

# Building “greenhouse gases accounts” fully integrated with monetary national accounts

Expert Forum for Producers and Users  
of Climate Change-Related Statistics  
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## Our purpose : facilitate the joint use of carbon emission and macroeconomic data in France

### – Partnership between

- INSEE, the national statistical office (NSO) → *compiles the monetary national accounts*
- The SDES, statistical office of the ministry of the environment → *compiles the Air emission accounts (AEA) and the carbon footprint*

### – Intended use of the new greenhouse gases accounts

- Analytical work by environmental and macro-economists, in the public sector and other research institutions
- Support macroeconomic and sectoral public decision making

## Three hybrid datasets to link the physical and monetary accounts

### – Production approach

- **Air emission accounts** and **physical energy flows accounts** with **monetary production and value added**
  - *energy and carbon intensity of resident production*

### – Demand approach

- **Carbon footprint** with **monetary final demand**
  - *carbon content of final demand*

### – Bridge tables between production and demand approaches

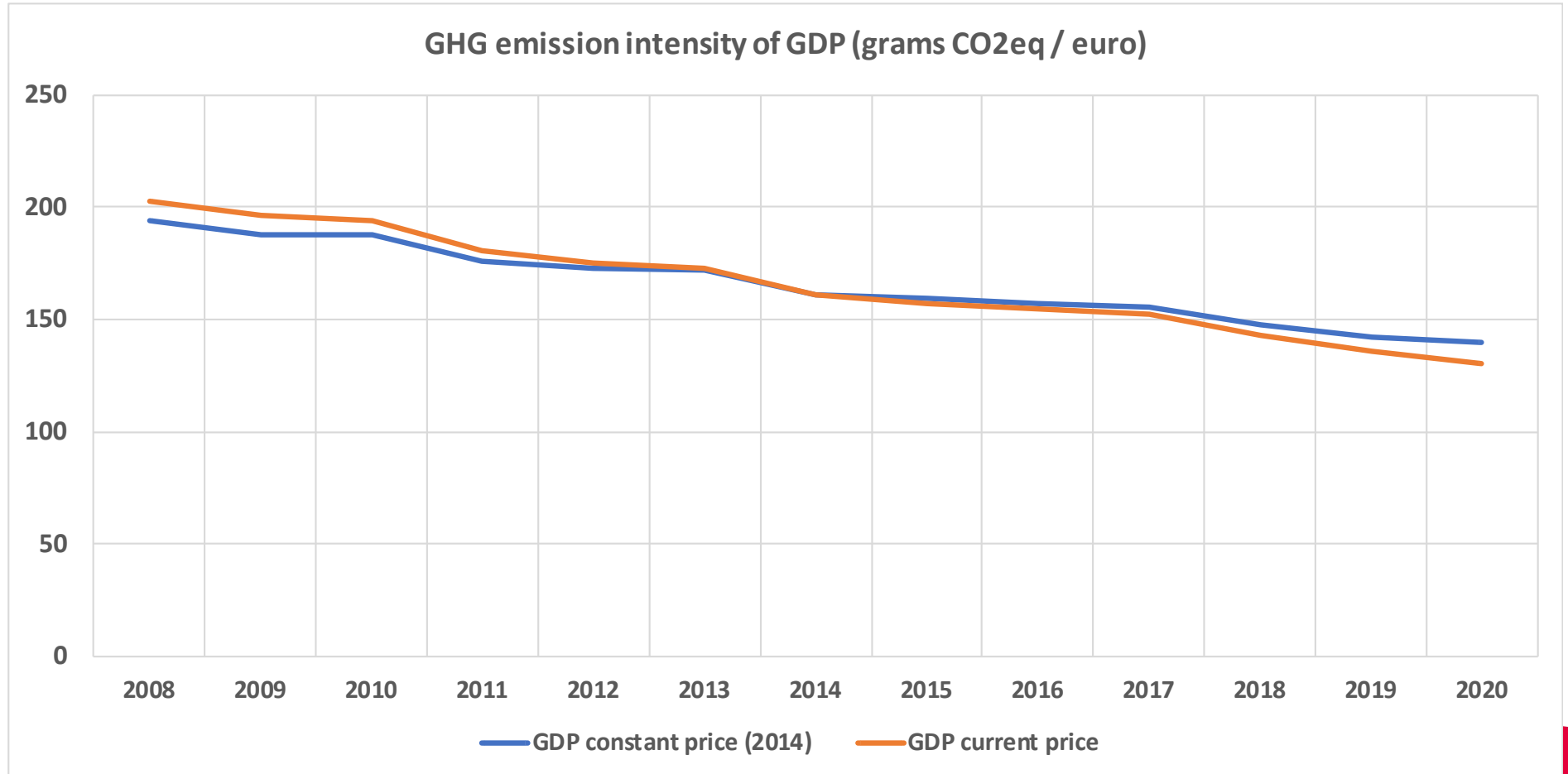
- **Carbon content of imports, exports** and **domestic production**
  - *carbon embedded in French international trade*



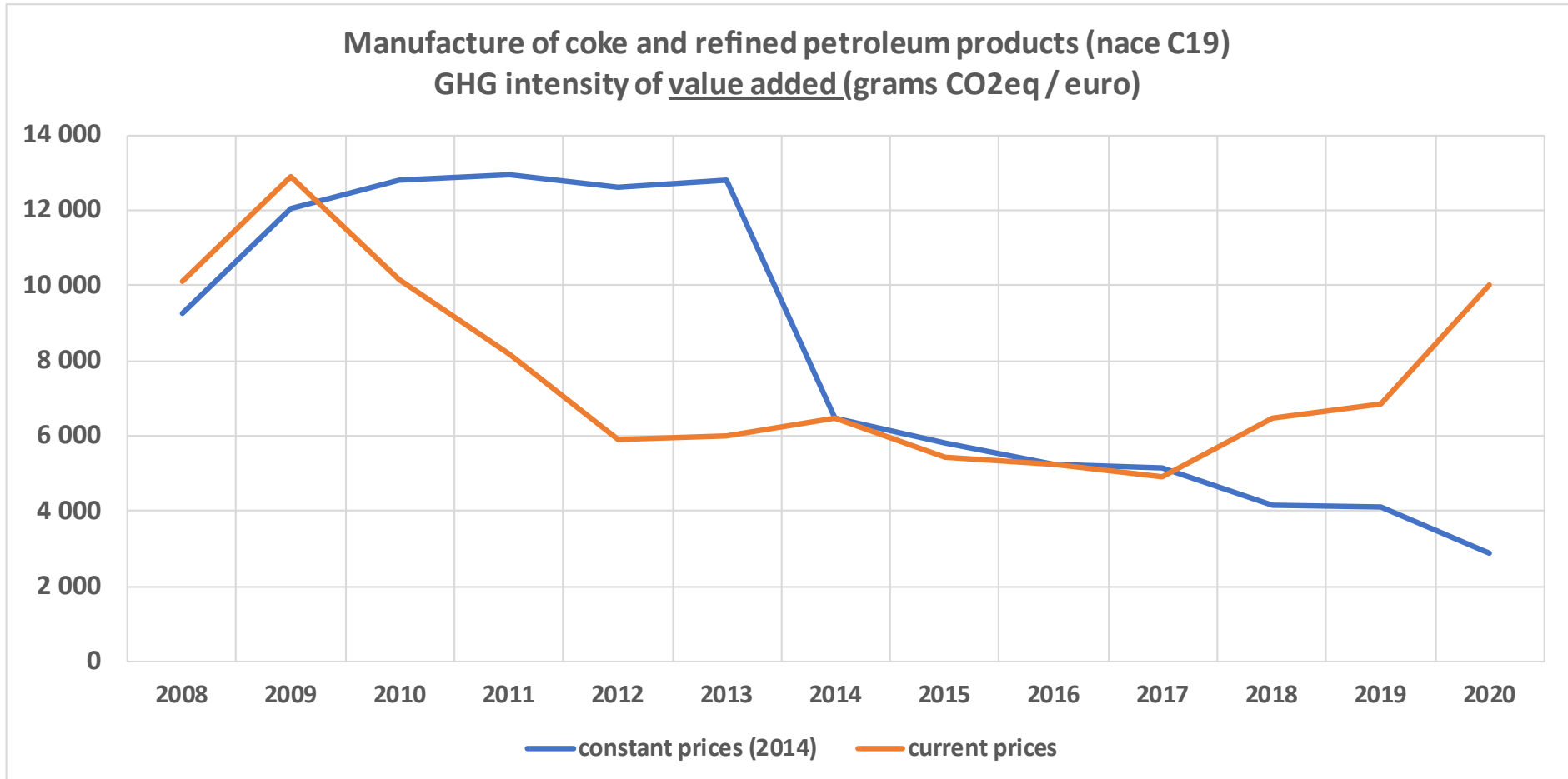
## **Illustrate the coupling / decoupling between resident economic activity and energy consumption and GHG emission**

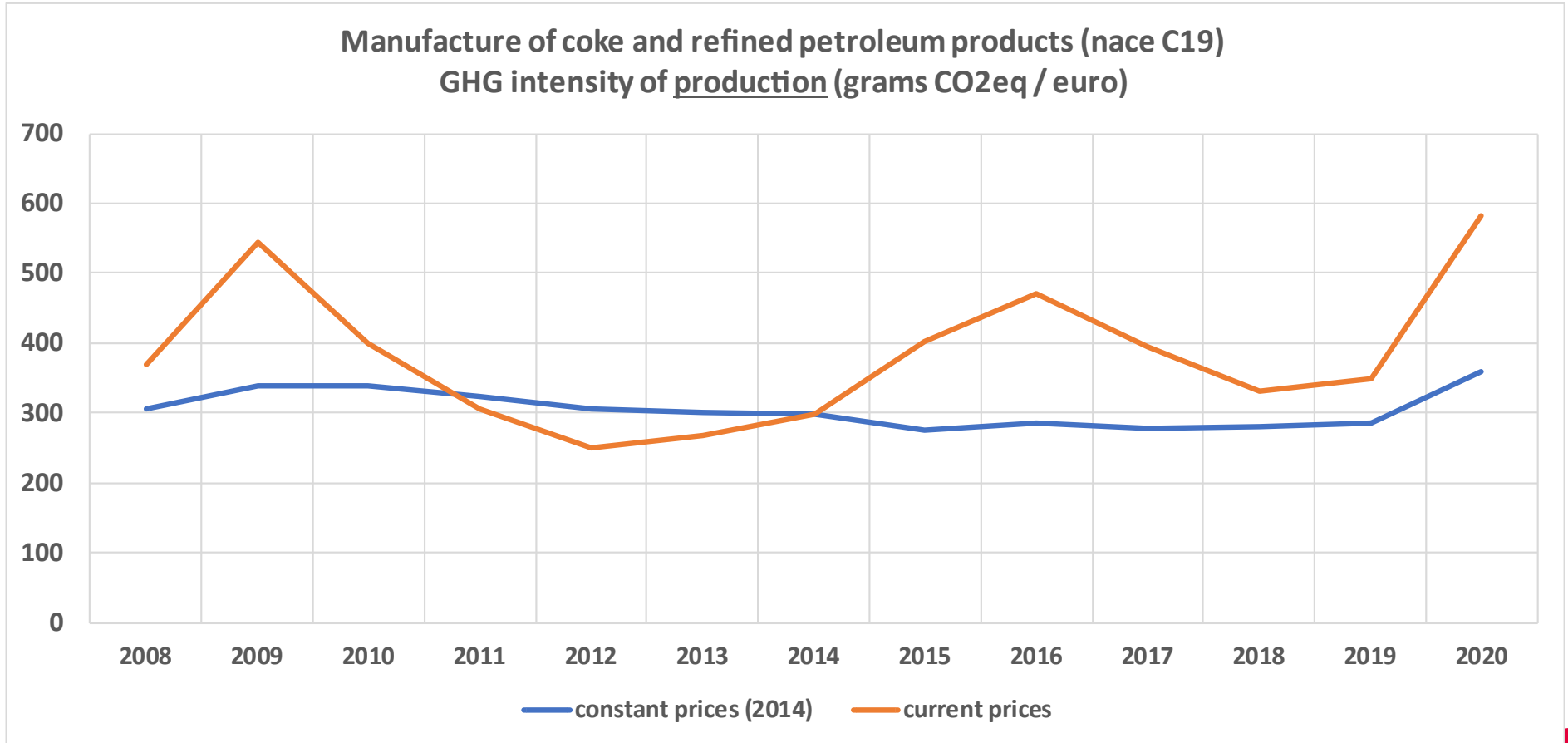
- **Energy and emission intensity of GDP**
  - At the economy level : intensity of value added
  - At the industry level : intensity of value added or production
- **Offer bridge tables to reconcile AEA with UNFCCC inventory (total emissions) and PEFA with IEA energy statistics**
- **Monetary series in current and constant prices**

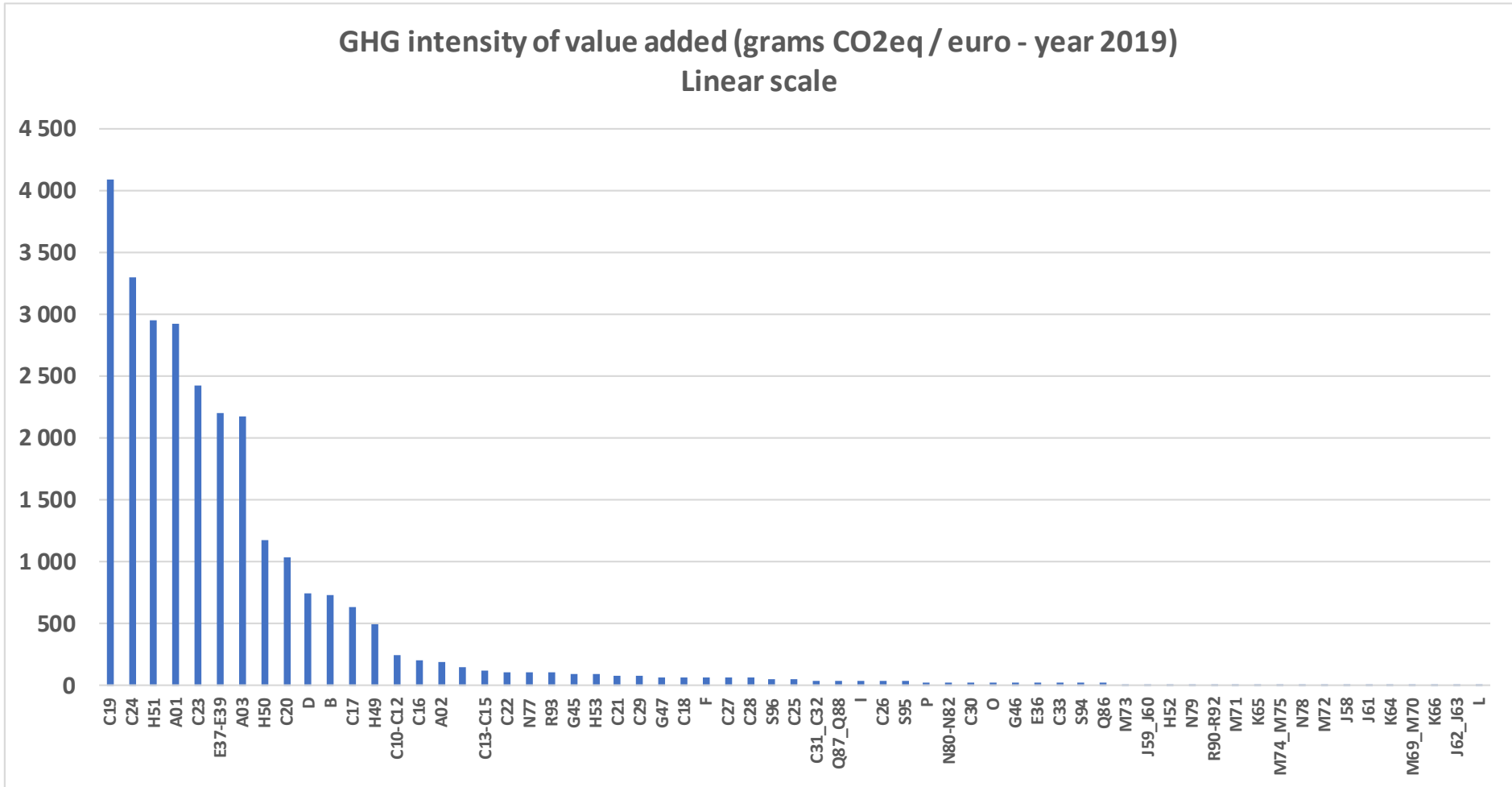




But industry level intensities can be harder to read, because the monetary value added may be quite volatile ...

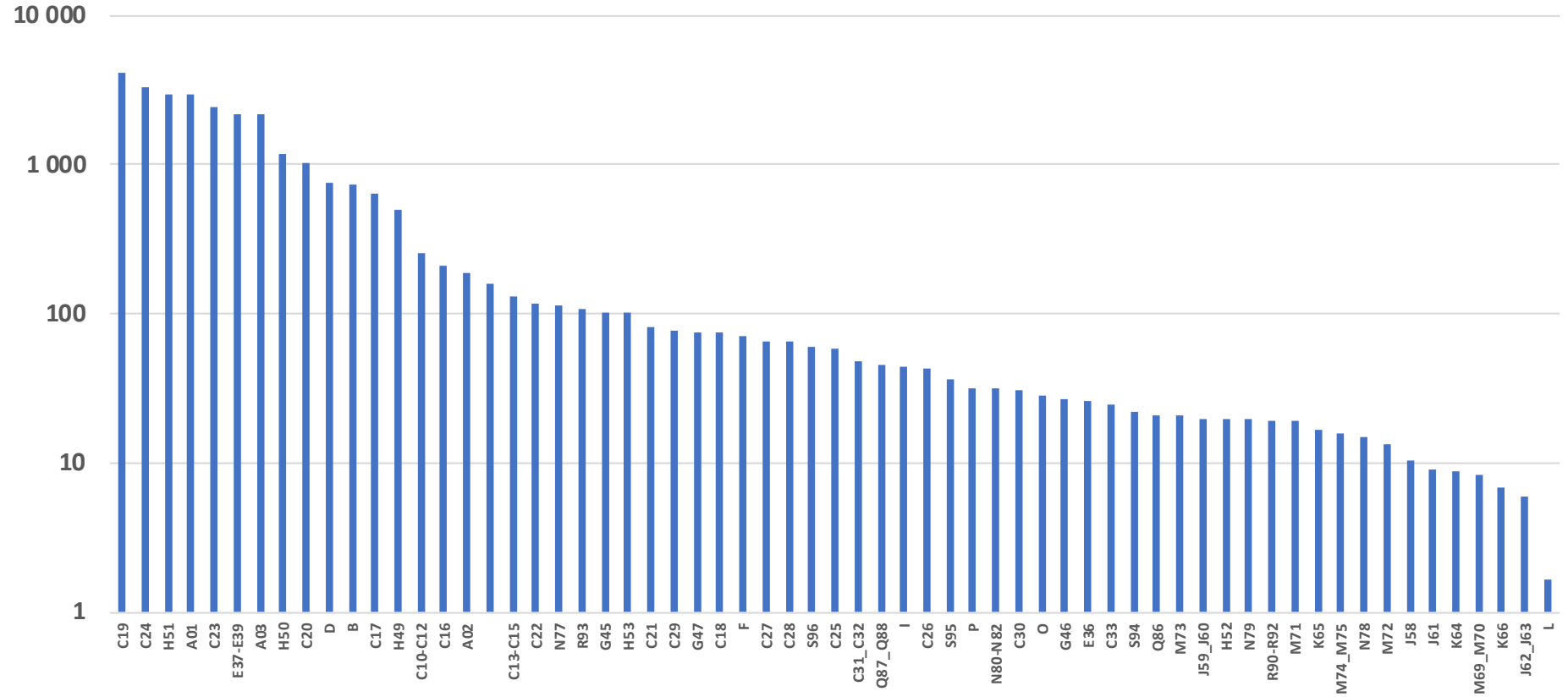








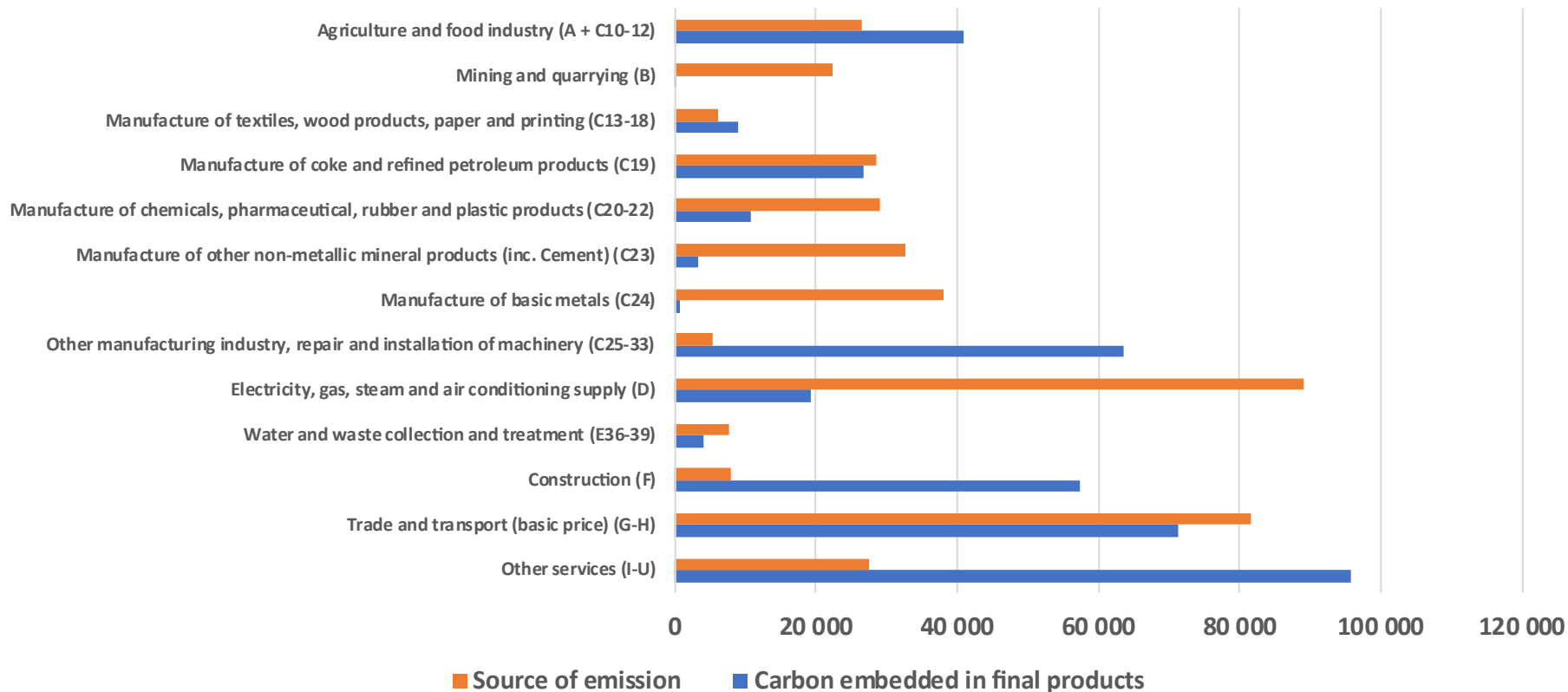
GHG intensity of value added (grams CO2eq / euro - year 2019)  
Log 10 scale



## Analyzing the GHG content of the French final demand (consumption and investment)

- **GHG content of the French final demand with two breakdowns**
  - GHG content of final goods and services
  - GHG emission at the source (initial production in all countries)
- **Estimation of the carbon footprint up to year N-1**
  - Some forecasting needed for the GHG content per euro of finished products in N-1
- **Need to properly decompose prices**
  - Content of finished goods and services ↔ purchaser prices
  - Emissions at the source ↔ basic prices (excluding taxes, trade and transport margins)

## CO2 footprint by industry (in tons - year 2019)



## The footprint calculation gives the following bridge table (in euros and CO2)

		Final user		
		France	RoW	
Origin of the emissions	France	A	B	Air emission accounts (A+B)
	RoW	C	-	Carbon footprint (A+C)

- A Carbon content of French production, dedicated to French final demand
- B Carbon content of French production, exported
- C Carbon content of French final demand, imported

**Interpretation challenge :** B and C do not represent the usual exports and imports found in monetary accounts, but rather the share of production induced by the foreign (resp. French) final demand

→ we can decompose further to analyse the carbon flows embedded into domestic production, imported and exported products



## Transitioning to a « multi regional input-output » (MRIO) model to improve the precision and analytical relevance of the carbon footprint

- FIGARO is a MRIO table developed by Eurostat and the JRC
  - 64 industries X 46 regions (countries or group of countries)
  - Annual update, up to year N-2
- To retain a complete consistency with French national accounts : we plan to use a so called « simplified single national accounts consistent » (SNAC) method
  - The carbon intensity of imported goods and services (per euro) comes from FIGARO, but is benchmarked to the official French national accounts aggregates

## To compute the French carbon footprint, we need a global view of GHG emissions

### – What we need : global Air emission accounts

- All greenhouse gases : CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and F-gases X 46 regions X 64 industries
- Yearly time series since 2010

### – What we have

- Official Air emission accounts : EU27 + UK, Norway, Switzerland, Turkey
- Eurostat global estimates for CO<sub>2</sub> (pilot project linked to FIGARO)
- OECD estimates for CH<sub>4</sub> and N<sub>2</sub>O : US, Russia, Japan

### – For the rest : need to come up with reasonable estimates based on UNFCCC inventories and / or EDGAR database

- Short to mid-term « gap filling » before Paris agreement ETF and the G20-DGI produce their full benefits
  - ***obvious area for international cooperation !***



## Project still in a design phase - we welcome any remark or foreign experience !

### – Timeline

- First dissemination : September 2024 (emissions and footprint up to 2023)
- Subsequent target : July N+1

### – Remaining work

- Test prototype tables and figures with future users
- Methodology : finalize robust estimation methods for emissions and footprint of year N-1
- Data source : finalize robust estimates of Air emission accounts for extra OECD countries (up to year N-2)



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