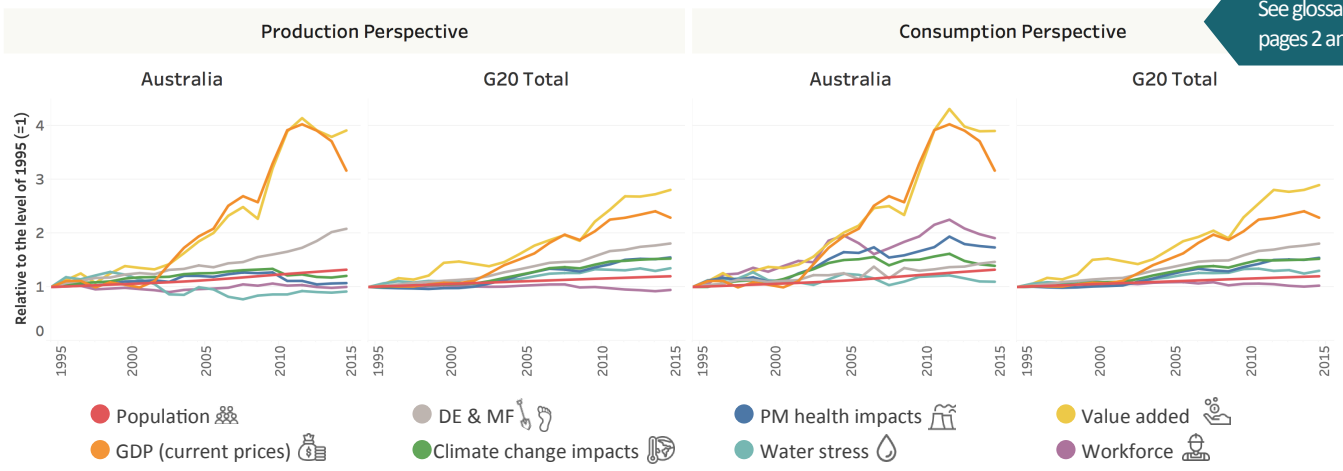
NATURAL RESOURCE USE IN THE GROUP OF 20

Status, Trends, and Solutions | Australia

STATUS AND TRENDS OF NATURAL RESOURCE USE

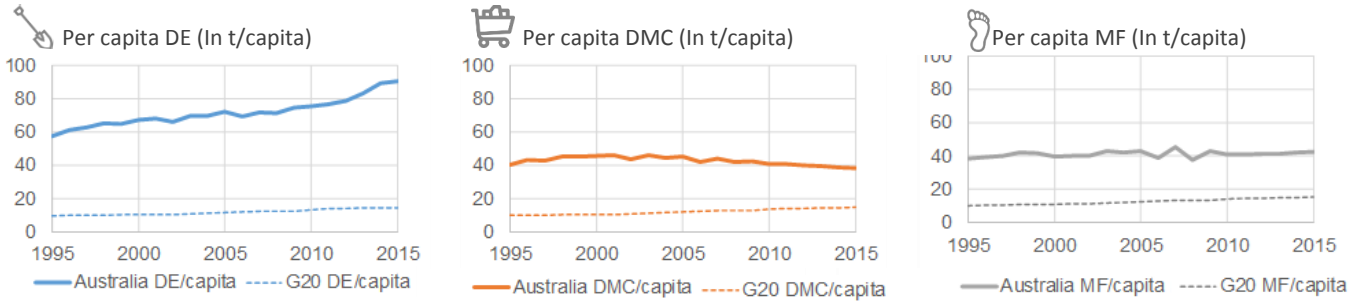
Figure 1: Socio-economic indicators, domestic extraction, material footprint, and material-related environmental impacts in Australia and in the G20 (1995-2015)*

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 Australia and in the G20 (1995-2015)



Source: IRP database

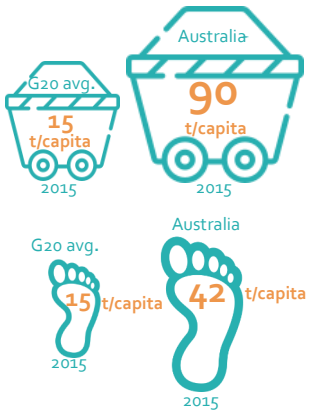
From 1995 to 2015

Population grew by **32%** and GDP grew by a factor of **3**.

Domestic extraction increased by **50%** and remained at **90** tonnes per capita (G20 average was 15 tonnes per capita in 2015)

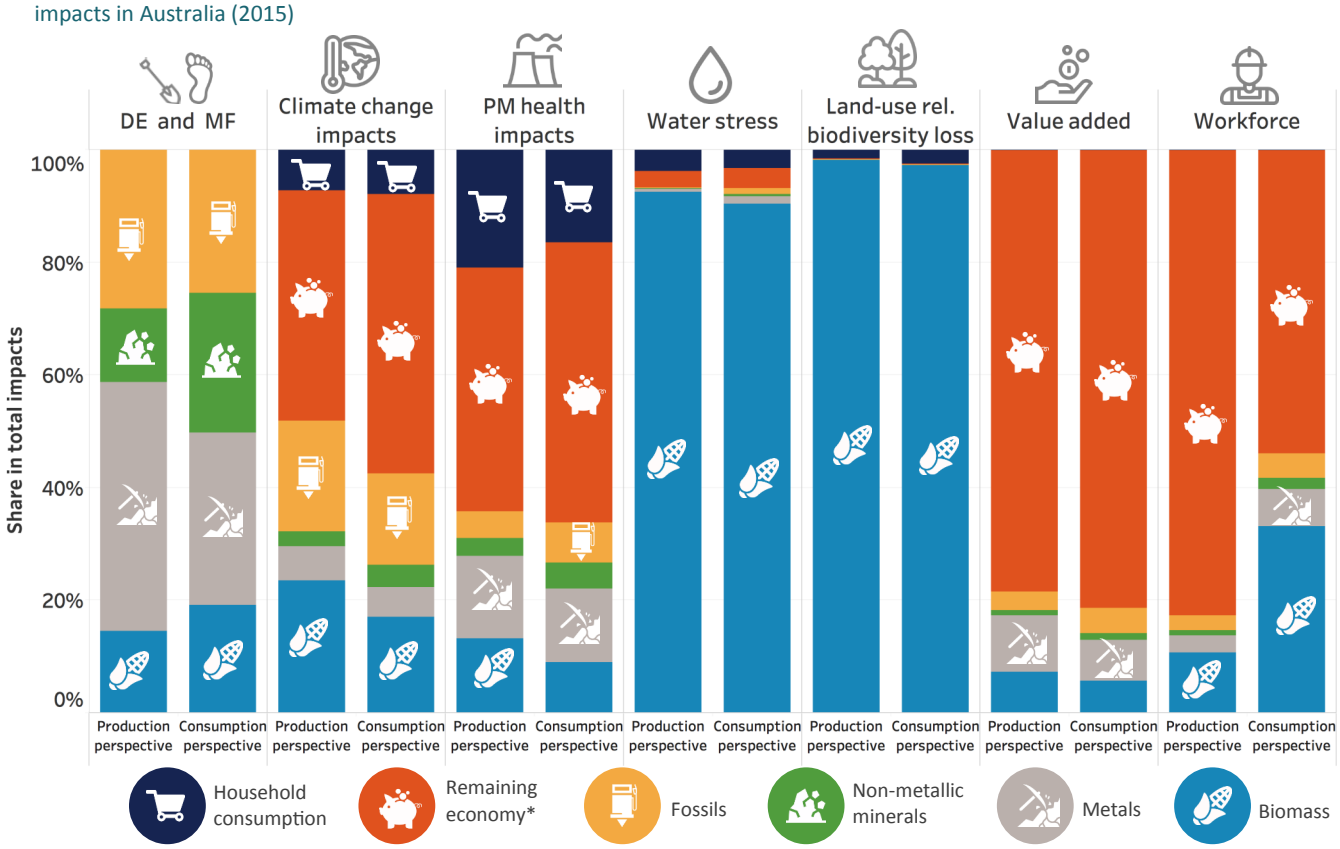
Material footprint remained stable at **42** tonnes per capita (G20 average was 15 tonnes per capita in 2015).

From a consumption perspective, Australia experienced relative decoupling of material footprint and all environmental impacts from GDP. However, climate change impacts were particularly elevated and remained almost **3** times higher than the G20 average.



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 Australia (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

Unlike the G20 average, metals dominated the share of domestic extraction amounts and material footprint, but contributed only a minor share to environmental impacts.

From a production perspective, the extraction and processing of natural resources accounted for approximately 50% of total climate change impacts (similar to the G20 average).

From a consumption perspective, materials caused more than 40% of climate change impacts (below G20 average of 50%).

In line with other G20 countries, Australia's water stress and land use-related biodiversity impacts were caused mainly by biomass production from both the production and consumption perspectives.

Resource extraction and processing caused one third of outdoor particulate matter related health impacts.

The material sector contributed to a minor share of value added as well as domestic jobs (both around 20%), and relied on low-income workforce in agriculture outside of Australia for food imports.

The share of impacts related to material extraction and processing was similar from a production and consumption perspective for all indicators but climate change and workforce.

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)

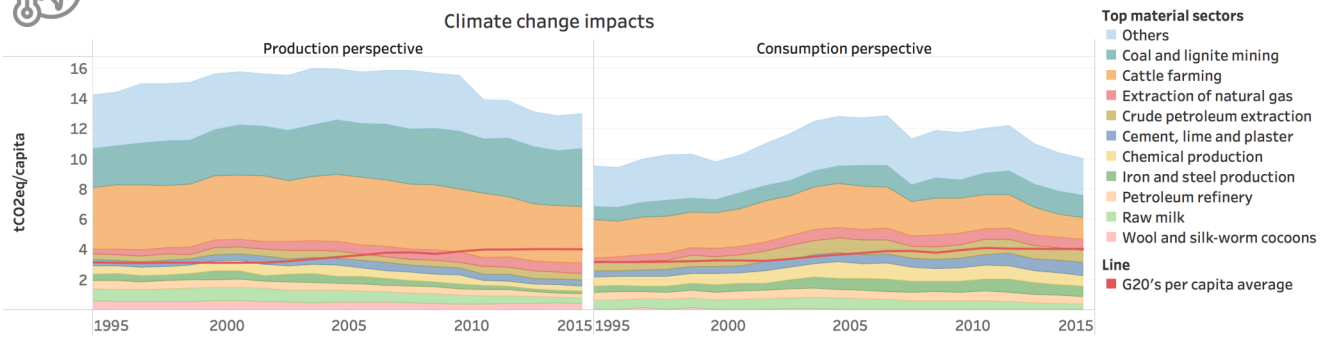
Domestic extraction (DE): Direct, gross physical extraction of materials within a country's territory (production perspective)

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

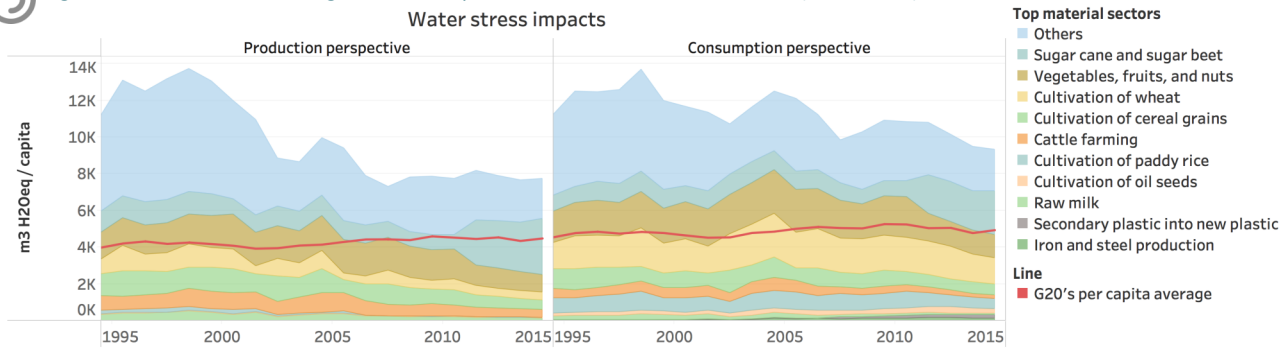
Key Sectors and Resources

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



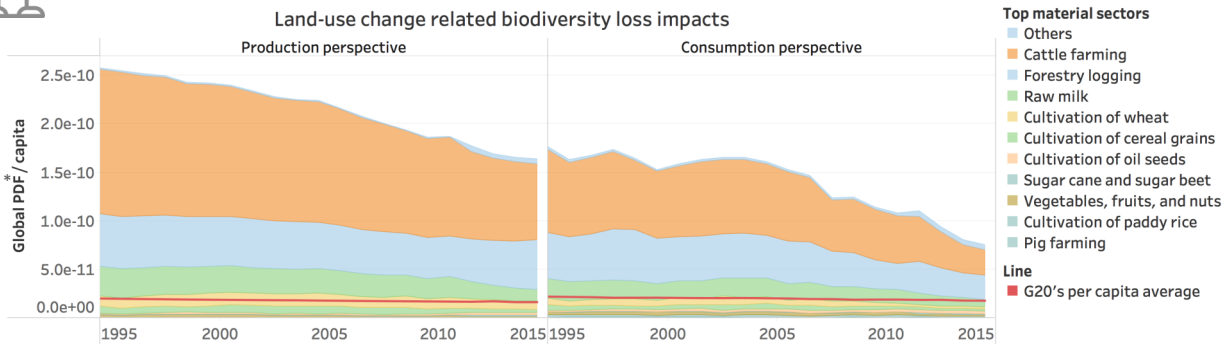
*Data after 2011 was nowcasted.
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

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



*Data after 2011 was nowcasted.
**PDF:* Potentially disappeared fraction of species
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

- From a production perspective, material-related climate change impacts were mainly caused by coal and lignite mining and cattle farming (each more than 25% of these impacts).
- Material-related climate change impacts remained much higher than the G20 average.
- Most materials with large climate change impacts (beef, other food products and petroleum) were directly consumed by households especially for food, mobility and heating.
- The construction sector used the largest share of climate-intensive materials.
- From a production perspective, water stress within the Australian territory remained high. This is due to arid climate in large areas, and irrigation requirements of crops, mainly sugar, vegetables, fruits, nuts, wheat and cereals.
- From a consumption perspective, water stress is twice as high as the G20 average. It is dominated by the local production of crops (sugar, vegetables, fruits, nuts, wheat and cereals) and by imported wheat and rice.
- From a production perspective, per-capita land use-related biodiversity loss is eight times higher than the G20 average, mostly caused by cattle farming and forestry.
- From a consumption perspective, land use-related biodiversity loss was roughly 4 times higher than the G20 average due to extensive local cattle farming and forestry.

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)

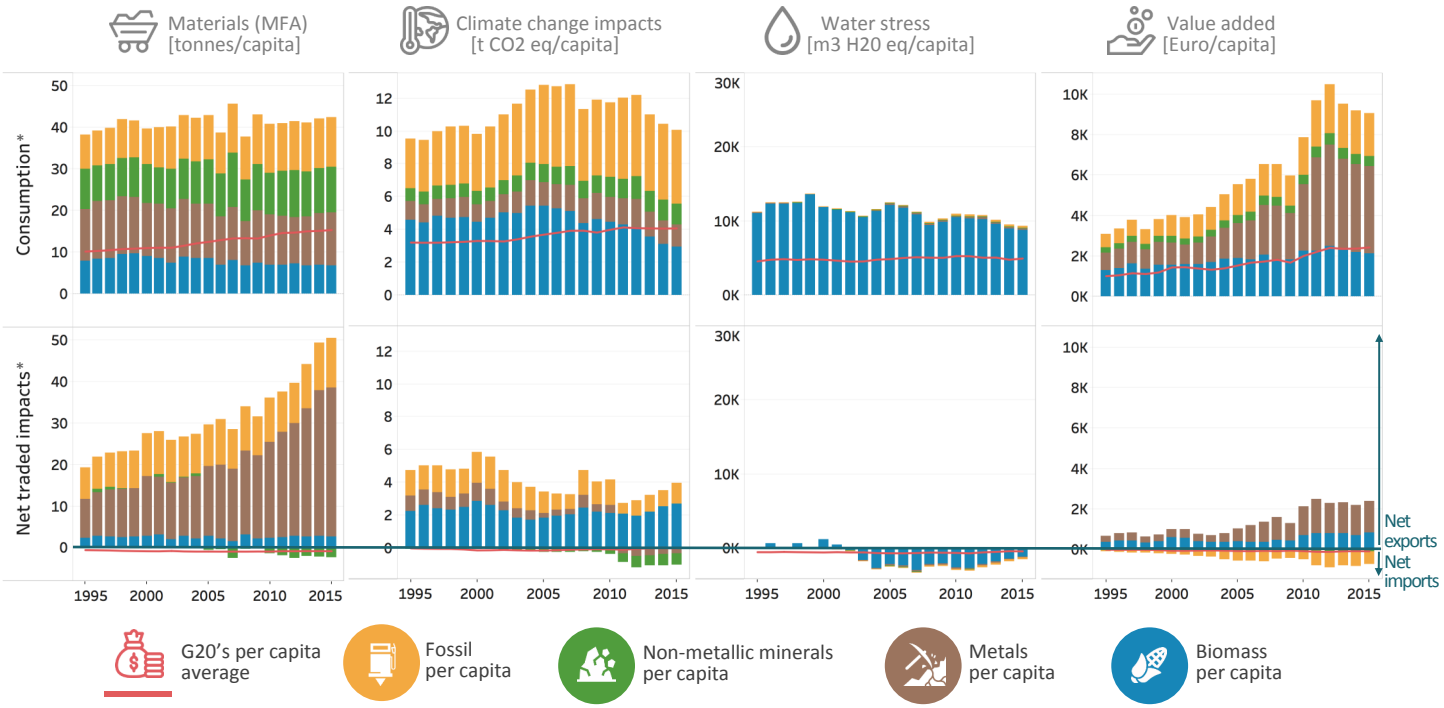
Material-related impacts: Impacts related to the extraction and processing of material resources (including the upstream supply chain, such as electricity generation and transport)

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 Australia (1995-2015)*



*Data after 2011 was nowcasted.
Consumption: Impacts throughout the supply chain from goods imported and consumed in Australia.
Net traded impacts: Difference between material-related impacts from a production and consumption perspective.
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

Australia was a large net exporter of metals and fossil resources, and a moderate net exporter of biomass. Furthermore, since 2006, Australia is a net importer of small amounts of non-metallic minerals.

More climate change impacts were caused by fossil and biomass exports than by fossil and biomass imports.

More climate change impacts were caused by imports of non-metallic minerals and metals than by exports of non-metallic minerals and metals (the latter since 2011).

Since 2002, more water stress impacts were caused by food imports (e.g. wheat) than by biomass exports (mainly sugar and meat).

For all biomass and metals, net value added was higher inside Australia than outside. It was the opposite for fossils.

Future trends and potential Decoupling

Scenarios developed by the IRP forecast an increase of GDP by more than a factor of 2.5 and a population growth of more than 60% until 2060.

If ambitious resource efficiency policies are introduced, Australia could see an absolute decoupling of domestic material extraction and domestic material consumption from GDP until 2060.

Material footprint and all environmental impacts per capita remained much higher than the G20 average. Reducing consumption of impactful resources like coal (particularly electricity), petroleum (particularly for mobility) and beef, and switching to more efficient and less impactful alternatives would make a difference.

Designing material and energy efficient buildings could help decrease material related impacts in the construction sector.

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.

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