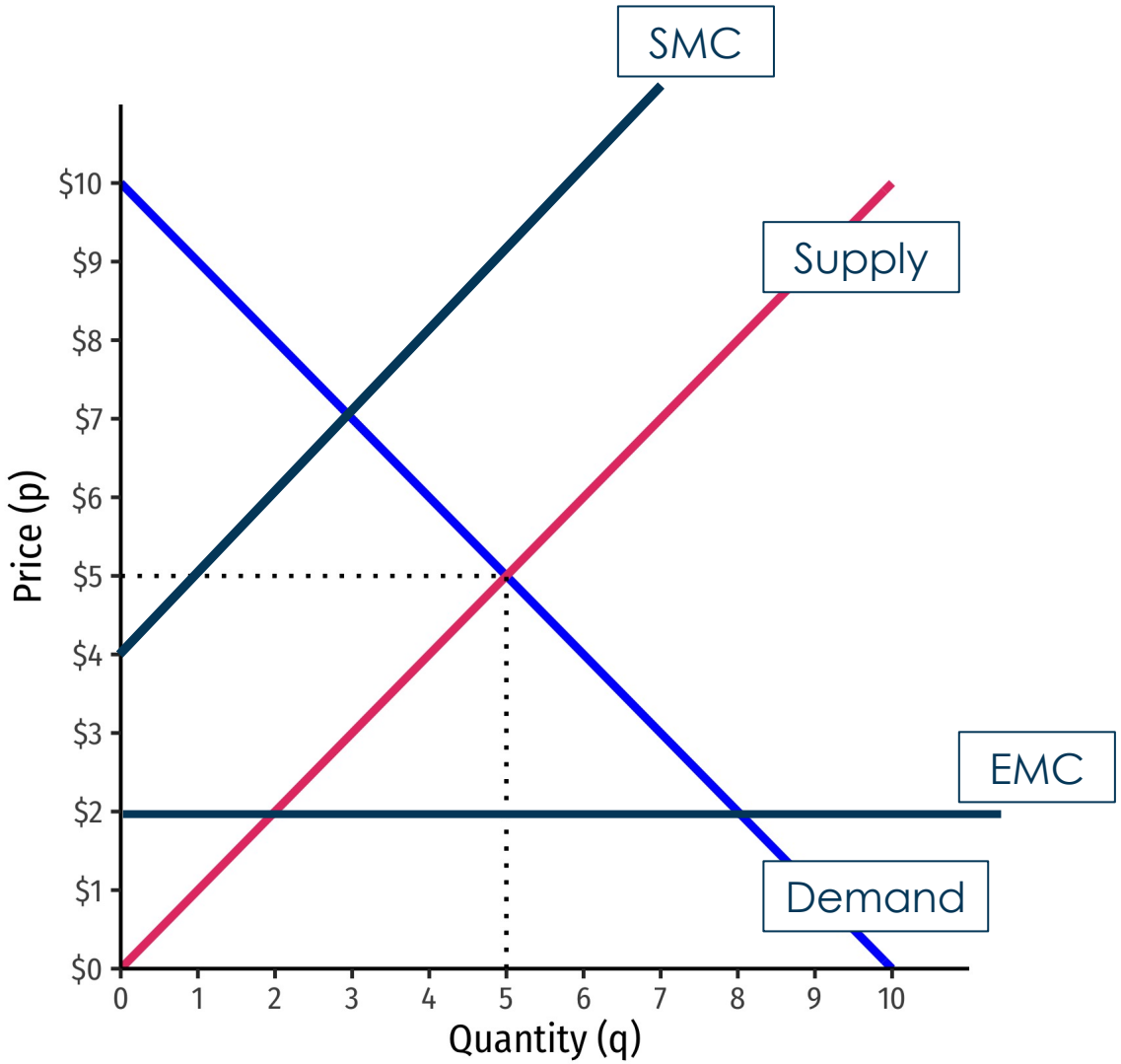
# Pigouvian Solution

Policy solutions to externalities should **focus on the missing price**

- Narrowly tailor policy to create or modify price

"Pigouvian" tax or subsidy

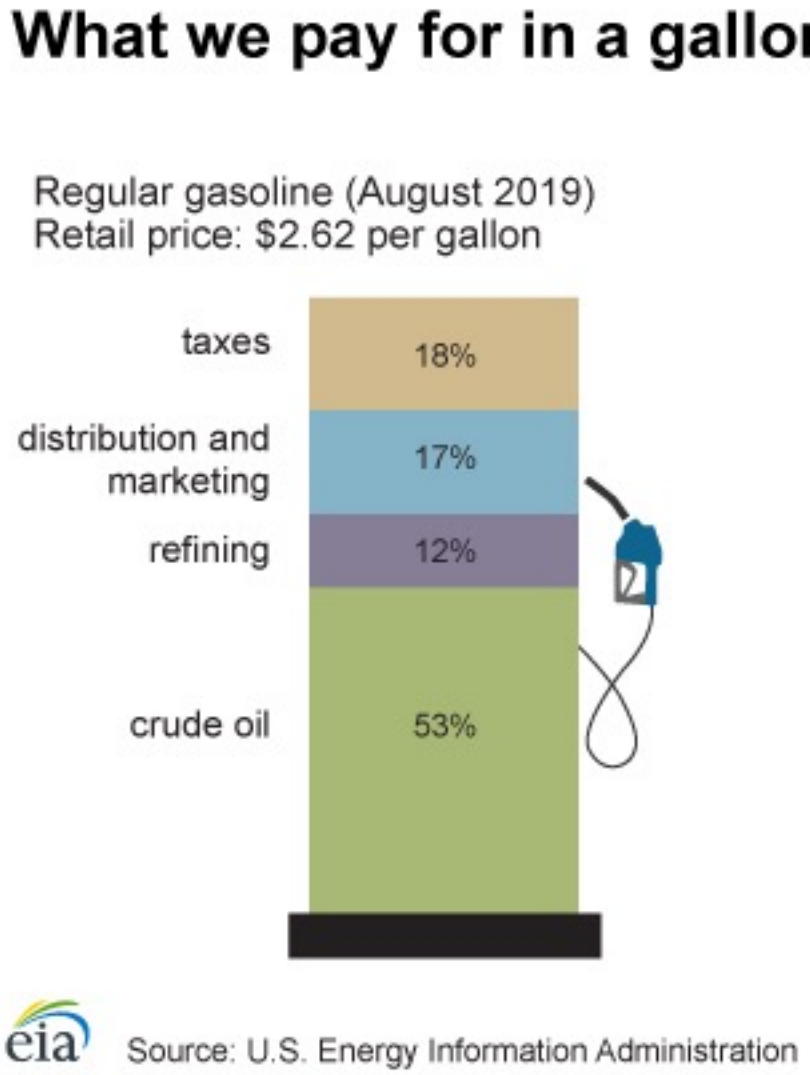
# Negative Externality




"Pigouvian" tax

Set a tax = EMC

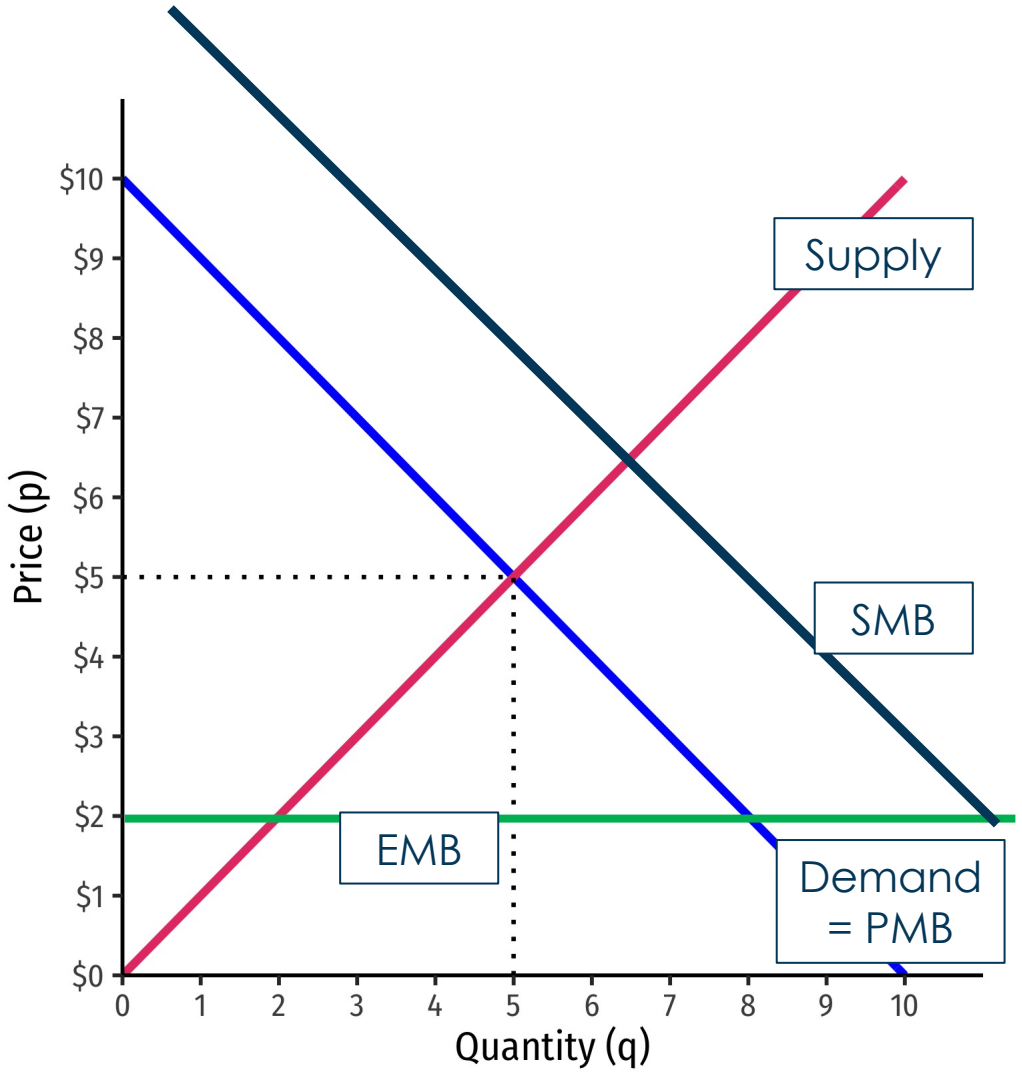
# Gasoline Tax




Externalities

- Air pollution
- Traffic congestion
- Pedestrian accidents

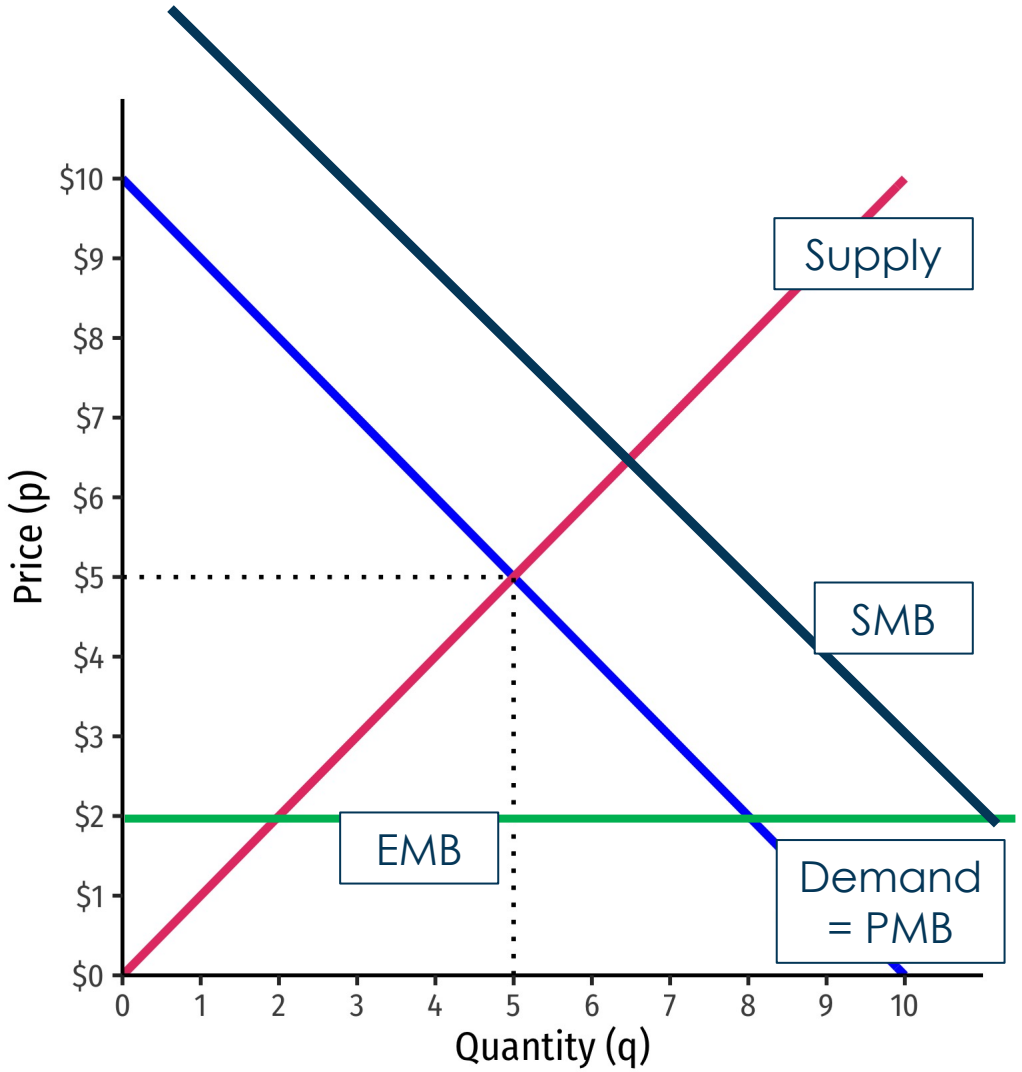
# Positive Externality




"Pigouvian" subsidy

Set a subsidy = EMB

# Positive Externality




"Pigouvian" subsidy

Set a subsidy = EMB

# Pigouvian Solution: Not that simple

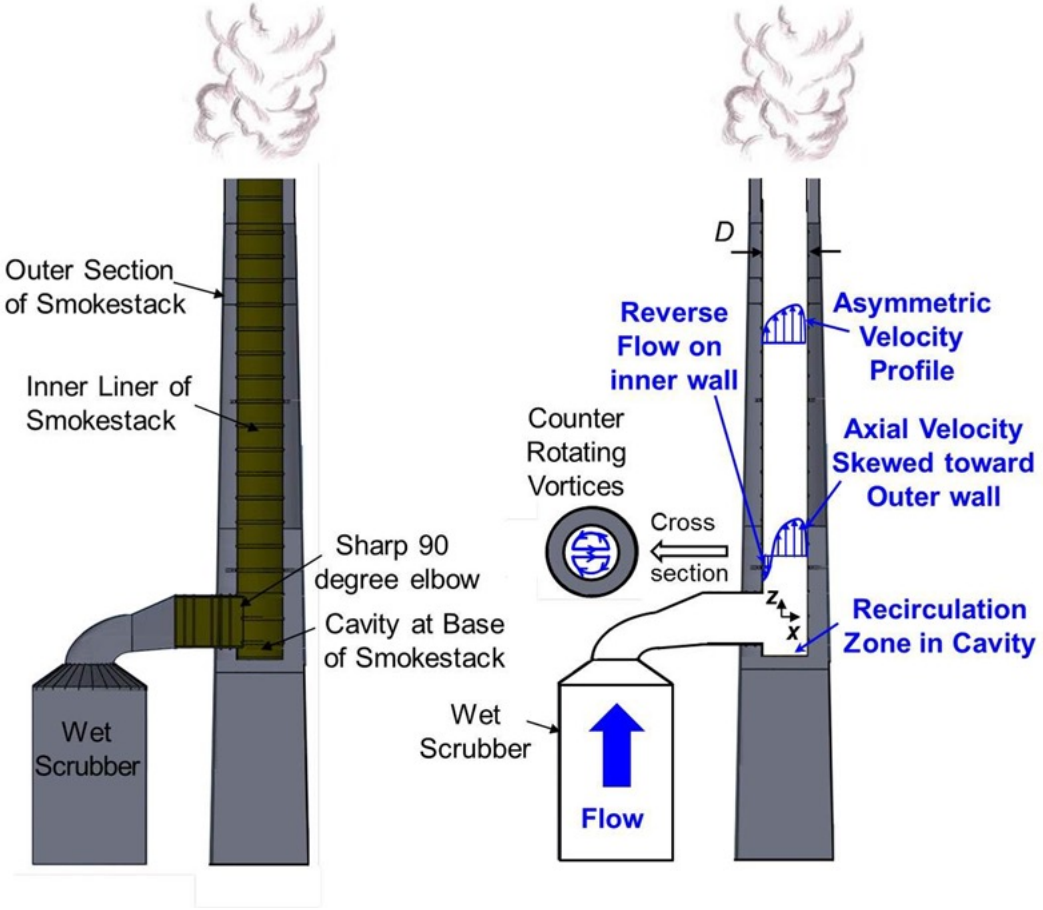
How do we know what the right tax is?

Will it be borne by the right parties?

Will it be administered correctly?

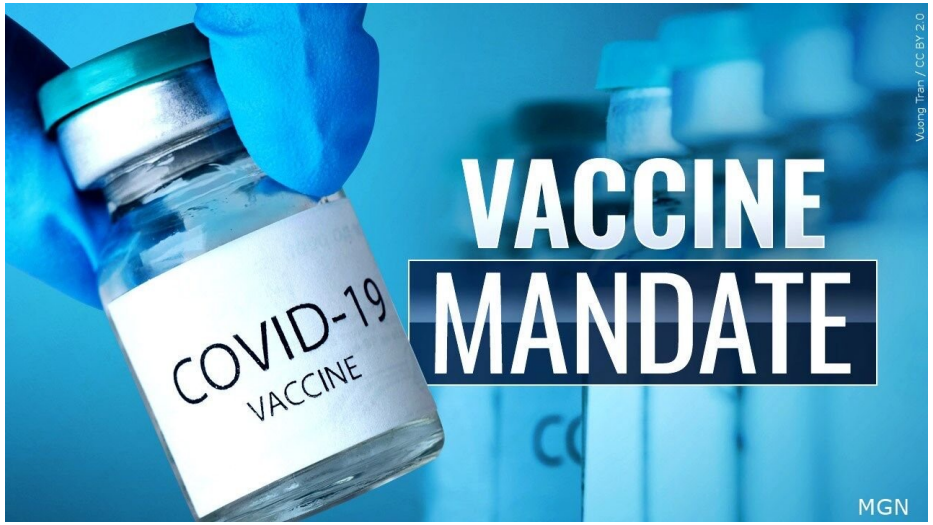
Are there opportunities for corruption?

# Command and Control Solutions




Govt. mandated activities or types of technology

# Command and Control Solutions


Govt. mandated activities or types of technology

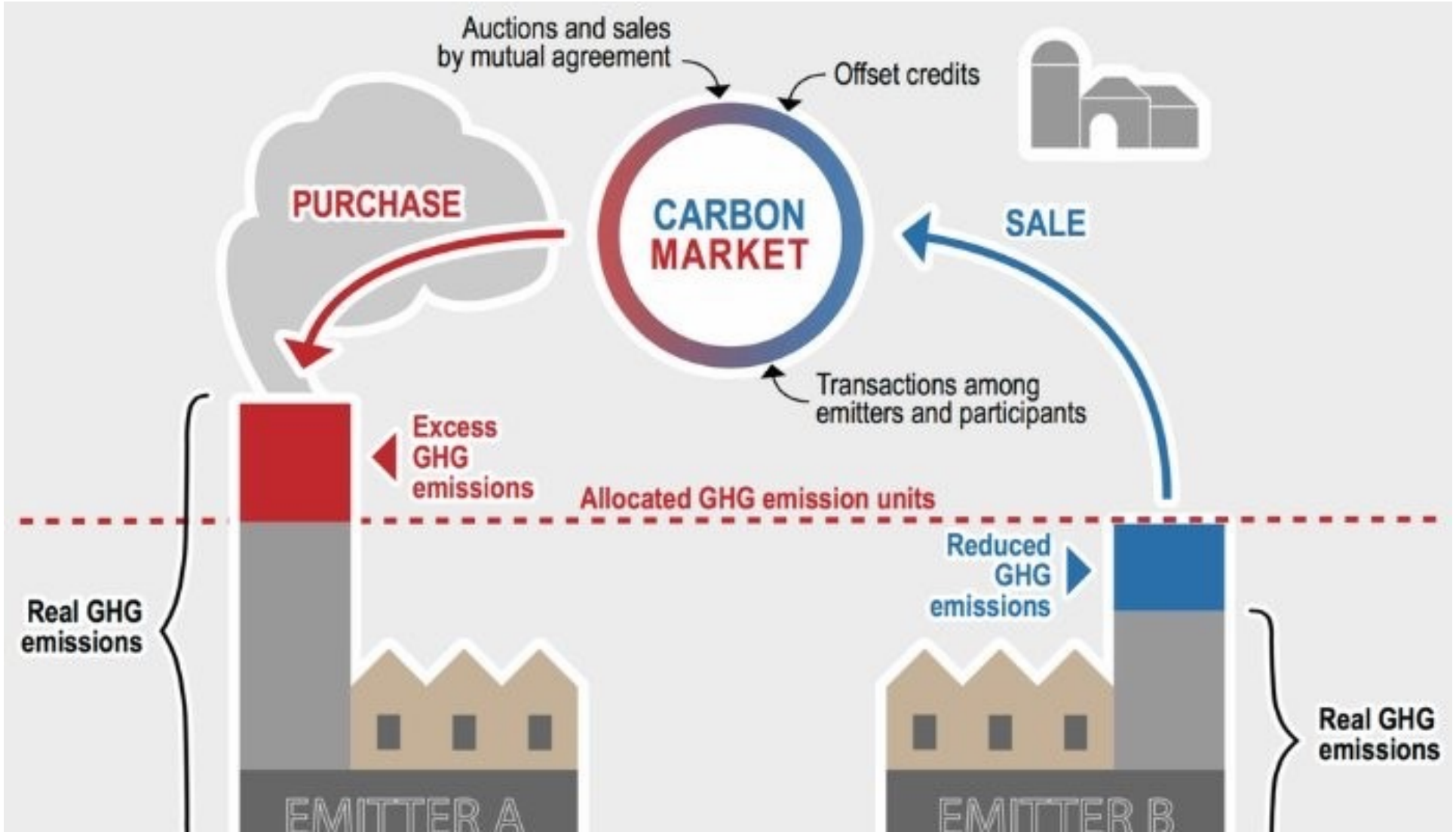
# Market Oriented Solutions

## Cap and Trade

### Cap
The government puts a limit (cap) on the amount of pollution

### Tradable permit
A government-issued permit that allows a firm to emit a certain amount of pollution during production and that can be traded to other firms.

# Market Oriented Solutions



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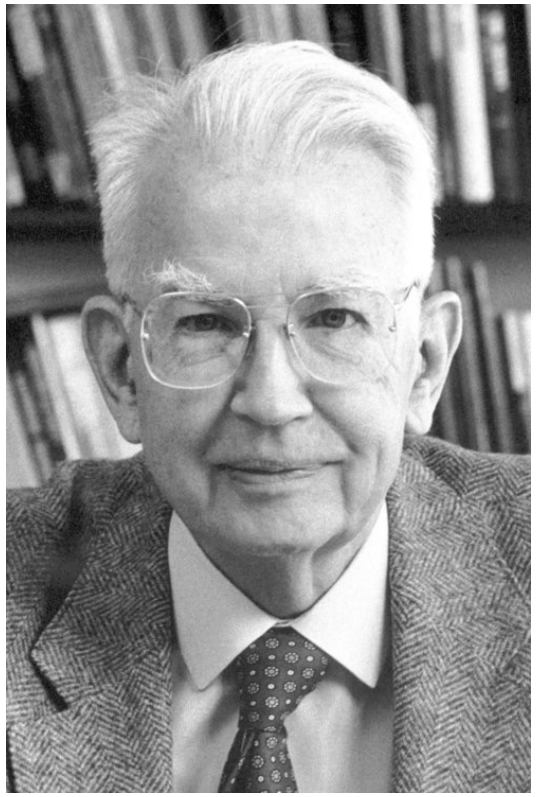


Ronald Coase: 1910 – 2013
Winner of the 1991 Nobel Prize

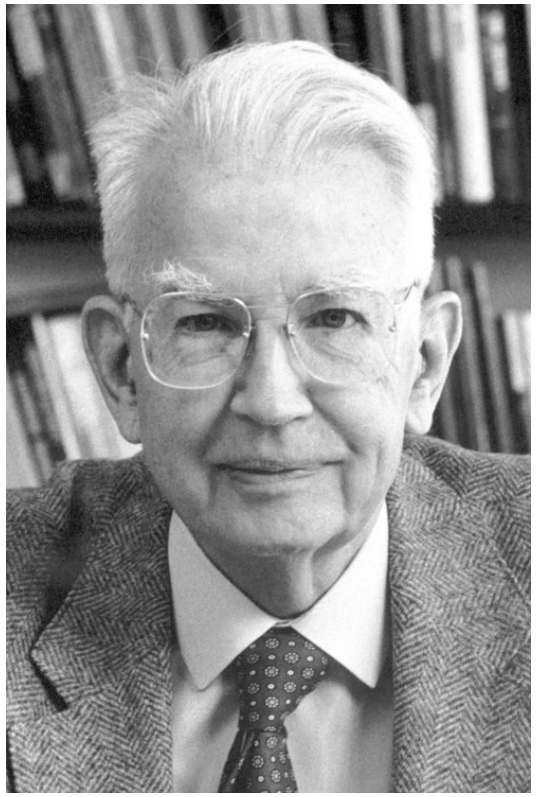
**Externalities as a property rights problem**

**Coasian Bargaining**

**Policy solutions focusing on a market (trade) developing when:**

1) **Transaction costs are low**
2) **Property rights clearly defined**

# Market Oriented Solutions



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**Coase Theorem**:

if transactions costs are low, clearly defined property rights allow parties to bargain to the efficient social outcome regardless of who has the property right

Internalize the externalities

# Market Oriented Solutions

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# Types of Goods

# Summarizing Types of Goods

| | Rival | Non-Rival |
|---|---|---|
| Excludable | Private goods | Club goods |
| Non-Excludable | Common Resources | Public goods |

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**Rivalry**: one use of a resource removes it from other uses

**Excludability**: ability or right to prevent others from using it (ownership)

# Club Goods

# Common Resources

# Common Resources

**Tragedy of the commons**: multiple people have unrestricted access to the same **rivalrous** resource

- Cannot exclude others
- No responsibility over outcome
- Incentive
to **overexploit** and **deplete** resource (before others do)
- A negative externality on others

# Common Resources

Elinor Ostrom
1933– 2012
Economics Nobel 2009

A wide variety of solutions are possible for managing common resources efficiently

- Government management
- Purely private property
- Civil society organizations

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So long as they set up **good rules** that solve the free rider problem, remove the incentive to overuse resource, negative externality on others

# Public Goods

# Public Goods

**Public Good**:
a good that is **non-rival** and **non-excludable**

- **Rivalry**: one use of a resource removes it from other uses

- **Excludability**: ability or right to prevent others from using it (ownership)

# Free Rider Problem

Individual bears a **private cost to contribute**, but only gets a **small fraction of the (dispersed) benefit** of a good

If individuals can gain **access** to the good without paying, may lead to. . .

**Free riding**: individuals consume the good without paying for it

# Free Rider Problem

# Public Goods Model