

# Carbon Tax Calculator to Help Foster Informed Voting

Justin Bare

University of Washington

Seattle, WA, USA

jbare@cs.washington.edu

## ABSTRACT

A string of Supreme Court decisions has allowed a massive influx of money into the political processes of the United States. The resulting rapid increase in the amount of biased information has made it difficult for Americans to find relevant facts that they can trust to help them decide on political issues. We have a vision of using online tools to introduce facts into the political sphere in ways that are transparent and fair, and that hold the producers of facts accountable for the information they provide. As a prototypical example, we are working on a calculator for a revenue neutral carbon tax proposal in the state of Washington. We will augment the tool with several novel features aimed at facilitating voters' understanding of the policy and its impacts. To this end we will employ a value sensitive design approach to create the features and evaluate how effective they are at supporting the values people desire from political information sources.

## Author Keywords

Value Sensitive Design; politics

## INTRODUCTION

Several recent United States Supreme Court decisions [1] have significantly weakened campaign finance laws. Corporations and wealthy individuals have taken advantage of these changes by massively increasing their campaign contributions. Spending in 2012 rose to more than one billion dollars, about three times the amount spent in 2008 [8]. This makes it difficult for citizens to find information that they can trust because they are never sure who is funding advertisements or other information sources.

Our current project is one step toward countering the flood of money and misinformation. By itself this is clearly not enough, but along with other political activity, it might help tilt the balance. Our goal is to provide high-quality information for the debate around this particular initiative, as well as a model that can be replicated for providing high-quality information. We aim to create a tool that supports the values that people desire from their information sources - in particular the values of transparency, fairness, and accountability.

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This specific project deals with a calculator tool for a revenue neutral carbon tax swap policy designed by the Carbon Washington organization that may be voted on in the near future. However, we hope that the design process and features developed will be transferable to many other political issues.

The Carbon Washington revenue-neutral carbon tax proposal is composed of four main parts:

1. reducing the state sales tax,
2. funding a tax rebate for low income households,
3. eliminating a business tax for manufacturers,
4. and instituting a tax on fossil fuels.

“Revenue-neutral” means that the total amount that the Washington state government raises from taxes every year will not change significantly as a result of this policy. The revenue reductions (1 and 3 above) and the additional spending (2) will be balanced by the new revenue source of the tax on fossil fuels (4).

The calculator is meant to inform stakeholders about the estimated effects of this policy on their interests. For example, individuals will be able to see how the different tax changes will affect their household finances. But we do not want this tool to be another element of partisan misinformation campaigns. Rather we hope to design a tool that a majority of stakeholders trust to give reliable, accurate information that will allow them to vote on the policy knowing that they have an adequate understanding of its implications. To effectively incorporate the values mentioned above into our tool, we will make use of Value Sensitive Design techniques throughout the design process.

## CONCEPTUAL INVESTIGATION

To get a better sense of the landscape of ideas that could go into this project, we began with a conceptual investigation of the stakeholders and values implicated in the calculator.

### Stakeholder Analysis

We brainstormed a list of stakeholders in the project and analyzed the ways they could be affected by the tool. Then we synthesized values from these effects and determined the value tensions among the stakeholders. This work is shown in Tables 1 and 2.

As we can see, all direct stakeholders are generally interested in having a tool they can trust that is transparent, accountable, and fair. However, these values are in tension with personal

Direct Stakeholders	Benefits	Harms	Values	Tensions
Environmentally conscious citizens and businesses	Portrayal of carbon tax is positive	Portrayal of carbon tax is negative	Sustainability Economic strength	Usability for other stakeholders Economic strength based on fossil fuels
Not environmentally conscious citizens and businesses	Portrayal of carbon tax is negative	Portrayal of carbon tax is positive	Economic strength	Usability for other stakeholders Sustainability
Policy wonks	More detailed information to analyze		Detail	Usability for other stakeholders
Journalists	Could have a popular article	Could have an unpopular article	Intrigue Narrative	Usability for other stakeholders
All of the above	Better understanding of the policy	Deceived by the information provided	Transparency Fairness Accountability Usability	Personal beliefs about sustainability may conflict with these values

**Table 1. Direct stakeholder analysis.**

beliefs about sustainability. So for example, an environmentally conscious citizen may value the calculator more if she perceives it as making more of a positive judgement about the carbon tax. Citizens are divided on the issue of sustainability depending on what they think about climate change. All citizens value economic strength, however some view sustainability as a critical piece of economic strength. Policy wonks and journalists have particular values that relate to their work. Because different users have different needs, their usability values may be in conflict. Members of marginalized groups are often in lower income brackets, so they would benefit from a calculator that portrays the carbon tax policy more positively, since it includes a rebate for low income families. Also, they may have particular usability needs (e.g. blind or low vision people).

For the indirect stakeholders, the value assignments and tensions play out similarly. Many of the aforementioned values are still important for these stakeholders, but this is often in terms of how their constituents or members would be affected.

### Researcher Stance

To clarify our roles as researchers on this project, we also explored our values, the designer values, in relation to the calculator. We personally value sustainability and equity. We also value economic strength, but through sustainability with the idea that continued human endeavors depend on preventing severe climate change. However, we also value the explicitly supported values of this project in terms of fostering a healthy political system in which citizens vote confidently with a reasonable belief that they can trust the information they have received. Therefore, we are putting aside our specific personal values for this project to design a tool that all stakeholders will hopefully deem credible.

### Conceptions of Key Values

In the following sections we'll take a more in depth look at the philosophical conceptions of the three key values in order to get a better idea of what our tool needs to support.

#### Transparency

The following two definitions offer conceptions of transparency that will be relevant to the work of this project. Moser offers the definition "to open up the working procedures not immediately visible to those not directly involved in order to demonstrate the good working of an institution" [5]. Another definition is "the disclosure of information by an organization that enables external actors to monitor and assess its internal workings and performance" [2].

Therefore, users should be able to access the internal workings of our tool in order to verify that they are in fact calculating the values correctly. This appears to be easy since the Javascript code for the website can be viewed directly in a browser. However, a key part of transparency for our purposes will be comprehensibility. Not all users are going to be able to understand Javascript, so we need to somehow expose the code behind the calculations to demonstrate proper computation in a way that is accessible to stakeholders who do not know programming.

#### Accountability

Two definitions of accountability are "the sense of individual responsibility and concern for the public interest" [6] and "public accountability involves answering, through various mechanisms from newspaper reports to hearings, public concerns about administrative activity" [7].

This will be a difficult value to design for - the first definition offers accountability as a kind of spiritual guide to follow to make sure anything that you do is in the public interest. The second definition is more practical and suggests that we design features that allow us to answer to criticisms from users in a public setting.

#### Fairness

It was difficult to find concise useful conceptions of fairness, so here we use impartiality instead, which is closely related, but we will outline the distinction as we see it.

John Stuart Mill defined impartiality as "being exclusively influenced by the considerations which it is supposed ought to influence the particular case in hand; and resisting the solicitation of any motives which prompt to conduct different from

Direct Stakeholders	Benefits	Harms	Values	Tensions
Environmentally conscious politicians and organizations	Portrayal of carbon tax is positive	Portrayal of carbon tax is negative	Sustainability Economic strength	Economic strength based on fossil fuels
Not environmentally conscious politicians and organizations	Portrayal of carbon tax is negative	Portrayal of carbon tax is positive	Economic strength	Sustainability
Social justice politicians and organizations	Portrayal of policy is positive Website is accessible	Portrayal of policy is negative Website is not accessible	Equity	Usability for other stakeholders Economic strength
All of the above	Constituents have a better understanding of the policy	Constituents are deceived by the information provided	Transparency Fairness Accountability	Official positions on sustainability may conflict with these values

**Table 2. Indirect stakeholder analysis.**

what those considerations would dictate” [4]. Another possible conception is “not that everyone receive equal treatment, but rather that everyone be treated as an equal” [3]. This second definition hints at what we believe to be an important part of fairness which is that all people’s issues should be addressed. So if we present the environmental and financial perspectives on the policy, we also should present the jobs perspective. Even if the environmental and financial perspectives are presented in a perfectly impartial fashion, to be fair to people who care about jobs we should present the analysis of the policy’s effects on jobs. Impartiality seems to require detachment from influencing interests, while fairness includes this as well as positive support for impartial information pertaining to the perspectives of all possible interests.

To these ends we will need to make sure that we provide more and more information through new features in a balanced fashion - not prioritizing some information agendas as more legitimate than others. And of course Mill’s definition restates our promise to leave out personal values that are not the explicitly supported values in the design.

### Value Scenarios

To inform the design of specific features, we explored several value scenarios to see what information different stakeholders may be interested in having access to.

#### Scenario One

“Sarah wanted to figure out how to vote on the carbon tax issue. She used the calculator and found out she would gain money from the policy, and it sounded like a good idea, so she decided to vote yes on the ballot. But then she saw an ad on TV talking about how this policy would ruin economic growth in Washington. Because of that, she decided to vote no. After the election, she found out that this ad was funded by ExxonMobil and regretted her decision.”

This scenario was crucial in expanding our ideas about how this calculator tool fits into the larger political sphere. At the outset, we considered the outcome of our project to be a sort of beacon of virtue in the information market. However, there will be other interests actively working against the information we provide. We need to engage with this to provide transparency in a larger sense than just exposing our tool’s inner workings. One idea to address this is to add a feature that list

the all the public advertisements about the policy along with where the funding for each advertisement came from.

#### Scenario Two

“Kate wanted to figure out how to vote on the carbon tax issue. She saw there was a calculator tool that would give her some quality information, so she went to check out the website. However, when she got there she felt overwhelmed by the amount of information available. She would hover over tooltips that told her way more than she ever wanted to know about the inner workings of the tool. And there were so many issues addressed, like the financial impacts of the policy, the environmental impacts, and the effect on jobs, among many others. She figured there was no way she could compute the tradeoffs among all of these, so she gave up and decided not to vote on this issue.”

This scenario shows a tension between transparency and information overload. This will be a difficult aspect to address. One way would be to keep the amount of information to a minimum, but this runs the risk of not being fair to various interests that would like ways to analyze the effects of the policy on specific aspects of society that they value. Another way to address the tension could be to provide some kind of scaffolding for users to figure out how they would trade off the different benefits and costs of the policy.

### TECHNICAL INVESTIGATION

This quarter we made two additions to the calculator: a version for businesses to compute the estimated impacts of the policy on their finances and a tooltip feature to support the value of transparency.

#### Business Calculator

The calculator for businesses is similar to the one for households except it includes the section for B&O manufacturing tax reductions instead of the rebate for low income families. Also, the required inputs have been adjusted to align with the kind of information that business owners will have about their finances. For example, we do not estimate how much sales tax a business pays because business owners will have this information available in their budget records. Developing this part of the website was a crucial step in supporting fairness because business owners are direct stakeholders that should be given the ability to determine how the Carbon Washington

policy would affect them. It would be unfair to have a tool that only works for households.

#### **“Where did this number come from?”**

The other technical investigation we performed was the design of a “where did this number come from?” tooltip feature, which is shown in Figure 1. The purpose of this feature is to support transparency, and especially the comprehensibility aspect of transparency. For example, users of the household calculator may be unsure of how we estimated their annual sales tax payments from their income. Without the tooltip feature, they could read through the Javascript code to figure this out. However, many users will not have adequate programming knowledge or even just adequate time for this to be a reasonable mode of transparency. So we added this tooltip which is accessed by hovering the pointer over a question mark icon next to the sales tax estimate line. Doing this causes a box to appear which shows a graph of the government data we use to perform the computation. It also includes a brief explanation of this graph and a link to the source document for the data.

#### **FUTURE WORK**

##### **Future Features**

In addition to the feature ideas that came out of the value scenarios above, we would like to develop other features to serve the explicitly supported values more completely:

- A section showing statewide impacts of the policy in interactive graphs would be helpful to provide a greater understanding of the societal impact, which would be especially helpful for policy wonks and journalist, but also other citizens.
- A feature similar to public bug report forums for software would allow us to provide public accountability through answering any complaints that people have about the tool.
- Videos explaining how each section of the calculator works could provide transparency about the inner workings through a different medium that may be preferred by some users.
- A section showing estimates of how much carbon dioxide would be saved through the policy and how the policy would affect jobs would help to balance out the current financial focus of the tool.
- Visualizations of the uncertainty in the estimates of the calculator would serve transparency by acknowledging that these values are indeed estimates and real life effects may be different.

##### **Empirical Investigation**

Once more features have been added, we will use an empirical investigation to determine how well the features support the values of stakeholders. Did users think the calculator was fair? Did they understand how the values were being calculated, or at least did they feel like this information was accessible if they wanted to know about the underlying computations? This would involve surveys and interviews with people

who have already used the tool, as well as laboratory tests to obtain more detailed information on users during interactions with the tool.

#### **ACKNOWLEDGMENTS**

This material is based upon work supported by the National Science Foundation Graduate Research Fellowship Program under Grant No. (NSF grant number).

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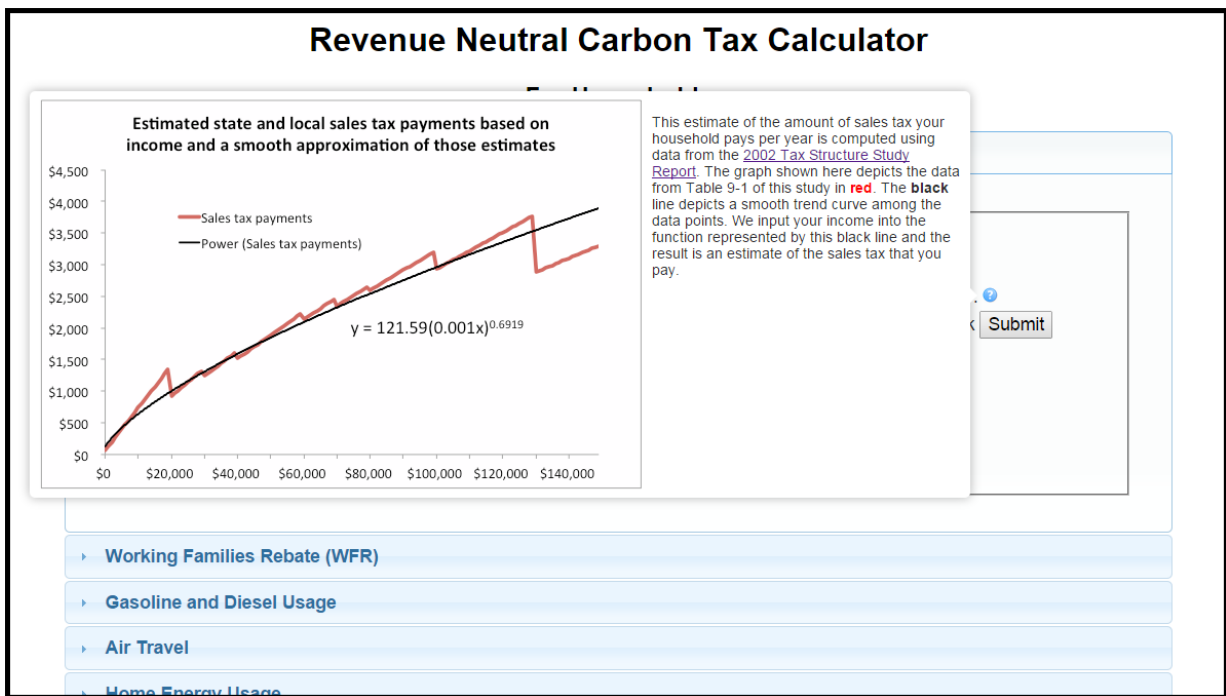


Figure 1. Tooltip that explains how a user's sales tax is estimated from their income in order to support the value of transparency.