

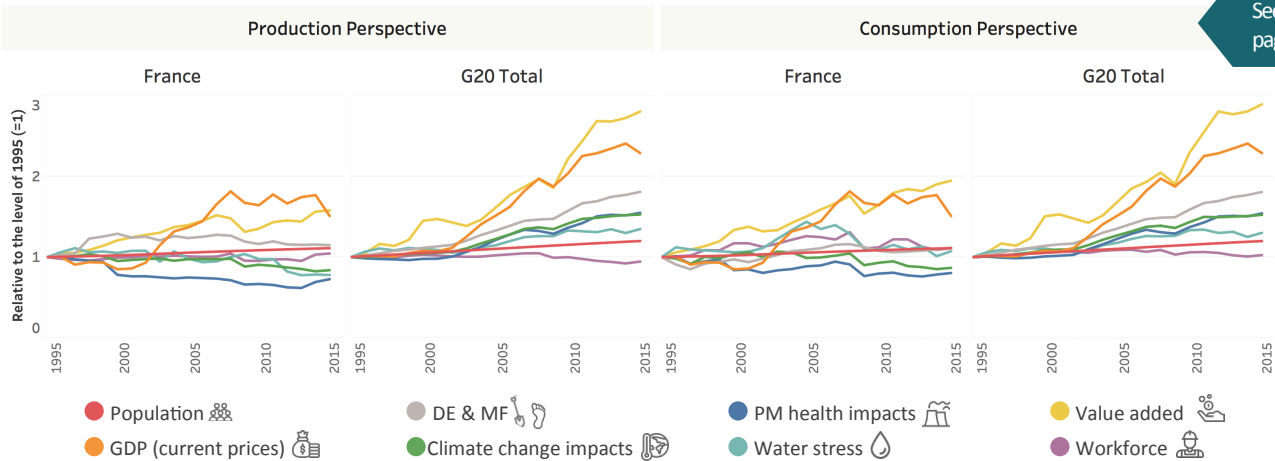
# NATURAL RESOURCE USE IN THE GROUP OF 20

## Status, Trends, and Solutions France

### STATUS AND TRENDS OF NATURAL RESOURCE USE

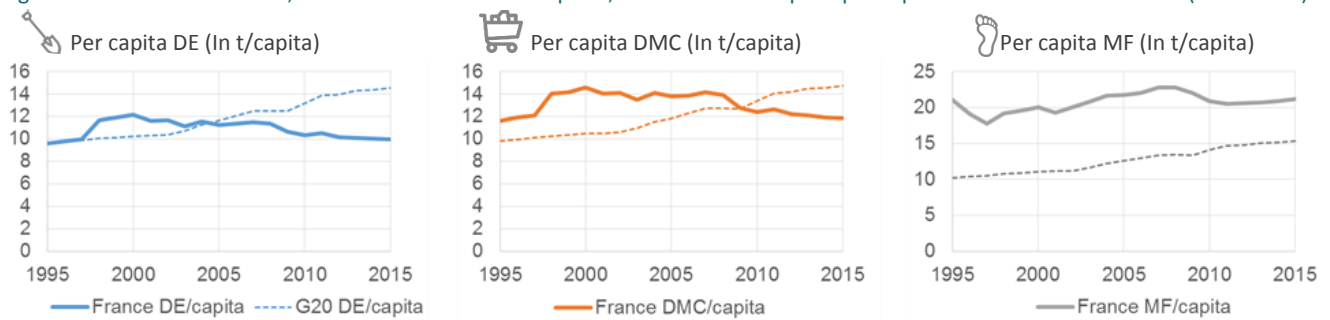
Figure 1: Socio-economic indicators, domestic extraction, material footprint, and material-related environmental impacts in France and in the G20 (1995-2015)\*

See glossary on pages 2 and 3



\*Data after 2011 was nowcasted.  
Source: IRP database, Exiobase v3.4 and Cabernard et al. 2019

Figure 2: Domestic extraction, domestic material consumption, and material footprint per capita in France and in the G20 (1995-2015)



Source: IRP database

### From 1995 to 2015

Population increased by **11%** while GDP increased by almost **80%** until the start of the global financial crisis in 2007. GDP remained rather stable afterwards with some fluctuations.

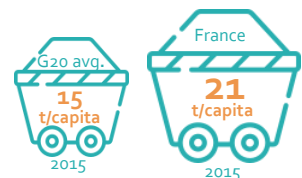
Material footprint remained around **21** tonnes/capita, with a slight intermediate increase until 2007 (G20 average was at 15 tonnes/capita in 2015).

The domestic extraction and domestic consumption of materials slightly decreased after the year 2000 and fell below G20 average.

France experienced absolute decoupling of climate change impacts related to material extraction and processing from economic growth. However, material-related climate change impacts remained above G20 average (**>20%** higher than G20 average from a consumption perspective).

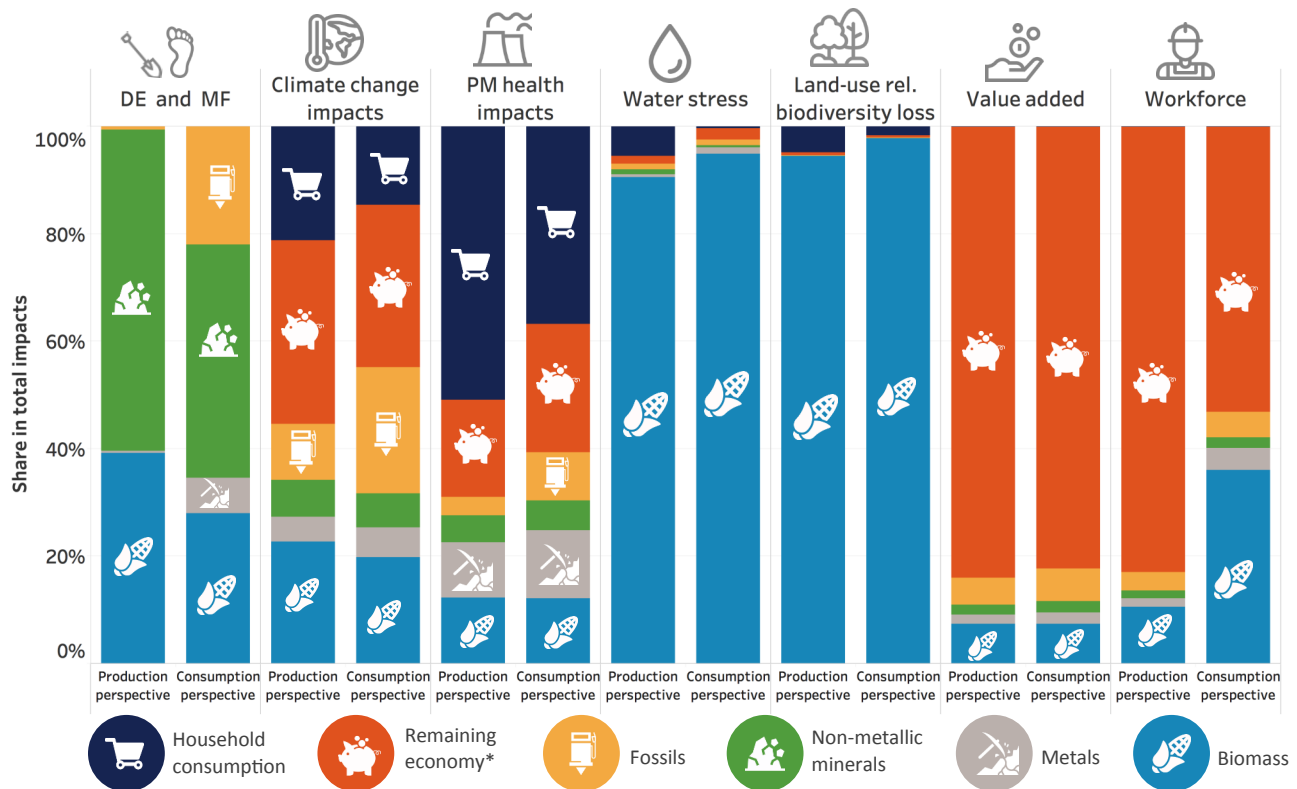
Water stress decreased from the production but not from the consumption perspective.

Particulate matter (PM) health impacts related to resource extraction and material processing showed the strongest absolute decoupling from both perspectives.



## CONTRIBUTION OF NATURAL RESOURCES BY CATEGORY

Figure 3: Contribution of resource types to domestic extraction, material footprint, and total environmental and socio-economic impacts in France (2015)



\*Remaining economy refers to activities other than resource extraction and processing (e.g. manufacturing of finished products, construction).

Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

- Non-metallic minerals like sand and gravel dominated the domestic extraction amounts, but contributed less to material footprint and only caused a minor share of environmental impacts.
- Biomass contributed ~40% to domestic extraction. There is nearly no metal and fossils extraction within France (from a production perspective).
- The extraction and processing of natural resources accounted for up to 40% of France's total climate change impacts from a production perspective and 50% from a consumption perspective (the G20 average was approximately 50% for both perspectives).
- In line with other G20 countries, water stress and land use-related biodiversity impacts were caused mainly by biomass production (consumption perspective).
- Outdoor particulate matter (PM) related health impacts came mainly from households and the remaining economy.
- The material sector contributed a minor share to value added as well as domestic jobs (both less than 20%) but relied on low-income workforce in agriculture outside of France for food imports.
- In general, the share related to material extraction and processing was comparable or higher from a consumption perspective than from a production perspective for all indicators.

## Glossary

### Consumption perspective:

The consumption perspective allocates the use of natural resources or the related impacts throughout the supply chain to the region where these resources, incorporated in various commodities, are finally consumed by industries, governments and households

**Decoupling:** Decoupling is when resource use or some environmental pressure either grows at a slower rate than the economic activity that is causing it (relative decoupling) or declines while the economic activity continues to grow (absolute decoupling)

**Domestic extraction (DE):** Direct, gross physical extraction of materials within a country's territory (production perspective)

**Domestic material consumption (DMC):** Amount of materials directly used by an economy (DMC = DE + Material Imports – Material Exports)

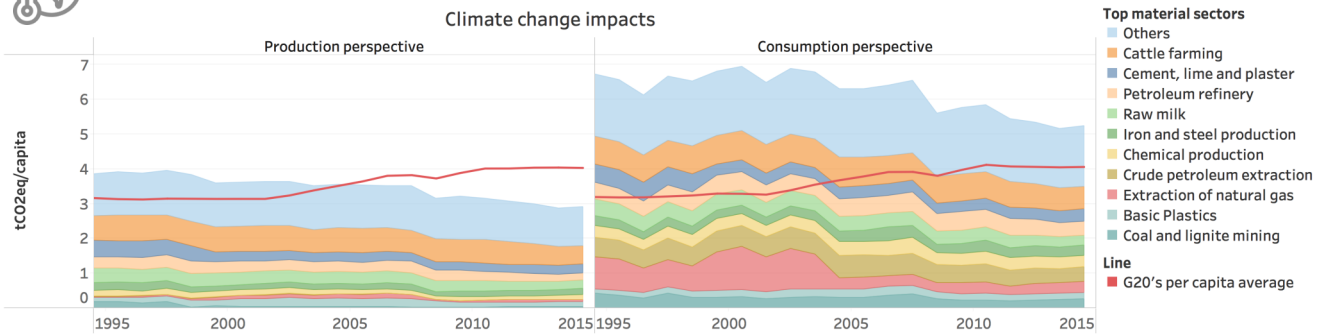
### Material resources:

- metals,
- non-metallic minerals,
- biomass,
- fossils

## KEY SECTORS AND RESOURCES



Figure 4: Climate change impacts from material sectors in France (1995-2015)\*

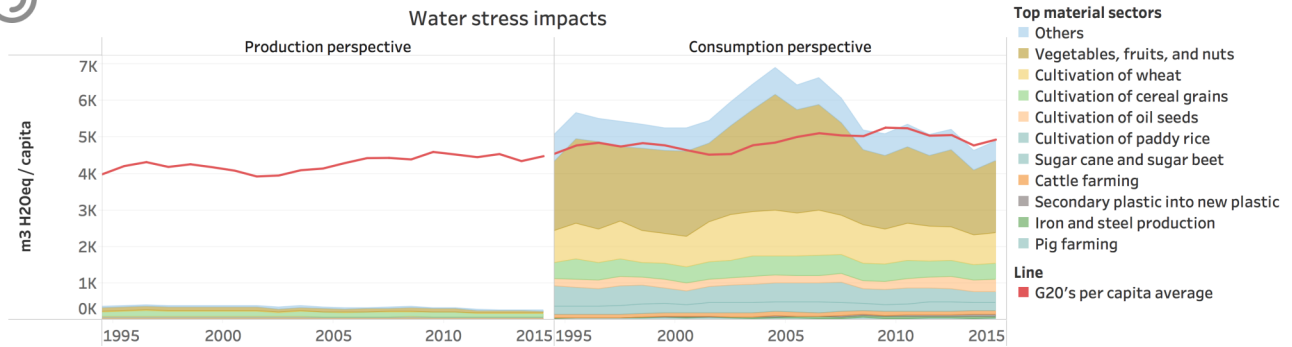


\*Data after 2011 was nowcasted.

Source: IRP database, Exiobase v3.4, Cabernard et al. 2019



Figure 5: Water stress from agricultural crop and material sectors in France (1995-2015)\*

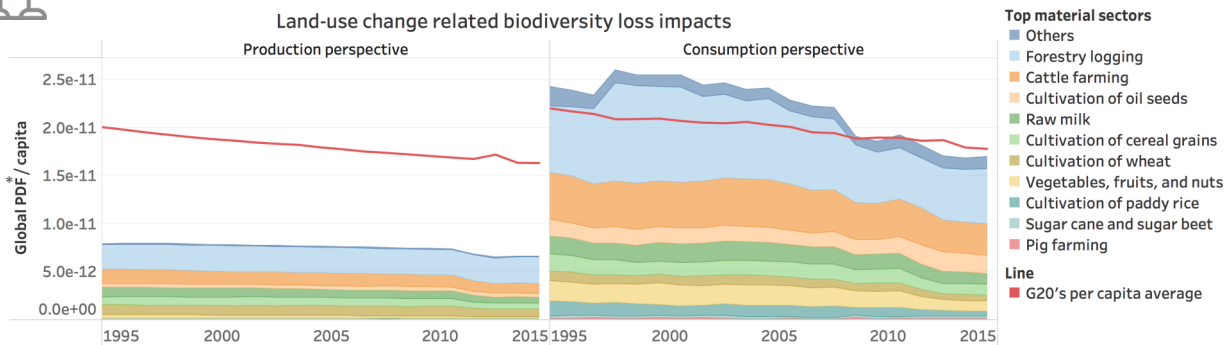


\*Data after 2011 was nowcasted.

Source: IRP database, Exiobase v3.4, Cabernard et al. 2019



Figure 6: Land-use related biodiversity loss from agricultural crops and material sectors in France (1995-2015)\*



\*Data after 2011 was nowcasted.

\*PDF: Potentially disappeared fraction of species

Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

- Material-related climate change impacts within France (production perspective) were particularly caused by cattle and milk production, followed by iron, steel, and cement production as well as petroleum refining.
- From a production perspective, climate change impacts decreased below G20 average. From a consumption perspective, they were more than 20% higher than the G20 average. This is due to imports of goods with large embodied greenhouse gas emissions for domestic consumption, e.g. crude petroleum.
- The construction sector, followed by motor vehicle manufacturing were the largest industrial users of climate-intensive materials.
- Materials with large climate impacts are often directly consumed by households, especially fossil fuels for mobility and heating, and food (particularly beef and dairy).
- From a production perspective, water stress is mainly caused by cereals, but at a very low level.
- Water stress caused abroad for French consumption is dominated by agricultural activities, such as the production of vegetables, fruits, nuts, wheat, other cereals and oil seeds.
- From a production perspective, land use-related biodiversity loss is considerably lower than the G20 average. It is similar to the G20 average from a consumption perspective. Main causes of this biodiversity footprint are imports of wood, beef, and oil seeds from regions with high ecological value.

**Material footprint (MF):** A nation's MF fully accounts for material extraction in other countries used for local consumption in the nation of interest (consumption perspective)

**Material intensity (MI):** Indicates efficiency of material use (MI = DMC/GDP)

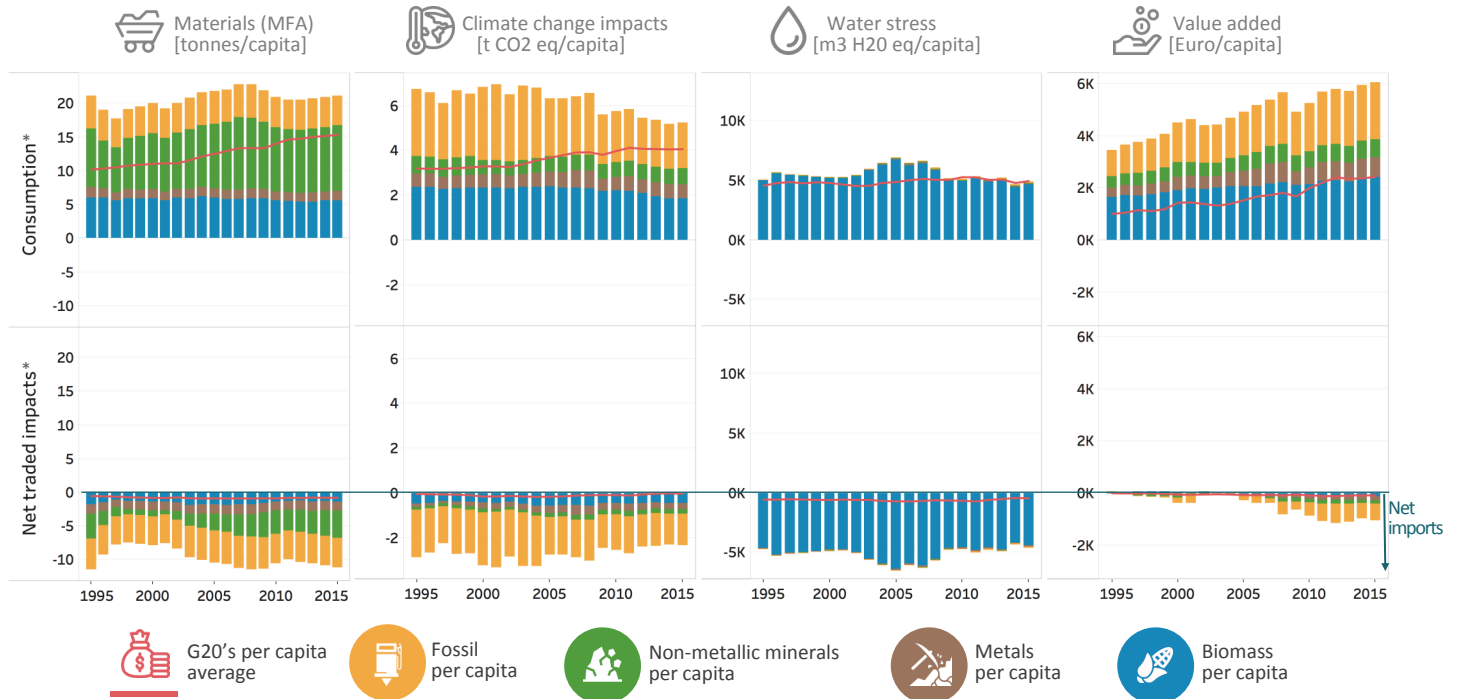
**Material-related impacts:** Impacts related to the extraction and processing of material resources (including the upstream supply chain, such as electricity generation and transport)

**Net traded materials/impacts:** Difference between material-related impacts from a production and consumption perspective. In the case of environmental impacts, a positive value means that the material-related impacts from exports are greater than the impacts from imports (and vice-versa: environmental impacts with negative values mean that the material-related impacts from imports are greater than the impacts from exports)

**Production perspective:** The production perspective allocates the use of natural resources or the impacts related to natural resource extraction and processing to the location where they physically occur

## THE ENVIRONMENTAL EFFECTS OF TRADE

Figure 7: Per-capita consumption footprints (above) and net traded impacts (below) in France (1995-2015)\*



\*Data after 2011 was nowcasted.

\*Consumption: Impacts throughout the supply chain from goods imported and consumed in France.

\*Net traded impacts: Difference between material-related impacts from a production and consumption perspective.

Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

- France is a net importer of all material types (much higher reliance on trade than G20 average). Accordingly, more environmental impacts are caused by material imports than by material exports.
- For all material types and particularly fossil fuels, net value added was created outside of France for material imports since the year 2004.

## FUTURE TRENDS AND POTENTIAL DECOUPLING

- Scenarios developed by the IRP forecast an increase of GDP by 113% to 141% and a rather small population increase (22%-26%) until 2060.
- If ambitious resource efficiency policies are introduced, France could see an absolute decoupling of domestic material extraction and domestic material consumption until 2060.
- Material-related climate change and water stress impacts have slightly decreased in the past two decades. However, material footprint and all environmental impacts per capita remain above G20 average (consumption perspective). Resource efficiency strategies along the entire supply chain (with a special focus on cattle farming) could help decrease these impacts.

This factsheet from the International Resource Panel, was prepared in cooperation with the Ministry of Environment of Japan and the Institute for Global Environmental Strategies, as a contribution to the G20 Resource Efficiency Dialogue 2019 in Japan. The document is based on research completed by the IRP for the report "Global Resources Outlook 2019: Natural Resources for the Future We Want." The data analysis and text for the G20 was prepared by Livia Cabernard, Stephan Pfister, Stefanie Hellweg (ETH Zurich), and Maria Jose Baptista (UNEP) with inputs from Victor Valido (UNEP), Yingying Lu and Heinz Schandl (CSIRO). The layout and infographics were designed by Yi-Ann Chen with support from Qinhan Zhu on figure layout. Icons used are from Freepik.