

Impact of carbon tax on different household income groups

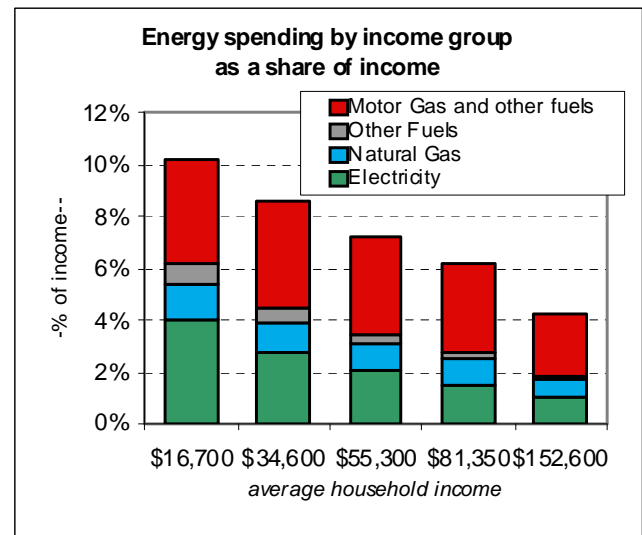
The impact of carbon taxes on different household income groups has recently become the topic of increasing discussion at the national level. This is also an issue of direct immediate concern for people in British Columbia, where the centerpiece of the provinces' 2008 Budget was a carbon tax that comes into effect on July 1, 2008.

B.C. together with other provinces, including now Ontario and Quebec, is also developing a cap and trade system for emissions from large industry sources. These will also lead to increased prices for households, even if the permits are granted for free. But these systems have not been developed yet and the impacts are more difficult to determine.

All the revenues raised from B.C.'s carbon tax will be redirected into tax cuts in other areas – including a low-income tax credit and personal and corporate income tax cuts – so the measure will be revenue-neutral for the B.C. government.

A “revenue neutral” carbon tax similar to B.C.'s has been proposed at the national level by the Green Party, some environmental organizations and is widely rumoured to be proposed by the Liberal Party.

While governments and some political parties have taken pains to propose revenue-neutral carbon taxes, different polls have found that a majority of Canadians said they would be in favour of a carbon tax if the revenues raised went to public investments in environmental projects – such as public transit, energy efficiency and renewable energy – and if the vulnerable were protected.



Given the generally positive public reception to B.C.'s carbon tax and the pressure that other governments are under to do something serious about climate change, it is important to take a closer look at the impacts. Fortunately, CUPE has already analyzed the impacts of a carbon tax as part of the *Alternative Federal Budget*.

This provides some answers to the following questions:

- How would a carbon tax increase costs for households of different income groups?
- What is needed to ensure that vulnerable lower income and middle-income families are protected and compensated for higher costs?

Impact of a carbon tax by income group

Higher income families and households tend to have larger carbon footprints – they consume more and are responsible for more greenhouse gas emissions per person.

However, lower income and middle-income families spend proportionately more of their income on energy and fossil fuels than higher income families. This is partly because lower income families have much less money to save, but also because energy and fossil fuels take a larger share of their annual spending budgets.

A carbon tax at a rate of \$10 per tonne CO₂e (including CO₂ and other gases) would increase the cost of fuels by the following amounts:

- motor gasoline 2.41 ¢ /litre
- diesel 2.76 ¢ /litre
- home heating fuel 2.76 ¢ /litre
- heavy fuel oil 3.08 ¢ /litre
- natural gas 1.88 ¢ m³
- propane 1.53 ¢ /litre
- kerosene/aviation fuel 2.62 ¢ /litre

At a rate of \$30 per tonne CO₂, a carbon tax would increase the cost of these fuels by three times this amount: for instance it would directly add 7.23¢ to the cost of a litre of gasoline.

A carbon tax would clearly increase costs more for those households that used more fuel and for those who use “dirtier” fuels.

Based on average household fuel use, a carbon tax at \$10 per tonne would add about \$90 to the *direct fuel bills* of an average Canadian household. With an average household size of 2.5, this works out to about \$36 per person. But the direct costs are only a part of the additional costs that families would bear.

Higher fuel prices increase costs throughout the economy by increasing the costs of transportation, production and distribution of virtually all goods and services in the economy. These increase costs for households *indirectly*.

Figures provided by Statistics Canada estimate that the *indirect* domestic GHG emissions from household consumption of goods and services amount to 1.93 times the emissions from *direct* fuel use. This means that the total domestic emissions associated with household consumption are almost three times (2.93) the level of direct emissions¹.

If these costs are passed on fully through to households, this means that a carbon tax would also increase total costs for households by almost three times the level of direct costs.

For instance, a broadly-based carbon tax at \$10 per tonne would increase costs by approximately \$260 each year for the average Canadian household. With an average household size of 2.5, this translates to \$103 per person per year².

A carbon tax at \$30 per tonne would increase direct household costs by an average of \$266 a year and total costs (direct and indirect) by about \$776 per year. This translates to \$310 per person per year.

Compensation needed to protect lower and middle income households

These calculations provide a simple rule of thumb: for every \$10 in a carbon tax per tonne CO₂, costs per person would increase by about \$100 annually.

The costs would of course vary a lot for different households, their consumption and fuel use. These costs would come down as people and businesses increase their energy efficiency, reduce fuel use and reduce emissions.

¹ This does not include the emissions associated with Canadian households' consumption of imported goods and services, which are equivalent to about 90% of the emissions associated with direct fuel use by households. If a carbon tariff or equivalent measure were in place for imported goods, then the costs would increase proportionately for (e.g. to about 3.83 times the direct fuel use impact).

² The figures reported are for national levels. Analysis has shown that the impacts are fairly similar at the provincial level for British Columbia. Marc Lee and Toby Sanger, 2008. *A Distributional Analysis of B.C.'s Carbon Tax*. Paper presented at the Canadian Economics Association Progressive Economics Forum meetings June 6, 2008.

Total additional costs would be lower for lower-income households, but they would be higher as a share of their annual income and spending levels. But with large variations of fuel use within income groups, approximately \$100 per person per year would be necessary to offset the increase associated with a \$10 per tonne carbon tax for lower and middle income families.

The table below shows the impacts of the additional costs associated with a \$10 and \$30 per tonne CO₂ carbon tax for different income groups in Canada, based on 2005 consumption levels.

Compensation for the increased costs of a carbon tax to vulnerable households is only part of the picture. The real reason for a carbon tax and measures such as a cap and trade program is to reduce our greenhouse gas emissions.

This is much harder for lower- and middle-income families to achieve because they have a lower level of emissions to start with and because they have less money and less ability to invest in more energy efficient technologies and alternatives, such as newer hybrid cars, efficient furnaces and energy retrofitting, etc.

It is essential that any climate change plan include public programs that would especially help low and middle- income households (and particularly those in remote communities) adapt, such as public transit and low income housing retrofit programs.

Many could also be affected through their work, with job or income loss for those working in industries or communities affected by a carbon tax and/or a cap and trade system.

Any carbon pricing system needs to be accompanied with Just Transition and Green Jobs Investment Programs to help workers and communities affected by these changes adapt and develop good quality jobs, greener industries and more sustainable communities.

Significant investments also need to be made in physical and social infrastructure to help communities prepare for and adapt to the more extreme weather and climate changes caused by global warming.

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Impact of Carbon Tax on Household Income Groups in Canada \$30/tonne CO ₂						
	Income groups					
	Average All groups	Lowest Quintile	Second Quintile	Third Quintile	Fourth Quintile	Top Quintile
Average household income (2005)	\$ 68,102	\$ 16,686	\$ 34,599	\$ 55,302	\$ 81,349	\$152,572
Average household size	2.51	1.45	2.11	2.56	2.99	3.41
<i>Carbon tax at \$30/tonne impact</i>						
- direct cost per family	266	96	184	259	341	450
- indirect cost	513	185	355	499	658	868
- total cost	779	281	539	758	1,000	1318
- percent of average income	1.14%	1.69%	1.56%	1.37%	1.23%	0.86%
- per person	310	194	255	296	334	386

This analysis was done using a spreadsheet model originally developed for the *Alternative Federal Budget*.

Direct fuel use by household quintile group was calculated using the 2005 Survey of Household Spending and average retail fuel prices from the Consumer Price Index and other Statistics Canada sources. Carbon tax rates were calculated using Environment Canada CO₂ emission factors.

The indirect impact of a broad-based carbon tax was calculated using estimates developed by Statistics Canada's Environmental Accounts division using their greenhouse gas input-output model to calculate the indirect emissions associated with household consumption. The indirect domestic emissions associated with household consumption amount to 1.93 times the direct emissions of households, according to Statscan's analysis for 2003, the latest year available. The GHG emissions associated with imported goods amount to another 0.90 times (e.g. 90%) these direct emissions, but these were not included.

The ratio of indirect to direct emissions is fairly constant through the income spectrum, based on calculations from the U.S. and only appears to change significantly for the top 10% of the income distribution. A share of this is associated with air travel, which is largely un covered by carbon pricing systems.

This analysis assumes full, but no more than full, pass-through of direct and indirect costs.

Adaptation to higher costs would bring the impacts down but this adaptation takes time (short-run *price elasticities* are low) and would be more difficult for lower income households.