Circular economy and material footprint indicators for Sweden

Dr. Sandra Gralde Stålhandske, Mårten Berglund, Statistics Sweden

Sandra.graldestalhandske@scb.se, marten.berglund@scb.se

UNECE 230313

SCB Sveriges officiella statistik

Indicators of circular economy – What gets measured gets done

- Research project 2020 – 2023
- Financed by Vinnova, *Sweden's Innovation agency*
- Indicators at different organisational levels
  > *Statistics Sweden responsible for indicators at the national level*
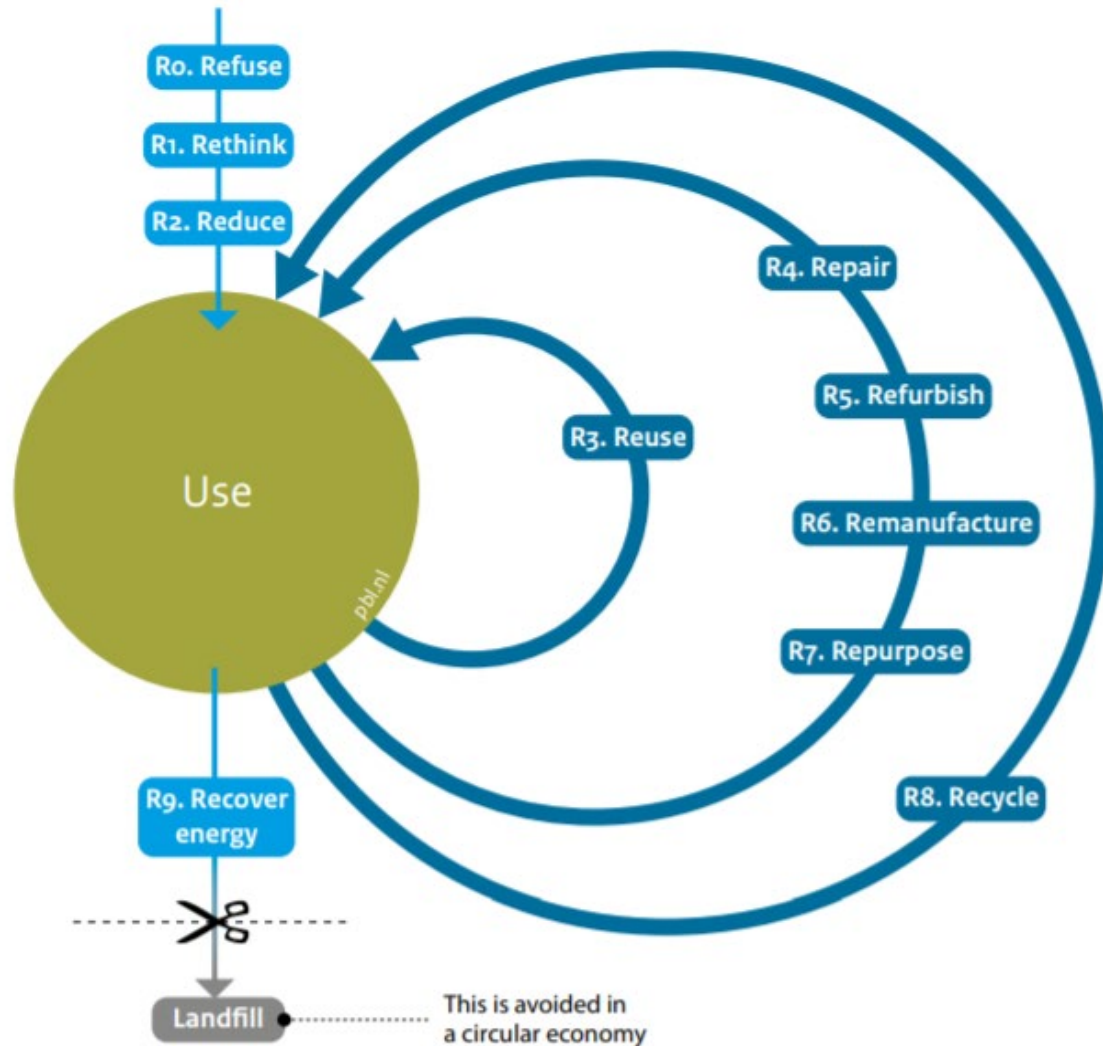
Circular economy at the national level in Sweden

- Action plan for circular economy – part of Sweden's intermediate environmental goals
  - *E.g. Reduce green house gas emissions, increase reuse of packaging, reduce food loss and food waste, increase recycling rate of municipal waste, increase recycling rate of construction and demolition waste*

- The Swedish delegationen for Circular economy – Suggested in the annual report for 2022:
  - **"Commission Statistics Sweden to track resource flows at the national level and develop national data and statistics."**

Dokument Delegationen för cirkulär ekonomi (delegationcirkularekonomi.se)
Handlingsplan cirkulär ekonomi (regeringen.se)

SCB

Circular economy: more than recycling

R0. Refuse
R1. Rethink
R2. Reduce
R3. Reuse
R4. Repair
R5. Refurbish
R6. Remanufacture
R7. Repurpose
R8. Recycle
R9. Recover energy

Use

Landfill

This is avoided in a circular economy

Potting et al, 2018 "Circular economy: what we want to know and can measure
https://www.cbs.nl/en-gb/publication/2018/03/circular-economy-what-we-want-to-know-and-can-measure

National indicators - circular economy indicators from Eurostat

- Production and consumption (10 indicators)
  > *E.g. RME, Generated waste per capita, generated food waste*
- Waste management (4 indicators)
  > *E.g. Recycling rate of plastic packaging, recucling rate of construction and demolition waste*
- Secondary raw materials (1 indicator)
  > *Circular material use rate*
- Competitiveness and innovation (6 indicators)
  > *E.g. Number of employees in the circular sector*

National indicators- circular economy indicators from Eurostat

Cirkulär ekonomi

Statistiken utgår ifrån de indikatorer Eurostat publicerar för EU:s medlemsländer. Några indikatorer är nya. Indikatorerna visar hur cirkulärt det svenska samhället är.

Vad är cirkulär ekonomi?

Målet med cirkulär ekonomi är att minska samhällets resursanvändning och miljöpåverkan. Det görs genom att minimera uppkomsten av avfall, hålla varor och material i användning på marknaden samt genom att använda förnybara resurser och system. Det innebär att produkter bör brukas länge, repareras eller återbrukas, och därmed behåller de även värdet så länge som möjligt.

Nationella indikatorer för cirkulär ekonomi

Indikatorerna rör flera delar av en cirkulär ekonomi: konsumtion och produktion, återvinning, sekundära råmaterial samt konkurrenskraft och innovation. De baseras i de flesta fall på officiell statistik som har kombinerats på nya sätt. Nationellt och internationellt pågår omfattande utvecklingsarbete för att mäta omställningen från en linjär till en cirkulär ekonomi.

Hitta på sidan

Resultat	Om statistiken	Kontakt
Tabeller och diagram	Dokumentation	Kontaktuppgifter

- Production and consumption (10 indicators)
  - > *E.g. RME, generated waste per capita, generated food waste*
- Waste management (4 indicators)
  - > *E.g. Recycling rate of plastic packaging, recycling rate of construction and demolition waste*
- Secondary raw materials (1 indicator)
  - > *Circular material use rate*
- Competitiveness and innovation (6 indicators)
  - > *E.g. Number of employees in the circular sector*
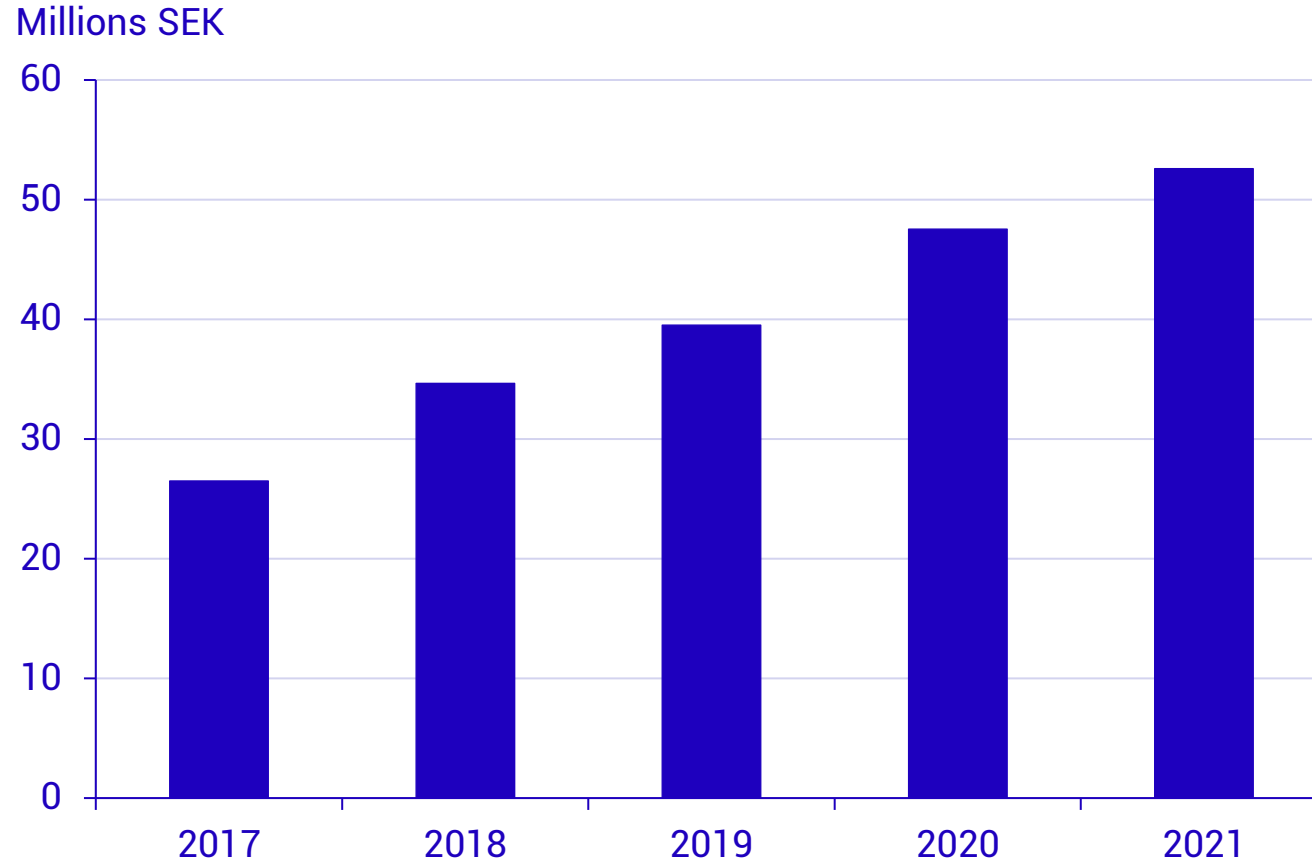
Cirkulär ekonomi (scb.se)

Generated waste per Capita

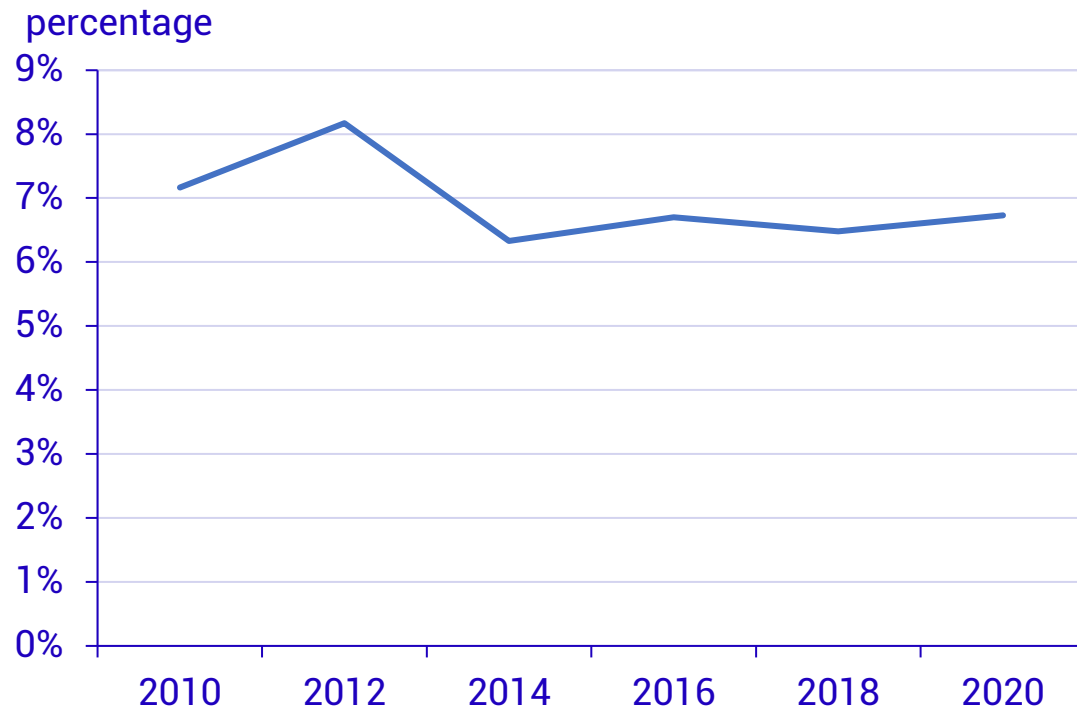
Generated Waste, tonnes
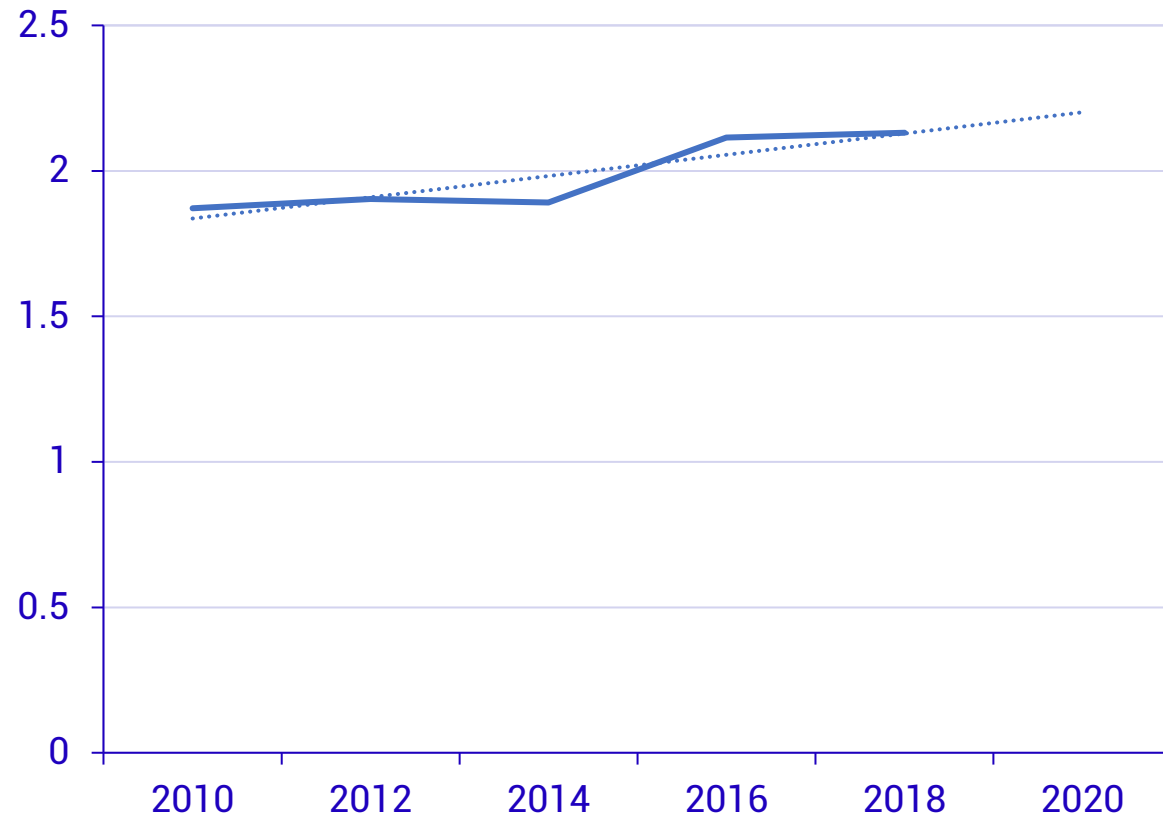
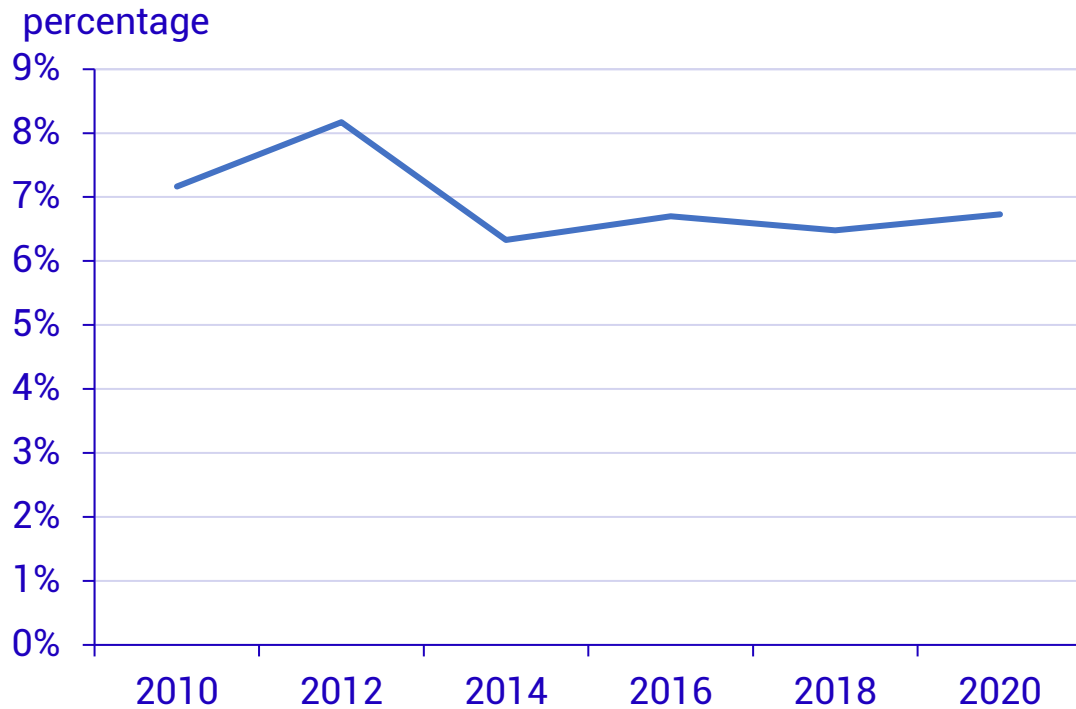# Tax reduction for reparation of white good appliances at home

Millions SEK

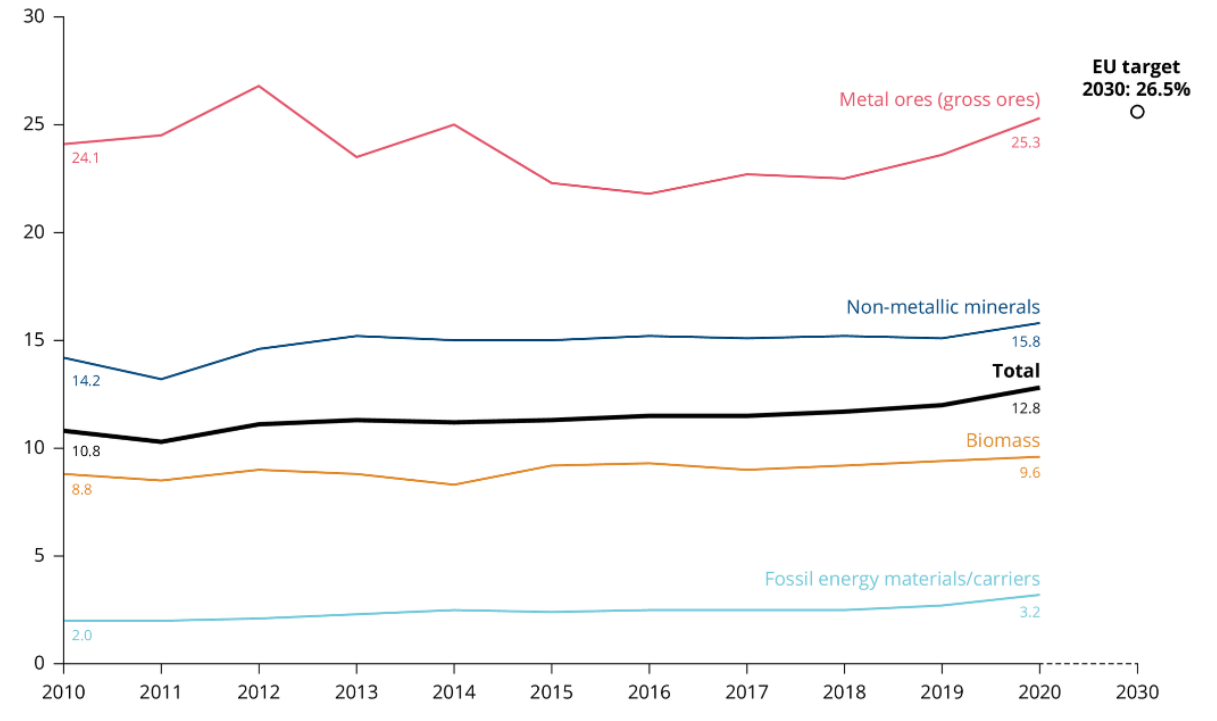# Circular material usage rate

percentage

http://www.scb.se/mi1306

Circular material usage rate

percentage

http://www.scb.se/mi1306

Source: EEA Circular material use rate in Europe (europa.eu)

Material footprints – overview of presentation

- Purpose:
  - Study the global extraction of natural resources induced by a country
  - Country comparisons of resource use in relation to the population
  - Correlation resource use−a country's economical development

- Material flow analysis and circular economy:
  - The flow of materials from nature to the society, societal metabolism

- Production − consumption:
  - From production to consumption perspective: various indicators

- The model used here to calculate material footprints

- Some results

Material flow analysis and circular economy

- ## The flow of materials into/out from society:
  - Resource use, inflow of raw materials from nature to society
  - Waste/emissions, outflow of materials from society to nature

- ## Circular economy and circulation:
  - Decreased waste flow and emissions to nature
 - Decreased resource use, decreased material footprint
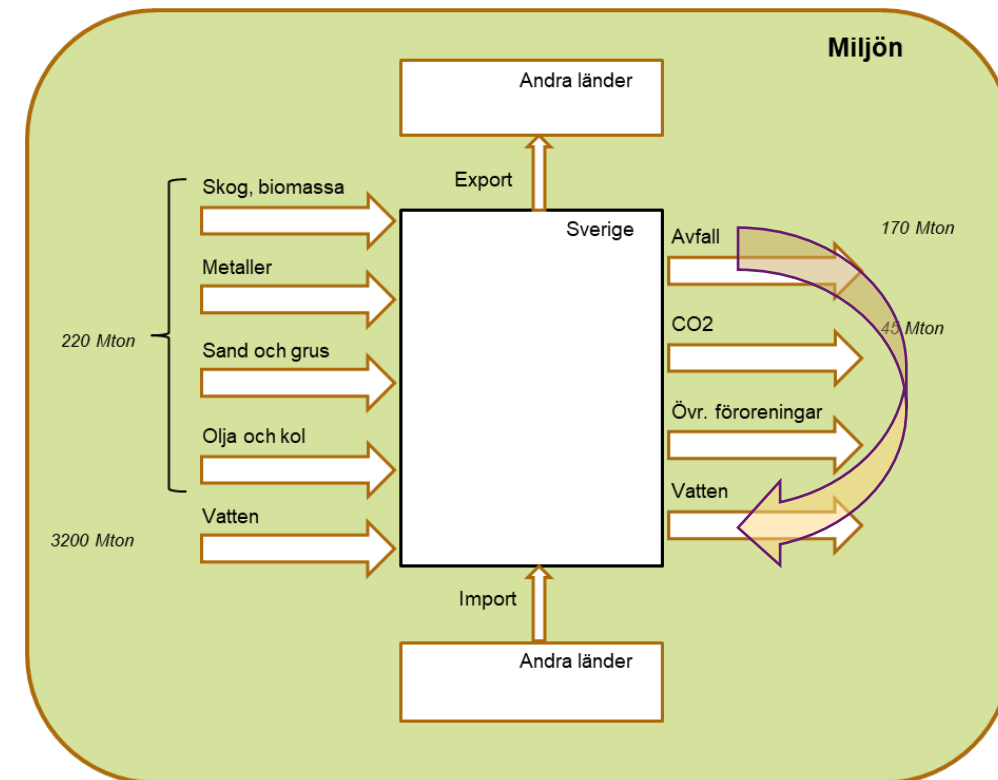
From production perspective to consumption perspective

| Environmental category	Production perspective ⟶ Consumption perspective		
	Production	**Direct consumption** (Production + Imports − Exports)	**Direct and indirect consumption** (The whole value chain, the rucksack)
Resource use	Domestic extraction	Domestic Material Consumption (DMC)	Material footprint
Energy	Energy production	Total primary energy supply	Energy footprint
Climate	Territorial GHG emissions	–	Carbon footprint, cons.-based emissions
Economy	GDP	Domestic consumption	Global value chains

SCB

Materialfootprint per capita

ton per capita
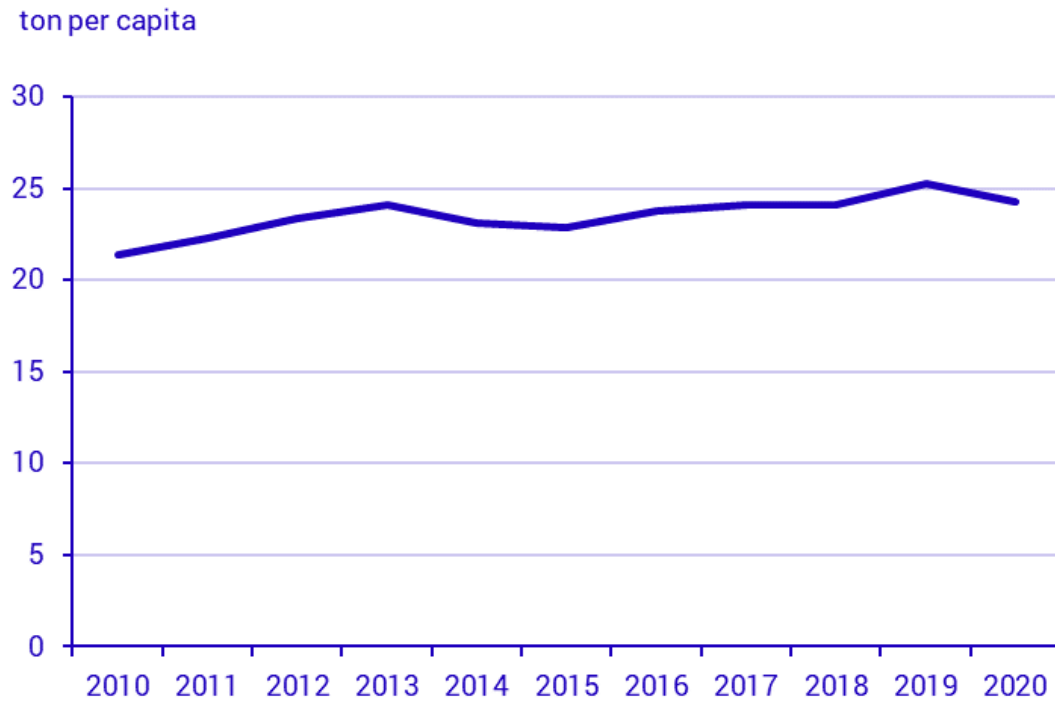
Materialfootprint per material category
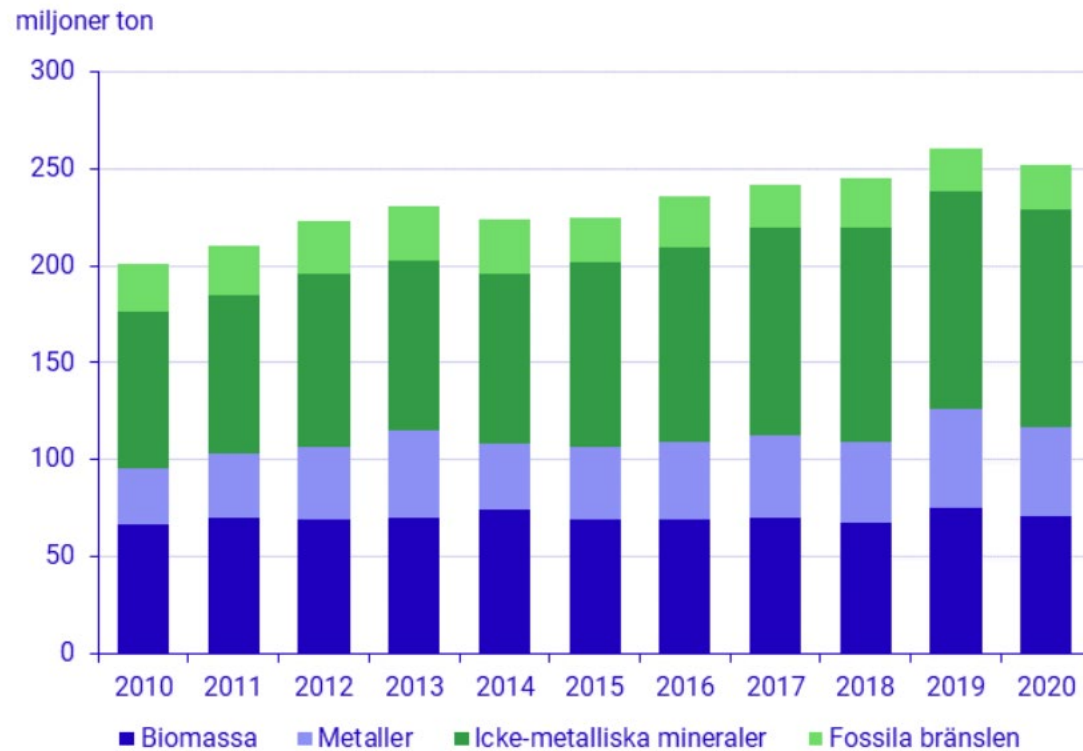
Domestic material consumption vs material footprint
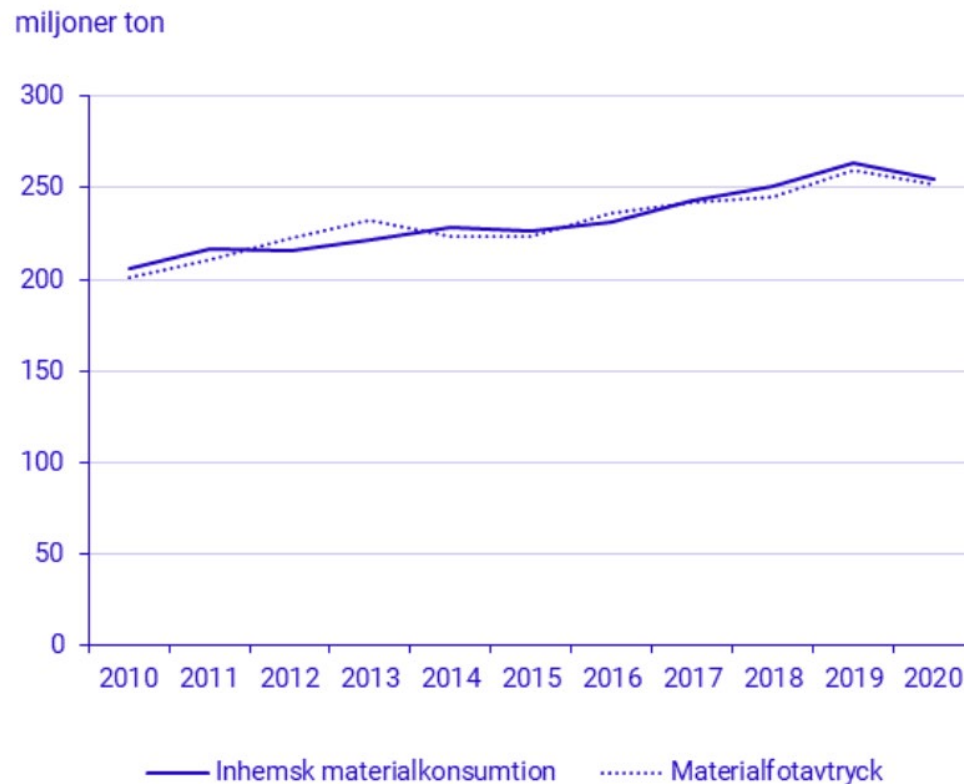
Further research questions to explore

- More analyses, e.g., the similarity between the domestic material consumption and the material footprint

- Model development, alternatives to the Eurostat model

- Regionalisation? May be possible on county level (DMC data is probably available)

SCB

Links

- Circular economy at Statistics Sweden (in Swedish only): https://www.scb.se/mi1306

- Environmental accounts at Statistics Sweden with material flow data: https://www.scb.se/mi1301

- Eurostat webpage with data about MFA and material footprints: https://ec.europa.eu/eurostat/web/environment/methodology

SCB