

# GLOBAL DATASET FOR INVESTIGATING UPSTREAM EMISSIONS, VALUE AND GHG PRODUCTIVITY

## User Instructions

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This briefing note introduces the Carbon Pricing Unlocked (CPU)<sup>1</sup> dataset on greenhouse gas (GHG) productivity in global supply chains. GHG productivity<sup>2</sup> is a metric that shows how efficient the economic value of a product is created relative to its climate impact. This free-to-use dataset<sup>3</sup> consists of an input-output table with GHG emissions, value added and GHG productivity for nearly 200 products at a global level.

### Why did we publish this dataset?

In the post Paris-Agreement era, businesses are increasingly feeling pressure from investors to manage climate related financial risks—including managing risks from their supply chains—by meeting the recommendations from the Financial Stability Board’s Task Force for Climate-Related Financial Disclosures (FSB-TCFD).<sup>4</sup> Furthermore, businesses seek to maintain or grow economic output whilst dealing with rising carbon prices<sup>5</sup> and other climate policies. Meanwhile, governments are taking more climate action themselves by setting up sustainable procurement strategies and using resources more efficiently.

Whilst both businesses and governments are increasingly gaining a better understanding of their own direct emissions, upstream and downstream emissions in global value chains remain difficult to quantify. **With the publication of this dataset, we aim to provide organisations with a starting point to quantify the GHG emissions embedded in their products and insights into the value created by each of those products.**

### What can you use this dataset for?

- ▶ Analyse climate-related risks and opportunities in your supply chain by identifying hotspots of GHG emissions and how those compare to the value added
- ▶ Determine the potential impact of climate policies through scenario analysis using a variety of carbon prices for the different products that you buy or sell
- ▶ Develop sustainable procurement and supply chain management strategies and shift your purchasing to less emission intensive supply chains
- ▶ Design an internal carbon pricing (ICP) approach by assessing where the GHG hotspots are in the value chain and how high the internal carbon price needs to be to have an impact on the value added<sup>6</sup>

### Who is the dataset for?

The dataset can be particularly interesting to the following type of departments within companies, governments and financial institutions:



1 For more information on the Carbon Pricing Unlocked partnership, refer to: <https://guidehouse.com/experience/energy/2018/carbon-pricing-unlocked>  
2 The ratio between the value added in monetary terms and the GHG emissions embedded in the product. In the CPU dataset, the GHG productivity is provided in US dollars per tonne carbon dioxide equivalent (US\$/tCO<sub>2</sub>e). See also Generation Foundation and Ecofys, *Impacts of a Global Carbon Price on Consumption and Value Creation*, November 2016.  
3 This dataset is derived from EXIOBASE 3, a multi-regional input-output database. For more information on EXIOBASE, refer to: [www.exiobase.eu](http://www.exiobase.eu).  
4 FSB-TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, June 2017.  
5 “State and Trends of Carbon Pricing 2019” *State and Trends of Carbon Pricing* (June), World Bank, Washington, DC.  
6 For more information on designing a best practice ICP approach, refer to: Navigant, The Generation Foundation and CDP, *How-to Guide to Corporate Internal Carbon Pricing*, December 2017.

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### How to use this dataset?<sup>7</sup>

1. Please read the 'Instructions' tab first to familiarise yourself with the dataset after opening the Excel file 'CarbonPricingUnlocked\_dataset.xlsx'
2. To identify potential GHG emissions and value added hotspots in your supply chain, from the 184 products available, identify one or more products that you want to analyse and refer to the worksheets 'GHG emissions' and 'Value added'
  - ▶ Rows in these worksheets represent the downstream perspective and indicate the GHG emissions and value added created by products at the global level
  - ▶ Columns in these worksheets represent the upstream perspective and indicate the GHG emissions and value added embedded within products at the global level
3. To identify which of your products potentially creates most value per GHG emitted, refer to the worksheet 'GHG productivity'
  - ▶ Each column under the products in the row "Value added to the product for each unit of GHG emitted" shows where the GHG productivity associated with that product comes from. This allows you to see which purchased products add the most value for the least amount of GHGs emitted for the product in question
  - ▶ Each row next to the products in the column "Value added by the product for each unit of GHG emitted" shows where the GHG productivity associated with the product goes to. This allows you to see where the product can add most value for the least amount of GHGs emitted
4. To identify the potential carbon cost of products at the global level, assume a carbon price (e.g. 100 US\$/tCO<sub>2</sub>e) and refer to the worksheet 'GHG emissions'
  - ▶ To determine the carbon costs created by products at the global level, multiply the carbon price by the 'total GHG emissions created per product' at the upper right of the table
  - ▶ To determine the carbon costs embedded by products at the global level, multiply the carbon price by the 'total GHG emissions embedded per product' at the bottom of the table.
5. To identify the 'value added at risk' of products at the global level, assume a carbon price (e.g. 100 US\$/tCO<sub>2</sub>e) and refer to the worksheets 'GHG emissions' and 'Value added'
  - ▶ Multiply the GHG emissions with the carbon price, and divide by the value added. This gives an estimate of the 'value added at risk' (%) for products at the global level
6. Repeat from Step 2 until 5 with various products and carbon prices to use the information on carbon costs and 'value added at risk' in managing your climate-related risks, developing a sustainable supply chain strategy, setting up your ICP approach or identifying new business opportunities

### What are the limitations of the dataset?

- ▶ This dataset only provides a global overview, while country-level data can show significant differences
- ▶ The dataset is static and provides a snapshot of 2015
- ▶ The dataset does not include any considerations on cost pass-through when using it to determine the carbon costs in products. In reality, suppliers may absorb (a part of the) carbon costs depending on market circumstances and their bargaining power. Data or assumptions on cost pass-through rate are needed to determine the carbon cost impact on product prices
- ▶ The dataset does not contain information on price elasticities and consumer's reaction to price differences

The full version of EXIOBASE 3 includes time-series and country-level data and is available here: [www.exiobase.eu](http://www.exiobase.eu)

7 We wish to thank Noémie Klein (Asset Resolution), Maarten Neelis (Ministry of Infrastructure and Water Management) and Harry Wilting (PBL Netherlands Environmental Assessment Agency) for their valuable contributions to this work.