



TAXING POLLUTION

*Research shows taxing pollution and
reducing taxes can produce economic vitality
and environmental protection
with social equity*



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Vermont Public Interest Research Group

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Research Shows Taxing Pollution and Reducing Taxes Can Produce Economic Vitality and Environmental Protection With Social Equity

INTRODUCTION

Tax Reform that Agrees with Vermont, the 1999 report published by The Vermont Fair Tax Coalition, describes how placing specific taxes and fees on environmentally and socially harmful activities can increase activities we want to encourage, like work, income or property, and decrease activities we want to discourage, like pollution and resource inefficiency. *Tax Reform* presented various options on how this would work for Vermont. These include reducing or eliminating certain kinds of taxes, such as property, sales or personal income taxes, and creating or increasing taxes on those things which contribute to air and water pollution. One specific example is a pollution tax (also referred to as a carbon tax) on the carbon content of fuels.

This document goes the next step in the discussion on pollution taxes. Looking at four different scenarios using a revenue-neutral (no increase in overall taxes) pollution tax on the carbon content of fuels, this report provides a basis for understanding how a pollution tax could work in Vermont.

The information provided in this report is to be used to continue the dialogue of using taxes differently and more wisely. If we do this, taxes can strengthen our economy, improve air and water quality, and keep taxes fair for all Vermonters. It is important for this discussion to continue, especially today, in an era of economic booms and surpluses.

SUMMARY

During the past few years, the Vermont Fair Tax Coalition has been exploring how Vermont's tax system can be reformed to better promote economic vitality, environmental protection and increased fairness. In its latest efforts, the Coalition explores how Vermont could tax pollution, through a tax on carbon emissions and a reduction of other taxes, while still maintaining a strong economy and social equality for all Vermonters. The study reveals that a simple pollution tax that refunds the tax revenue to residents and businesses can achieve these objectives.

WHY A POLLUTION TAX?

The pollution tax in this context is a tax on the carbon content of fossil fuels, measured in dollars per ton of carbon contained in the fuel or per ton of carbon dioxide emitted. Fuels with higher carbon contents would have higher taxes. Thus coal and oil would have higher taxes imposed than gasoline and propane. When fossil fuels are burned, they produce carbon dioxide. Because carbon dioxide is emitted from many dispersed sources, like cars, trucks, stoves, lawnmowers, motor boats, and manufacturing equipment, it is difficult to control with regulations. A pollution tax is one of the most effective ways to discourage carbon dioxide emissions and energy use.

A pollution tax that targets carbon dioxide emissions is reasonable because it satisfies

A pollution tax is one of the most effective ways to discourage carbon dioxide emissions and energy use.



three critical areas for Vermont's current and future energy and environmental needs. First, the Vermont Department of Public Service has identified a pollution tax as a "promising means" to meet Vermont's energy goals. Second, a pollution tax would decrease carbon dioxide emissions, the primary greenhouse gas contributing to global warming. Finally, a pollution tax would decrease many other air pollutants, including mercury and NO_x, created from burning fossil fuels.

In 1994, the Vermont General Assembly took a big step in planning for Vermont's energy use through the creation of a periodically updated comprehensive energy plan. This led to the Vermont Department of Public Service publication, *Fueling Vermont's Future*, the state's comprehensive energy plan and greenhouse gas action plan. In *Fueling*, the Department promoted the use of a pollution tax to meet Vermont's energy goals, stating that, "a pollution tax is one promising means of reducing carbon dioxide emissions from energy use and limiting the scale of climate change."¹ The Department went on to say that "a pollution tax is one of the most effective ways to encourage conservation, efficiency, and fuel switching. It is the only emissions controlling mechanism that can comprehensively address carbon emissions from all combustion sources."²

Carbon dioxide emissions result from the burning of fossil fuels – coal, fuel oil, natural gas, and gasoline combustion. Global warming of the atmosphere occurs when carbon dioxide is released into the air in amounts greater than natural systems can absorb. Eighty-seven percent of greenhouse gases emitted in Vermont relating to energy use and production come from the combustion of fossil fuels.³ Of the carbon dioxide released into the atmosphere, 47 percent comes from transportation use and another 20 percent from the residential sector, with the remainder in the utility, commercial, and industrial sectors.⁴ Carbon dioxide constitutes the largest share of greenhouse gases and its share is increasing the fastest.

Global warming presents a serious threat to Vermont's environment and economy. The

U.S. Global Change Research Program recently published a report, *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change*, on the potential impacts of global warming by state. The report, ordered by Congress in 1990 to help lawmakers understand the possible impacts of global warming, shows that over the next one hundred years global warming would cause Vermont's average annual temperature to increase. The increased temperature could threaten Vermont's ski industry, tourism industry, and agriculture, including sugaring.

Burning fossil fuels creates many other air pollutants, including nitrogen oxides, sulfur dioxides, hazardous air contaminants, and mercury. Many of these pollutants contribute to Vermont's major air and water quality problems, like acidification of Vermont lakes, mercury contamination of lakes and streams, acid rain, and ground level ozone. Decreased air quality is also linked to health concerns, especially impacting the health of the elderly, children, exercising adults, pregnant woman, and people suffering from lung or liver disease. Both environmental and health problems associated with burning fossil fuels have negative impacts on Vermont's economy, ranging from pollution clean-up costs paid for by the state or increased health insurance costs paid for by Vermont businesses.

All these pollutants would decrease under a pollution tax, because less energy would be used. For example, coal is the cheapest (and the most polluting) of the fossil fuels per unit of energy, so it would experience the highest relative price increase from a pollution tax. This, in turn, would decrease the amount of coal used, due to its higher price, which is good for Vermont's economy, environment, and Vermonters' health.

A pollution tax is a worthwhile tool. Our research shows a pollution tax can fit in with Vermont's energy policy, promote greater environmental and health protection, and it is a prudent measure to protect a large segment of Vermont's economy.



OVERVIEW OF RESEARCH

The Vermont Fair Tax Coalition’s research shows that a pollution tax on carbon dioxide emissions can be used to meet established goals of environmental protection and economic vitality, and remain consistent with social equity for all Vermonters. The study looked at four scenarios:

- Scenario One:* \$100 per ton pollution tax with refund to business and residents
- Scenario Two:* \$50 per ton pollution tax with reduction of sales tax
- Scenario Three:* \$85 per ton pollution tax just on gasoline with elimination of the sales tax
- Scenario Four:* \$50 per ton pollution tax with an offset on property taxes and increase in renters rebate

The objective of the study was to determine if it is possible to have a progressive pollution tax that could promote energy efficiency, environmental protection, and fairness in the overall tax burden faced by Vermont taxpayers. A regressive tax is one in which low-income households bear a greater additional tax burden relative to their income than high-income households. Therefore a progressive tax would give lower income households a greater net benefit relative to their income than higher income households. Even though many pollution taxes can be regressive, this research shows a pollution tax can be progressive.

A pollution tax would by its very nature promote energy efficiency. Pollution, a by-product of energy inefficiency, results from a failure of the market system to account for environmental and health costs related to pollution from production and consumption activities. These costs are referred to as externalities, because they are borne by people outside or “external” to the contract between the energy provider and the energy user. Examples of externalities are health problems and costs associated with poor air quality due to burning of fossil fuels. If the full cost of energy use

(including health and environmental costs) were included in energy prices, less energy would be used and cleaner energy would be available.

Increased energy efficiency and the availability of cleaner fuels would promote environmental protection. For example, 70 percent of air pollution currently emitted in Vermont comes from gasoline combustion. The types of pollution emitted include carbon dioxide, nitrogen oxides, volatile organic compounds, and particulates. The pollution tax would increase the cost of gasoline, which in turn would influence people to use gasoline more efficiently. Pollution would decrease and air quality would improve.

**SCENARIO ONE:
\$100 Per Ton Pollution Tax with Refund - Most Promising**

The \$100 per ton pollution tax with refund to businesses and residents would achieve the three objectives of promoting environmental protection, maintaining economic vitality, and supporting social equity.

Looking at the business and industrial sector, the tax collected would then be used to offset 17 percent of employers federal FICA and Medicare payments. The amount of money raised in each sector would be refunded to that sector. Because FICA and Medicare are paid to the federal government, the pollution tax payment would not actually reduce the payments made; the federal payments would be used to calibrate the state pollution tax rebate. These calculations assume both commercial and industrial businesses would be taxed.

Revenue Raised with \$100 Per Ton Pollution Tax	
Total Revenue Raised	\$175,000,000
Residential	\$ 43,000,000
Commercial	\$ 19,400,000
Industrial	\$ 8,900,000
Transportation	\$ 103,200,000



For the residential sector, a portion of the tax would be returned on a straight per-household basis. The flat rebate would apply to renters, homeowners, the employed, and the unemployed. The amount that would be returned is approximately \$400 per household per year. The pollution tax would be paid by Vermonters and vacation home residents, but the rebate would be returned to Vermonters only. The rebate would exceed the amount paid for the pollution tax for most low-income households, while the amount paid for the pollution tax would exceed the rebate for most high-income households.

The other scenarios researched proved to be either regressive or too difficult to implement. For instance, Scenario Two, which would levy a \$50 pollution tax on residents and reduce the sales tax by an equivalent amount would make the overall tax structure more regressive. With the current sales tax, households with the lowest income spend approximately 1.35 percent of their income on sales tax. Under Scenario Two, the same households would spend more than two percent of their income on the pollution tax. Scenario Two would also recycle less revenue to Vermonters than a flat rebate would.

Scenario Three would create an \$85 pollution tax on gasoline with an elimination of the sales tax. Under this scenario, levying a tax on gasoline and eliminating the sales tax would be closer to a break-even situation for most

households. However, eliminating the sales tax would result in greater savings for high-income households than for low-income households. In addition, reducing the sales tax would benefit anyone shopping in Vermont. While this may be a boost to retailers, it means that the reduction is not directed at only Vermonters, but rather is shared by anyone buying non-essential items in the state.

Finally, Scenario Four would create a \$50 pollution tax with a reduction or offset on property taxes and an increase in the renter's rebate. It would be difficult to treat the two classes of residents fairly and Scenario Four would still be more regressive than the current situation. Also, because a portion of the property tax is paid by non-residents, reducing property taxes would spread the benefit to many taxpayers who are not year-round Vermont residents.

CONCLUSION

Vermont can make a significant difference in decreasing its pollution and costs related to our economy, health, communities, and environment. One small, first step toward that future - a step in-line with current Vermont energy policy - is a pollution tax. The Vermont Fair Tax Coalition research shows that a pollution tax can be progressive, economically viable, and promote environmental protection and energy efficiency.

¹ *Fueling Vermont's Future*, Vermont Department of Public Service, page 4-80, 1998.

² *Fueling Vermont's Future*, Vermont Department of Public Service, page 4-81, 1998.

³ *Fueling Vermont's Future*, Vermont Department of Public Service, page 2-15, 1998.

⁴ *Fueling Vermont's Future*, Vermont Department of Public Service, page 2-15, 1998.



Recycling a \$100 Carbon Tax in Vermont

Research by Deb Brighton

This research looks at the possibility of using a carbon tax to decrease air and water pollution and their impact on human health, while ensuring that Vermonters can still have a healthy economy.

The idea is to find a mechanism for returning the business-paid portion of the carbon tax to businesses, and the residential-paid portion to the residents, keeping the following principles in mind:

- From the business side, the combination of the tax and the return of revenues should increase the cost of carbon fuels but decrease the cost of labor, encouraging a shift from energy-intensive business to job creation.
- The combination of the tax and the return of revenues should be progressive – that is, lower income households should see a greater net benefit than higher income households.
- All Vermonters, including renters as well as homeowners, and unemployed people as well as employed people, should be encouraged to reduce energy consumption; similarly, all Vermonters should receive benefits.

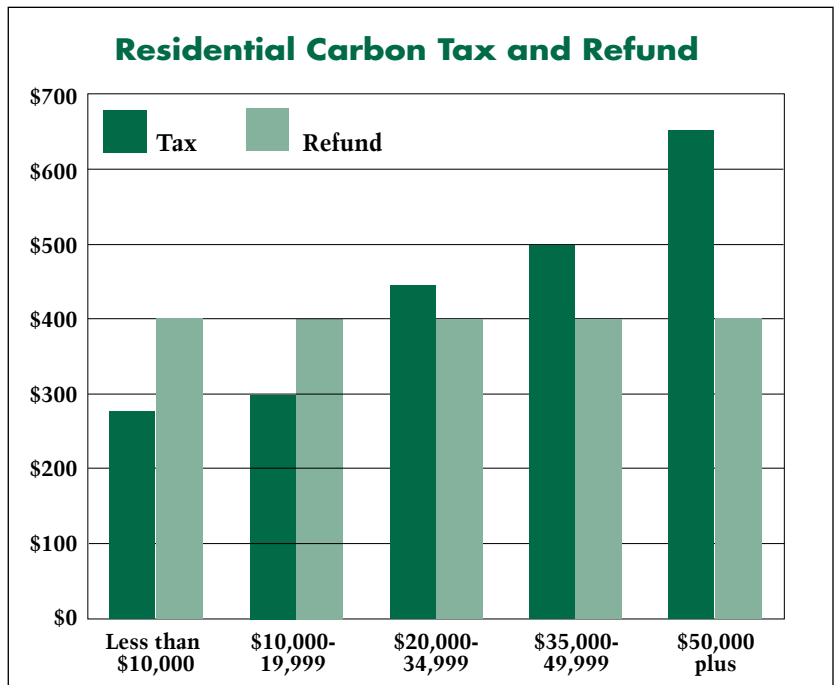
BUSINESS

The business portion of the tax collected could be used to offset approximately 17 percent of the employer’s federal FICA and Medicare payments. Because FICA and Medicare are paid to the federal government, the carbon tax payment would not actually reduce the payments made; the federal payments would be used to calibrate the state carbon tax payment.

These calculations assume both commercial and industrial businesses would be taxed.

RESIDENTIAL

The residential portion of the tax could be returned to homeowners on a straight per-household or per-capita basis. The flat rebate is appealing because of its simplicity. It would apply to renters and owners, to the employed and unemployed. It also has the political advantage of being visible and identifiable so that people do not feel that they have simply been hit with another tax. The amount returned would include the carbon tax paid by vacation home residents, yet it would be returned to Vermonters only. The amount to be returned is estimated to be about \$400 per household per year, without including a carbon tax on electricity generated in nuclear and large-hydro facilities. The rebate would exceed the carbon tax for most low-income house-





holds. Because \$5 is siphoned off for LIHEAP, the average household might see a slight increase, although the carbon tax collected on condos and gasoline from tourists may offset the LIHEAP cost.

The distribution graph on the preceding page accounts for the costs, but not the benefits of additional LIHEAP funding. It assumes no change in energy use.

The rebate could either be in the form of a check, or in the form of a credit card that could be used to offset state taxes, or sold to another person or business to be used to offset state taxes.

Other less attractive options considered for returning the residential portion include reducing or offsetting other regressive taxes such as:

- **Sales Tax Exemptions**

Exempting more items from the sales tax would not return as much money to low-income people. First, exemptions would effectively dilute the amount returned to Vermonters because anyone buying those items in Vermont would benefit. Second, because higher income people in general consume more than lower income people, most exemptions would result in higher rebates to higher-income people.

- **Income Tax**

Lowering the income tax and increasing the earned income tax credits would not reach the neediest Vermonters. Many are not employed. Many do not file income taxes. And, the net state income tax for many low income households is already below the amount that would be returned through a flat carbon tax.

- **Property Tax**

In general, higher income households live in more expensive houses than lower income households do. Lowering property tax rates will return more money to higher income households than to lower income households – unless it is done by increasing the homestead exemption, in which case it will be effectively a cumbersome flat tax to all homeowners with the same tax rate.

Because any attempt to lower the property tax will benefit only the 2/3 of Vermont households who own their own houses, separate programs must be devised to give similar benefits to renters. Because the link is weak between the homeowner and renter programs, these programs are often underfunded.

Therefore, it really does not make sense, either for equity or policy reasons, to return a carbon tax revenue in proportion to rent, house value or local tax rate.

BASIC NUMBERS: \$100 CARBON TAX

	\$100 Carbon Tax	\$100 Carbon Tax Including Hydro, Nuclear
Revenue Raised (Million \$)	175	295
Residential	43.4	91
Commercial	19.4	57.9
Industrial	8.9	42.9
Transportation	103.2	103.2
Residential Including Transportation	95	142.6
Impact on Annual Household (\$)	437	604
Residential Energy	196	363

USING A CARBON TAX TO OFFSET THE SALES TAX

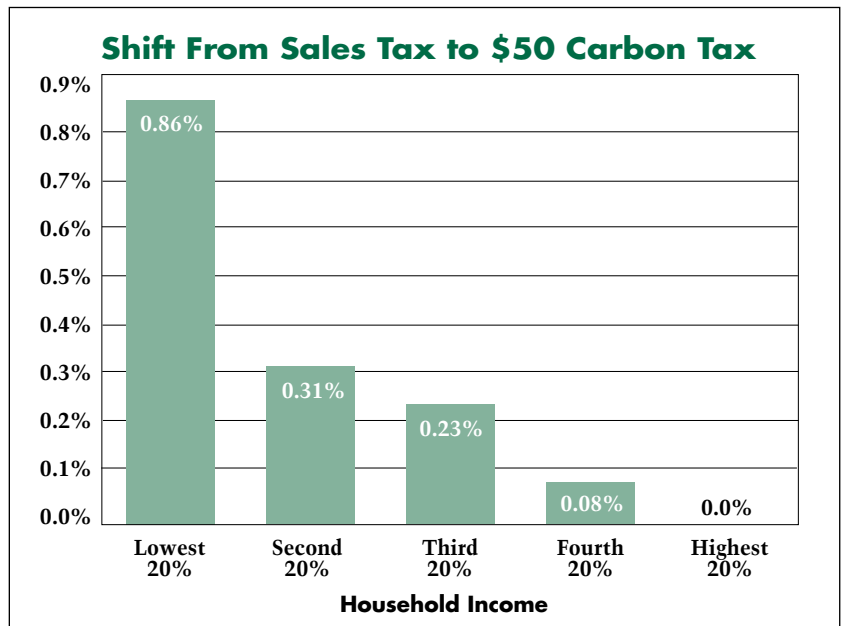
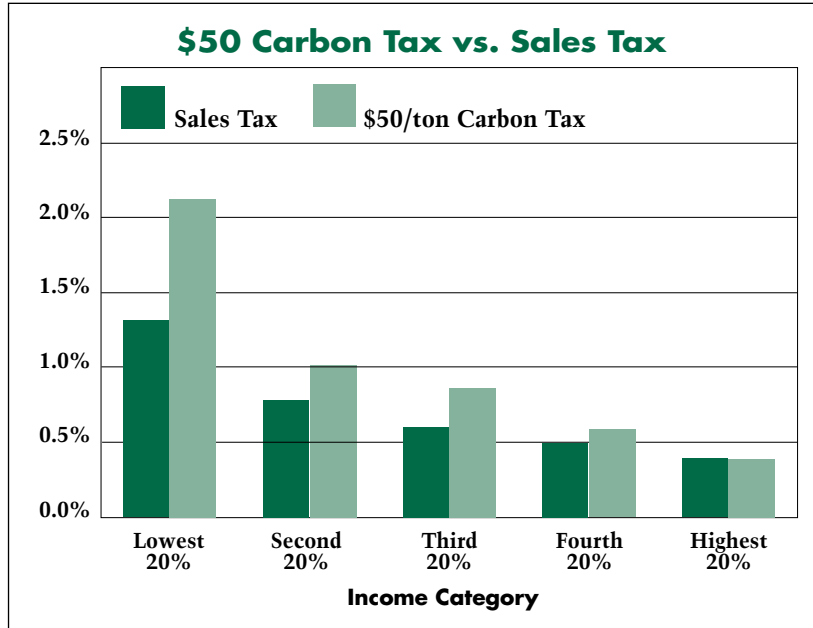
Both the sales tax and the carbon tax are regressive – they claim a higher percentage of the income of lower-income households than they do of higher-income households. However, the carbon tax is more regressive unless balanced by a progressive rebate. Levying a carbon tax on residents and reducing the sales tax by an equivalent amount would make the overall tax structure more regressive. It would also recycle less revenue to Vermonters than a flat rebate.



The table at the bottom of the page shows the amount households spend annually on different categories of items subject to the Vermont sales tax. For all categories, the higher income households spend more than the lower income households do. Therefore a tax on expenditures would cost higher income households more than it would cost lower income households. The greater the difference between the tax paid by higher income households and that paid by lower income households, the less regressive the tax. The column on the right shows the ratio of the tax on high income households to the tax on low income households; the higher the number, the less regressive the tax.

Because the carbon tax has the lowest ratio of all the listed expenditures, it is the most regressive, unless offset by a progressive rebate. The graph below shows roughly what would happen if the sales tax were eliminated and replaced by a \$50 carbon tax. The lowest income households would see their taxes increase, while the highest income households would see no change.

Higher income households spend much more on gasoline than lower income house-



	INCOME CATEGORY					Ratio
	Lowest 20%	Second 20%	Third 20%	Fourth 20%	Highest 20%	
Housekeeping Supplies	\$10.70	\$16.45	\$22.65	\$26.20	\$40.30	3.77
Entertainment	\$33.45	\$45.75	\$70.40	\$99.90	\$170.05	4.80
Personal Care Products/Services	\$9.50	\$15.45	\$19.40	\$27.50	\$35.50	3.74
Reading	\$3.55	\$5.50	\$7.55	\$9.95	\$16.00	4.51
Miscellaneous	\$20.55	\$30.25	\$38.45	\$50.85	\$61.90	3.01
Total Sales Tax	\$79.75	\$113.40	\$158.45	\$214.40	\$323.75	4.06
\$50 Carbon Tax	\$133.43	\$163.08	\$223.93	\$248.95	\$323.12	2.42
\$85 Carbon Tax on Gasoline	\$83.25	\$143.25	\$225.66	\$249.10	\$316.97	3.81

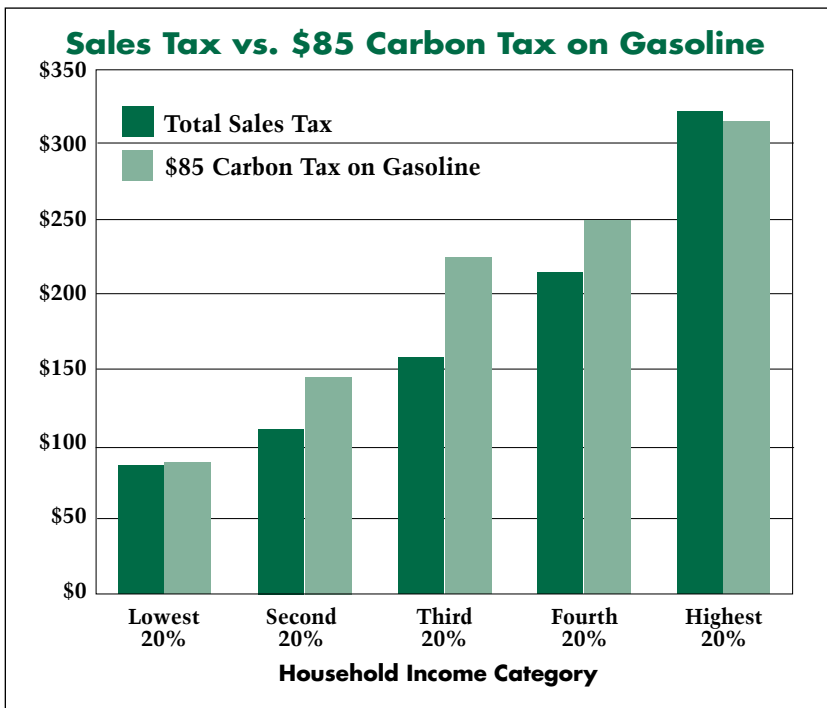


holds do. The income-based variation in gasoline spending is substantially greater than the income-based variation in energy use in general. Levying a tax on gasoline and eliminating the sales tax would be closer to a break-even situation for most households. That is, a carbon tax on gasoline is not significantly more regressive than the sales tax. (The carbon tax of \$85 was chosen in the graph below because it would cost the residential sector about the same as a \$50 carbon tax or the sales tax.)

REPLACING OTHER TAXES WITH A CARBON TAX

Looking at actual dollars (as opposed to percentages of income), eliminating the sales tax on any category of expenditure would result in greater savings for high income households than for low income households. A flat per capita rebate would return equal dollar amounts to each person; this would be a higher proportion of the income of lower income households than it would be of higher income households.

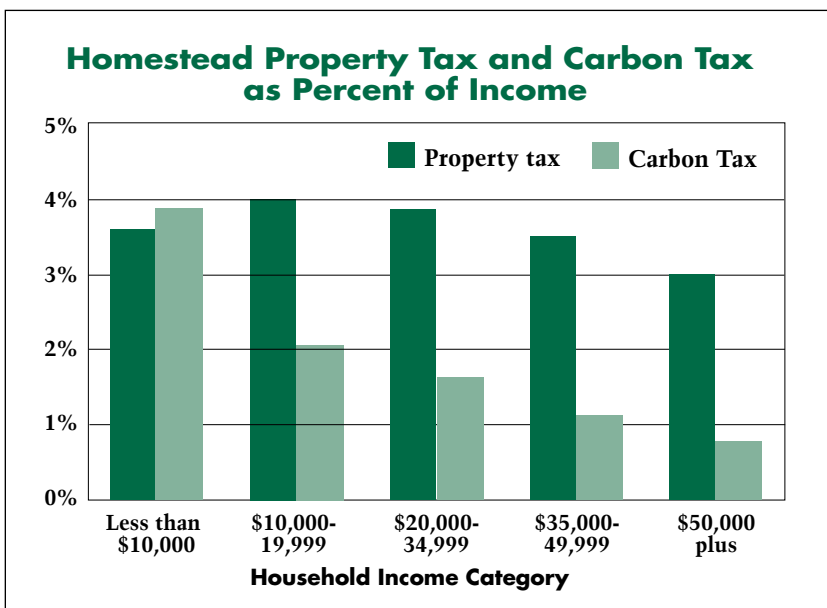
In addition, reducing the sales tax would benefit anyone shopping in Vermont. While this may be a boost to retailers, it means that the money is not directed at Vermonters, but rather it is shared by anyone buying non-essential items in the state.



USING A CARBON TAX TO OFFSET THE PROPERTY TAX AND INCREASE THE RENTER REBATE

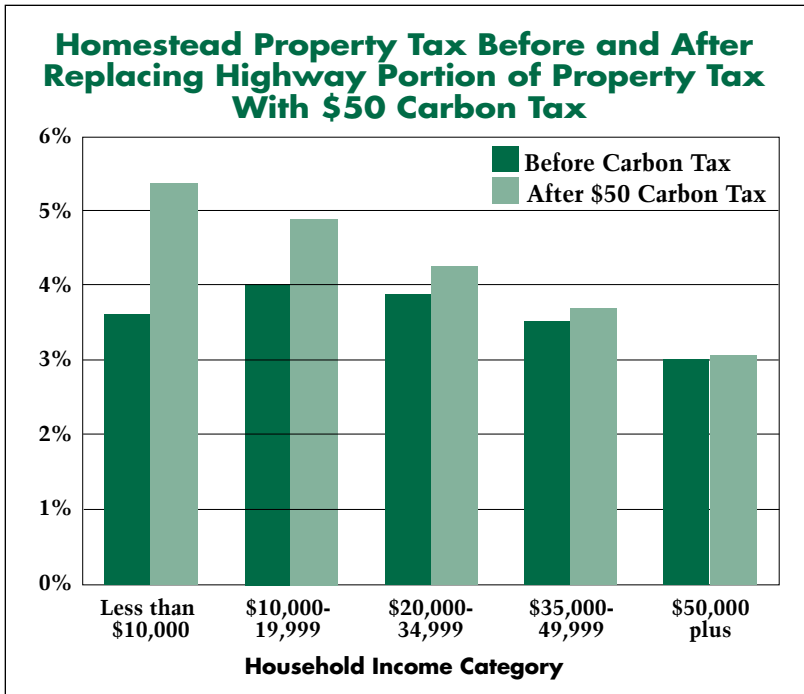
Homeowners

Although the property tax is not progressive, both Act 60 and the homeowners, rebate program have made it much less regressive than it was. The carbon tax would be more regressive than the property tax, as shown in the graph below.



A \$50 carbon tax raises roughly the same amount as the property tax raises for highways. The graph below gives an idea of what would happen if the highway portion of the property tax were replaced by a \$50 carbon tax. The combination (of the remaining homestead property Tax plus the carbon tax) would be more regressive than the present homestead tax.

Also, because a portion of the property tax is paid by non-residents, removing the highway taxes from the property tax would spread the benefit to many taxpayers who are not Vermont residents. This means that the benefit to Vermont residents would be less than it



As a result of the program, renters in higher income categories would pay a higher percentage of their incomes in rent. The carbon tax, on the other hand, shows the opposite distribution. Households in the higher income categories would pay a lower percentage of their income in carbon tax.

In general, there are two ways to strengthen the renter rebate program without changing the overall structure: increase the percentage of rent that constitutes property taxes, or increase the threshold per-

would be if the tax revenues were simply divided among residents.

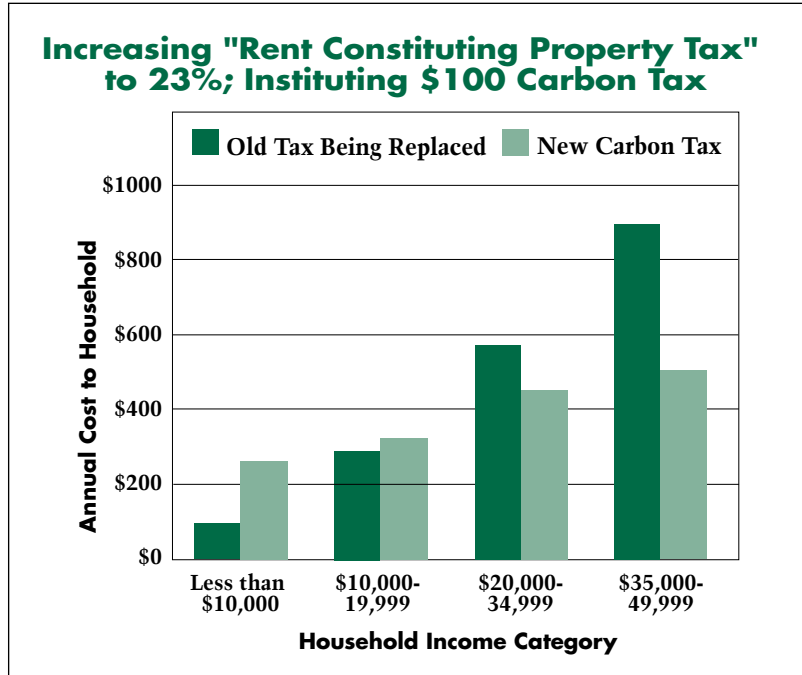
Other changes to the property tax that would be less regressive and also target residents include providing a substantial homestead exemption for the municipal (non-school) tax, or playing with the homeowners' rebate program. However, these are less related to the carbon tax, less systematic, and more likely to be changed by the legislature.

CARBON TAX REPLACING RENTERS REBATE

Although it can be argued that renters pay the property tax through their rent, most people agree that a decrease in property taxes would not result in a decrease in rents. In order to provide some benefits to renters, the renter rebate program was designed as a companion to the property tax rebate program. This functions as a "circuit breaker" program: if 21 percent of the household's rent exceeds a threshold percent of household income, the excess is rebated.

centages that trip the circuit breaker. Increasing the percentage of rent that constitutes property taxes is generally easier to do, but it has its pros and cons. It has been changed frequently by the legislature. However, increasing the threshold percentages that trips the circuit breaker may be more difficult, because these percentages are the same ones that apply to the homeowners' rebate program, and it may be logically and politically preferable to keep the same thresholds for the two programs.

Increasing the percentage of rent constituting property taxes would result in savings for all renters with income less than \$47,000. However, the savings would be greater- either in actual dollars or as a percent of income - for higher income households than for lower income households. Replacing this with a carbon tax would be a regressive move. Higher income households would see more benefit than lower income households. The graph below shows the rent that households would save if the "rent constituting property taxes" were increased to 23 percent in comparison to the net tax households would pay if there were a \$100 carbon tax. For low-income households there would be a net decrease.





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