

Cap-and-Trade & Climate Policy



Using musical chairs to illustrate cap and trade

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Adapted from Dr. H Hummel (2007)

Climate Economics

- Today, consumers (and industries we support) dump an unlimited amount of greenhouse gases into the atmosphere for free.
- As a result, *fossil fuel prices do not reflect their full cost.*
- Life on Earth pays the ultimate price: *more severe droughts, floods, fires and storms* along with *collapsing ecosystems and extinction.*
- For this reason, some economists have called climate change *“the greatest market failure in history.”*

Climate Policy

Policymakers have 3 main options for putting a cost on greenhouse gas pollution:

- 1) a carbon tax or “pollution fee” (tax)
- 2) creating a market for carbon emissions (market mechanism – allowances)
- 3) command & control (direct regulation)
 - Few sectors with “best available” or “reasonably available” control technology

In order to stabilize global warming, **fossil fuel prices would rise** under any of these policies.

Americans have little appetite for a carbon tax. But there is also little understanding of the market-based alternative – *a carbon cap-and-trade program*.

How would it work?

Cap-and-Trade Climate Policy

- “Cap-and-trade” means the government establishes a **cap** that limits the total amount of pollution allowed, and then distributes permits for a “right to pollute” the global atmosphere, which can be **traded** like private property.
- The amount of greenhouse gas emissions permitted *declines each year*, creating demand for a **new commodity: carbon permits**.
- When offered enough money or faced with high enough costs, polluters who own permits (or need permits) will reduce their emissions.
- These trades establish a market price for greenhouse gas pollution.



Got it?

A familiar game can illustrate the concepts...

Musical Chairs: A Helpful Analogy

Each chair represents the “right to pollute”:

one metric ton of carbon dioxide (1 mtCO₂)

or an equivalent amount of any other greenhouse gas

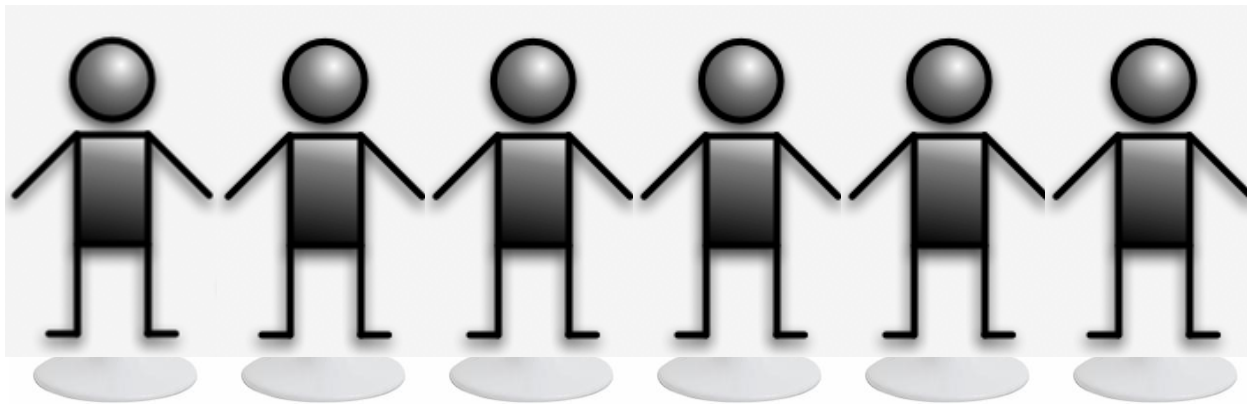


If you have a permit, you can have a chair.



Musical chairs

At the start of the game, everyone has a seat – because there are no limits on carbon emissions.

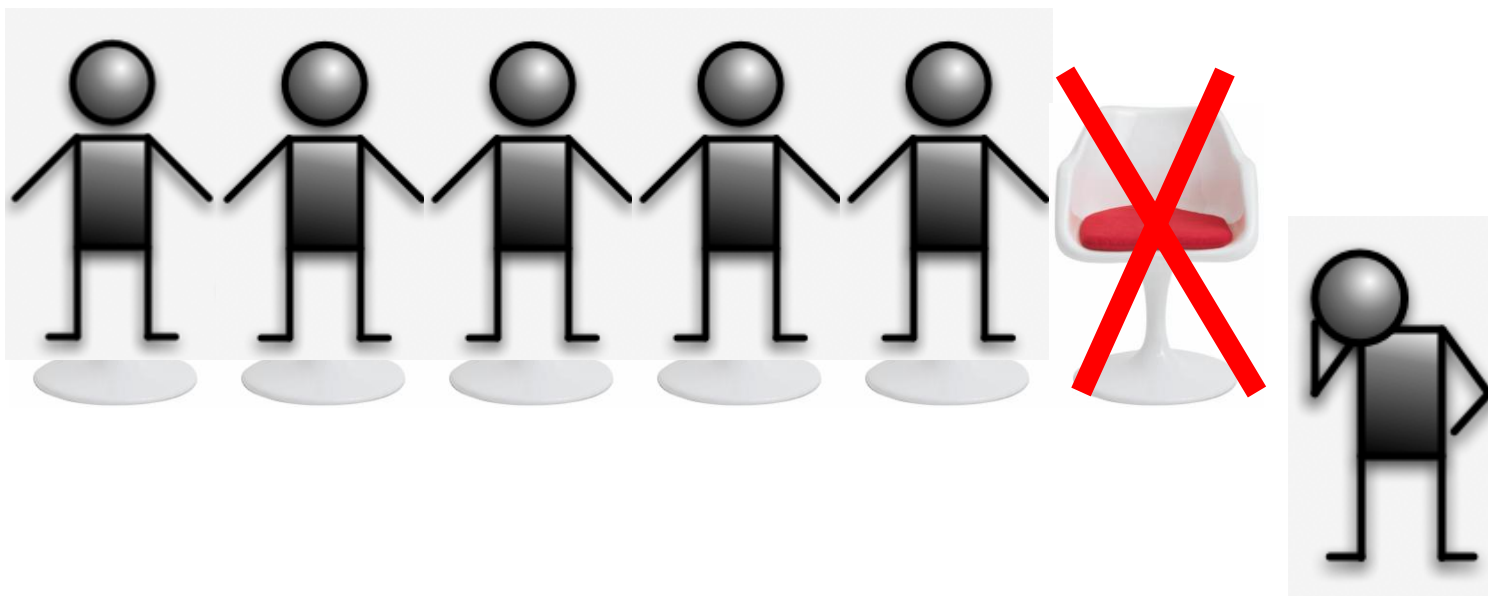




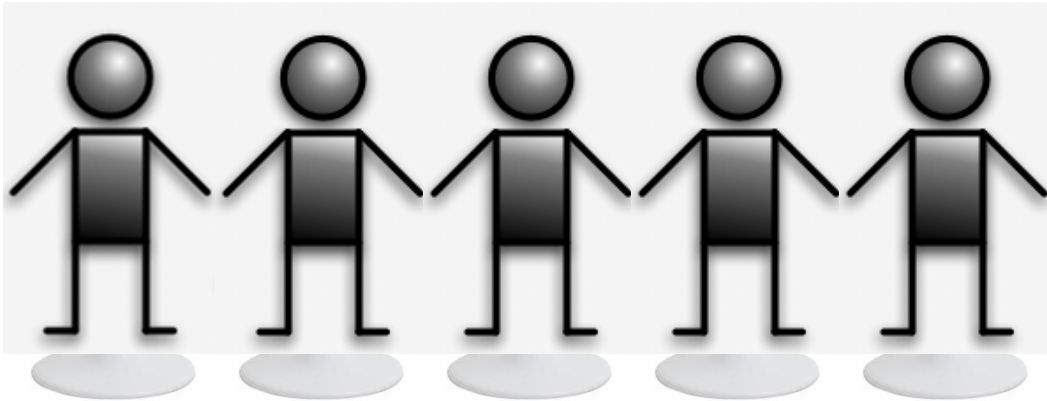
Musical chairs

After the first year, a cap is imposed by limiting the amount of permits and making **players compete for the permits available**.

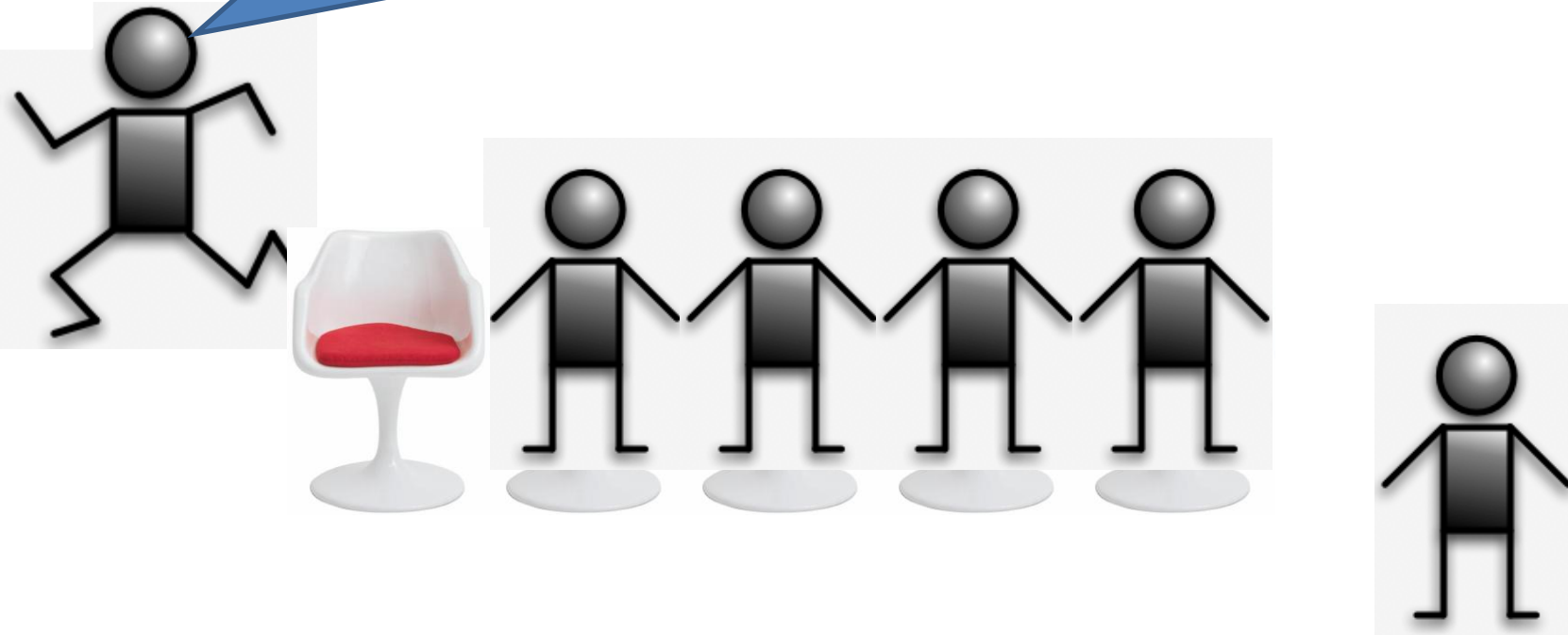
In our analogy, one player doesn't have a chair...



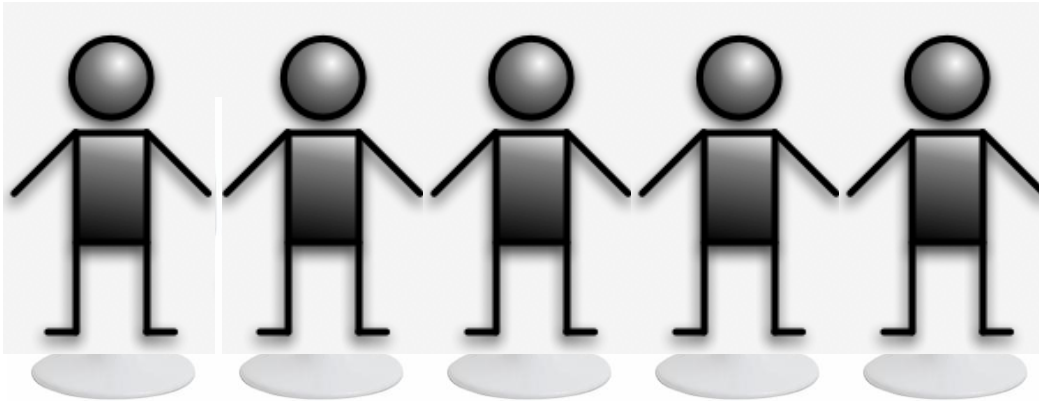
Would anyone be willing to trade their chair for \$30?



Sure! For that price, I can finance an efficiency upgrade, eliminating my need for a pollution permit.



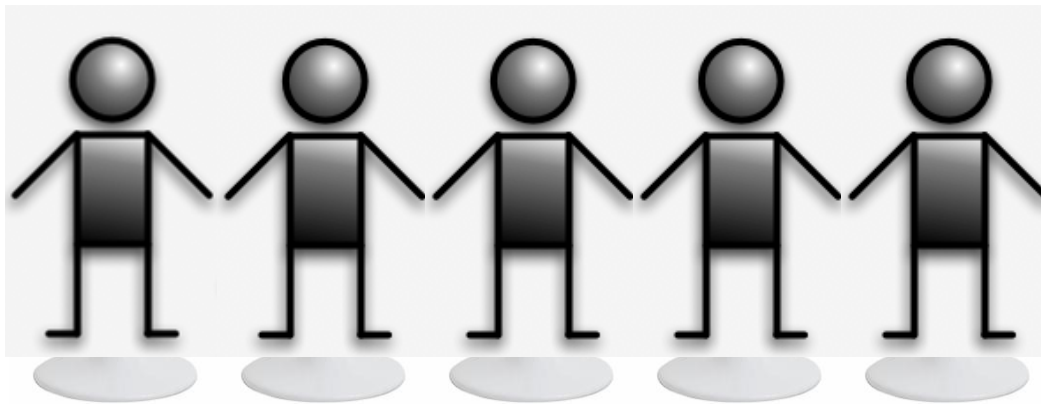
So, the market price for the “right to pollute” in the first year is \$30 for one ton of carbon dioxide.





Using Market Incentives

At that price, some players may realize it would be more **profitable to reduce their emissions** and sell their permits.



Profit opportunities are a main driver for **innovation and investment** in the global economy today, **and the climate challenge needs both.**



Using Market Incentives

If I could I build wind farms to replace my coal power plants, then I could *sell* permits...





Using Market Incentives

Hey, I made a profit by reducing my fossil fuel use and avoiding carbon emission costs!





Achieving Reduction Targets

The purpose of the game is to reduce greenhouse gas emissions.

The game authority (federal or state government) reduces the number of permits available each year until the ultimate cap has been achieved.

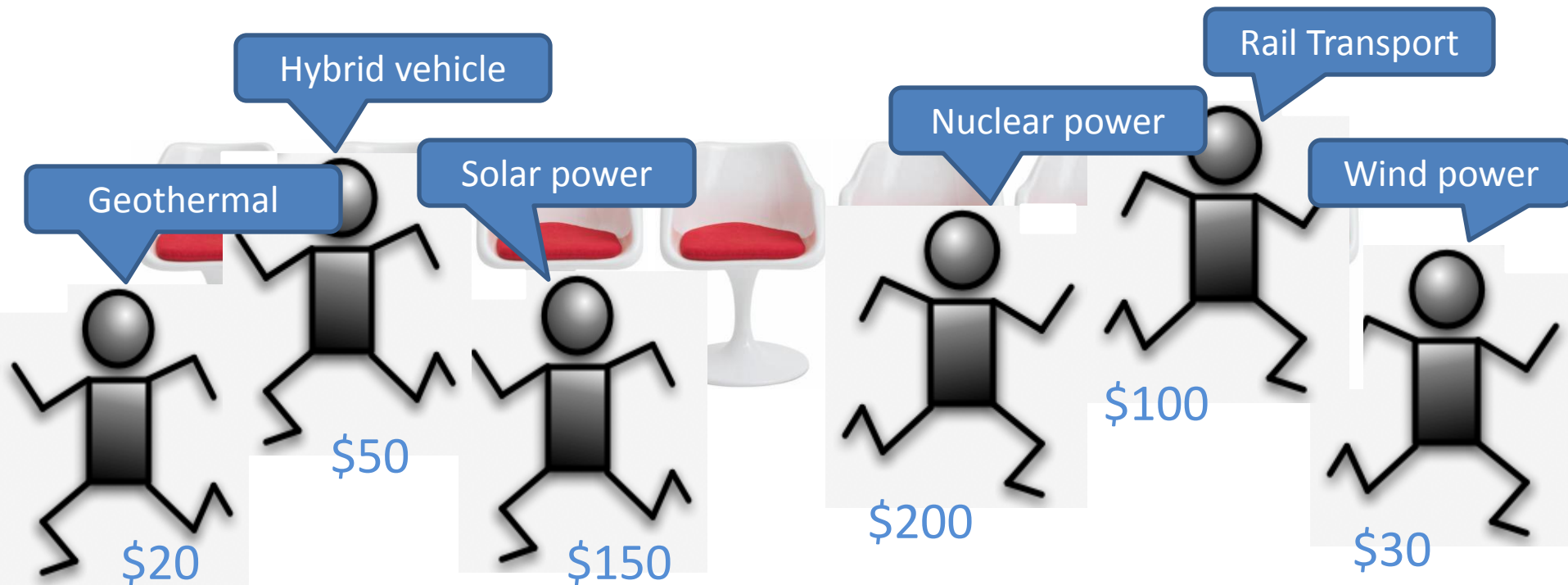




Achieving Reduction Targets

In a market, players leave when they **find better options as costs rise.**

Cap-and-trade lets players **choose at what price they leave** the game
– *and how they want to make that change.*





Achieving Reduction Targets

Who will be the last
greenhouse gas polluters left
in the game?





Achieving Reduction Targets

The last ones remaining in the game are those who:

- A) can **afford to pay** the most, or
- B) have the **least flexibility** to change games.

The underlying assumption is that uses of fossil fuels for which people are **willing to pay the most must be the most valuable.**



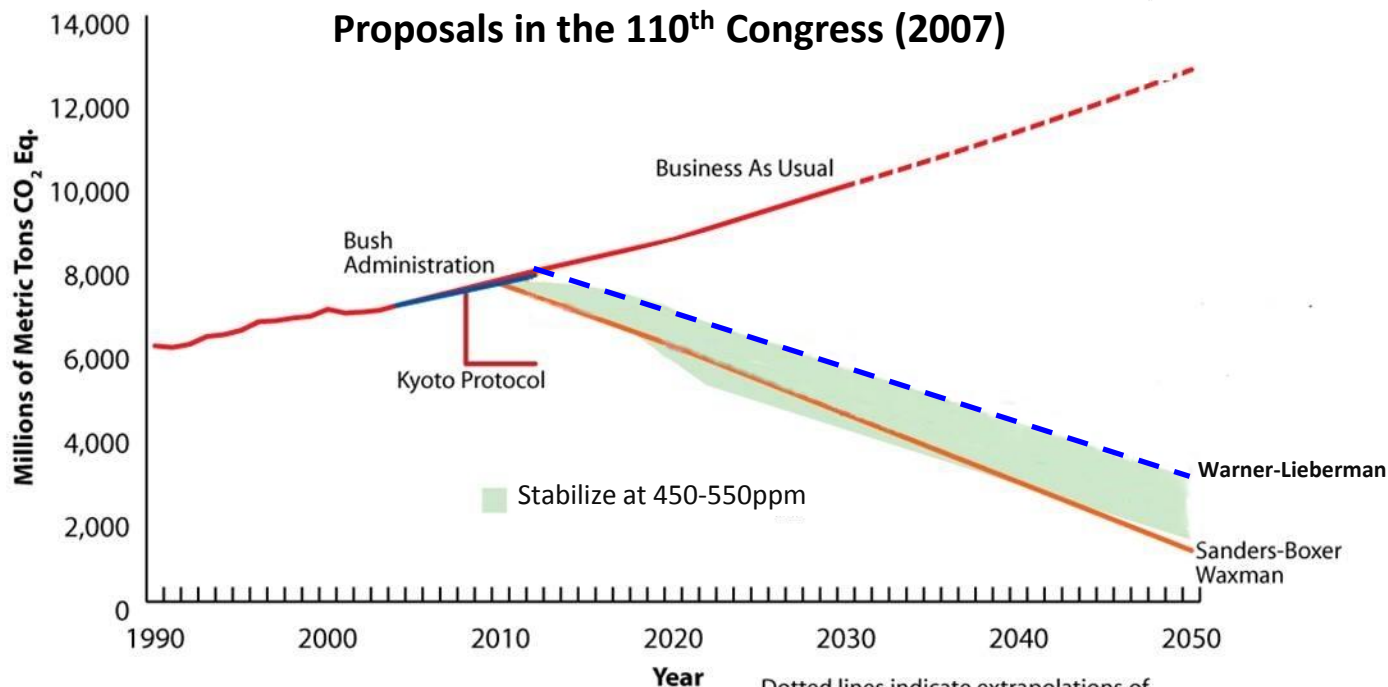
To stabilize global warming, *most* uses of coal, oil, and gas will have to move to a different game: **the clean energy economy.**



Achieving Reduction Targets

To avoid the worst climate impacts, the U.S. must eliminate **at least 80%** of its emissions by 2050.

Comparison of Two Leading Climate Policy Proposals in the 110th Congress (2007)



WORLD RESOURCES INSTITUTE

Chart modified for clarity

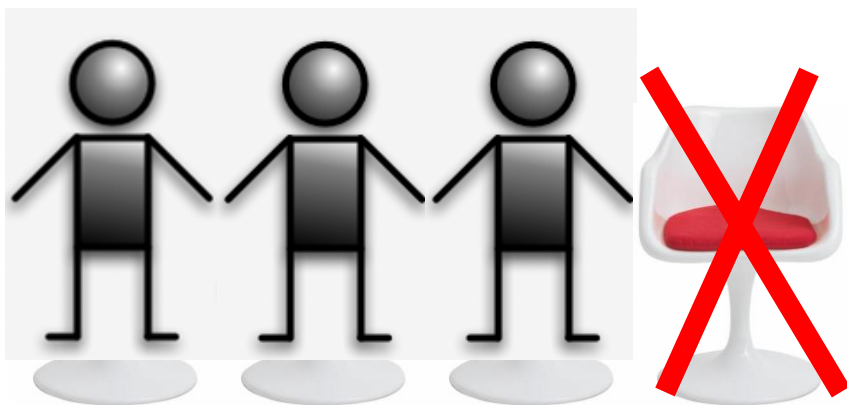
Dotted lines indicate extrapolations of Energy Information Administration projections



Achieving Reduction Targets

As the cap tightens in each new round (compliance period), **fewer permits are available**.

So, players with permits charge the buyers higher prices.

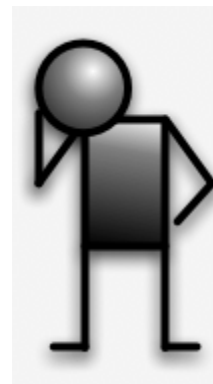


**SELL
PRICE:**

\$90

\$90

\$90





Achieving Reduction Targets

As high as it takes to motivate one of us to stand up.



**SELL
PRICE:**

\$90

\$90

\$90

How high can the price go?



The Carbon Market at Work

So, is it cheaper for me to:

1. *buy a permit from another player,*
2. *reduce my own emissions, or*
3. *buy offset credits?*



**SELL
PRICE:**

\$90

\$90

\$90



Coverage and Distribution

Two critical aspects of cap-and-trade are determined by **how each round begins**:

1. Which polluters should be required to play?
2. Should polluters have to **buy** permits in an auction – or should they receive a **free** allocation of permits?

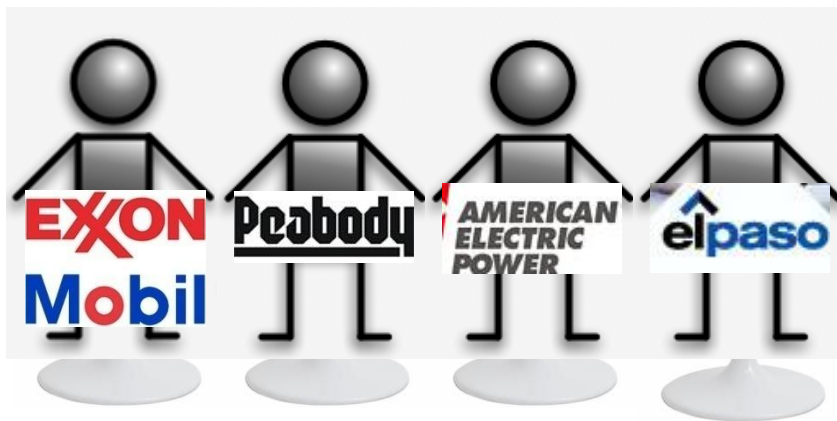


Coverage

For practical reasons, most proposals only require **fossil fuel suppliers and large polluters** to play directly.

As they pass on their costs, the rest of the economy is affected.

Examples of “covered” pollution sources:



Oil
Refineries

Coal
companies

Power
Plants

Natural Gas
companies

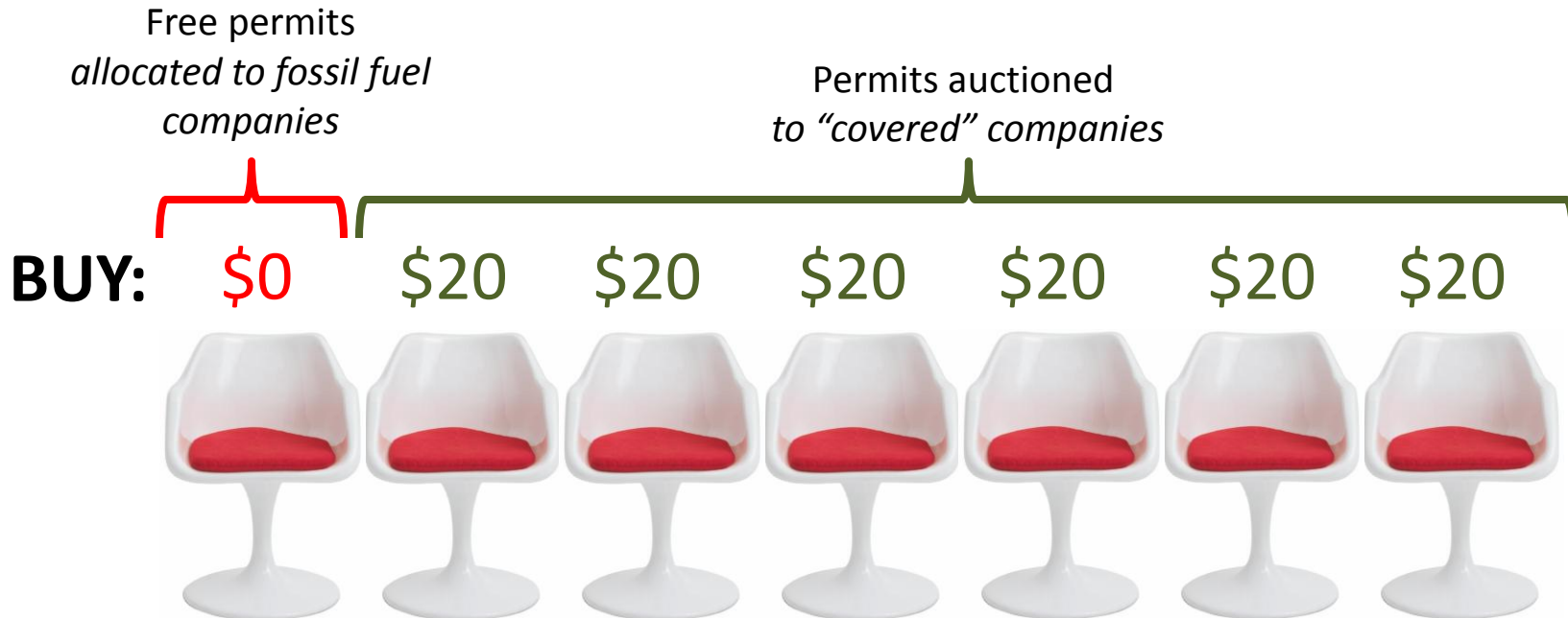


Chemical
companies

Aluminum
smelters

Auctioning Permits vs Allocating for Free

Though sales of coal, oil, and gas should decline as carbon prices rise, economists say **less than 20%** of the permits should be given for free to compensate those firms for additional profits *they might have had otherwise*.



Spending

With hundreds of billions of dollars being raised, expectations are high about who could benefit from climate policy – and how:

- **Tax credits and Incentives** – support for efficiency and zero carbon energy sources
- **Research & Development** – like the Apollo Project but for low or zero carbon energy sources
- **Low-income Households** – committing at least 15% of all revenues to neutralizing impact of higher prices on fossil fuels and other goods
- **Adaptation** – helping vulnerable communities (1) avoid harm from climate change, and (2) recover from climate damages
- **Green Collar Jobs** – encouraging job development in the clean energy industry

For Further Reference

The following public interest organizations have a strong focus on climate policy design and development in the U.S.:

Washington Department of Ecology

<http://www.ecy.wa.gov/climatechange/>

World Resources Institute

www.wri.org

Pew Center on Global Climate Change

www.pewclimate.org

Resources For the Future

www.rff.org

Western Climate Initiative

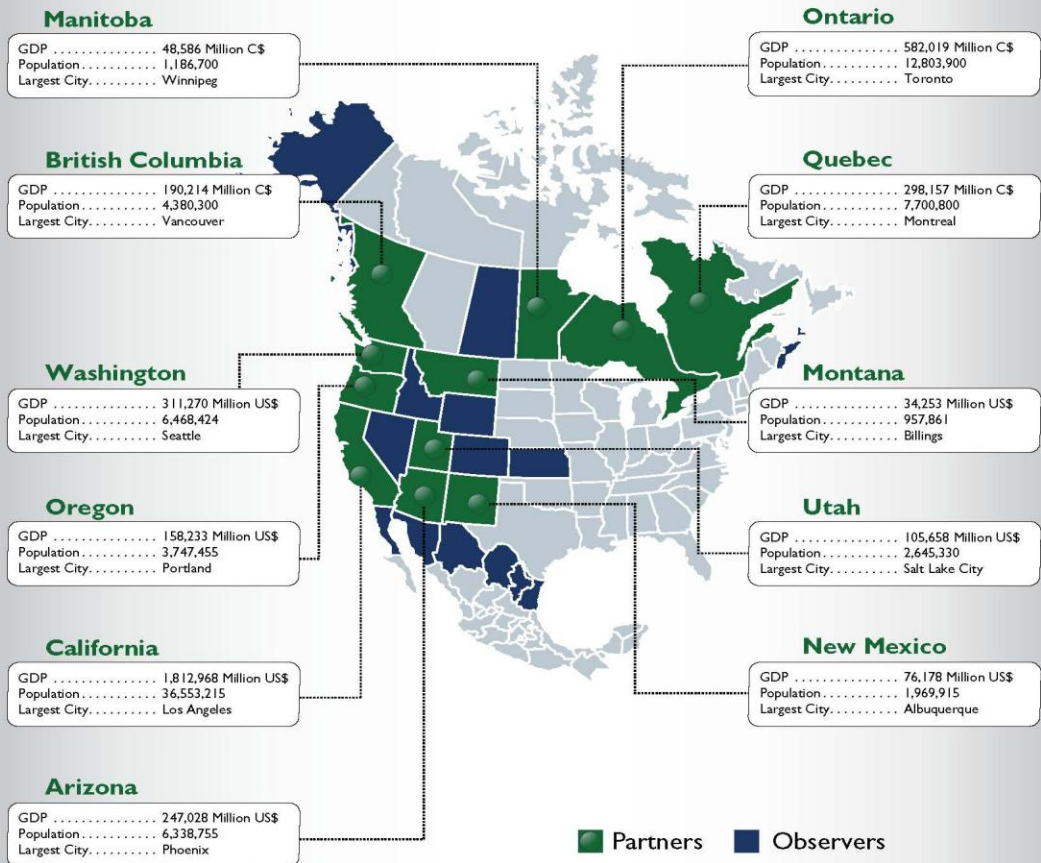


Western Climate Initiative

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Western Climate Initiative



WCI OBSERVERS		
CANADA	UNITED STATES	MEXICO
Nova Scotia	Alaska	Baja California
Saskatchewan	Colorado	Chihuahua
	Idaho	Coahuila
	Kansas	Nuevo Leon
	Nevada	Sonora
	Wyoming	Tamaulipas

All Figures for 2007
 Source for US data: US Census Bureau and US Bureau of Economic Analysis
 Source for Canadian data: Statistics Canada

WCI Cap and Trade

- WCI Cap and Trade Policy Framework (Sept 2008)
- Coverage: 90% of the region's emissions; 6 greenhouse gases
- Cap: 15% below 2005 levels by 2020
- Threshold 25,000 metric ton annual emissions
- Offsets allowed
- Unlimited banking ; no borrowing; three year compliance periods
- Early Reduction Allowances (ERA)
- Allowance distribution left to each partner; recommend 10% minimum auction
- Start date 2012 with fully economy coverage in 2015

National Context -- Waxman-Markey Bill American Energy and Security Act (H.R. 2454)

- Coverage: 85% of U.S. emissions; 7 GHGs
- Cap: 17% below 2005 levels by 2020; 83% below by 2050
- Threshold: 25,000 metric tons annual emissions; EPA may lower to 10,000 metric tons after 2020
- Offsets allowed
- Unlimited banking, 2 year compliance period
- Allocation of allowances: initially 85% free allocation/15% auction
- Holders of allowances issued by WCI before 12/31/11 can exchange them for federal allowances
- Start date 2012; full economy coverage in 2016

Offsets

- Agriculture (soil sequestration & manure management)
- Forestry (afforestation/ reforestation, forest management, forest conservation, forest products)
- Waste management (landfill gas and wastewater management)

Offsets criteria

Core criteria

- Real
- Additional/ surplus
- Verifiable
- Permanent

Supporting criteria

- Transparency
- Quantifiable,

conservative, accurate,
reduces uncertainty,
addresses leakage, etc

Process

- Draft recommendations (Dec)
- Reviewing existing offset protocols (Jan)

For more information

- Website and WCI listserv –
www.westernclimateinitiative.org
- Washington's Website and listserv –
www.ecy.wa.gov/climatechange
- WCI
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