NERC SB306 Clean Air Fee or Tax Study Outline

Building on NERC's RFP response, the following project outline summarizes the methods NERC intends to use to address specific requirements from the RFP and SB306. The *Report Outline* section shows the intended structure of the final report. The *General Requirements* section details the expected treatment of each report topic outlined in SB306.

Report Outline

I. Executive Summary
II. Introduction
- Explanation and Scope of Study
- Background on carbon pricing
- Review of carbon pricing schemes around world
- Review of existing research and studies

III. Explanation of suggested clean air fee or tax
- Administrative structure
- Revenue allocation options

IV. Scenarios and estimation results
- Direct and indirect economic impacts
- Distributional impacts by household income groups
- Distributional impacts by geographic region
- Impacts on identified key industries

V. Other considerations
- Imports and exports of energy sources
- Revenue generation and long-term stability
- Interactions with other Oregon statutes

VI. Summary of findings and recommendations
VII. Further Research and Applications
VIII. Conclusion

Appendix I - Detailed description of modeling technique
Appendix II - Detailed scenario results

General Requirements

NERC will provide the following specific analysis and information to the Legislative Revenue Officer regarding implementation of a Clean Air Fee or Tax in Oregon:

1. **Identification of an effective administrative structure.**
   NERC will evaluate existing administrative structures including, but not limited to, motor fuel excise tax and public utility taxes as well as novel approaches to identify the most effective administrative structures for a clean air fee or tax in Oregon.

   Recent Congressional Research Service reports (Ramseur et al. 2012; Ramseur and Parker 2009) emphasized the trade-offs between comprehensiveness and administrative

complexity for a clean air fee or tax. Our analysis will focus on evaluating the following criteria:

- Economic efficiency (through efficient market price signals)
- Effectiveness in reducing greenhouse gas emissions
- Cost-effectiveness of administration and distributional impacts across income levels, business sectors, and geographic regions.

In addition, we will evaluate the effectiveness of applying a clean air fee or tax at a downstream level where taxes are applied directly when fuels are combusted (taxing fuel users or consumers) versus at an upstream level similar to British Columbia where taxes are applied when fuels enter the Oregon economy (taxing fuel producers or importers). This section will draw from existing research, along with case studies of existing programs. The BC Carbon Tax implementation was unusual for its low administrative, and start-up costs; NERC will attempt to identify a structure or structures that impose a similarly small, new burden on payers and collectors of the tax.

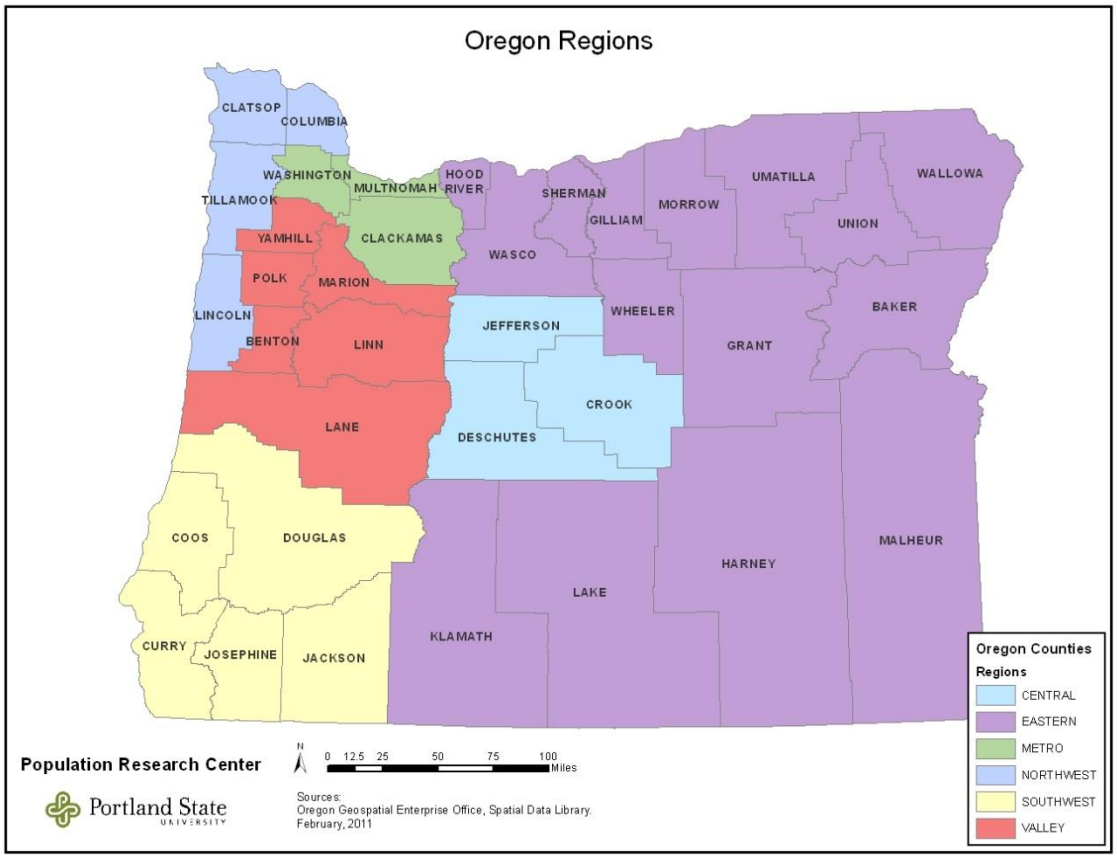
2. **Evaluation of the direct and indirect economic impacts on low-income households and a variety of geographic units including cities, counties and unincorporated areas around the state.**
   Following our report *Carbon Tax and Shift: Making it Work for Oregon's Economy*, we will break out economic impacts on households into five or more different income groups. The most basic modeling input will be the expected increase in price of a variety of fuel types. In the modeling process, these price increases will affect each household income class differently, depending on proportion of income spent on energy as well as indirect increases in prices of other consumer goods due to energy price increases. For a more in-depth discussion of this process, see the explanation of REMI in section 4.

   Based on previous research, we know that a clean air fee or tax would be extremely regressive; the use of the revenues created by the tax can be used to offset this effect. NERC will demonstrate the negative impacts on low-income households if revenues are not used to offset the increase in energy prices in the repatriation scenarios discussed later. In addition to analyzing increased costs to households from energy, consumer goods, transportation and others as a percentage of annual household income, we may examine alternative measures of income (e.g., lifetime income or annual expenditures) as proposed by previous studies such as Grainger and Kolstad (2012), Hassett et al. (2007) and Morris and Munnings (2013) to properly characterize the regressivity or progressivity of a clean air fee or tax. This aspect of differential impacts by income level will be addressed in section 8.

   In order to capture regional differences in economic impacts, we will use a multi-region version of the REMI model. We expect to use a six-region model, which will break Oregon into:

   - Portland Metro
   - Willamette Valley
   - Central Oregon
   - Southern Oregon and Southern Coastal Region

- Northern Coastal Oregon
- Eastern Oregon



Utilities publish information on their energy mix, which will be used to create energy price increases for each region. NERC will report on impacts to jobs, output, and income for each region. REMI also includes a demographic forecasting feature that will allow us to estimate population change in each region due to the policy. Using data from the Bureau of Labor Statistics Consumer Expenditure Survey and other sources, and input from the Legislative Revenue Office and other stakeholders, we will identify the most meaningful geographic distinctions, including cities, counties and unincorporated areas in Oregon, for analyzing disparities and distributional differences in fee impacts.

3. **Evaluation of the economic implications for key industries as identified by the Oregon Business Development Commission.**
The analytic model used in this project will include at least 70 industry sectors. These industry sectors will also be broken down geographically into six regions as described above. Following guidance from the Oregon Business Development Commission, NERC will highlight five key industry clusters in the economic impact reporting (in addition to other groupings listed below). These five industry clusters are:

- Outdoor Gear and Activewear
- High Technology

- Forestry and Wood Products
- Advanced Manufacturing
- Clean Tech

NAICS codes provided by Business Oregon will be mapped to the REMI sectoring scheme, which will allow us to highlight the impacts on these industries in our results. Because the NAICS codes lag industry changes and new/emerging industries and clusters often do not have distinct codes, it is difficult to arrive at a well-defined, universally-accepted, distinct set of NAICS codes for certain industry groupings. NERC will generally follow industry cluster NAICS classifications provided by Business Oregon, but may face issues when attempting to present economic impacts for new/emerging industry clusters such as Clean Tech. NERC will explore other published sources, and will most likely break out the results for Clean Tech into a section with additional caveats in order to isolate any "double-counting" in the industry definition.

In addition to the industries identified by Business Oregon, NERC will also highlight the economic impacts on Agriculture, Energy Suppliers and Utilities, Transportation, State and Local Government, Construction, Hospitality, and Other Manufacturing Sectors. NERC will also highlight industries that see large or unexpected impacts, discovered during the modeling process.

Depending on data availability and willingness of key firms to share data, case studies demonstrating impacts at the firm level will be performed. In addition, NERC's modeling will also consider economic impact tradeoffs between reinvestment targeted at particular industries and economic efficiency. The intent of this section would be to provide a better understanding of the specific positive or negative impacts experienced by specific industries, as well as gaining insight into competitiveness issues.

4. **Evaluation of the direct and indirect impacts, including the impact on jobs and wages, on existing state and local government revenue sources and on per-unit costs of specific fuel types.**

We will evaluate the direct and indirect economic impacts, including the impact on jobs and wages (with attention paid to the wage levels of jobs created/lost), on existing state and local government revenue sources, and on per-unit costs of specific fuel types. In our previous study, we performed analysis of the impacts on jobs, wages, and tax revenue benefits for state and local governments. Part of this analysis included forecasting price changes for a variety of fossil fuels used in Oregon. With an expanded scope, this report will build on this initial research to incorporate a greater level of detail. We plan to incorporate components of dynamic economic feedback in our analysis to examine the dynamic technology switching or adoption behavior of firms and industries under a clean air fee or tax. In addition, environmental feedback effects of utilizing the clean air tax or fee revenue for state climate goals will be included.

Using greenhouse gas inventory data from the Oregon Department of Environmental Quality (DEQ) and Oregon Department of Energy (DOE) as well as scientific analysis performed by our climate change science team, we will estimate the Oregon-specific impacts on per-unit cost of fossil fuels. The results will then feed into our economic

impact analysis, which includes both direct and indirect impacts on employment, labor income, total value added and economic output, and fiscal impacts on existing state and local government revenue sources.

The modeling process will begin with the Carbon Tax Analysis Model (CTAM). In our previous report, we used CTAM to estimate the total revenue and emissions impacts of the tax. In the expanded study, we will use CTAM to estimate the increase in prices due to the clean air fee or tax, relative to the Energy Information Administration's long-range forecast. We will use these augmented price forecasts as inputs in REMI.

REMI is a program used to estimate economic impacts. At its core is an input-output framework that tracks the industry/government/household interactions within the economy. New economic activity is assumed, and the necessary economic reactions from other sectors of society are estimated. REMI goes beyond this basic framework by including dynamic changes over time. In this framework, new economic activity changes the structure of the economy and this new structure is carried through to future time periods. REMI also includes econometric equations that estimate the reaction of individuals to the economic changes. Agents in the model will change their buying patterns and may even move based on changes in prices and economic opportunity in the area.

REMI features a dynamic forecast of economic activity in a particular region. The model includes its own energy price forecast. We will use our CTAM price estimates to alter the REMI price estimates, and dynamically forecast the changes in the economy associated with the increase in energy prices. In our previous report we were able to include some price pass-ons, but in order to estimate the full economic impact of the tax we need to have a fully-dynamic model. The clean air tax will directly increase the price of fuel, which will then increase the price of other consumer goods. Some industries have a greater ability to pass on these price increases by increasing their own sale prices. REMI will also be used to estimate the net effect of different revenue repatriation scenarios, in order to understand the tradeoffs between different policy options.

The REMI outputs will be used as inputs in combination with emissions factors derived from existing Oregon greenhouse gas inventories. The physicists on the project team have experience with this type of modeling. Because REMI produces dynamic estimates for each year until 2060, the forecast can be used to alter baseline estimates of fuel use. This will generate a dynamic estimate of emissions reductions in Oregon associated with the clean air tax or fee. These dynamic GHG emissions impacts will feedback into our estimations of the tax revenue generated by the tax. By creating bridges between these dynamic models, we will be able to produce more accurate revenue estimates.

5. **Assessment of potential methods for treatment of imported and exported energy sources at the state level.**
   NERC will conduct research to identify relevant legal requirements, and model border policy scenarios that accomplish the goals of the clean air fee or tax. Additionally, NERC will estimate the impacts of Oregon businesses and households, with an

emphasis on the methods that will likely minimize negative effects. We will identify and assess current strategies employed by regions that currently employ a clean air fee or tax to address imported and exported energy sources at the state level, and consult relevant research to find promising ideas that have not yet been implemented.

6. **Evaluation of revenue generation from the fee or tax at different tax rate or fee levels, including an analysis of long term revenue growth and stability over the business cycle.**

This study would estimate the emissions reduction and revenue generating potential of the fee or tax, and identify specific scenarios that demonstrate options for revenue repatriation or reinvestment. Expanding upon NERC's previous research, we will evaluate and project long term revenue growth and potential, and stability and seasonality over the business cycle of different appropriate clean air fee levels or tax rates. These fee levels or tax rates will be determined through engagement with the Legislative Revenue Office and other stakeholders, and research in the most current and acceptable studies in the fields of social cost of carbon (SCC) and full cost accounting. In NERC's previous study, proposed tax rates were well below estimates for the total social cost of carbon. For this study, we will consider a broader range of prices, including prices at or near estimates for the full social cost of carbon. These prices will be key in assessing the stability of revenues collected by the state in the long-term. We will also use emission factors for other environmental pollutants to estimate the decrease in greenhouse gases and particulates other than carbon. The tax will be applied to fuels based on carbon-equivalent (CO_2e) content, which includes greenhouse gases other than CO_2. The additional emissions factors will be used to break out the estimated reductions of other gases in order to allow other researchers to estimate additional health impacts.

The fee or tax analysis will include discussions of the scope of tax, setting the tax rate and budgetary goals, placement of tax incidence and burden, border and leakage issues (including application of the tax on imported energy), competitiveness of existing Oregon industries as well as opportunities for new industry development. In NERC's previous study, we found it useful to report on a variety of scenarios in order to demonstrate the tradeoffs involved in implementation. NERC will also investigate legal restrictions that may be applied to revenue use. It is assumed that our final report will make recommendations, but include alternatives geared toward helping policymakers understand dynamics of the tax.

The net effect of a clean air fee or tax in Oregon is highly dependent on the usage of the revenues. Methods for repatriating or reinvesting clean air fee or tax revenues may include cutting rates on corporate income or personal income taxes; directly subsidizing energy purchases for poor citizens; expanding tax credits; investing in carbon reducing programs such as energy efficiency, low-carbon transportation, and renewable energy; providing assistance for Oregon industries; providing Oregonians with direct rebates or writing "green checks" (direct payments to residents). The study would also evaluate the greenhouse gas reduction gains that would result from the different revenue repatriation or reinvestment scenario options. Additionally, NERC will investigate methods for avoiding revenue-negative outcomes like those experienced in BC.

7. **Provision of background information on the costs and benefits of existing law resulting in greenhouse gas emissions including, but not limited to, the following statutes: ORS 468A.270, 468A.280, 469.501,469.503, 469.3504, 469.505, 469.507, 469A.005 to 469A.210, 469A.300, 646.910 to 646.923, 646.925, 757.365, 757.370, 757.375, 757.380, 757.385, 757.524, 757.528, 757.531, 757.533, 757.536 and 757.612.** Pursuant to the analysis of implementing a clean air fee or tax, the study will review estimated costs and benefits of existing laws and statutes. The listed Oregon Revised Statutes cover a number of air quality issues aimed at reducing GHG emissions, although with varying degrees of success. Reduction of GHG emissions will have related environmental benefits but they also come at a cost. To the extent that benefits and costs of existing statutes can be measured from fiscal impact statements, other studies and our own analysis, we will compare those estimates with the benefits and costs of implementing a clear air fee or tax.

   NERC will develop a standardized system for assessing the interaction between each statute and a clean air fee or tax.

   ORS 468A.270 and 468A.280. This study will assess the costs and benefits of the Oregon Clean Fuels Program and related provisions contained in HB 2186 (passed in 2009). We will compare existing laws and statutes to obtain the ten percent reduction of GHG emissions from petroleum transportation fuels from 2012 to 2022 to that of a clean air fee or tax. Comparison will also include the registration and reporting requirements for parties that involve importing, selling, or distributing electricity or fossil fuels that can generate GHG emissions when combusted.

   ORS 469.501-507 and 469A.005-210 and 300. Utilities are subject to a number of GHG emission standards in terms of plant siting, carbon dioxide standards for base load and non-base load plants, and the construction and operation of plants. Comparison will also be made with the impacts from renewable portfolio standards and the use of renewable energy certificates.

   ORS 757.365-612. These statutes generally relate to utility regulation: from pilot programs for solar energy, credit for compliance with renewable portfolio standards, GHG emission standards and restrictions to long-term financial planning, to electric bill payment assistance.

8. **Evaluation of potential revenue allocation options designed to maximize positive impacts and mitigate detrimental or disproportionate impacts on low-income households and on various geographic areas and economic sectors.**
   One of the goals of the research is to identify clean air fee or tax revenue repatriation scenarios that minimize adverse impacts on Oregon's industries and jobs, while also maximizing carbon reductions and accounting for the benefits of such a tax. Options for revenue use will be compared based on their ability to maximize positive impacts and mitigate detrimental or disproportionate impacts on low-income households and selected business sectors. These effects will be tracked across time and geographic regions. Because this study will feature multiple geographic regions, data on energy and commodity prices in each region will allow us to estimate varying effects on low-

income households across geographic regions. The analysis of methods will include an emphasis on both desired outcomes and ease of implementation.

Based on previous research and conversations with BC tax administrators, we believe that a broadly-applied tax is ideal, but recognize the need to protect certain industries. Our previous report shows a tradeoff between targeted industry support and economic efficiency. We assume that the new, expanded analysis will show this same dynamic. One goal of modeling different repatriation scenarios will be to demonstrate to policymakers the dynamics and tradeoffs associated with each method.

In addition, to accurately characterize the disproportionate impacts on households across income levels from the clean air fee or tax and potential revenue allocation options, we will utilize alternative measures of income (e.g., lifetime income or annual expenditures) as proposed by previous studies such as Grainger and Kolstad (2012), Hassett et al. (2007) and Morris and Munnings (2013).

Project Timeline

Milestone	**Date**
Release of Project RFP	September 3, 2013
Deadline for Submitting Proposals	September 17, 2013
Review of Proposals	September 19-20, 2013
Notice of Intent to Award Project	September 20, 2013
Signing and Initial Project Meeting	October 1, 2013
Project Update Meeting	October 15, 2013
Draft of Project Outline/ Meeting to Review	November 1, 2013
Completion of Project Outline	November 15, 2013
Review Project Outline with Interim Legislative Committees	November 20-21, 2013
Revised Project Outline Based on Legislative Input	December 15, 2013
Monthly Project Update Meeting with LRO Staff	January-September, 2014
Draft Final Report to LRO	October 15, 2014
Final Report to LRO	November 1, 2014
LRO Releases Final Report	November 15, 2014
Review Project Report with Interim Legislative Committees	December 8-9, 2014

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