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Transportation Sector Emissions and Reduction Measures

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Issue

A new study by the Belfer Center for Science and International Affairs at the Harvard Kennedy School, entitled "*Analysis of policies to reduce oil consumption and greenhouse gas emissions from the US transportation sector* ", finds that reducing US greenhouse gas (GHG) emissions from the transportation sector—a significant driver of oil security and climate change concerns—will be a much bigger challenge than conventionally assumed. The US transportation sector consumes the majority of the country's imported oil and produces a third of total GHG emissions, making it a key driver to achieve a GHG reduction target of 17% below 2005 levels by 2020. The study indicates that reducing transportation emissions will require stronger policy initiatives than are currently being considered by US policy makers.

The Belfer Centre study examined the effectiveness of five transportation scenarios, and indicated that the most effective policy for reducing carbon emissions is to encourage both the development and sale of more efficient vehicles with strict efficiency standards and the use of fuel taxes to increase the cost of driving. Since the Canadian government has aligned its nationwide GHG reduction targets and its mandatory fuel efficiency targets with those of the US, these findings are highly relevant.

Background

Per capita greenhouse gas emissions in Canada are among the highest in the world and are rising. Transportation accounts for about 25% of Canada's total greenhouse gas emissions; total emission from the sector increased by 27% between 1990 and 2005. Environment Canada believes that aligning Canadian regulations with US federal rules will ensure that

significantly cleaner vehicles and engines will be marketed in Canada while maintaining a level playing field among companies. BC has a more ambitious GHG emissions reduction target of 33 per cent by 2020; 37% of BC's total GHG emissions come from the transportation sector[i].

Options

The Belfer Center examined five scenarios. An energy-economic equilibrium model was used to estimate the cost and carbon-mitigation impacts of each over the 20-year period to 2030 (see Figure 7 from the report, below):

1. CO_2 Tax. A price on CO_2 could result either from a CO_2 tax or a cap-and-trade program. CO_2 prices influence fuel costs in proportion to their emissions intensity from combustion. The Belfer Center selected prices that are significantly higher than those projected under American Clean Energy and Security Act (ACES) of $30/t of CO_2 in 2010 escalating to $60/t in 2030 and found that even at these levels the extensive use of offsets would be required in order to meet targets. Economy wide cap and trade programs may be years away in both the US and Canada; however BC intends to have a cap-and-trade program in place in 2012 under the Western Climate Initiative (WCI). The price of carbon under the WCI is still to be determined. BC currently has a carbon tax in place at 3.33c per litre rising in 2012 to approximately $30/t of CO_2 emitted.

2. CO_2 Tax plus Transportation Tax. The largest reductions in GHG emissions from transportation are obtained by increasing the cost of driving with fuel taxes. While a CO_2 tax can be used similarly to a fuel tax, CO_2 prices at their projected levels are far too small to create a significant incentive to drive less. According to the study, fuel prices above $2/litre may be needed to significantly reduce US GHG emissions and oil imports. At such prices, CO_2 emissions from the transportation sector alone are reduced to 14% below 2005 levels and net crude oil and petroleum product imports decrease by 5.7 million barrels per day, relative to 2008 levels. BC currently has a motor fuel tax in place. This varies depending on the fuel type and region with an average rate of around 19c per litre[ii].

3. Increase Corporate Average Fuel Economy (CAFE) Standards. The US has set mandatory fuel efficiency standards, starting in 2011, of 6.7 litres per 100 km by 2020. As per the alignment policy, these have also been adopted by the Government of Canada. In order to encourage removal of inefficient vehicles from the roads, the US has implemented a program called 'Cash for Clunkers'. In Canada the equivalent program is called 'Retire Your Ride', and in BC, the 'ScrapIT' program. Replacing a 1990 sedan with a 2009 hybrid can result in a reduction of up to 67% in greenhouse gas emissions.

4. Performance-based Tax Credit. Aggressive performance-based tax credits for alternative motor vehicles were found to be expensive and the least effective at reducing GHG emissions, costing the US government between $22 and $37 billion per year. Artificially increasing the popularity of such vehicles through tax credits has the unintended effect of decreasing new conventional-vehicle fuel economy as compared with implementing CAFE standards without the credits. Efficiency policies such as fuel-efficiency standards and purchase-tax credits are politically attractive but do not address growth in vehicle miles travelled, an important root cause of GHG emissions from transportation.

5. Combined Aggressive Case. This scenario combines the four above and has the highest economic cost, but does not achieve the greatest reductions in GHG emissions and oil consumption. The Belfer Center believes reductions would be greater if the tax credits were eliminated.

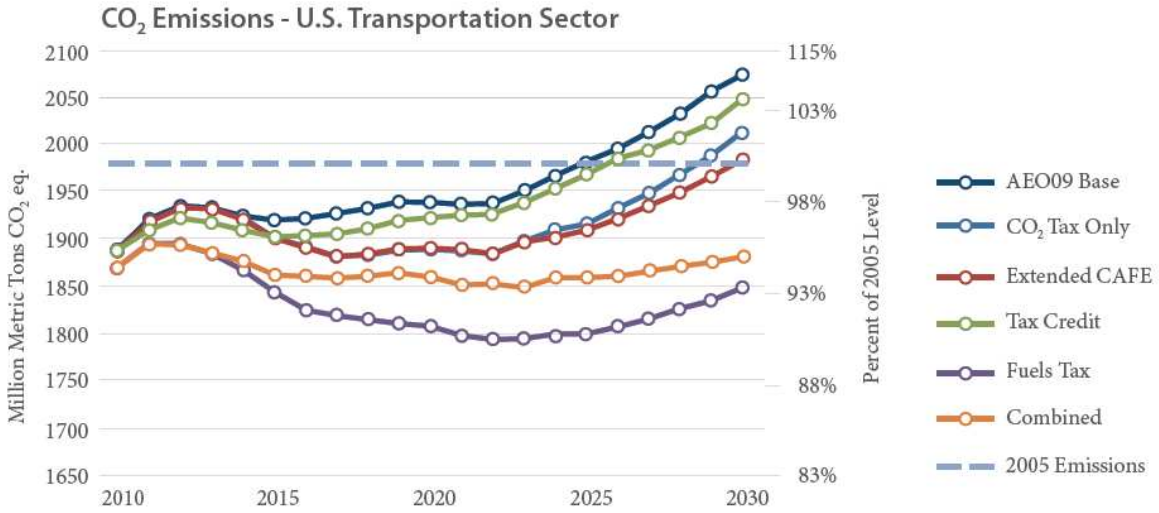

FIGURE 7: CO2 emissions from transportation.

All the policy scenarios modeled by the Belfer Center failed to meet the Obama administration's goal of reducing total US GHG emissions 17% below 2005 levels by 2020. These projected shortfalls imply that, without additional policy action, the purchase of large quantities of offsets will be needed to meet the targets; this will do little to shift the US to a lower-carbon domestic economy. These results imply that Canada too will fail to meet its GHG emissions reduction goals in the transportation sector.

Recommendations

The report found that the macroeconomic impacts of reducing GHG emissions are small, even when relatively aggressive policy scenarios are examined (see Figure 16 from the report, below). Losses in annual Gross Domestic Product (GDP), relative to business-as-

usual are less than 1%, and GDP is projected to grow at 2% to 4% per year through to 2030 under all scenarios. Like the Stern review on the Economics of Climate Change, the Belfer study clearly indicates that aggressive climate change policy will not result in economic hardship.

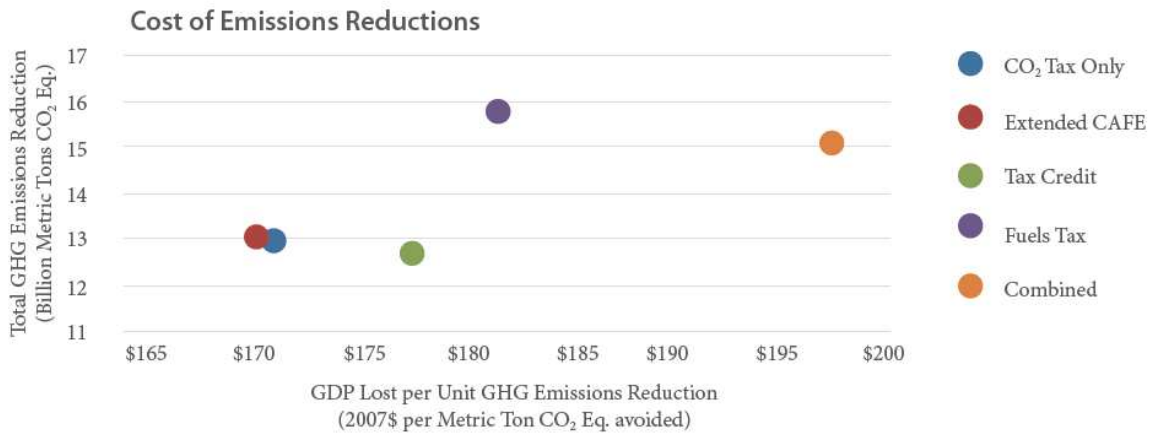

FIGURE 16: Cost of GHG emissions reductions, in terms of GDP lost per unit GHG emissions reduction, against the total GHG emissions reduction.

BC has taken steps additional to those introduced federally by setting emissions reduction targets at 33% below 2007 levels by 2020. BC has a carbon tax and a motor fuel tax in place, although the current collective level of approximately 22.3c per litre will need to increase to above $2 per litre to reduce transport emissions to the desired levels. In terms of removing inefficient cars from the road, 'Retire Your Ride' and 'ScrapIT' have less ambitious targets than proxy schemes in Europe. Additionally, BC uses performance-based tax credits rather than incentives to encourage the switch to alternative vehicles. In 2005 the BC government introduced a provincial sales tax rebate for British Columbians buying new hybrids. That incentive has been extended to April 1, 2011. This approach is inconsistent with the Belfer report, which suggests that tax credits are the least effective method of reducing GHG emissions from transportation.

Further Reading:

May 2009, Sierra Club Canada: *Canada must match Obama's pace in vehicle fuel efficiency standards*
http://www.sierraclub.ca/en/node/1453

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http://www.hastebc.org/haste-news/canada-set-mandatory-vehicle-fuel-standards

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http://www.env.gov.bc.ca/epd/bcairquality/topics/government-vehicle-programs.html

November 2007, The Pembina Institute, *BCs 2020 emissions reduction target: How do we get from here to there?*
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Sources:

The Belfer Center for Science and International Affairs, Harvard University, February 2010: *Analysis of policies to reduce oil consumption and greenhouse gas emissions from the US transportation sector*, W. Ross Morrow, Kelly Sims Gallagher, Gustavo Collantes

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http://www.ec.gc.ca/doc/media/m_124/report_eng.pdf

BC Government, *BC Air action plan*
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[i] Livesmart BC, BCs Greenhouse gas emissions

[ii] Ministry of Finance, Tax Bulletin, Revised January 2010

WORD COUNT: 1201 (not counting reading/sources)