

## Challenge: Carbon tax disaggregation per industry (110 industries)

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29th London Group Meeting, September 13<sup>th</sup>, 2023*

### Introduction

Imposing a monetary cost on environmental damage may result in significant shifts by households and industry to curb potentially environmentally harmful behaviour, increasing demand for cleaner technologies and more energy-efficient products and encouraging clean technology research and development. It is important, therefore, to describe the correlation between economic signals sent through environmental taxation and resulting behaviour and price mechanisms. The Organization for Economic Cooperation and Development (OECD) provides a guideline for environmental taxation described in the System of Environmental-Economic Accounting (SEEA) which covers the scope, approach, exclusions, and the application.

Because climate change adaptation and mitigation overlap with the broader scope of environmental protection (at least partially), environmentally related taxes can influence research and development (R&D) on strategies focused on both climate change adaptation as well as mitigation. These taxes, such as the carbon tax, can have profound impacts on the mitigation front, modifying behaviour resulting in reduced emissions and spurring more research and development in the areas of adaptation and mitigation efforts through increased government revenue.

In May 2023, Statistics Canada released its first experimental Environmental Tax Statistics product (ETS), available at the national and provincial/territorial levels, for reference years 2010-2018. This new product records government revenues generated from environmental tax from industry, government, non-profits, households and from gross fixed capital formation. It follows the classification systems (product, industry, tax) used in Statistics Canada's Supply Use Tables (SUTs).

### Sources and methods

For the purpose of the ETS, environmentally related taxes refer to taxes whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific, negative impact on the environment,<sup>1</sup> such as air emissions, other pollutants (effluents to water), fuel consumption, or vehicle ownership. The estimates produced by the ETS are based on the annual taxes levied on products and production processes which could adversely affect the environment.

It is important to note that the decision of whether (or not) a tax is considered environmentally related is made according to the specific tax base on which the tax is levied, that is, physical units that are directly linked to environmental pressures. Following the OECD methodological guidelines that are in line with the SEEA, certain taxes such as value-added taxes (VAT) or goods and services taxes (GST) are excluded and as such, are considered out of scope in the ETS. A tax base is comprised of the aggregate of the in-scope commodity level estimates whereas a tax type refers to the in-scope taxes to be applied to said bases.

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<sup>1</sup> System of environmental-economic accounting 2012: Central Framework. Section 4.150.

## Canadian Supply and Use tables and Canadian Government Finance Statistics

All estimates in the ETS are derived from Statistics Canada data. The environmentally related tax revenue comes from the Supply and Use Tables (SUTs) Margins & Taxes tables or the Canadian Government Finance Statistics (CGFS). Canada produces annual SUTs at the national and sub-national levels, reporting about 490 goods and services, 270 industries and final demand categories, and 19 different tax types. However, some tax bases are embedded into a single line in the SUTs such as the taxes on products and taxes on production. For tax bases falling under these categories, like emission trading permits or hunting/fishing licenses, data are extracted from the Canadian Government Finance Statistics (CGFS).

In-scope taxes for the ETS include taxes with an environmental rationale. These in-scope taxes are derived from the Margins and Taxes tables and include: the federal air transportation tax (FATT), federal custom import duties (FCID), the federal excise tax (FEX), the federal gas tax (FGS), the provincial gas tax (PGS) and the provincial environment tax (PENV). Environmentally related tax statistics apply the same definitions as the underlying taxes of the Environmental Accounts.

Environmentally related taxes from the Margins and Taxes sub-set are selected from relevant tax bases as per the OECD guidelines. In some cases, the tax base is the measured or estimated amount of emissions of a polluting substance. However, it is often difficult and expensive to measure emissions directly, since so many taxes are based on proxies for emissions, for example the use of fuel oil.

The environmental related tax amounts identified from the SUTs and the CGFS are then reported in four main categories (tax base categories): energy taxes, transportation taxes, pollution taxes, and natural resources taxes.

Energy taxes are broken into carbon taxes (which are charges placed on greenhouse gas emissions released primarily from energy production, including the burning of coal or natural gas) and other taxes on greenhouse gas emissions other than CO<sub>2</sub>. Also included are emission trading permits (which record government revenue from the auctioning of emissions permits also known as the 'cap and trade' system), which are treated as taxes on production in the Canadian National Accounts.

Examples of transportation taxes are personal and commercial motor vehicle registration taxes. Pollution taxes cover, among others, fees on ozone-depleting substances and non-energy related GHG emissions, as well as recycling fees like tire eco fees. Hunting and fishing licenses are examples of natural resources taxes.

### Key findings ([data table](#), [analytical text](#))

- Environmentally related taxes reached \$29 billion at the Canada level in 2018. This represents just above 10% of total taxes<sup>2</sup> collected.
  - Energy taxes reached almost \$21 billion (72% of the total). Carbon tax accounted for \$2.7 billion of this \$21 billion.
  - The Industry sector contributed \$15 billion (52% of the total) while the Household sector contributed \$14 billion to Canada's total environmentally related tax revenue, 2018.

Statistics Canada is aiming to release 2019 and 2020 estimates of ETS in December 2023.

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<sup>2</sup> Total taxes are composed of taxes on products and production.

## **Industry disaggregation – specific challenge: Carbon tax disaggregation per industry**

The disaggregation of carbon tax revenue by industry level could prove useful for decision makers, especially in the context of climate change mitigation efforts. As per the OECD guidelines, Statistics Canada aims to disaggregate carbon tax revenues by industries (approximately 110). The challenge is that although reported per industry, carbon taxes are embedded within the “Taxes on products” line of the SUTs, along with many other items. The information comes to the SUT team as a “total” for the whole industry from the CGFS.

To obtain an allocation per industry, the carbon tax revenue is disaggregated by applying the SUT expenditure patterns. Essentially, the revenues, provided by the provinces and territories by product, are allocated to industries and households based on this pattern and taxability. However, an industry that may not have incurred in carbon tax expenditure in a certain province, may show as indeed having an expenditure if this general expenditure pattern is applied, or vice versa. For example, if at the Canada level, a commodity incurred an environmentally related expenditure, if this is applied at the provincial level, a province may show as having expenditures when, there are none for that commodity. To complicate matters further, some industries have special tax exemptions in each province or territory, which also require special treatment to the data to best reflect actual tax revenue.

To address these challenges, work is currently underway with both internal and external stakeholders that includes:

- Detailed review and updated industry exemption (relief provided upfront through exemption certificates, when certain conditions are met) patterns by geography with regards to carbon pricing (in collaboration with subject-matter analysts at Environment and Climate Change Canada and the Department of Finance); and
- Analysis of whether it would be statistically sound to use GHG industry emission patterns to help assign the carbon tax amount paid.

### Questions for London Group members

- If carbon tax revenues are collected as one “total” amount for the industry, what method(s) do you use or recommend to disaggregate by payee industry?
- It was suggested that we look at the GHG emission patterns to allocate the carbon tax; we are not sure exactly how to correlate it. Do you have any experience using this method?
- What other methods should be investigated?

## **A quick word on climate change adaptation and mitigation**

Another area of guidance to consider improving is whether to classify the behavioural changes the economic impacts of environmental taxation cause under either adaptation or mitigation. As these correlations evolve, it will be important to understand the differences to make the best use of this taxation revenue.

### **For more information (information available in English and in French)**

Methodological Guide: Canadian System of Environmental-Economic Accounting

[Methodological Guide: Canadian System of Environmental-Economic Accounting \(statcan.gc.ca\)](#)

Canadian System of Environmental-Economic Accounts - Environmental tax statistics (ETS)

[Surveys and statistical programs - Canadian System of Environmental-Economic Accounts - Environmental tax statistics \(ETS\) \(statcan.gc.ca\)](#)