



Carbon Tax Center (CTC) Spreadsheet Q&A

1. What are the limits of the CTC model?

The CTC model (1) provides a "rough but reasonable" estimate. It does not calculate beyond 2034 because "beyond that point (and likely before) the tax rate would almost certainly be adjusted". Furthermore, the model does not account for greenhouse gas emissions other than CO₂, such as methane, N₂O, CFCs, or black carbon. Since CO₂ alone is the greenhouse gas most responsible for the warming, and has been the focus of political discussions, this is an appropriate start. In the long term however, focusing on CO₂ alone will not solve the problem.

Furthermore, the model does not allow you to vary the rate of fee increase, as the CCL's proposal does. That is, the model will only rise by \$10 per ton per year, or \$15 per ton per year, but not \$15 in the first year and \$10 in every year after that.

2. How much will the fee increase the price of gas?

When calculated using US tons, an incremental \$15 carbon fee increases gas prices by \$0.15, \$0.29, and \$0.42 per gallon in the first three years, respectively. Using metric tons, the corresponding values are \$0.13, \$0.26, and \$0.38. The annual increase varies because the model assumes an annual 1% decrease in fossil carbon content per gallon due to increased infiltration of biofuels, hydrogen, etc.

3. How is the dividend per capita calculated? What will the dividend be in the future?

The dividend per capita takes the estimated total carbon emissions for a year, multiplies by the fee for that year, and divides by the US Census Bureau's estimate of population in that year. Using a \$10 increment, the per capita dividend is \$174, \$337, and \$490 for the first 3 years, \$1,187 in 2020, and \$1,933 in 2030.

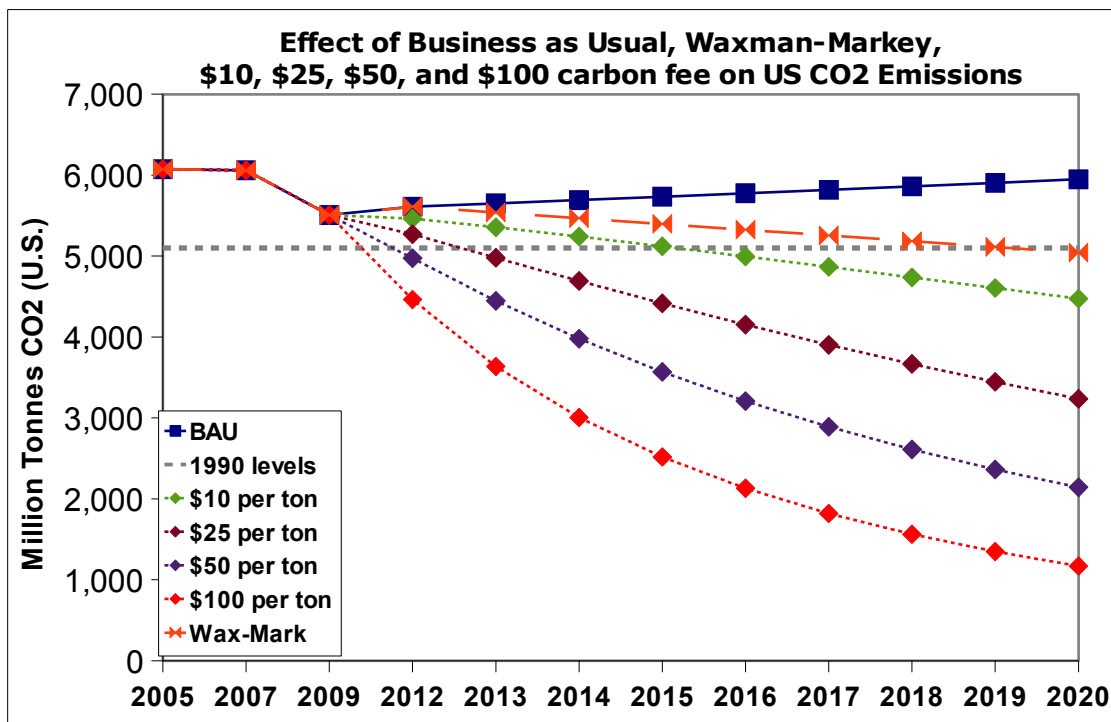


Figure 1: A graph comparing US CO₂ emissions under different carbon pricing regimes. The gray dashed line indicates US CO₂ emissions in 1990; the target level chosen under the Kyoto Accords.

4. What does the CTC's model account for?

The CTC model varies the carbon price and calculates its effect on US CO₂ emissions from 4 sectors: electricity (40% of emissions), gasoline (21%), aviation (4%), and "other" (35%). Electricity incorporates nearly all coal production in the US, as well as some oil and natural gas emissions. Gasoline covers both diesel and gasoline use, and aviation covers jet fuel. "Other" is an estimate that groups together the hundreds of other disparate sectors burning fossil fuels, and is thus necessarily less rigorous than the other sectors.

5. *When would a \$10 per ton fee halve US emissions? What about a \$25 per ton fee?* *[This question is answered for both 2007 (pre-recession) and 2009 (post-recession). 2009 numbers have been put in parentheses after each corresponding 2007 number.]

In 2007 (2009) US CO₂ emissions were 6.12 (5.50) billion metric tons, equivalent to ~0.5 ppm atmospheric CO₂ rise. Half would thus be 3.06 (2.75) billion metric tons. Recalling that the model arbitrarily only projects to 2034, the smallest increment that will halve our 2007 (2009) emissions by 2034 is \$13.50 (\$16.50) per ton of CO₂. A \$25 per metric ton increment gets us there by 2021 (2023). Thus, a \$10 price per ton of CO₂ will not halve our emissions within the time frame of this model.

6. *If we had signed Kyoto, what would we have had to reduce our emissions to?*

Kyoto requires signees to reduce their emissions to 1990 levels by 2012 (2). In 1990, the US emitted 5.099 billion metric tons of CO₂ (3). A \$10 increment (the CCL's recommendation) would get us there by 2016 (Figure 1).

7. *How will a \$15 fee affect our dependence on foreign oil?*

The U.S. imported 58% of its oil in 2007 (4) (Figure 2). The CTC predicts a \$15 fee reduces our gasoline usage in 2020 by 1.85 million barrels per day; a 9% reduction over business as usual.

8. *When will a carbon tax get us to 350?*

A carbon price alone will never get us to 350. Since we are at 392 ppm CO₂ in the atmosphere, and CO₂ survives for hundreds to thousands of years in the atmosphere, humanity must do two things to get us to 350: 1) Get fossil fuel emissions to 0, 2) go "carbon negative"; actually remove CO₂ from the atmosphere and sequester it safely. A price on carbon can reduce our emissions to 0, but it can not turn us carbon negative.

9. *What would get us to 350, and why aren't we lobbying for that?*

Getting to 350 means going carbon negative. That means employing carbon capture and sequestration (CCS) technology that removes CO₂ from the atmosphere and traps (i.e. "sequesters") it permanently. We aren't lobbying for it yet because 0 emissions is the bigger priority. Coal, oil, and gas are already perfectly sequestered carbon. The slower we dig it up, the less we'll have to remove. Furthermore, whereas the technology to go carbon negative is not yet scalable or obvious, the technology to go carbon neutral is. Our efforts will bear greater immediate and long-term fruit by focusing on a carbon price.

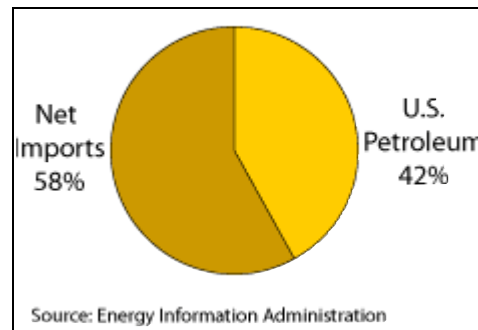


Figure 2: Net oil imports and domestic production as shares of US demand in 2007.

References:

1. Charles Komanoff. "4-sector National Carbon Tax Model." The Carbon Tax Center, 2011. URL: http://www.komanoff.net/fossil/CTC_Carbon_Tax_Model.xls
2. United Nations Framework Convention on Climate Change. "Kyoto Protocol". Last accessed: 7/23/11. URL: http://unfccc.int/kyoto_protocol/items/2830.php
3. U.S. Environmental Protection Agency. "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009". URL: http://epa.gov/climatechange/emissions/downloads11/US-GHG-Inventory-2011-Complete_Report.pdf
4. Consumer Energy Report. "Where The US Gets its Oil From". Last Accessed: 7/23/11. URL: <http://www.consumerenergyreport.com/research/crude-oil/where-the-us-gets-its-oil-from/>