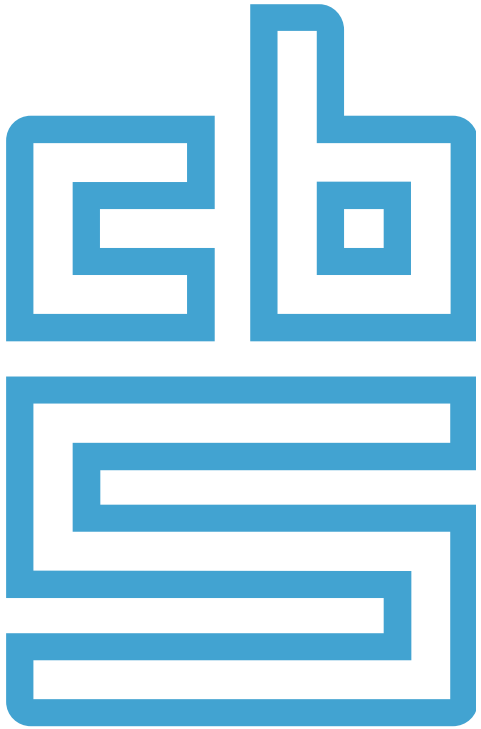


Producing carbon footprint in the Netherlands

UNECE Expert Forum for Producers and Users of Climate Change-Related Statistics, 31 August – 3 September 2021, Geneva, Switzerland

Edwin Horlings, Adam Walker & Niels Schoenaker

2 September 2021

Carbon footprint statistics are important

- Increasing demand for footprint statistics to support climate policy (EU and Netherlands)
- Carbon footprint is a key indicator
- Need for timely, consistent, internationally comparable data to inform policy

Inconsistencies are confusing

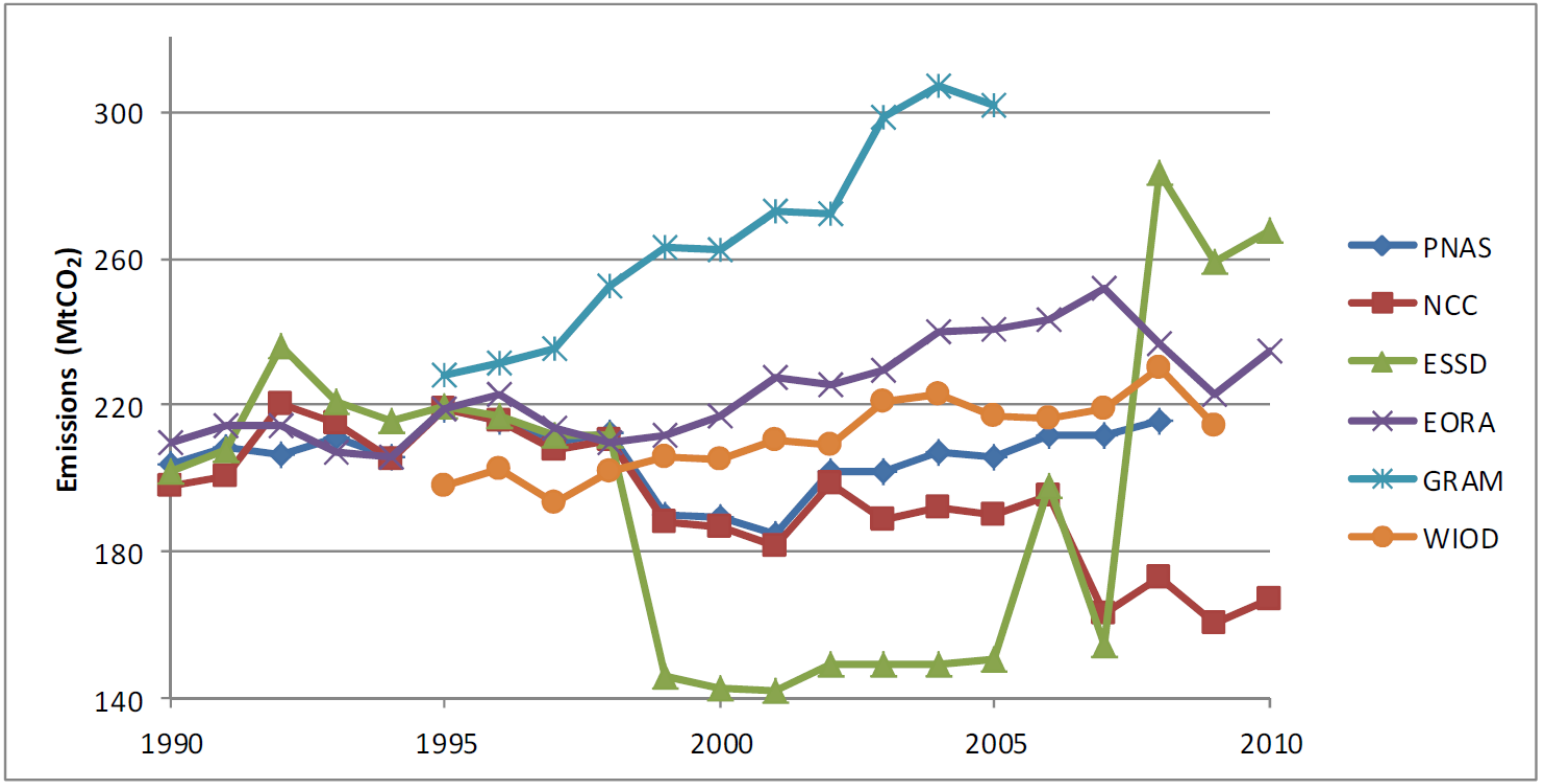
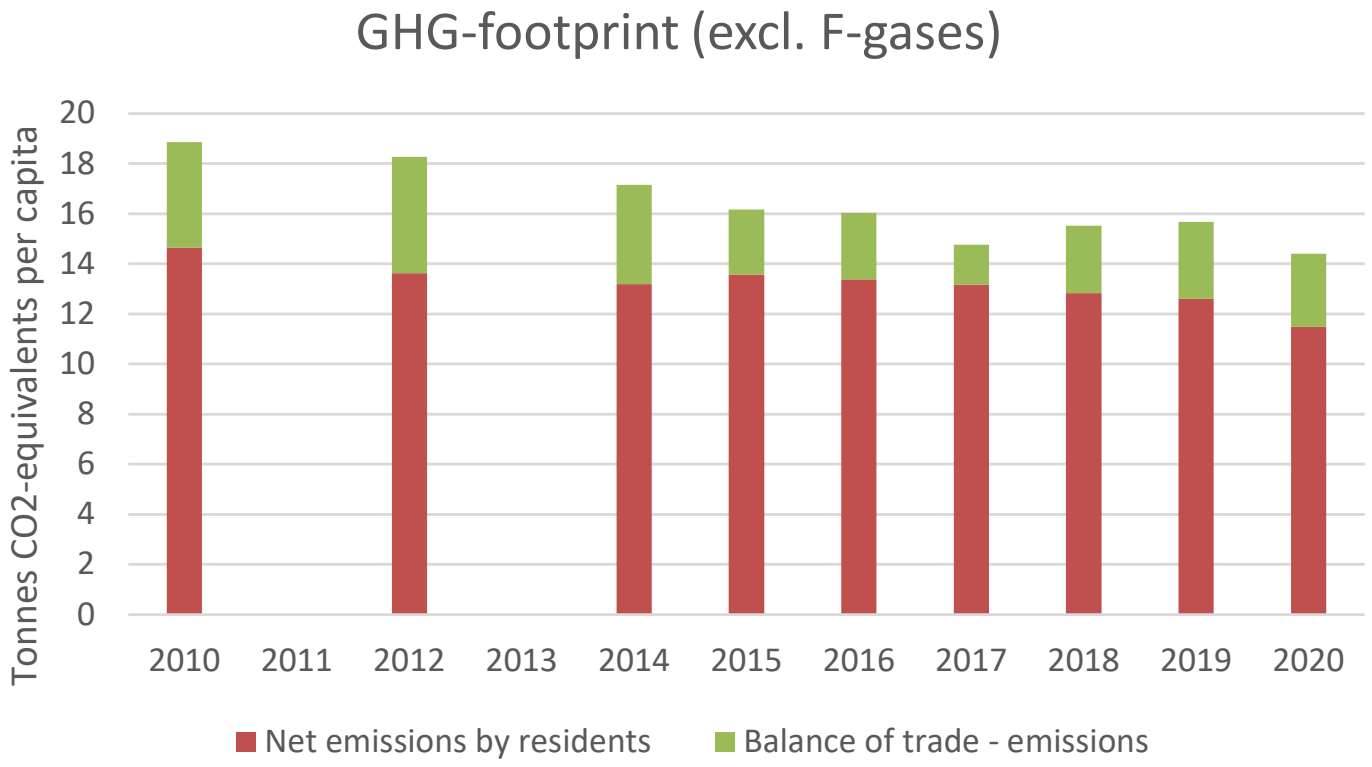


Figure 1. Dutch carbon (CO_2 only) footprint from 6 MRIO studies

We would like to calculate footprints with complete information

- A detailed input-output table:
  - every country
  - highly detailed
  - timely (t minus 1)
  - full information on emissions and other aspects
- Result would be an NxN matrix:
  - each row is supply chain from consumption to primary industry
  - each cell in a row is actual emissions that occur in that industry in that country due to consumption in the Netherlands

Current method: Emissions Embodied in International Trade (EEIT)



Current method: Emissions Embodied in International Trade (EEIT)

Emissions caused by

- production of exported goods and services produced in the Netherlands ($vnlexp$)
- production abroad of imported goods and services ($vnlimp$)

$$v_{nl}^{exp} = E_1'(I - AD_1 - AI_1)^{-1}s_1$$
$$v_{nl}^{imp} = E_j'(I - AD_1 - AI_1)^{-1}t_1$$

Major assumption

Emissions in other regions are calculated using technical coefficients of domestic intermediate use and imported intermediate use of the Netherlands (i.e. the input-output structure of the Netherlands AD_1-AI_1)

Preferred approach: Multi-Regional Input-Output tables (MRIOs)

- Considerable advantages
- Various options

Statistics Netherlands uses Exiobase to calculate footprint statistics

Exiobase has considerable advantages

- Detailed data
  - per consumption sector
  - per foreign country
  - per industry
- Timely
- Multiple footprints
  - emissions, natural resouces, land use, biodiversity, water use, employment, value added

Exiobase is not suitable for regular production of national statistics

- Different editions of Exiobase are not of the same quality (every update since 2011 is a nowcast)

- Availability is uncertain: it is made by academics if and when they have funding to do so

- Large investments needed to make Exiobase consistent with the SNA (SNAC-Exiobase)

Carbon footprints must be based on an MRIO that is institutionally embedded

- Need for long-term consistency and reliability
- Demand for multiple footprints, not just emissions
- One statistic for each footprint instead of several to avoid confusion among users

Towards a data infrastructure for all footprint statistics

- All footprints for all monitoring reports calculated in one go
- Achieve efficiency gains: spend less time analysing plausibility and prevent double effort
- Facilitate consistency and transparancy
- Standard methods to improve detail and timeliness
- Based on a “single authoritative MRIO”

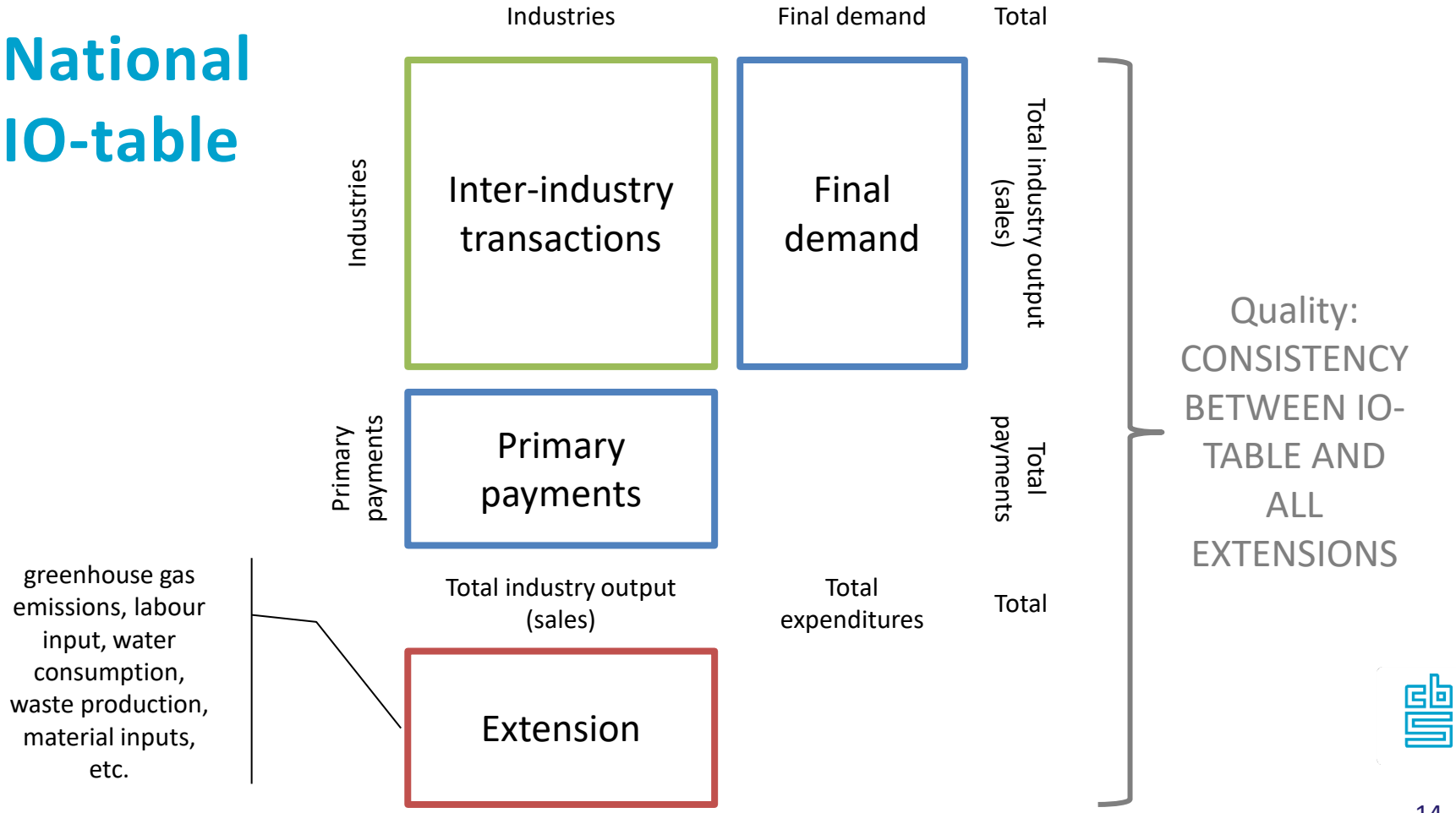
FIGARO will be the foundation

Full **I**nternational and **G**lobal **A**ccounts for **R**esearch in input-**O**utput analysis

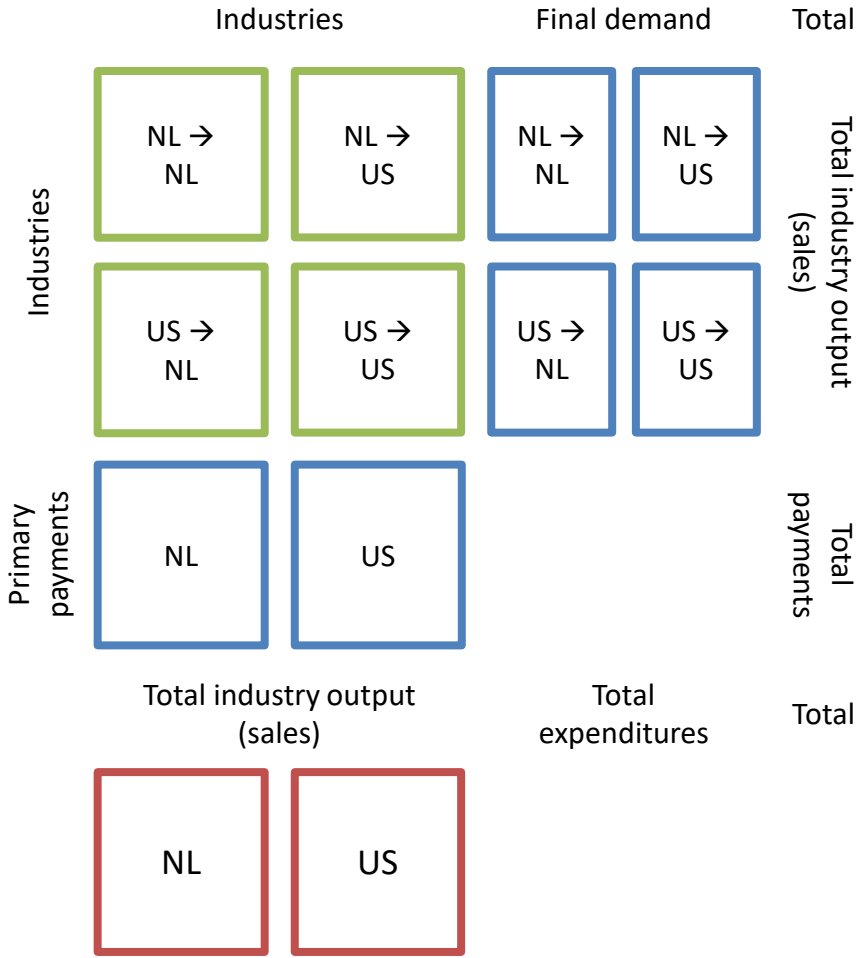
- 46 countries, 64 sectors up to and including 2017
- 64 countries, minimum 17 sectors, 2018 and 2019

No readily available “extensions” (such as emissions) but FIGARO is developing

National IO-table



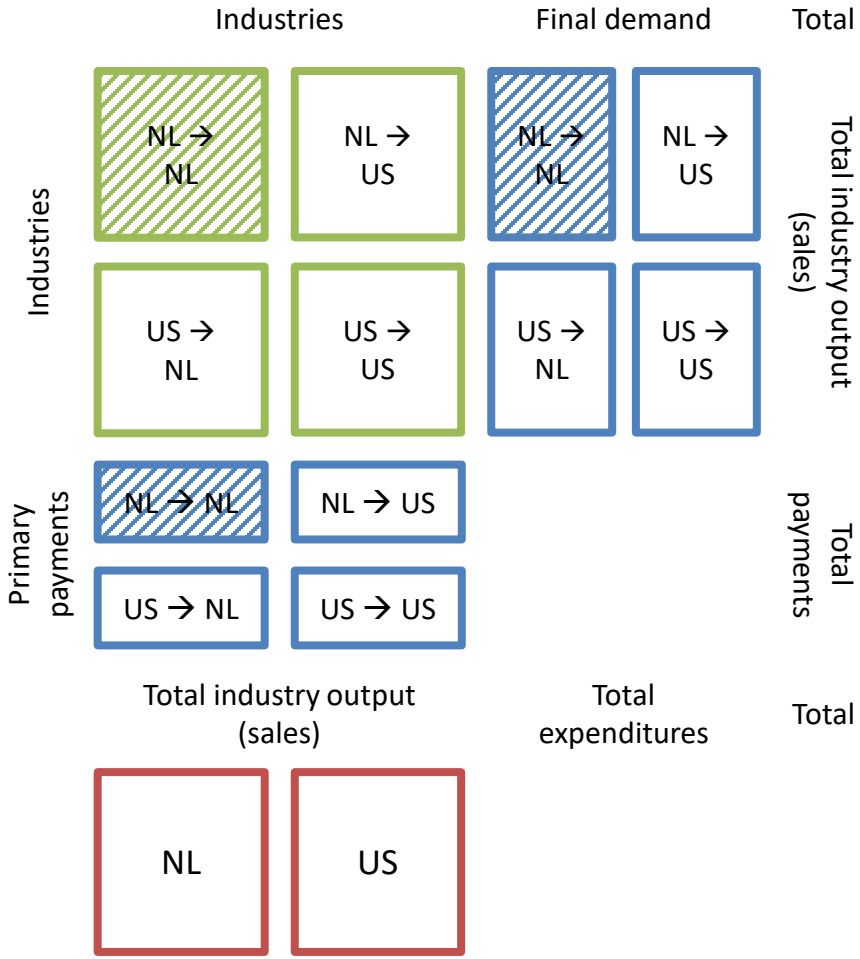
Multi-Regional I/O-table



Quality: SPECIFIC VALUE CHAINS AND LOCATIONS

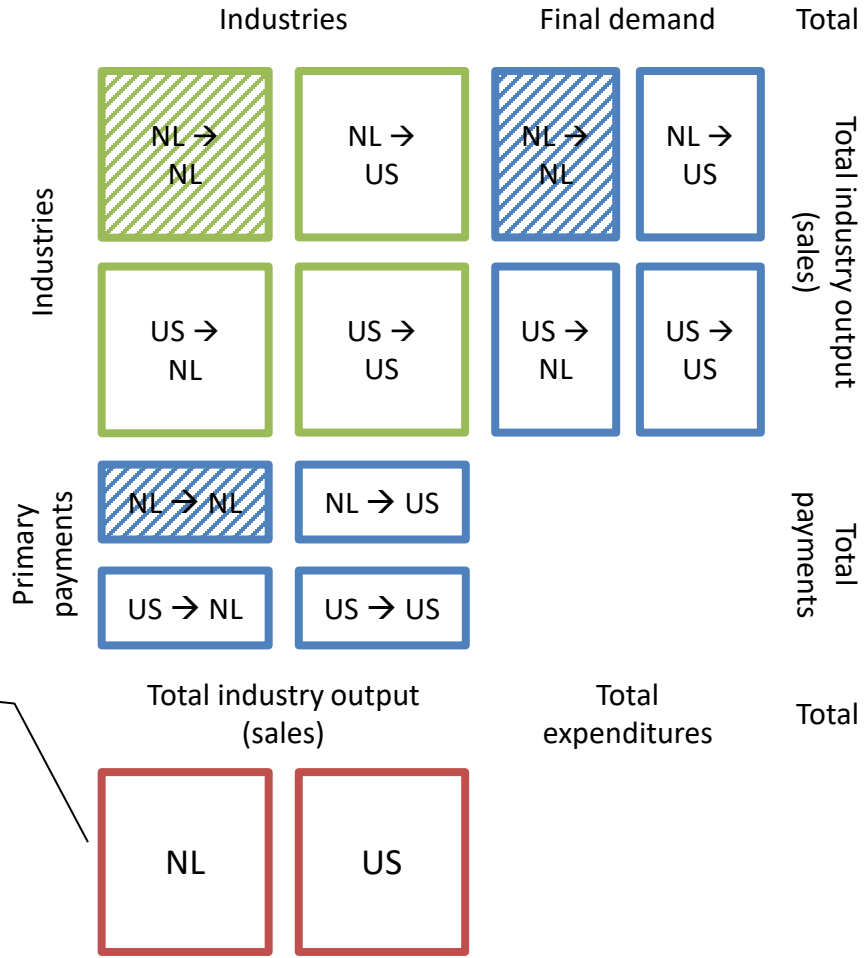
SNAC-MRIO

SNAC = System of National Accounts Consistent



Quality: CONSISTENCY BETWEEN MRIO, SNA STATISTICS, AND ALL EXTENSIONS

SNAC-MRIO

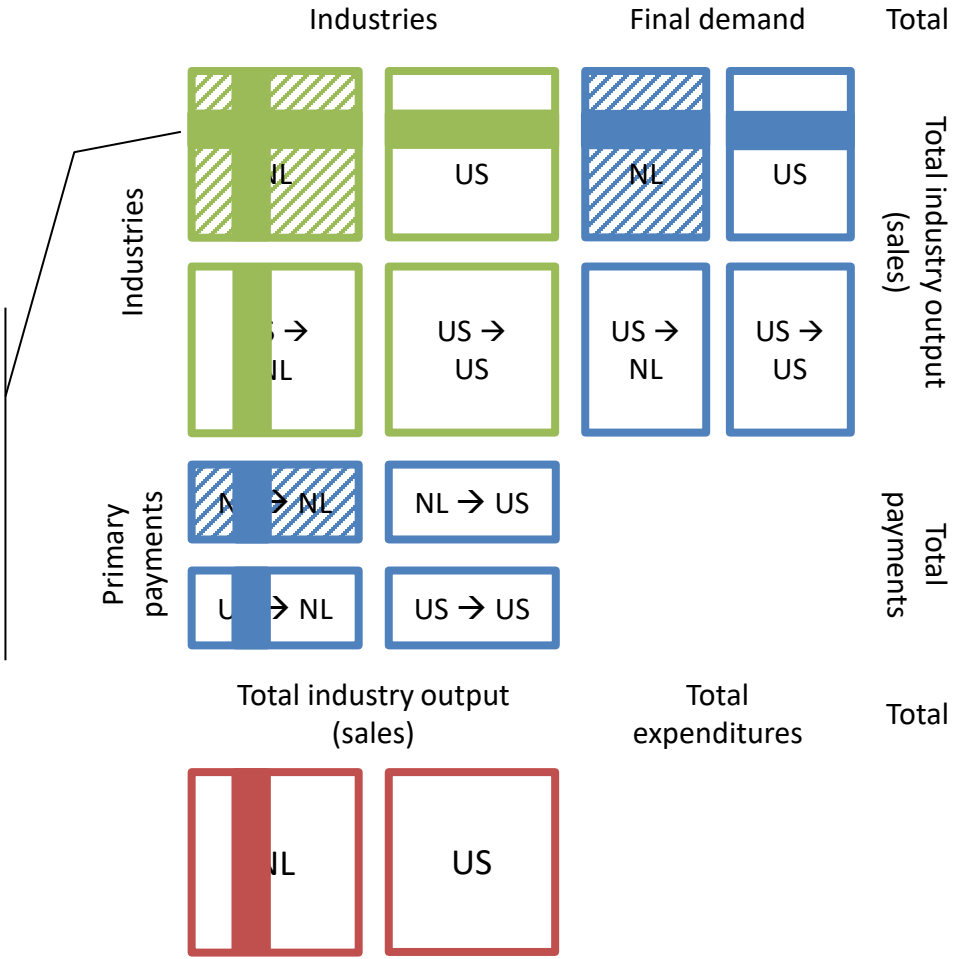


more detail through <u>decomposition</u> for example: greenhouse gas emissions by type of GHG or by source of emissions

Quality: MORE DETAIL NEEDED FOR SPECIFIC QUESTIONS

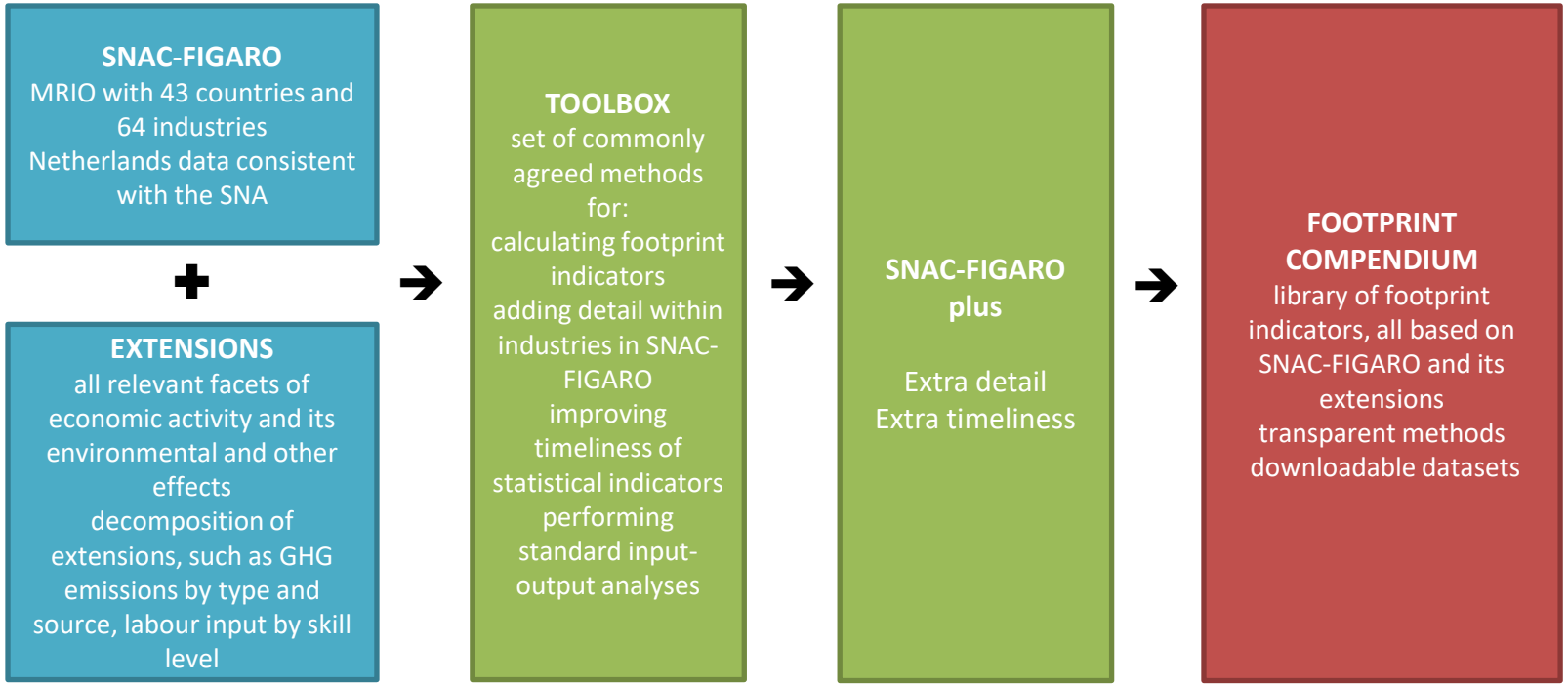
SNAC-MRIO

more detail <u>within industries</u> for example: steel within basic metals industry; oil, gas, or gravel within mining; distinction by firm size



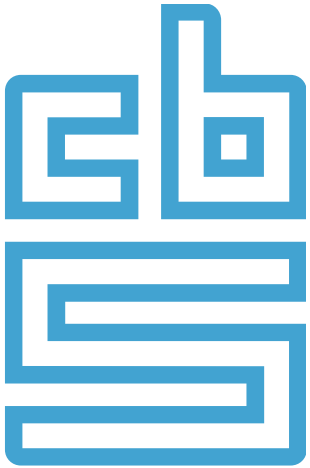
Quality: MORE DETAIL NEEDED FOR SPECIFIC QUESTIONS

Data infrastructure and footprint compendium



The challenges going forward

- Many partners needed
  - International data: Statistics Netherlands is not the NSO of the world
  - Collaboration within the Netherlands: data infrastructure must be a collective effort
  - Funding
- Improving FIGARO
  - Towards a single authoritative EE-MRIO with all the trimmings
  - Time is of the essence
- Bridging the time between ‘old’ and ‘new’ estimates



Facts that matter