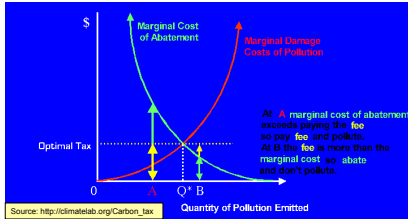


Carbon Taxes as a Tool for Climate Protection



Jim Lazar, Consulting Economist
Microdesign Northwest, Olympia, WA
Pacific Northwest Carbon Pricing Conference
May 21, 2011

Characteristics of a Carbon Tax

- Imposed by government on carboniferous energy, at the point of production or importation.
- Price is knowable in advance; generally a schedule.
- Economic response depends on price elasticity and cross-elasticity with other energy alternatives.
- Best example (besides BC): proposal by Rep. Bob Inglis, R, NC, in 2009. \$10/ton in 2012, rising to \$100/ton in 2040.

Advantages vs. Cap and Trade

- Price is known
- Not easily subject to evasion or manipulation
- Revenues available for designated purposes
- Revenue-neutrality is an option

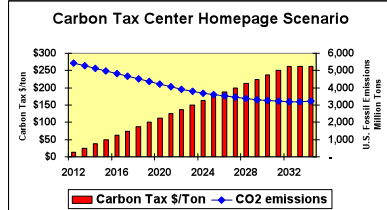
Disadvantages vs. Cap and Trade

- No opportunity for economic optimization;
- CO2 reductions cannot be precisely known in advance.

Localized disparities in cost can be very serious. (Same with Cap and Trade and Cap and Dividend)

Price Elasticity Alone Is A Blunt Instrument

- Carbon Tax Center estimates that \$262/ton is needed to achieve 50% reduction in CO2 by 2035 through price elasticity.
- BC Tax is \$20/ton, rising to \$30 in 2012.

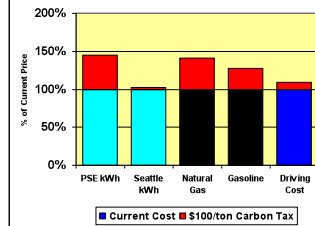


Source: Carbon Tax Center. http://www.komanoff.net/fossil/CTC_Carbon_Tax_Model.xls

What would \$100/ton mean?

- ~44% increase in Puget Sound Energy electric rates.
- Miniscule change to Seattle City Light.
- ~40% increase in retail natural gas rates
- \$1.00/gallon (25%) increase in gasoline prices
- BUT only 9% to total cost of driving.
 - ~7% reduction in gasoline use
 - ~2% reduction in driving

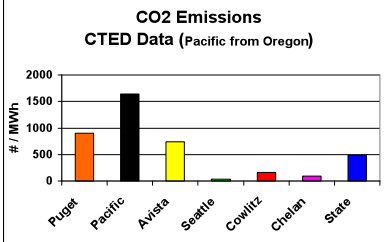
Relative Impact of \$100/ton Carbon Tax



Source: Microdesign Northwest Calculations

CO₂ Emissions Vary Considerably by Utility

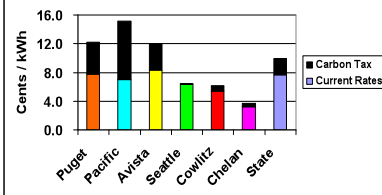
- Public Power utilities have lower CO₂ emissions because more of their power comes from hydro.
- Private Utilities get more of their power from natural gas and coal.



Rates for Pacific Power Could More than Double

- Private Utilities get most of their power from natural gas and coal.
- Public utilities would see little impact.

Residential Electric Rates with \$100/Ton Carbon Tax



Some Industries Could Be Severely Affected

Most Energy Intensive Energy > 5% of cost

- Aluminum (~ 30%)
- Pulp and Paper
- Cement
- Steel
- Oil Refining
- Agriculture
- Food Processing
- Transportation
- Data Centers

Least Energy Intensive Energy < 2% of cost

- Services
- Retail
- Aircraft Manufacturing
 - \$150,000 of aluminum in a \$150 million Boeing 777
- Computers
- Computer Software
- Fabrication and assembly
- Construction

Source: U.S. Department of Energy <http://www.eia.doe.gov/oiaf/aecio/otheranalysis/heim.html>

Some Gnarly Issues: Imported Electricity; Exported Gasoline

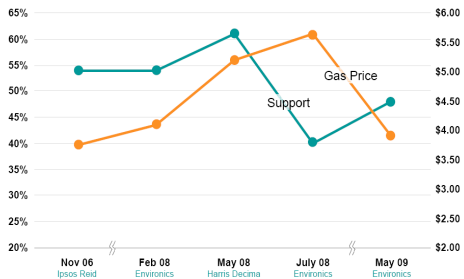
Imported Electricity

- PSE gets about 30% of it's power supply from coal plants in Montana. Who taxes the carbon?
- BC Hydro buys coal power from Alberta, and exports "hydro" to the south. Who taxes the Alberta coal?
- California approach: make the entity delivering the power into California responsible for the carbon content, regardless of where it came from.

Exported Petroleum Products

- Puget Sound refineries serve Oregon. Should we tax the carbon on Oregon gasoline?
- Oregon COULD import from other places (Alaska), if the economics made it worthwhile.
- Much of Eastern Washington petroleum product comes from Utah and Wyoming refineries.
- BC Approach: tax only that consumed in BC, regardless of origin.

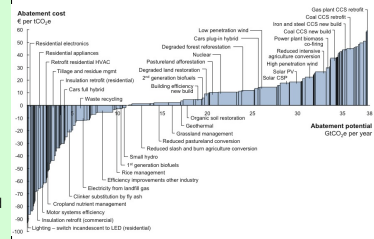
Public Support for the BC Carbon Tax



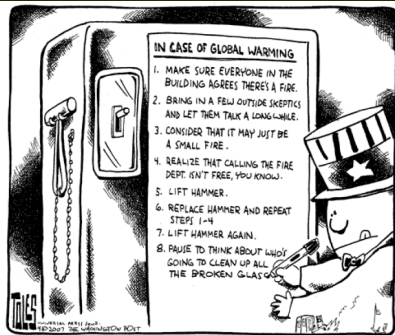
Source: Carbon Politics: The bumpy implementation of the BC Carbon Tax. Richard Littlemore Pricing Carbon Conference November 20, 2010

Alternative: Moderate Carbon Tax, Directly Invested in Carbon Reductions

- McKinsey supply curve tells us we can reduce CO2 emissions for < \$30/ton.
- A \$30/ton carbon tax, invested in carbon reductions, can achieve carbon goals.
- \$100/ton carbon tax, used for other purposes, might not.
- Keeping it focused, and not diverted, is a huge political challenge.



Whatever you do, don't do nothing.



Source: Beyond the Economics of Inaction: The role of carbon prices in Climate Policy. Frank Ackerman, Stockholm Environmental Institute, November 20, 2010

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