

Final Paper Outline

Description of Topic

- I. Topic:
 - a. In this paper, I will explore ways to control carbon emissions through carbon tax and emissions trading systems.
 - i. I will begin with a basic description of each system.
 - ii. Then, I will do case studies on a country or province that has successfully adopted each system.
 - iii. Lastly, I will look at the proposed carbon tax in Washington state and analyze this tax compared to the others I have researched.
- II. Reasoning:
 - a. I chose this topic because of its relevance with the proposed carbon tax in Washington. I would like to be more knowledgeable on this topic as I move to vote and encourage others to vote for this measure.
 - b. This topic is extremely relevant to this course as carbon tax is a growing form of mitigation efforts worldwide in response to climate change.
- III. Research Question
 - a. How does the proposed carbon tax in Washington State compare to other successful systems?

Paper Outline

- I. Introduction to Carbon Tax and Emissions Trading Scheme
 - a. Carbon Tax
 - i. Carbon pricing directly linked to the level of carbon dioxide emissions.
 - ii. In this system, the price of emission is set but reduction of emissions is not.
 - b. Emissions Trading Scheme
 - i. Carbon pricing instrument that limits or caps the allowed amount of GHG emissions
 - ii. In this system, the price of emissions is not set, but left up to the market to decide. The emissions are controlled.
- II. Case study:
 - a. Sweden: Carbon Tax
 - i. Carbon tax was implemented in Sweden in 1991 at a rate of \$44.37 per metric ton of CO₂.
 - ii. Industries, such as manufacturing and agriculture, pay a lower rate at \$11.28 in 1993 compared to \$45.15 elsewhere.
 - iii. Revenue from this tax goes to general government budget. From 2005 to 2007, the tax generated \$3.65 billion annually.

- iv. In December of 2008, Sweden reported that greenhouse gas emissions had dropped more than 40 percent from the mid-1970s.
 - b. New Zealand: ETS
 - i. The New Zealand Emissions Trading Scheme (NZ ETS) was adopted in 2008.
 - ii. This policy requires all sectors of the economy to report on their emissions and (with the exception of agriculture) purchase emission units.
 - iii. The price of these units is intended to create a financial incentive to reduce emissions.
 - iv. Because it is still relatively new, there are still transitional phases to be passed through.
 - 1. One recent change was limiting unit trading to domestic units only in order to better control the price of units.
 - v. The goal of this action was to meet commitments under the Kyoto Protocol and New Zealand is on track to meet their reduction target in 2020.
 - vi. Another goal—to reduce net emissions below business as usual levels—is important for New Zealand’s transition to a low emissions economy.
- III. Application to Washington State Carbon Tax
 - a. Summary
 - i. Four parts of the policy proposal
 - 1. Reduce state sales tax by one percent.
 - 2. Fund the Working Families Rebate.
 - 3. Eliminate B&O business tax for manufacturers.
 - 4. Institute a carbon tax of \$25 per metric ton COS on fossil fuels consumed in the state of Washington.
 - ii. The first three points help to make this policy revenue neutral, but I will focus on the final point—the actual carbon tax.
 - iii. The rate is less than that of Sweden’s carbon tax, but still substantial.
 - 1. It will be phased in over two years starting at a rate of \$15.
 - 2. The rate will then increase at 3.5% plus inflation to a maximum of \$100 in 2016 dollars.
 - iv. CO2 emissions from fossil fuels are about 83m metric tons annually.
 - v. This tax will cover about 90 percent of emissions.
 - vi. They project carbon emissions to decline by 2% per year.
 - vii. Cite effectiveness of carbon tax in British Columbia.
 - 1. Since its implementation of carbon tax in 2008, carbon emissions are down 16 percent and the economy is doing as well as other areas in Canada if not better.
 - b. Opinion and analysis
 - i. Carbon tax is the best method to implement now in Washington.
 - ii. Reasons against ETS:
 - 1. Price volatility
 - 2. Possibility of a more regional or nationwide ETS in the future

- iii. Best scenario: Implement carbon tax now and a regional or nationwide ETS later on.

Preliminary list of sources

Lennox, James A., and Renger Van Nieuwkoop. "Output-based Allocations and Revenue Recycling: Implications for the New Zealand Emissions Trading Scheme." *Energy Policy* 38.12 (2010): 7861-872. *Science Direct*. Web. 27 May 2016.

<http://www.sciencedirect.com.offcampus.lib.washington.edu/science/article/pii/S0301421510006634>

Notes: This article details the New Zealand Emissions Trading Scheme (NZ ETS). In September 2008, this ETS was passed; it covered agriculture and forestry, which are large contributors to New Zealand's emissions. But, the next year, a new government concerned about international competitiveness amended the legislation to delay the entry of agriculture into the ETS. There was a lot of concern about how this legislation might disadvantage New Zealand producers in a global economy—one concern that seems to be apparent in many forms when discussing carbon pricing in the U.S. This article mainly discusses a model of the NZ ETS and how different levels of output-based allocation and different methods of recycling any net revenues can significantly alter the macroeconomic impacts of an ETS in New Zealand. Their study suggested that at moderate to high carbon prices, revenues from pre-existing taxes may be significantly eroded. Additionally, many permits must be auctioned to avoid negative fiscal impacts. This details the many problems with price volatility associated with cap and trade systems.

Nilsson, Lars J., Bengt Johansson, Kerstin Åstrand, Karin Ericsson, Per Svenningsson, Pål Börjesson, and Lena Neij. "Seeing the Wood for the Trees: 25 Years of Renewable Energy Policy in Sweden." *Energy for Sustainable Development* 8.1 (2004): 67-81. *Science Direct*. Web. 27 May 2016.

<http://www.sciencedirect.com.offcampus.lib.washington.edu/science/article/pii/S093082608603920>

Notes: This article provides an overview of environmental policy in Sweden since 1975, including their carbon-pricing program. Carbon tax was introduced in Sweden as a part of a larger energy program. This program included investment subsidies, an energy efficiency program and funding for technology in renewable energy. The tax was brought in with a concurrent general tax reform. This tax made biomass relatively less expensive than oil or coal for heating, leading to the competitiveness of biomass. The carbon tax had increased in increments. Industry pays a lower tax than other sectors, at only 25 percent of the carbon tax; in industry therefore biomass has not been as competitive as in other markets. This is one major challenge to Sweden's carbon tax in how market distortions can exist between sectors.

Tietenberg, T. H. "Reflections--Carbon Pricing in Practice." *Review of Environmental Economics and Policy* 7.2 (2013): 313-29. *Oxford Journals*. Web. 27 May 2016.

<http://reep.oxfordjournals.org.offcampus.lib.washington.edu/content/7/2/313.full>

Notes: This article explores carbon-pricing programs and uses existing programs to offer recommendations for future programs. The first section dives into five different carbon pricing programs currently functioning. The first of these is Sweden's carbon pricing. Next, the article discusses studied effects of carbon-pricing systems. These include cost savings, emission reductions, and technological innovations. Lastly, Tietenberg offers recommendations for future programs. These recommendations involve paying attention to instrument choice, revenue use, the role of offsets, and the role of price volatility. This will help me to argue for the use of carbon tax in Washington over a cap and trade system.