Overview Frame

Costs of climate change: Hotter, drier, more severe storms, and rising seas adds up to $1.9 trillion for the U.S.

Three big problems: high energy prices, oil addiction, global warming
One solution: Repower America with clean energy

Practical and affordable solutions exist: What’s missing is political will and the policy framework to drive investment

A federal cap and trade with provisions to support energy efficiency and energy technology innovation is the best way to drive the emission reductions we need

Fair distribution of allowance value to consumers (focusing on low-income), technology investment, and adaptation.
Arctic meltdown

Since 1979, more than 40% of the Polar Ice Cap has melted away.

SUMMER ARCTIC SEA ICE BOUNDARY IN 1979
Temperature rise above pre-industrial (°C)

- Risks to Many
- Increase
- Negative for Most Regions
- Net Negative in All Metrics
- High

- Risks to Some
- Increase
- Negative for Some Regions; Positive for Others
- Positive or Negative Market Impacts; Majority of People Adversely Affected
- Low

- Risks to Unique and Threatened Systems
- Risk of Extreme Weather Events
- Distribution of Impacts
- Aggregate Impacts
- Risks of Large Scale Discontinuities

IPCC 2007

Impacts

2 °C

Poor are the most vulnerable
Acting now to reduce US global warming pollution is practical and affordable

(We can’t afford not to)

• McKinsey concluded no net economic cost to control US global warming emissions if we start now
  – Benefits from reduced energy use cover the cost of cleaning up remaining supply
  – Study considered only proven technologies and assumed uninterrupted improvement in standard of living

• Other studies suggest benefits of stopping global warming range up to 20% of GDP by 2100
Efficiency Can Pay For Supply-side Measures

2030 U.S. abatement potential under mid-range commitment and action

Source: McKinsey
All regions can contribute cost-effective emissions reductions

**Cost**  Real 2005 dollars per ton CO2e

<table>
<thead>
<tr>
<th>Region</th>
<th>Abatement potential</th>
<th>Megatons CO2e</th>
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<tbody>
<tr>
<td>Northeast</td>
<td>330</td>
<td>330</td>
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<tr>
<td>West</td>
<td>600</td>
<td>600</td>
</tr>
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<td>Midwest</td>
<td>890</td>
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<tr>
<td>South</td>
<td>1,130</td>
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Source: McKinsey analysis
Cap and trade is the key strategy to control US global warming pollution at least cost.

**Revenue from cap supports immediate cost minimization through energy efficiency**

**Federal emissions cap** to drive investment in proven clean technologies*

**Abatement**

GtCO₂e/year in 2030

- Cost after learning-by-doing
- Cost without learning-by-doing

* Putting a price on greenhouse gas emissions helps to encourage energy efficiency and innovation but it is insufficient.
McKinsey-inspired NRDC strategy would allow us to cut U.S. global warming pollution 80% by 2050

1 Constant 2007 dollars
2 Billions of tons of CO₂ equivalent eliminated per year relative to business as usual projections
Source: NRDC analysis partially extrapolated from McKinsey report; see www.marketinnovation.org
The Rising Tide for Global Warming Solutions

April 2008

LEGEND:
- **Green**: Commitment to Mandatory Cap (25 States)
  (41% of total US emissions)
- **Light Green**: Considering Mandatory Cap (6 States)
  (8% of total US emissions)
- **Blue dots**: Mayors Signed on to Climate Agreement (818)
- **Blue leaf**: Cap on Vehicle Emissions (18)
Comparison of Legislative Climate Change Targets in the 110th Congress, 1990-2050
As of September 9, 2008

For a full discussion of underlying methodology, assumptions and references, please see http://www.wri.org/usclimatetargets. WRI does not endorse any of these bills. This analysis is intended to fairly and accurately compare explicit carbon caps in Congressional climate proposals and uses underlying data that may differ from other analyses. Price caps, circuit breakers and other cost-containment mechanisms contained in some bills may allow emissions to deviate from the pathways depicted in this analysis.
What is Cap and Trade

5 Simple Steps to Cap and Trade

1. Set the cap: Guided by climate science, the government sets the cap on overall greenhouse gas emissions.

2. Allocate permits: The government assigns “allowances,” with each representing a ton of carbon dioxide emissions, so that their total number equals the cap. Allowances can be distributed to firms for free, or auctioned off.
5 Simple Steps to Cap and Trade cont’d.

3. Measure emissions: Firms monitor and report their emissions. Electric utilities, for example, already have equipment installed on smokestacks of power plants that measures pollution in real time and sends the data to EPA.

4. Ensure compliance: At the end of each year, every regulated firm turns in enough allowances to cover its emissions.

5. Guarantee flexibility: The market provides flexibility in how firms can meet their targets. They can reduce emissions, buy allowances, borrow allowances from the future, use “banked” allowances from earlier years, or purchase offsets from non-covered entities.
Who is regulated?

• Sources of GHG emissions:
  – Electricity Sector
  – Transportation
  – Industrial Emitters/Chemicals
  – Agricultural Sector

• Coverage:
  – Electricity sector
  – Industrial Sector
  – Petroleum at producer/importer
  – Natural gas residential/commercial
  – Other GHG produce/importer
What are “allowances”

– Allowances are permits to emit GHGs

– Number of allowances created is same as tonnage limit of cap, 1 ton of emissions = 1 allowance

– Allowances have monetary value in cap and trade system
The Distribution of Emissions Allowances and Allowance Value under a Federal Cap-and-Trade Program

Mitigation for Unrecoverable Compliance Costs and Competitiveness Concerns
i.e., allocations to regulated entities for unrecoverable compliance costs; allocations to energy intensive industries with limited cost-pass through ability; allocations to industries facing international competition

Incentives for GHG-Reducing Actions and Behaviors
e.g., incentives for the adoption of building codes and standards, incentives for renewable energy deployment, incentives for CCS deployment, incentives for land use planning and mass transit, recognizing and encouraging early action, incentives for states to implement necessary regulatory changes

Equity Concerns for Consumers, Communities and Workers
e.g., mitigate end use energy consumer costs, worker retraining/assistance for dislocated workers, low-income energy assistance; adaptation assistance for communities affected by physical climate impacts

Technology and Adaptation Investment
e.g., Large scale RDD&D in low and zero-emitting technologies, such as low carbon and zero carbon fuels, low and zero carbon generation technologies, low and zero carbon vehicle technologies, advanced energy infrastructure; RDD&D in climate mitigation and adaptation measures and strategies

Purpose/Objectives > Recipients > Methodology
Two basic allocation approaches

- Grant pollution permits to various entities
- Auction pollution permits and redistribute revenues to various entities
- Either way, the value of permits are expected to be large: ~$50-$200 billion/yr.
Free Allocation vs. Auction of Allowances

**Auction**: most efficient/transparent approach—can recycle revenue.

- Argument—raises costs—answer—recycle revenue to appropriate parties

**Free Allocations**:

- Free Allocation—to anyone including emitters.
  - Free allocation to emitters: Transition assistance vs. Windfall profits
  - Free allocation to non-covered sources: Competitiveness/Clean technology deployment/emission reductions
Grandfathering to Emitters; Auction and Reduce Income Taxes

- Both mechanisms hurt all but the top 10% of the income distribution
- Are the most regressive
- Of all of the options, grandfathering is the most expensive approach per unit of CO2 reduced
Auction and Reduce Payroll Tax

• After grandfathering or reducing income taxes, the next most regressive
• Everyone bears a net cost, but the poorer you are, the larger the percentage of your income spent on carbon costs
Auction and Expand EITC; Auction and Return Lump Sum; Auction and Spend on Energy Efficiency

- Are the most progressive, with the bottom 1-2 deciles coming out slightly ahead
- If implemented carefully, energy efficiency is the least-cost way to allocate revenues
Example: LW Allocation

Allocation of Allowances
(% of total available allowances, 2012-2050)

- Auction: 51%
- Transition Assistance to Regulated Entities: 16%
- Coal Capture and Sequestration: 3%
- States & Tribes: 11%
- Consumers: 11%
- Domestic Agriculture and Forestry: 5%
- International Forests: 2%
- Landfills and Coal Mines: 1%

Source: Pew Center on Climate Change
Example: LW Auction Revenue

**Distribution of Auction Revenue**
(% of total available allowances, 2012-2050)

- Non-auction Allowances: 48%
- Advanced Energy Research (ARPA-E if in existence): 1%
- International Adaptation and National Security: 3%
- Adaptation Fund: 9%
- Low-Income Energy Assistance Fund: 9%
- Climate Change Worker Fund: 3%
- Energy Technology Development Program (early auction funds): 27%

Source: Pew Center on Climate Change
Dingell Boucher Draft Proposal

Allocation Option A

(Does not include 2012-13 or natural gas local distribution companies for commercial/residential use, which come under the cap in 2017/2021)
Dingell Boucher Draft Proposal

Allocation Option B

(Does not include 2012-13 or natural gas local distribution companies for commercial/residential use, which come under the cap in 2017/2021)
Dingell Boucher Draft Proposal

Allocation Option C

((Does not include 2012-13 or natural gas local distribution companies for commercial/residential use, which come under the cap in 2017/2021))
Dingell Boucher Draft Proposal

Allocation Option D

((Does not include 2012-13 or natural gas local distribution companies for commercial/residential use, which come under the cap in 2017/2021))
Green Recovery

- **Invest $100 billion over 2 years in**
  - Building retrofits
  - Mass transit and freight rail
  - Wind Energy
  - Solar Energy
  - Advanced biofuels
  - Smart grid electrical transmission systems

- **Creates 2 million new jobs**
  - Nearly 4 times more jobs than spending the same amount of money within the oil industry
  - Roughly **triple the number of good jobs** — paying at least $16 dollars an hour — as spending the same amount of money within the oil industry

- **Reduce the unemployment rate** from 5.7% to 4.4%
- **Funded by a cap and trade program**

Source: Report by the University of Massachusetts Political Economy Research Institute
Green jobs use skills many workers already have

<table>
<thead>
<tr>
<th>GREEN INVESTMENTS AND JOBS</th>
<th>STRATEGIES FOR GREEN ECONOMIC INVESTMENT</th>
<th>REPRESENTATIVE JOBS</th>
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<tbody>
<tr>
<td>Building Retrofitting</td>
<td>Electricians, Heating/Air Conditioning Installers, Carpenters, Construction Equipment Operators, Roofers, Insulation Workers, Carpenter Helpers, Industrial Truck Drivers, Construction Managers, Building Inspectors</td>
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<tr>
<td>Mass Transit/Freight Rail</td>
<td>Civil Engineers, Rail Track Layers, Electricians, Welders, Metal Fabricators, Engine Assemblers, Bus Drivers, Dispatchers, Locomotive Engineers, Railroad Conductors</td>
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<tr>
<td>Smart Grid</td>
<td>Computer Software Engineers, Electrical Engineers, Electrical Equipment Assemblers, Electrical Equipment Technicians, Machinists, Team Assemblers, Construction Laborers, Operating Engineers, Electrical Power Line Installers and Repairers</td>
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<tr>
<td>Wind Power</td>
<td>Environmental Engineers, Iron and Steel Workers, Millwrights, Sheet Metal Workers, Machinists, Electrical Equipment Assemblers, Construction Equipment Operators, Industrial Truck Drivers, Industrial Production Managers, First-Line Production Supervisors</td>
<td></td>
</tr>
<tr>
<td>Advanced Biofuels</td>
<td>Chemical Engineers, Chemists, Chemical Equipment Operators, Chemical Technicians, Mixing and Blending Machine Operators, Agricultural Workers, Industrial Truck Drivers, Farm Product Purchasers, Agricultural and Forestry Supervisors, Agricultural Inspectors</td>
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