ECN 362 — Homework #4 (Due 8 Apr 2014 on Canvas)

Read this article: http://tinyurl.com/m4kc4z8[1]

1. Go here (http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=90&pid=44&aid=8) and look up TOTAL CO_2 emissions (million metric tons, mmt) for Canada and China in 2011 and 2001. (Ignore decimals! Do not round)
   (a) List mmt emissions for both years for both countries.
   (b) Has the *total* gone up or down in the past decade for Canada? China?

2. From the same place, look up 2011 CO_2 emissions from
   (a) Coal for Canada and China in mmt AND % of 2011 totals from (1a).
   (b) Petroleum for Canada and China in mmt AND % of 2011 totals from (1a).

3. Scientists recommend zero emissions of GHGs by 2050 to prevent dangerous climate change (http://tinyurl.com/lekfg24). Let's target a 40% emissions reduction in both China and Canada in ten years. Let's *assume* that elasticity over a ten-year period is is -0.5 for BOTH coal and oil in both countries.[2] Now go to http://www.eia.gov/countries/index.cfm?view=consumption for 2012 oil and http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=5&pid=5&aid=2 for 2011 coal, to look up consumption of
   (a) Coal (thousand short tons, tst) in Canada and China.
   (b) Oil (millions barrels/day, mbd) in Canada and China.

4. Using a 2011 price of $37/short ton for coal and $87 per barrel for oil, calculate:
   (a) Using a -0.5 elasticity, how big should an "extra carbon tax" (ECT) be if it is going to reduce quantity demanded by 40 percent over 10 years for coal and oil in each country? Ignore inflation, the fact that this is a point elasticity estimate, and existing taxes.
   (b) (You may want to use a spreadsheet for the following questions...) According to CBC (http://tinyurl.com/ku67j28), about 30% of the $1.30/liter price of gasoline in Canada is from taxes and 50% is from the price of crude oil. What would the price of **gasoline** be if the price of **oil** was *increased* by the ECT you found in 4(a)?
   (c) How much revenue will the ECT generate in the first and last year of this program for the Canadian and Chinese governments? Use 2011 consumption levels for first year consumption. Assume that 10th year consumption is 40 percent lower than first year consumption. Calculate ECT-revenues using the SAME pre-tax prices for oil and coal in year 1 and year 10. You will get four values for revenues in Canada and China in year 1 and revenues in year 10.
   (d) How much will **each** Canadian citizen receive if ALL first year ECT revenues are rebated to citizens (assume 30 million people)?
   (e) How much will **each** Chinese citizen receive if ALL first year ECT revenues are rebated to citizens (assume 1.3 billion people)?

5. Assume you are a citizen of Canada or China (choose one). Would you (as a person, not a country) support this tax as a consumer (who pays for energy) and citizen (who experiences climate change and local pollution)? Why?

[1] No articles mentioned on this HW will be on the exam, BUT the ideas will!

[2] According to http://www.inderscience.com/info/inarticle.php?artid=27645, coal price elasticity in China is -1.1 in the long run and nearly 0 in the short run. NB: I've switched from petroleum for convenience