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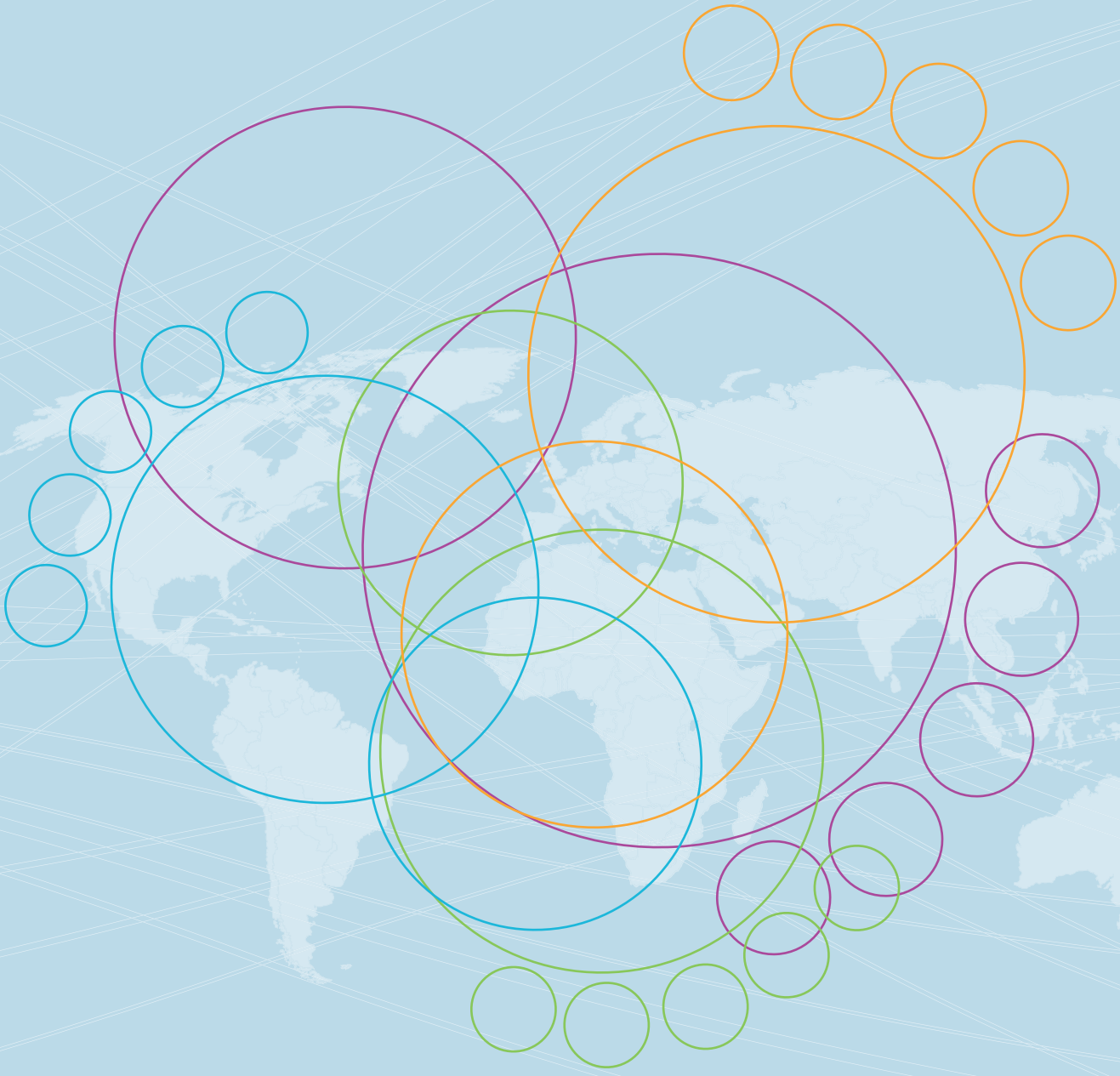
The Global Resource Footprint of Nations

Carbon, water, land and materials embodied in trade and final consumption



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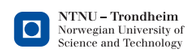
Carbon, water, land and materials embodied in trade and final consumption
calculated with EXIOBASE 2.1



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- 2.-0 LCA Consultants (2.-0 LCA)
- Dutch Central Bureau of Statistics (CBS)
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- Swiss University of Technology (ETH)
- Institute for Prospective Technological Studies (IPTS)
- Sweden Statistics (SCB)
- Sustainable Europe Research Institute (SERI)
- Technical University of Twente (TUT)
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The numbers and figures presented in this booklet are based on EXIOBASE version 2.1 from December 2013.

Limited background information on the construction of the database and the methodology has been provided in this booklet.
More information on these issues is available on www.creea.eu.
Exiobase is available via www.exiobase.eu.
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Content

Preface

Magda Stoczkiewicz
Director, Friends of the Earth Europe

In 1995, Friends of the Earth, the world's largest grassroots environmental network, published *Towards Sustainable Europe*, a study that advocated the concept of 'Environmental Space'. Besides shedding light on the planetary boundaries of our resource consumption, the study also encompassed the elements of equity and justice. As the study suggested: "*Sustainability, [...] needs social as well as environmental balance. Therefore, the principle of equity and social justice is reflected in the permitted use of Environmental Space per capita.*"

However, almost twenty years later, Europe continues to use an ever increasing amount of the world's resources, and has become more dependent on imported resources than any other region in the world. The constantly increasing pressure on the earth's dwindling resources is exacerbating social inequalities and environmental damage. Friends of the Earth Europe advocates measuring Europe's resource use – its carbon, water, land and material footprint – as the first step towards reducing resource consumption in the region.

The development of the EXIOBASE database is, therefore, heartening and I congratulate its authors for the magnitude and quality of the work done. I am hopeful that it will help to convince European decision makers to put forward policies leading to an absolute reduction in Europe's resource use.

Bas de Leeuw
Managing Director, World Resources Forum

Countries across the world need to come up with periodic reports on the productivity of their resources, given the increasingly urgent need for robust knowledge and universal data transparency in resource use. Resource efficiency indicators need to be defined more clearly to enable setting of meaningful targets and adequate monitoring of global use of resources. These were some of the key recommendations filed at the World Resources Forum (WRF) 2013, held in Davos. WRF 2011 had already called for the improvement of data and indicators, since 'one cannot manage what one cannot measure'. There is, in other words, an indisputable need for clarity.

Consumers today are increasingly interested in 'the world that lies behind the product', i.e., the impact of their consumption choices in terms of their production location and their environmental impact by way of the resources used and pollution caused during production. These questions are also assuming increasing significance for businesses and governments. Only authentic and reliable information can form the basis for improved production processes and product design, and for effective and just legislation and other policies. In an increasingly connected world, such information needs to have a common base, along with broad acceptance and authority grounded in solid science.

Due to the complexity and sensitivity of the issue, it might take some time for global formal statistics and policies to effectively address this need. A giant step in the right direction has been taken with the publication of *The Global Resource Footprint of Nations*, reflecting the work of a consortium in the European project CREEA (*Compiling and Refining Economic and Environmental Accounts*), presented in an attractive and accessible format.

This booklet provides a comprehensive and transparent analysis of the key resource flows connected to the consumption and production systems in a globalized world. It will now be possible to trace the origins of resources for the large consumers as well as to determine the share of various countries in the global environmental footprint.

This publication comes in response to the urgent need for information along these lines as expressed by the WRF community of policymakers, business leaders, NGOs and researchers. It will facilitate the answers to critical environmental concerns in today's world. Let this be the beginning of a new era of environmental policymaking.

Prof. Arnold Tukker
Coordinator, CREEA Project

I am proud to present this booklet, the result of years of hard work. This is the first time, to our knowledge, that the total global environmental footprint – encompassing the carbon, water, land and material consumption footprint of various countries – has been compiled using one detailed, consistent and comprehensive global economic-environmental database. The initial version of the database was built in the course of the project EXIOPOL (acronym for *A New Environmental Accounting Framework Using Externality Data and Input-Output Tools for Policy Analysis*), and expanded and updated in the follow-up project CREEA (*Compiling and Refining Economic and Environmental Accounts*), both of which were funded by the Framework Programmes of the European Commission. The complexity of building such databases is enormous, and it is only thanks to a team of gifted scholars, most of them authors of this booklet, that we were able to achieve this goal. I sincerely hope that this work on global Environmentally Extended Input Output databases, which has so far been undertaken predominantly by the scientific community, will lead to the development of official databases by the formal international statistical community.

Glossary

Carbon footprint	Life cycle emissions of greenhouse gases (GHGs) of final consumption, expressed in tonnes of CO_2-equivalents. Hence, this includes non-CO_2 greenhouse gases, such as CH_4 or N_2O, but does not cover greenhouse gases related to land use change.
Water footprint	Volume of blue water (surface and groundwater) consumed as a result of the production of a good or service, or the sum of goods and services consumed in a country; expressed in cubic metres of water consumption (withdrawals minus return flows; in figures often termed 'water extraction').
Land footprint	Life cycle land use of final consumption. Land use data underlying the land footprint calculations include cropland, pasture and forest and are expressed in km².
Material footprint	Life cycle material use of final consumption. This only includes economically used materials. Thus the indicator equals the 'Raw Material Consumption (RMC)' indicator. It is expressed in tonnes.
t, kt, Mt, Gt, bt	Tonnes Kilo tonnes (1 000 tonnes) Mega tonnes (million tonnes) Giga tonnes (billion tonnes) billion tonnes
m^3, Mm^3, km^3	Cubic metre Mega cubic metres (million cubic metres) cubic kilometres (billion cubic metres)
km^2	Square kilometre

CO_2-eq	Measure to express the emission of different greenhouse gases in one single unit, i.e., the global warming potential of a tonne of CO_2.
Blue water	Ground water or surface water extracted for economic use (contrasts with 'green water', which is water from precipitation or soil water for economic use, usually for rain-fed agriculture). Henceforth referred to in the text of the booklet simply as 'water'.
GHG	Greenhouse gases
GDP	Gross Domestic Product data taken from The World Bank (2011 http://data.worldbank.org/)
HDI	Human Development Index data taken from 'Human Development Report' (UNDP, 2009)
HLY	Happy Life Years data taken from 'The (un)Happy Planet Index 2.0' (Abdallah et al. 2009. nef: London)
MR EE SUT/IOT	Multi-regional Environmentally Extended Supply and Use Tables/ Input-Output Tables
Regions	AFR Africa APAC Asia and Pacific AUS Australia CAN Canada CN China EU Europe LAM Latin America ME Middle East USA United States of America

Introduction

An interlinked, global economy

The use of natural resources and emission of substances into air, water and soil takes place at millions and millions of economic production sites all over the world. Agricultural processes often use ground and surface water for irrigation and occupy most of the available arable land. Mining sites extract resources. Power plants emit carbon dioxide (CO_2) and other greenhouse gases (GHG). Goods are transported all over the world by ships, airplanes and trucks, resulting in further emissions. Even consumption processes have a significant impact on the environment, via emissions from the fossil fuels used to heat homes, drive cars or cook food. Production and consumption, hence, form a complex web of activities reflecting a single, global, interconnected economy which impacts the environment in multi-faceted ways.

A number of countries can efficiently monitor their resource extraction as well as emissions due to production and consumption processes within their own territories. However, it is also important to understand how these activities are connected. First, all production is ultimately driven by consumption. If these connections are known and understood, it becomes simpler to understand how changes in consumer behaviour, income and expenditure patterns will change the life cycle impacts of consumption. Second, and equally important, is the fact that production chains have become global. Meat produced in Europe may be from livestock fed with soy from Brazil. A car manufactured in the US may be driven in Argentina and could contain electronic equipment from China.

Therefore, merely monitoring national resource extraction and emissions does not reflect resource use and the emissions related to final consumption in a country, as the environment is impacted all along the production chain. While there are countries that appear to have met internationally agreed upon targets for emission reduction in terms of emissions within their own boundaries, a closer look reveals that the life cycle emissions of their final consumption have, in fact, increased. In other words, over time, production of emission-intensive goods consumed in such countries has simply moved elsewhere.

Hence, there is a need for an environmental accounting system that makes such interrelations between production and consumption, and the related impact at a global level, visible. So-called 'Multi-regional Environmentally Extended Supply and Use/Input-Output Tables' (MR EE SUT/IOT) are now widely seen as the most promising approach towards creating such an accounting system.

In short, a supply-and-use or input-output table encapsulates a country's entire economy, with production divided into a few dozen industry sectors, and consumption divided into a few dozen product (and service) groups. The tables express (in monetary terms) how much each industry sector produces of these specific products (output) – for instance, the value of cars, expressed in Euros, produced by the car industry in that country. The tables also illustrate how much each industry sector needs of these specific products to realize this production (input) – e.g. the amount of steel, glass, plastics, electricity and electronics required by the car industry in that country to produce its output of cars. They further enable identification of the primary resource use and emissions ('environmental extensions') for each industry, such as the amount of iron ore extracted by the mining sector, the size of land used by the agricultural sector, or CO_2 emissions by the electricity production sector.

At the country level, this approach allows for an analysis of how the various sectors of the economy of a country are interconnected. For instance, if examining the final use of cars by the consumers in a country, this approach makes it possible to analyse the production value contributed by the car industry, the glass production industry, the steel industry, and so on. Also, since the emissions, water and material extraction, and land use per Euro for each industry are known, it becomes possible to estimate the total life cycle emissions, primary water and material extraction, and land use for the total consumption of cars in that country.

However, this example is just for one country, while imports and exports in the current global economy are substantial, amounting to approximately 20 % of the global Gross Domestic Product (GDP). It is thus essential to also understand the emissions and primary resource use involved in imports. For that, one needs to create EE SUT/IOTs for the most important economies of the world and identify the trade flows between the specific sectors of all the countries. This exercise results in the aforementioned MR EE SUT, which paints a very detailed picture of all linkages between production and consumption in the global economy. One of the great strengths of this MR EE SUT/IOT approach is that it is inherently consistent. All direct emissions of GHG and primary extraction/use of water, land and materials by industries are, by definition, related to the final consumption of products – they cannot be 'lost' in the calculations.

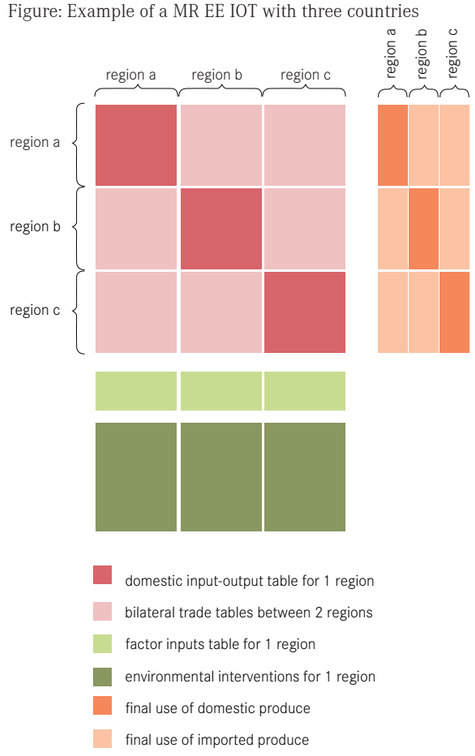
EXIOBASE

Building an MR EE IOT is time consuming, and thus far, only a handful of such databases are available. EXIOBASE was developed with support from the EU's Sixth and Seventh Framework Programmes, with economic-environmental analyses in mind. The database provides data at an unprecedented level of consistent detail in terms of sectors, products, emissions and resources for all the countries covered.

EXIOBASE has the following characteristics:

- Covers 43 countries (95 % of the global GDP) with over 150 smaller countries combined in 5 'Rest of the World' groups by continent.
- Full trade matrices with insights on which product from which country is exported by which sector to which industry sector in another country.
- Base year 2007.
- Distinguishes over 160 industry sectors and 200 product categories by country.
- Covers the relations between industries and countries, not only in monetary value, but also in physical terms.
- Covers 40 emitted substances, land use, water use and 80 resources by industry.

Figure: Example of a MR EE IOT with three countries



This booklet

Using the latest version of EXIOBASE, this booklet endeavours to provide an insight into the environmental footprint of final consumption in the countries covered. It presents 43 country factsheets encapsulating the carbon, water, land and material footprint of final consumption in the countries covered by EXIOBASE. In this, it was decided to use simple indicators. The carbon footprint adds up greenhouse gases like CO_2, CH_4 and N_2O as CO_2-equivalents – using weights reflecting the contribution to global warming of a tonne of emissions of a specific greenhouse gas relative to a tonne of emissions of CO_2. Land use cover change is not included in the carbon footprint indicator used here. For materials, the volume extracted has been counted, for water, the volume consumed (withdrawal minus return of flows) and for land, the surface used. It may be argued that for water, for instance, the scarcity in the river basin from which it is extracted should be taken into account, or for land use, the (agricultural) productivity of this land. On such more sophisticated indicators for water, land and material use, however, the consensus is still limited.

The booklet further showcases a number of comparative analyses, such as how environmental pressures correlate to GDP, Human Development Index (HDI), and population of a country. It illustrates the extent to which many developed countries rely on the carbon, water, land and material footprint from abroad.

This exercise attempts to shed light upon a number of issues: First, that databases like EXIOBASE help to provide insights about how consumption drives environmental pressures. So, rather than relying on research initiatives such as this one, it would be desirable for supra-national institutions to develop such databases with a more formal status. Second, the analysis of interrelations between economies shows that the countries in which consumption takes place should take responsibility for the environmental impacts caused abroad. And finally, the country comparisons might provide indications towards how countries can achieve good quality of life with a limited environmental footprint, since the analysis singles out economies with a high quality of life and good GDP along with a limited envirnonmental footprint. It is the belief of the authors of this booklet that databases such as EXIOBASE and the analyses based on them are essential for effective pursuit of key sustainability agendas such as the *United Nations Green Economy Initiative*, the *United Nations Ten Year Framework of Programmes on Sustainable Consumption and Production*, and *Circular Economy, Resource-efficiency*, and *Reduce, Re-use and Recycle (3R) initiatives*.

Themes

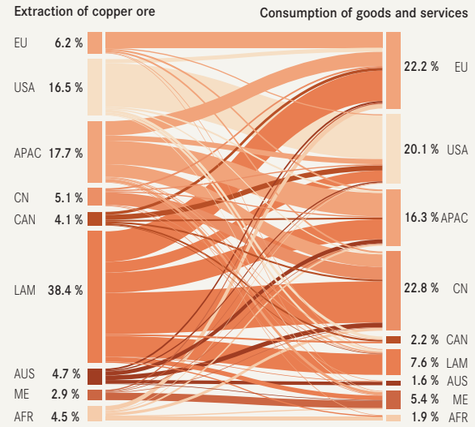
The Interconnected World

The global economy is an increasingly complex web of interrelations between countries and sectors. EXIOBASE fully captures this worldwide web and can, therefore, illustrate how supply chains are organized and how embodied environmental impacts 'flow' through the global economy. This study illustrates how final consumption of goods and services in a region impacts other regions. This has been shown for four kinds of aggregated footprint: carbon, water, land and material. For material extraction, global production and consumption of copper ore is highlighted as an example for single products.

Copper footprint

When focussing on a specific ore, in this case copper ore, it can be seen from the accompanying graph that the main region of extraction of copper and the destination of the bulk of embodied copper consumption are very different.

In 2007, a total of 1.8 bt of copper ore was extracted. Latin America produced 38 % of this copper ore, mainly in northern Chile, but only 6 % was embodied in the final consumption of products and services in Latin America.

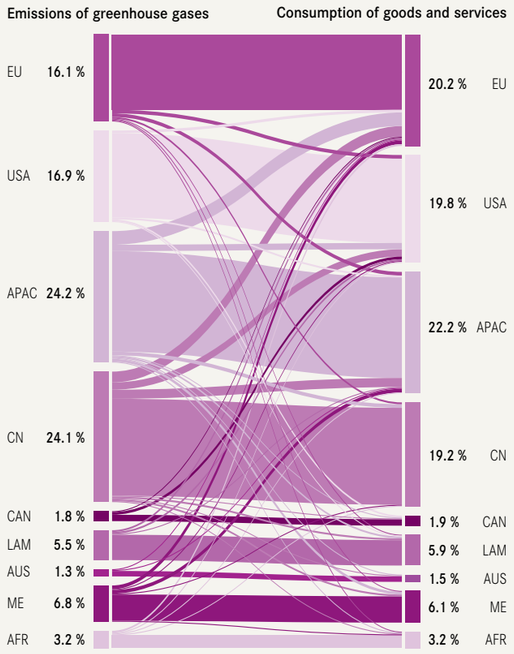


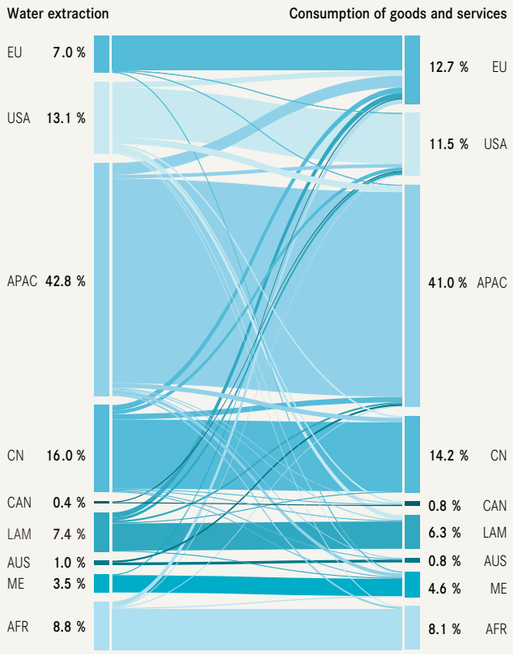
Carbon footprint

The total global emissions of greenhouse gases (GHGs) were almost 38 Gt CO_2-eq in 2007. In the figure below, for instance, it is clear that for Europe and the USA, the GHG embodied in consumption were significantly higher than the territorial emissions. In Europe, the difference was more than 25 %. Conversely, in China and the Asia Pacific region, emissions on account of domestic production processes were significantly higher than those embodied in their consumption, reflecting the role of these regions as the 'factory of the world', by virtue of exporting large amounts of consumer goods to Europe and the USA.

Water footprint

In 2007, total global 'blue' water consumption, i.e., fresh surface and groundwater taken up and evaporated or incorporated into goods and products, was 1 660 km^3. Most of the uptake was in the Asia Pacific region, which is also where most of the embodied consumption of water takes place. Compared to territorial extraction (i.e. hydrological water consumption, see above), Europe was the largest importer of embodied 'blue' water.



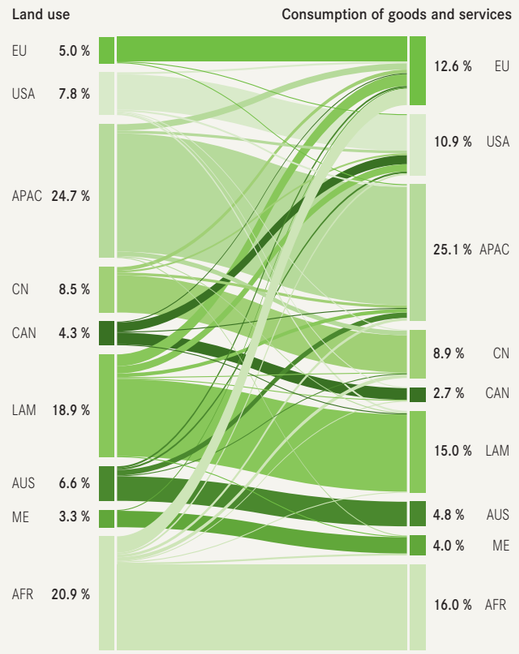


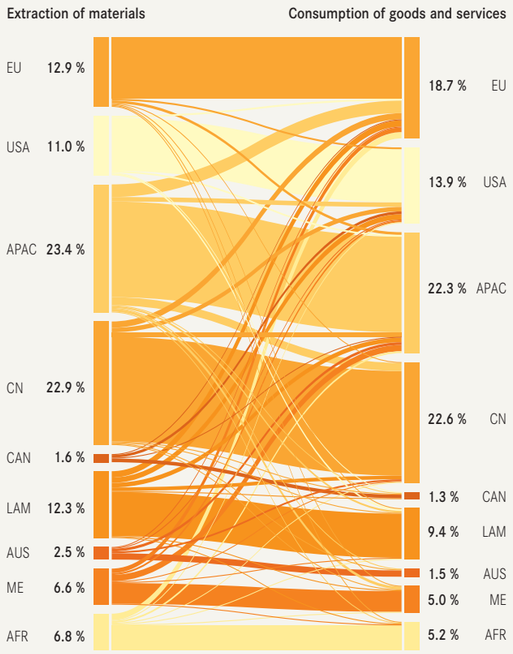
Land footprint

The total land used for production of all goods and services consumed in the world in 2007 was 88 million km^2. In the diagram below, it can be seen that almost 21 % of this land use took place in Africa. However, only 16 % of this land was used to satisfy consumption within Africa. Therefore, part of Africa's land use was used to satisfy consumption requirements in other parts of the world, especially Europe. The diagram also shows that while the Asia Pacific region was the largest user of land in absolute terms, both from a supply and from a consumption standpoint, the biggest exporters of embodied land after Africa were Canada, Australia and Latin America, the key players in primary agricultural production.

Material footprint

Total material extraction in the world (in terms of usage) was 66 bt in 2007 and comprised extraction of bulk materials (sand, clay, gravel, etc.), crops (wheat, rice, etc.), fossil fuels (coal, oil, gas, etc.) and specific ores (iron ore, bauxite, etc.). In terms of weight, it is bulk materials that dominate the overall material footprint of a country or region. It is known that most bulk materials are locally produced and consumed. Therefore, it is expected that the regions of production and consumption are strongly connected at the global level of aggregation, as shown in the diagram below. The figure also makes it clear that the Middle East (delivering oil), Asia Pacific, Latin America and Africa (all delivering a mix of biomass, metals and industrial minerals) are the main exporters of materials embodied in trade.





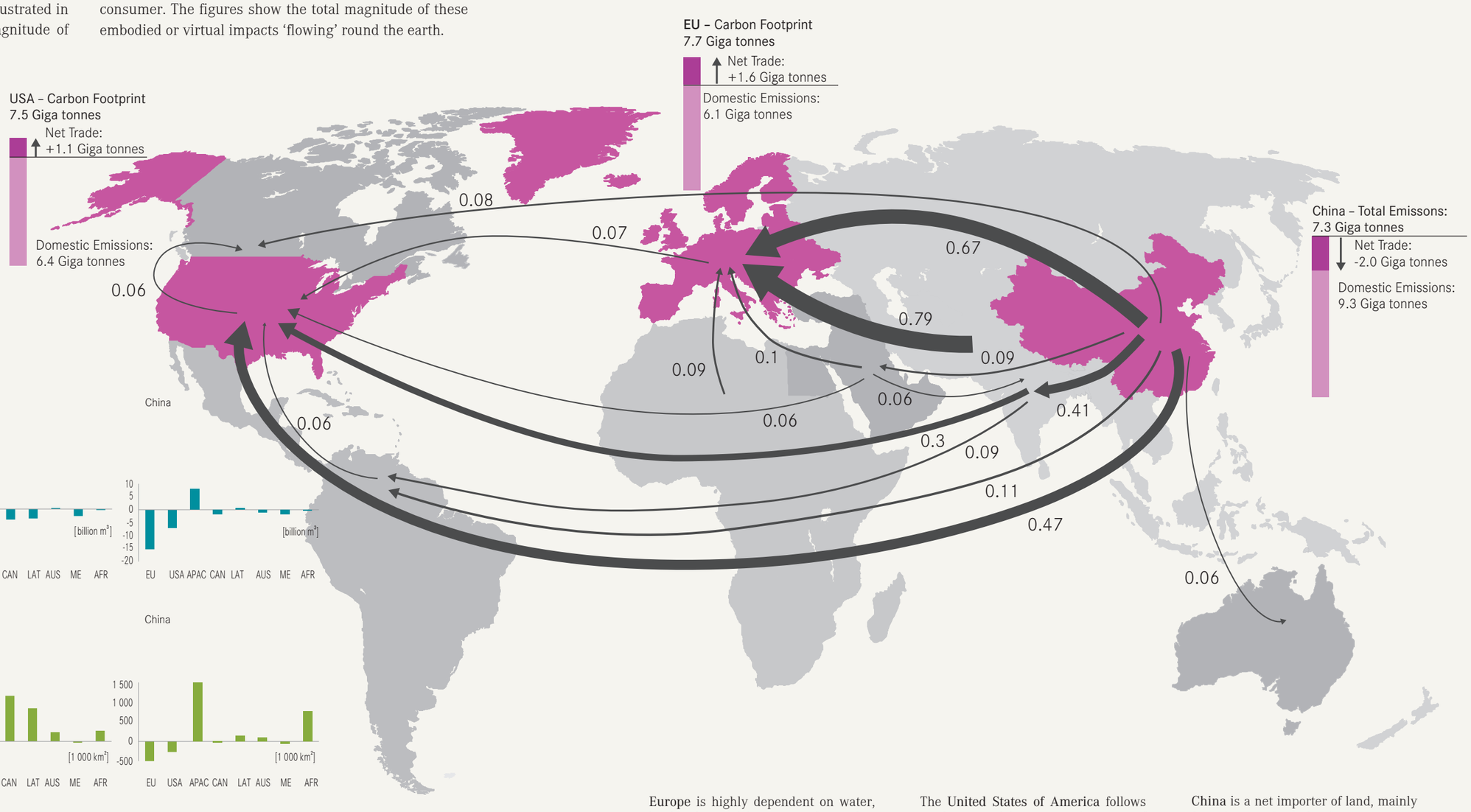
The EU, USA and China as Global Consumers

Globalization and the attendant increase in trade have brought about changes in the patterns of linkages between the various regions of the world, with environmental impacts in one region being caused by consumption in another. While consumption of resources and pollution associated with internationally traded products can constitute an important source of environmental impacts, the question that arises is just how much of the total environmental impact is dislocated from the country of production to the country of consumption?

In the case of GHGs, 23 % of global emissions in 2007 were embodied in trade between the nine regions illustrated in the map below. The focus here is on the magnitude of dislocation of environmental impacts from producer to consumer. The figures show the total magnitude of these embodied or virtual impacts 'flowing' round the earth.

The large figure below shows GHG emissions expressed as CO_2-eq embodied in trade. In 2007, Asia was the major net exporter of GHG emissions. China exported 2 Gt of CO_2-eq more than it imported, while the rest of the Asia Pacific region had an export surplus of 0.79 Gt of CO_2-eq. The destination of most of these exports was either Europe or North America, the two main net importers of GHG emissions. While Europe had net GHG import (imports minus exports) of 1.6 Gt of CO_2-eq, the United States alone imported over 1 Gt of CO_2-eq more than the volume of emissions embodied in its exports. This trend clearly illustrates how the high volume of foreign emissions associated with European and American consumption increases their already high carbon footprint, and could have a significant impact on the GHG mitigation policies in these regions.

The figures represent the trade balance for water, land and materials between Europe, the USA and China, the biggest consumers of these resources, and the rest of the world. Countries and regions that import more natural resources embodied in traded goods than they export – on the positive side of the axis – are the ones dependent on resources from elsewhere.



Note: The figures here are net impacts, i.e., the impacts of consumption in the USA from production in China, and are not 'trade related' impacts which include imports that may be processed further and re-exported to a third country. The balance of trade shows net imports, and is counted as imports minus exports.

Europe is highly dependent on water, land and material resources from other regions, especially from the Asia Pacific region, Latin America and Africa. In fact, Europe is responsible for most of the net imports of natural resources in the world.

The **United States of America** follows as the second largest net importer of resources. The USA mainly imports products with high associated land use from Canada and Latin America, and those with high material content from China, Latin America and the Asia Pacific. For water consumption, however, the USA emerges as a net exporter, except with regard to China.

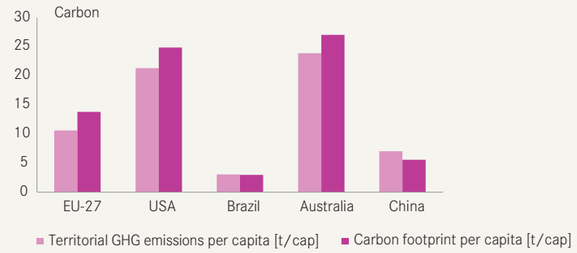
China is a net importer of land, mainly from the rest of Asia, but is a net exporter of both water and material embodied in traded products. The overwhelming majority of China's net exports are bound for Europe and the USA.

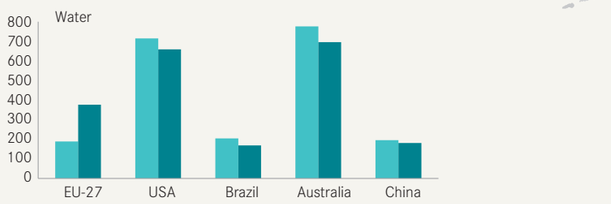
From a Production to a Consumption Perspective

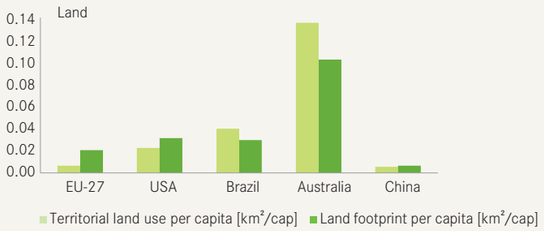
In the last few decades, countries across the world have implemented policies aimed at reducing the ecological impact and improving the performance of their economies on the environmental front. In this context, while some countries have managed to reduce emissions of GHG within their territories in absolute terms, other countries have boosted their environmental performance parameters by using fewer raw materials today than 20 years ago, while maintaining continuous economic growth. However, the question is whether this improvement is based on real reduction in consumption or whether it is the result of moving environmentally intensive production to other regions of the world.

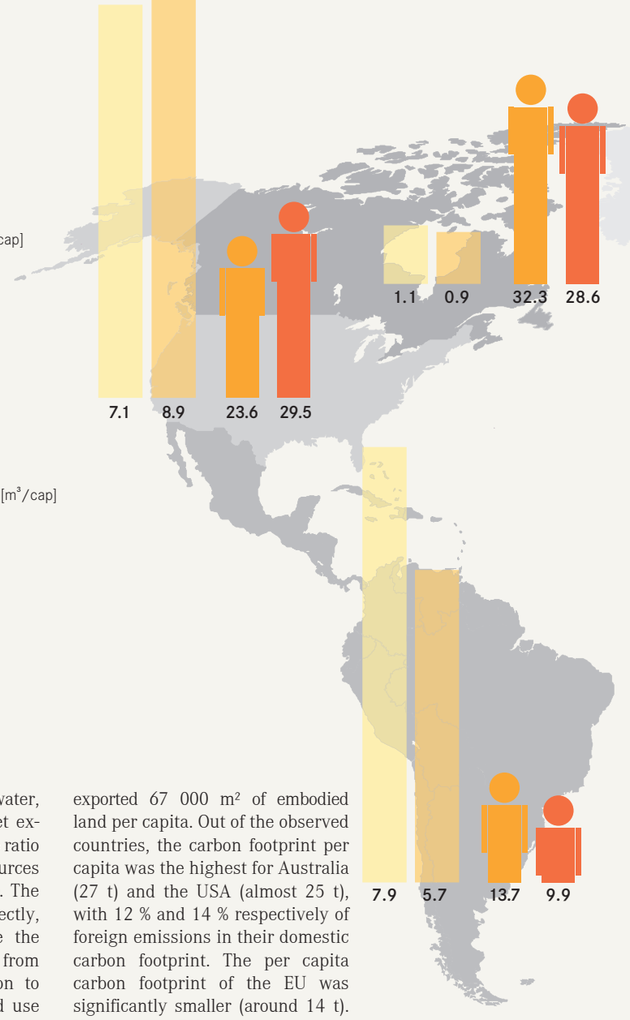
Traditionally, the environmental performance of a country is evaluated from a production perspective, focusing on the environmental pressures and impacts generated within its own territory, such as national GHG emissions or the uptake of water from the water bodies within that country.

However, switching from this territorial, production-oriented perspective to a consumption perspective allows an evaluation of the extent to which countries are relocating their environmental problems to other regions of the world by increasing their imports of resource-intensive products while maintaining their own consumption patterns.





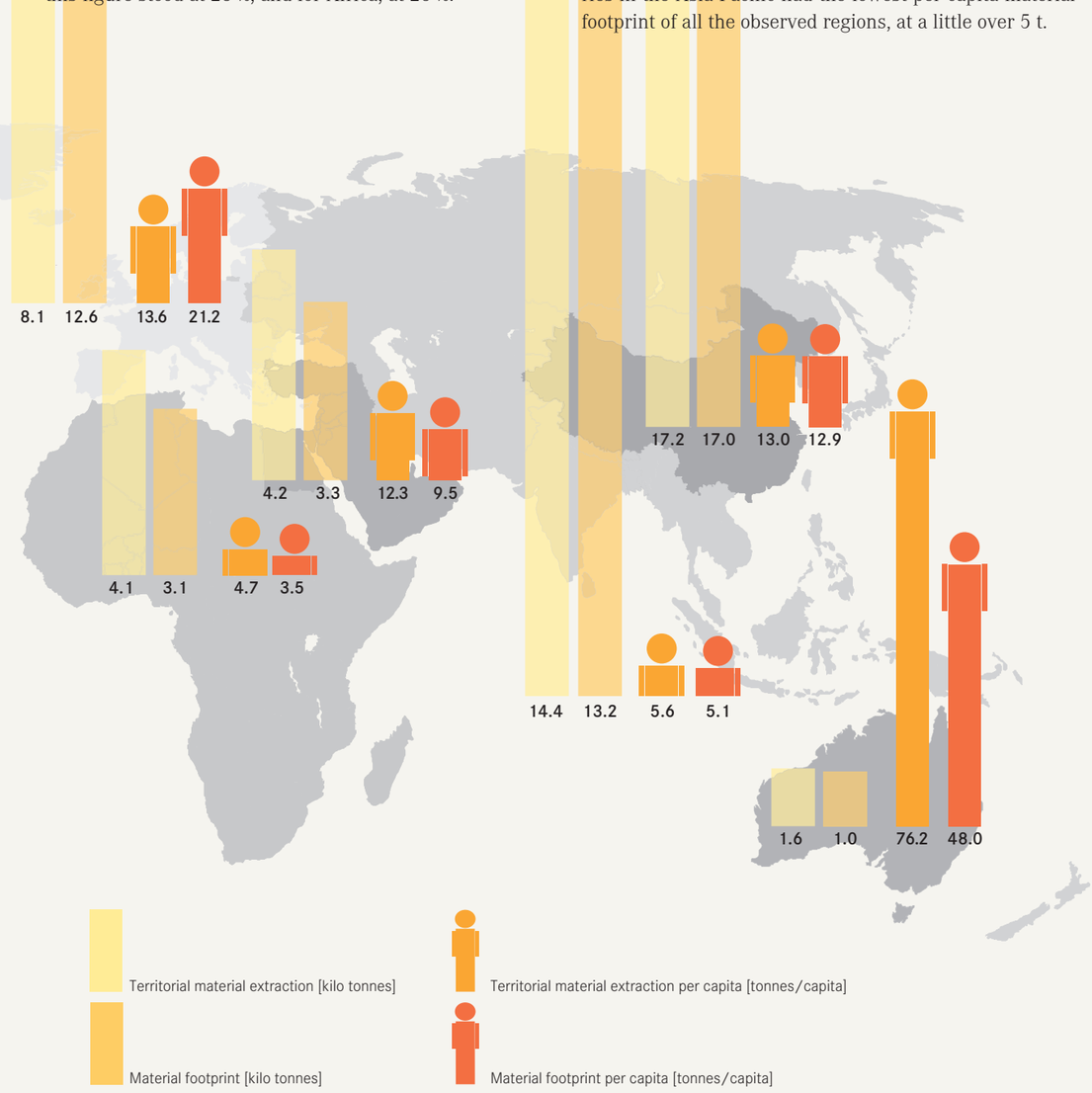




The smaller graphs show the production and consumption perspectives for carbon emissions, water and land use for them EU-27, the USA, Brazil, Australia and China in 2007. Besides materials, Europe was also the biggest net importer of embodied resources, i.e., water, land and GHG emissions. The EU-27 water footprint per capita was 380 m³ in 2007, double the amount of water extracted (hydrological water consumption) within the EU. The remaining four countries were net exporters of embodied water, Australia being the largest net exporter, at 81 m³ per capita. The ratio of domestic versus foreign resources was even higher for land use. The EU-27, directly and indirectly, consumed more than double the amount of agricultural land from other countries in comparison to land use within the EU. Land use was by far the highest in Australia, where huge pasture areas of low biological productivity are used for livestock production. Australia thus exported 67 000 m² of embodied land per capita. Out of the observed countries, the carbon footprint per capita was the highest for Australia (27 t) and the USA (almost 25 t), with 12 % and 14 % respectively of foreign emissions in their domestic carbon footprint. The per capita carbon footprint of the EU was significantly smaller (around 14 t). However, the EU generated almost a quarter of its consumption-related GHG emissions in other countries.

A study of the material footprint, i.e., material extraction versus material consumption, reveals disparate patterns for various countries and regions of the world. Europe and North America were the biggest net importers of material resources in 2007. More than a third of raw materials required meeting the demand for consumption goods and services in Europe originated from other regions of the world. North America's own share in raw materials was 17 % of its material footprint. While China had a near-balance between extraction of raw materials and its global material footprint, all other regions of the world were net exporters of raw materials. In percentage terms, Australia was the biggest net exporter, wherein 37 % of the raw material extraction in Australia became part of the material footprint of other countries and regions. For Latin America, this figure stood at 28 %, and for Africa, at 26 %.

Australia's role as a significant net exporter of raw materials is also clearly visible when seen from the per capita perspective. In 2007, more than 76 t of raw materials per capita were extracted within Australia, of which 28 t per capita exported were (net) to other regions of the world. However, even so, Australia's per capita material footprint in 2007, at 48 t, was higher than that of any other region in the world. North America came in second, with 29 t of per capita material footprint, as against 24 t of per capita domestic extraction. Europe's material footprint per capita was around 21 t, 8 t per capita more than was extracted within Europe. Although the absolute numbers for both raw material extraction and the material footprint were highest for China, their per capita material footprint, at around 13 t, was still far below the level of the 'rich' countries. Countries in the Asia Pacific had the lowest per capita material footprint of all the observed regions, at a little over 5 t.

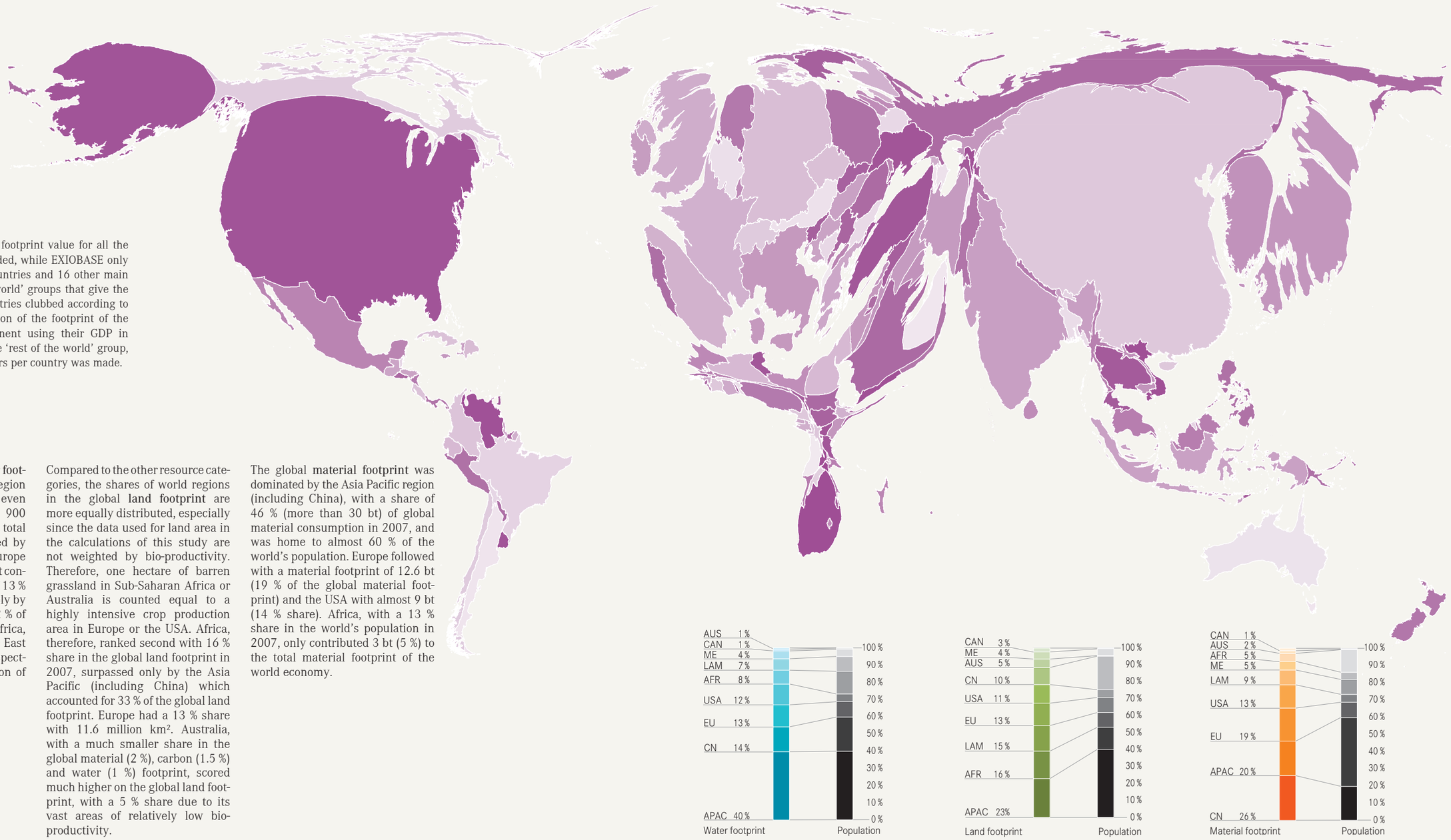


The Uneven Distribution of Global Resource Consumption

In absolute terms, the global carbon, material, water and land footprint is very unevenly distributed across the world. In all four categories, a significant share of the total global environmental impact is a consequence of the consumption activities of a few major economies. This has important implications for global environmental policies, as it is especially incumbent upon these countries to implement measures which help in reducing their domestic as well as foreign resource footprint.

In case of the carbon footprint, two major emitting countries dominated the global footprint in 2007. The USA had a 19.7 % share in the global carbon footprint (7.5 Gt CO_2-eq of GHG emissions) with only 4.5 % of global population. China followed with 19.3 % (7.3 Gt CO_2-eq of GHG emissions) with, however, an almost equal share in population (19.9 %). These two countries alone, thus, emitted 39 % of all climate-active gases in 2007. Japan, India and Russia followed in the global ranking, all contributing between 4 and 5 % to the global carbon footprint. Therefore, the top 5 emitters together were responsible for more than 52 % (or almost 20 Gt CO_2-eq) of GHG emissions, with 46 % of global population. The major EU economies: Germany, UK, Italy and France, followed, with shares between 2 and 3.5 % in global GHG emissions. The top-25 list of global emitters, which accounted for more than 82 % of the global carbon footprint in 2007, included a number of emerging economies like Brazil, Mexico, South Africa, Turkey, and as well as developing countries such as Indonesia and Thailand.

On the other end of the global spectrum are a large number of countries which only contribute marginally to the global climate problem. The 100 countries emitting the smallest absolute amounts of GHG together accounted for a miniscule 1.6 % of the global carbon footprint.



For the Worldmapper figure, a footprint value for all the countries of the world was needed, while EXIOBASE only provides data for the EU-27 countries and 16 other main economies, and 5 ‘rest of the world’ groups that give the footprint of the remaining countries clubbed according to continent. A simple extrapolation of the footprint of the remaining countries per continent using their GDP in comparison with the GDP of the ‘rest of the world’ group, in relation to population numbers per country was made.

With regard to the global **water footprint**, the Asia Pacific region (including China) plays an even more dominant role. Almost 900 billion m³ (54 % of the world’s total water resource) was consumed by this region alone in 2007. Europe was the second most significant consumer of water, with a share of 13 % (212 billion m³), followed closely by the USA (200 billion m³, or 12 % of the global water footprint). Africa, Latin America and the Middle East accounted for 8, 7 and 5 % respectively of the global consumption of water resource in 2007.

Compared to the other resource categories, the shares of world regions in the global **land footprint** are more equally distributed, especially since the data used for land area in the calculations of this study are not weighted by bio-productivity. Therefore, one hectare of barren grassland in Sub-Saharan Africa or Australia is counted equal to a highly intensive crop production area in Europe or the USA. Africa, therefore, ranked second with 16 % share in the global land footprint in 2007, surpassed only by the Asia Pacific (including China) which accounted for 33 % of the global land footprint. Europe had a 13 % share with 11.6 million km². Australia, with a much smaller share in the global material (2 %), carbon (1.5 %) and water (1 %) footprint, scored much higher on the global land footprint, with a 5 % share due to its vast areas of relatively low bio-productivity.

The global **material footprint** was dominated by the Asia Pacific region (including China), with a share of 46 % (more than 30 bt) of global material consumption in 2007, and was home to almost 60 % of the world’s population. Europe followed with a material footprint of 12.6 bt (19 % of the global material footprint) and the USA with almost 9 bt (14 % share). Africa, with a 13 % share in the world’s population in 2007, only contributed 3 bt (5 %) to the total material footprint of the world economy.

Comparing the World's Environmental Footprints

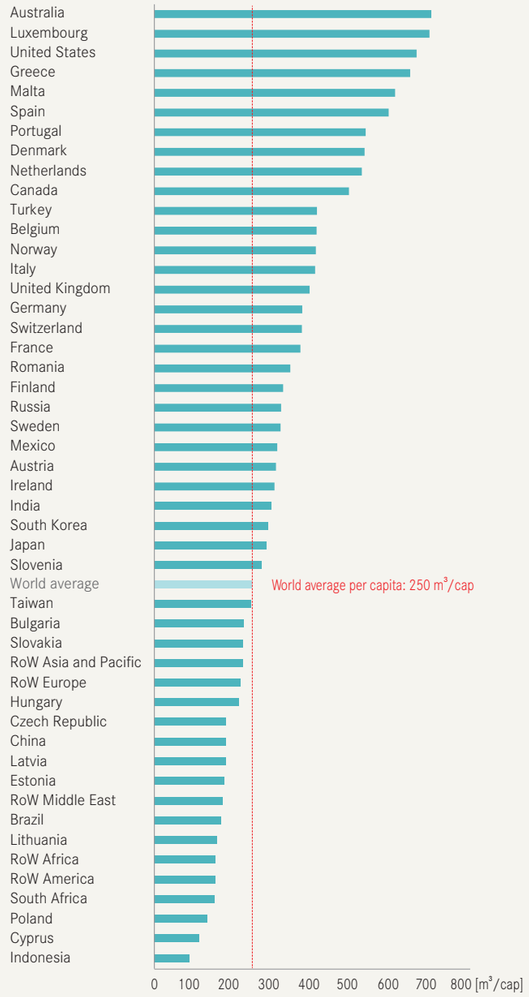
Like the footprints in absolute terms, the per capita carbon, material, water and land footprints too are unevenly distributed across countries. In general, rich, developed countries have a high environmental footprint, while poor, underdeveloped countries have a low environmental footprint. It is fairly obvious that while the latter need to increase their footprint to eradicate poverty, the former have a particular responsibility to avoid overusing more than their share of 'environmental space'.

Carbon footprint per capita

The global carbon footprint per capita in 2007 was close to 6 t CO_2-eq. Citizens of Australia, the USA and Luxembourg were responsible for emissions over five times this volume, reflecting their high GDP per capita. These countries were followed by other, rich OECD countries. Emissions in Africa, China and India were well below average. France had relatively low GHG emissions per capita due to its high reliance on nuclear power.

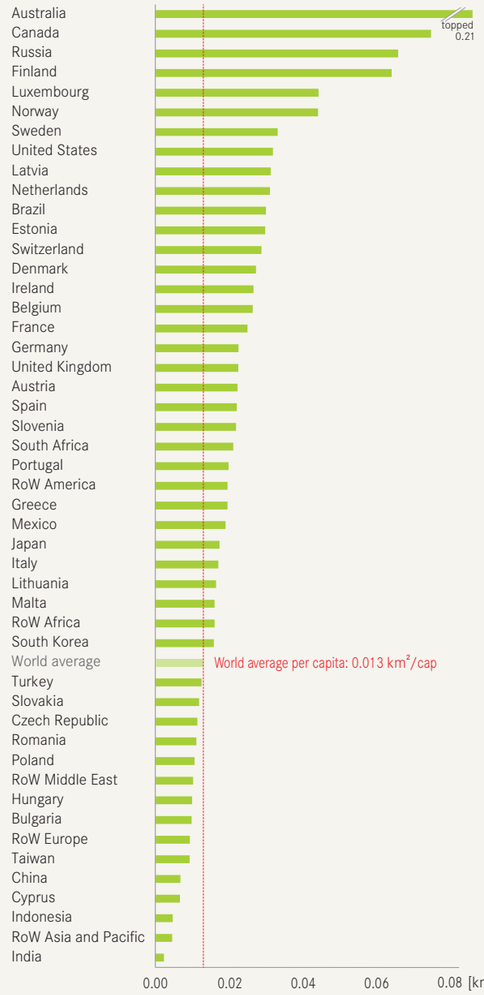
Water footprint per capita

As in the case of the carbon footprint, the water footprint for 2007 too was the highest for Australia, the USA and Luxembourg respectively, on account of their high per capita GDP. Further, rich countries with limited precipitation, such as Greece, Spain, and Turkey, had high levels of water consumption per capita, since their agricultural systems largely rely on irrigation. For water, the difference between the countries with the highest and lowest footprint was around a factor of 8, which is less pronounced than in the case of the land and material footprint.



Land footprint per capita

In the case of the land footprint, sparsely populated countries with extensive land use, such as Australia, Canada, Finland and Russia, were at the top. For these countries, the amount of land directly available for its population was the determining factor. At first sight, the high rank of the Netherlands, one of the most densely populated countries in the world, is surprising. However, this is due to the intensive Dutch livestock industry, which relies heavily on imported feed, hence creating a high land footprint abroad.



Material footprint per capita

Conforming to trend, countries with high per capita GDP tend to have a high material footprint per capita. Rich countries like Australia and Finland, hosting large primary industries such as mining and forestry, or those like Ireland that experienced a building and construction boom, had particularly high ranks. In this context, it is notable that construction materials are usually responsible for half of the material footprint of a country.

Our Interlinked Economy – Part I

Theme 1, 'The Interconnected World', shed light on the correlation between consumption in one part of the world and resource extraction in others. However, connections between resource extraction and final demand, which happen through trade in specific products and transformation through specific processes, were not explored in detail. In this section, the linkages between material extraction and final consumption are comprehensively explored, thus showing the flow of the environmental footprint through the world economy.

The diagram shows the flow of material footprint in the world for 2007. It's tracking the flow of economic demand from right to left, showing which sources of economic demand, on the right, are creating the most significant resource extraction impacts (material footprints) on the left. The figure below shows how the material footprint embodied in the world's final demand, via different steps in the value chain, is related to primary extraction of material resources for 2007. On the right-hand side of the figure is the total embodied material footprint of final demand of all consumers in the world, which amounted to 66 bt, shown as one big rectangular block.

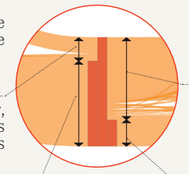
On the left hand side, the large orange block represents total (used) world material extraction of 66 bt as a result of total final demand. Going from left to right, the diagram illustrates how the material footprint embodied in products flows through the economy, from semi-finished products to final consumable products. For instance, it is clear from the diagram that the material footprint of global consumption is largely caused by consumption of construction work services and its embodied material footprint. In turn, the material footprint of the construction work services is mainly due to consumption of sand and clay, cement and stone.

The material footprint of the final demand of all consumers in the world is shown as one big rectangular block which amounts to 66 bt. On the left hand side, the large orange block represents total (used) world material extraction of 66 bt caused by this total final demand. Going from left to right, it can be seen how the material footprint embodied in products flows through the economy from semifinished products to final product consumed by final consumers. For instance it can be seen that the material footprint of global consumption is mainly caused by the consumption of construction work services and its embodied material footprint. In turn, the material footprint of the construction work services is mainly due to its consumption of sand and clay, cement and stone.

WHERE DOES EXTRACTION OCCUR?
The left side of each sector block shows where in the economy the extraction or impacts occur as a result of the sector's activities.

Upstream Extraction/Impacts
The portion total domestic extraction or impacts that occur, somewhere in the economy, as a result of this sector's economic demand for the output of other sectors, such as the Cattle or Cereal grains sectors.

Direct Extraction/Impacts
The portion total domestic extraction or impacts that occur on site, as a direct result of this sector's activities, such as the use of land for livestock.

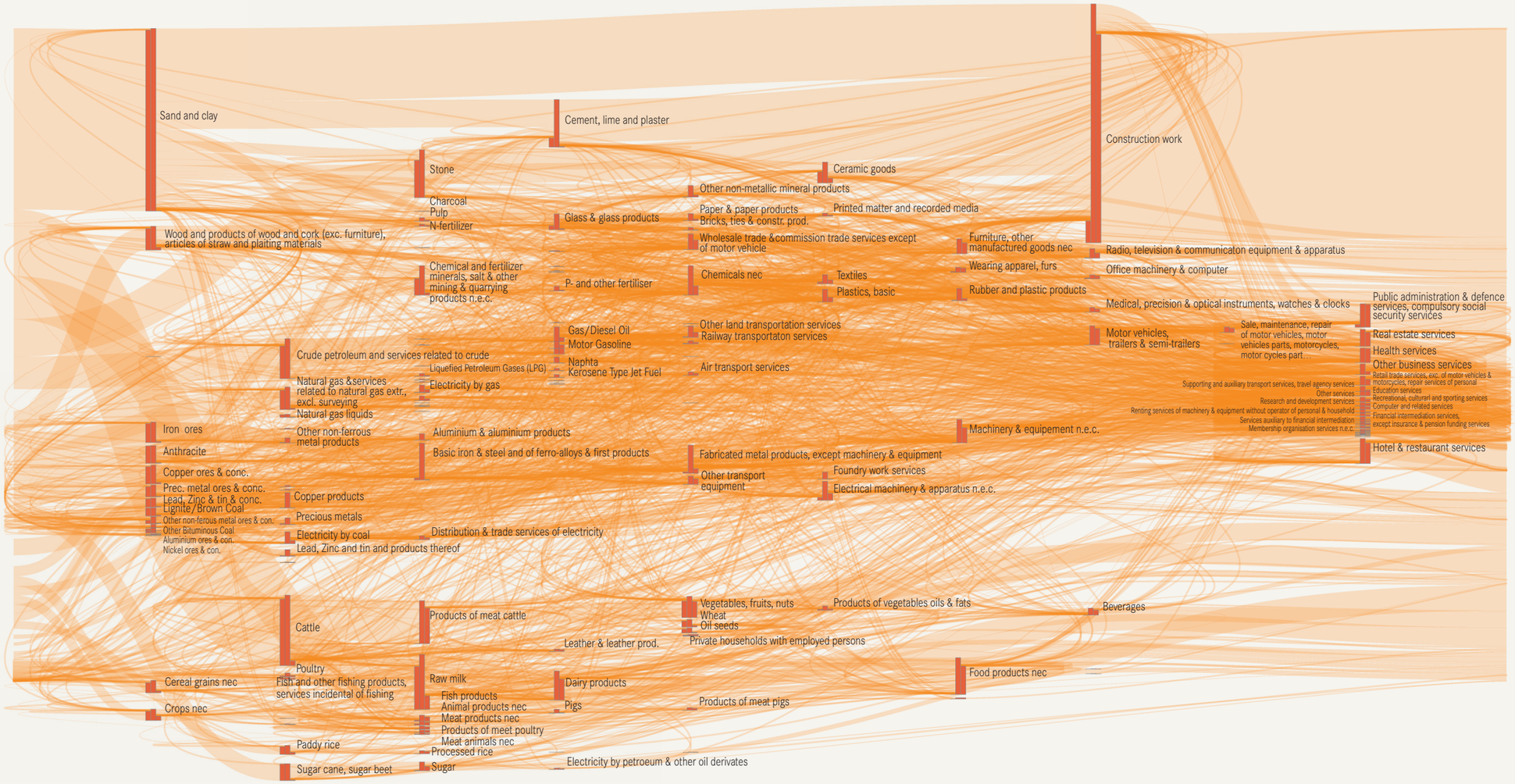


WHERE DOES THE DEMAND COME FROM?
The right side of each sector block shows where in the economy the demand for the sector's output comes from.

Downstream Extraction/Impacts
The portion of this sectors total (combined upstream and direct) domestic extraction that occurs in response to economic demand for its output from other industry sectors, such as Dairy products or Food products sectors.

Final Consumption Extraction/Impacts
The portion of this sectors total (combined upstream and direct) domestic extraction that occurs in response to final economic demand for its output from households, government, or foreign countries.

66 billion tonnes of exctracted materials



66 billion tonnes of material footprint embodied in 40.7 trillion € in global final consumption

Our Interlinked Economy – Part II

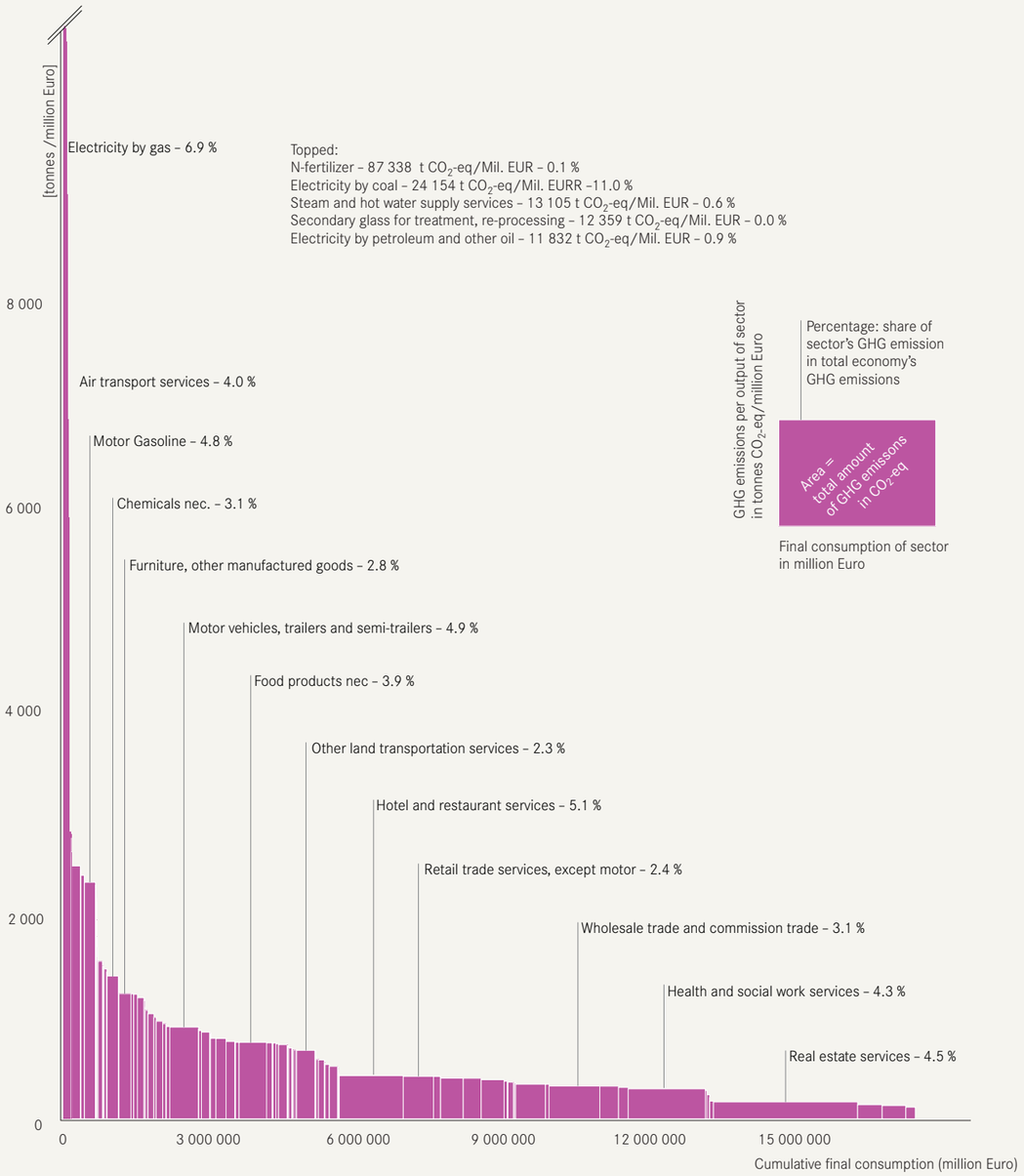
As seen earlier in the study, consumption in one country can leave a significant part of its environmental footprint in other parts of the world. It is interesting to determine which products in the final consumption basket contribute most to the carbon footprint, and whether these have specific orders of priority in different countries/regions.

The contribution of final use of a product to the total footprint of a region can be split into two parts: the quantity of the product bought and the footprint of its production per Euro. This analysis deals only with the production phase and not the use of these products since direct emissions from households, as available in EXIOBASE, cannot be attributed to the use of individual products. Additional information would be needed to make such an attribution.

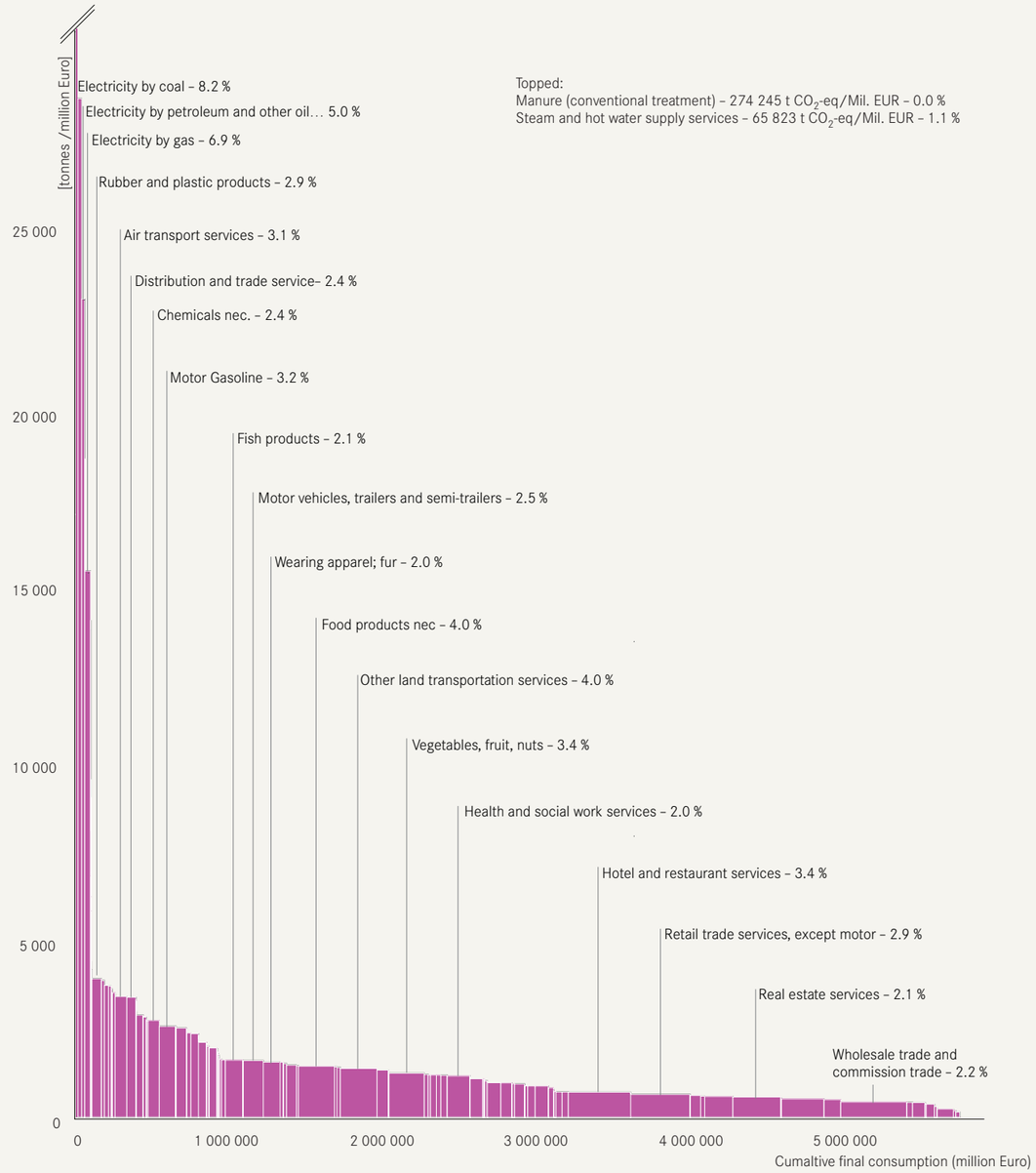
Private consumption of products and their footprint per Euro can be plotted in an 'expenditure versus footprint per Euro' graph. The graph below shows the carbon footprint of products consumed in OECD and non-OECD countries in EXIOBASE.

The x-axis represents the cumulative expenditure of private households. The y-axis shows embodied carbon (expressed as tonne CO_2-eq) per Euro spent on the product. The products are ordered from the highest to the lowest carbon footprint per Euro. The total area under the graph represents the total carbon footprint of private household consumption (exclusive use phase). The product categories that contribute more than 2 % to the total carbon footprint are labelled. In contrast to a calculation for the water footprint (not shown here) the structure of embodied GHG emissions for both regions is quite similar. The same kind of products show up as having a high GHG emission per Euro and the largest contribution to total GHG emission associated with private household expenditure.

GHG Emissions OECD



GHG Emissions Non-OECD



Relationship Between Wealth, Well-Being and Footprint

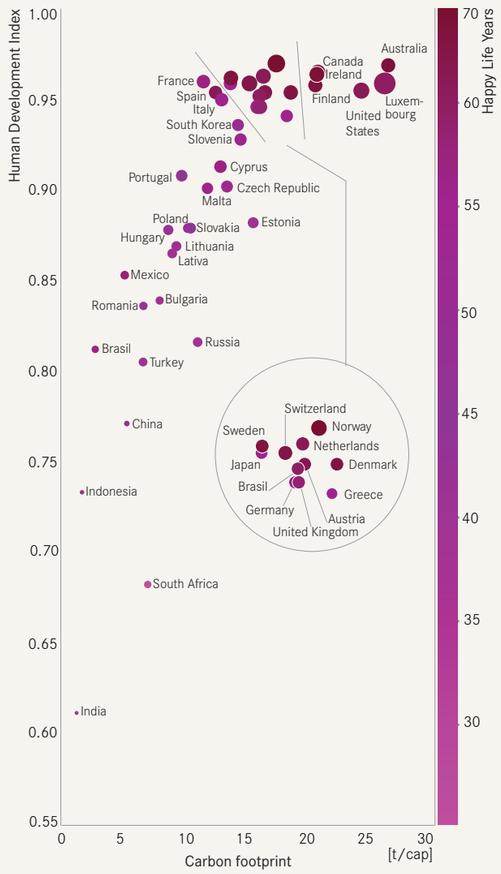
The increased well-being of its citizens is generally the ultimate goal of a modern society. However, increasing the well-being and the associated development status of a society requires resources. The question is whether increasing our well-being always leads to a high impact consumption pattern. In an ideal situation, increasing well-being and development can be decoupled from environmental impact.

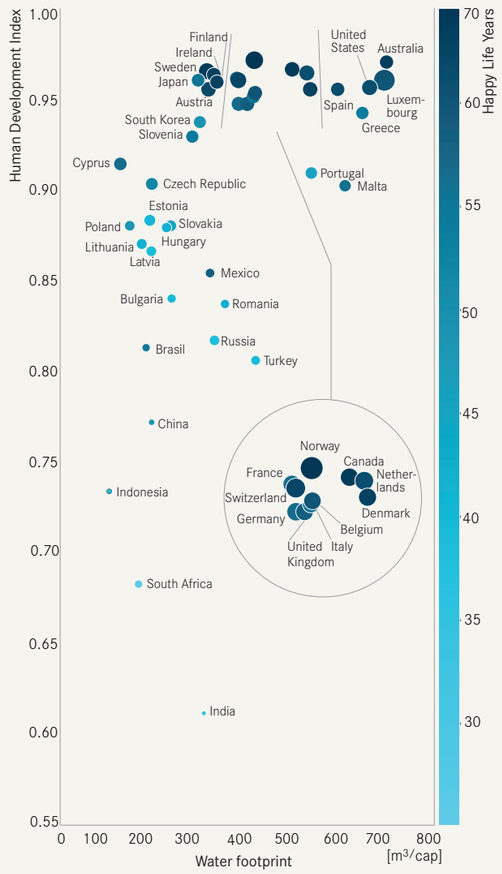
Traditionally, GDP has been used as a measure of welfare and as a proxy for the well-being and development of a society. While this is a valid simplification for developing countries, using GDP as an indicator of the development/experienced well-being for high-income countries has long been questioned. Several alternative indicators have been proposed, of which the most prominent are human development index (HDI) and happy life years (HLY). HDI is based on the notion that human development is the process of enlarging people's choices, quantified in three basic areas: health, education and standard of living. HLY focuses on outcomes: experienced well-being and its duration. The figures below plot HDI and HLY for countries against their carbon, water, land and material footprint per capita for the year 2007.

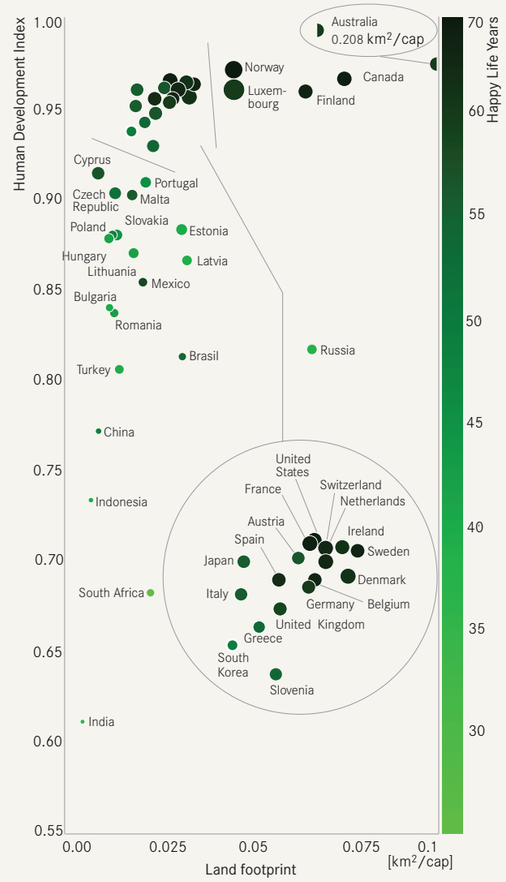
The figure plotting HDI/HLY versus the carbon footprint shows that countries with HDI above 0.9 and with more than 60 happy life years had a carbon footprint of more than 10 t of GHG emissions per capita which, in general, reflects a high GDP. However, two countries from Latin America – Brazil and Mexico – have an HDI of over 0.8 and more than 50 happy life years, with a low carbon footprint. There is, thus, a clear levelling off of the curve, where high impact nations (with a large per capita footprint) do not benefit in terms of increased happiness, and have similar HDI values to regions with half the emissions impact.

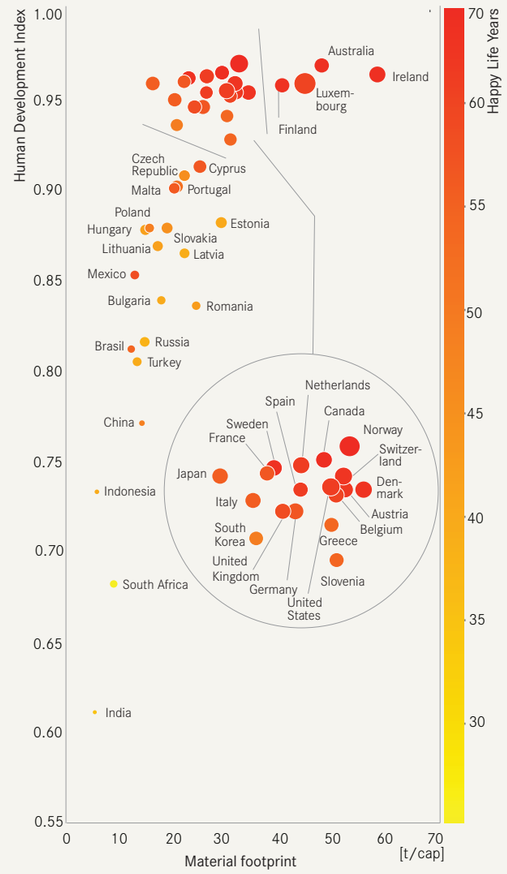
A similar trend can be observed for the land, water and material footprint: intensive use of resources was required to reach a high plateau level of HDI and HLY. There is some scatter across the data points due to the fact that scarcity is not accounted for in these indicators — regions highly endowed with water or land resources generally had higher per capita impact, with no accompanying increase in happiness or level of development. The opposite can also be observed: Cyprus managed to keep its water footprint at an exceptionally low level, and Japan's policy efforts to reduce waste resulted in the lowest material footprint observed for highly developed countries. These countries exemplify the possibility of decoupling of standards of living from environmental impacts. However, it is also clear that strong natural constraints or targeted policy efforts are needed to achieve such a decoupling.

Figures:
Dependence of human development index (y axis) and happy life years (colour) on per capita environmental impact (consumption based approach). The dots are sized according to the purchasing power parity GDP per capita of the country.









Country Factsheets

Australia

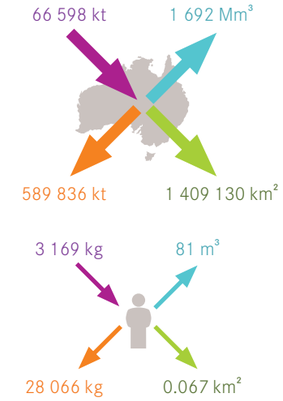
Population: 21 015 900 | Land area: 7 741 220 km² | GDP: 625 361 Mil. €

Australia has the highest per capita carbon, water and land footprint in the world, and ranks second only after Ireland, in terms of material footprint. Australia's land footprint is particularly high compared to the world average, reflecting the country's low population density. Australia is a net exporter of water, land and materials embodied in trade but a net importer of embodied carbon. Although Australia also has a high GDP per capita, the carbon footprint per unit of GDP is high.

FOOTPRINTS

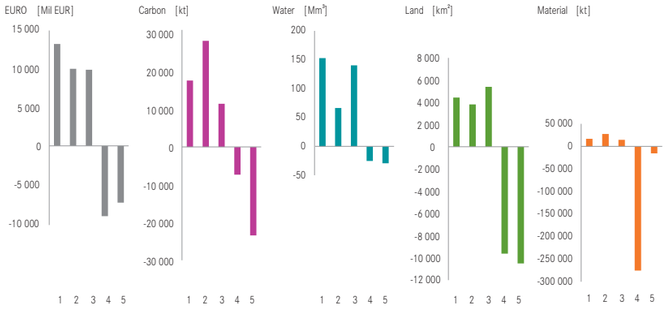
	Carbon	Water	Land	Material
per country	586 226 kt	14 743 Mm³	4 366 080 km²	1 010 229 kt
per capita	27 038 kg	701 m³	0.208 km²	48 070 kg

NET TRADE



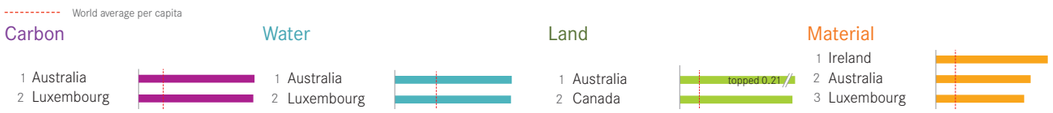
TRADE FLOWS BY PRODUCT

Shown below are the net trade of products imported/exported to/from a country (imports minus exports) – the products include products for both further processing into more advanced goods/services (that may be later exported) and for final consumption. Environmental impacts are shown for the complete up-stream international supply chain of each product.



1 Machinery and equipment n.e.c.
2 Gas/Diesel Oil
3 Radio, television and communication equipment and apparatus
4 Iron ores
5 Other Bituminous Coal

RANKING



KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.909 kt/Mil €	0.024 Mm³/Mil €	6.982 km²/Mil €	1.615 kt/Mil €		
Per capita footprints relative to world average	4.73	2.80	15.67	4.86		
Contribution to global total	1.50 %	0.89 %	4.96 %	1.54 %	1.53 %	0.32 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³	0.013 km²	9 886 kg		

Austria

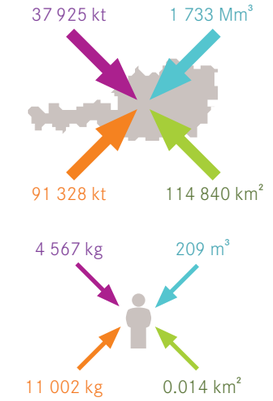
Population: 8 300788 | Land area: 83 870 km² | GDP: 273 653 Mil. €

As a developed country, Austria ranks high in terms of its carbon and material footprint per capita. However, not only are Austria's land and water footprint somewhat more moderate, but also, a very high fraction of these are imported. For water, this reflects the rather limited water extraction in Austria itself. Not surprisingly, agricultural products make the maximum contribution to the net imports of embodied water and land.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	140 379 kt	2 555 Mm³	185 200 km²	260 050 kt
per capita	16 912 kg	308 m³	0.022 km²	31 328 kg

NET TRADE



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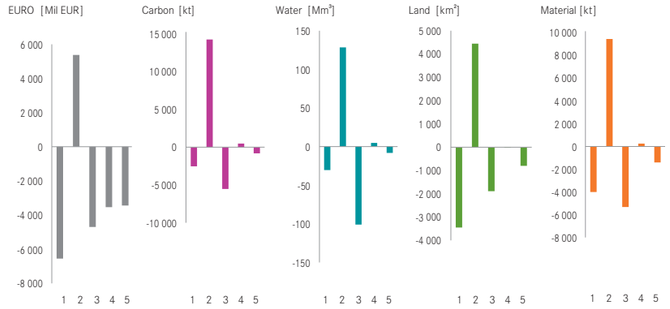
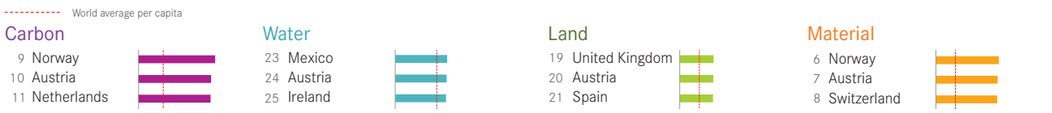


1 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
2 Chemicals nec
3 Plastics, basic
4 Machinery and equipment n.e.c.
5 Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods

RANKING



KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.513 kt/Mil €	0.009 Mm³/Mil €	0.677 km²/Mil €	0.950 kt/Mil €		
Per capita footprints relative to world average	2.96	1.23	1.68	3.17		
Contribution to global total	0.37 %	0.15 %	0.21 %	0.40 %	0.67 %	0.13 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Belgium

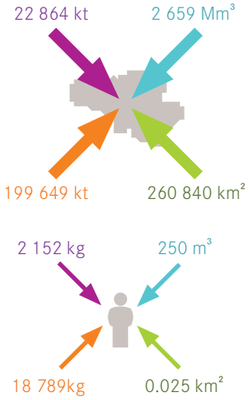
Population: 10 625 700 | Land area: 30 530 km² | GDP: 335 161 Mil. €

The Belgian economy is both developed and open, which makes it dependent on the global economic climate via multiple trade relationships. Belgium is a densely populated country with high levels of urbanization and a well-developed transport network. Belgium imports most of its water, land and material footprint. This is explained by the low availability of natural resources and rural land within the country. In relation to the world average, the Belgian environmental footprint per capita is relatively high, notably its carbon footprint, which is three times the world average.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	174 935 kt	4 365 Mm³	281 037 km²	320 557 kt
per capita	16 463 kg	411 m³	0.026 km²	30 168 kg

NET TRADE



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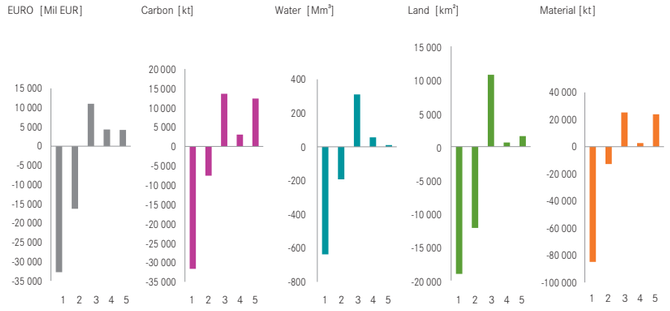


1 Plastics, basic
2 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
3 Chemicals nec
4 Other land transportation services
5 Crude petroleum and services related to crude oil extraction, excluding surveying

RANKING

World average per capita

Carbon
12 United Kingdom
13 Belgium
14 Germany

Water
11 Turkey
12 Belgium
13 Norway

Land
15 Ireland
16 Belgium
17 France

Material
9 Slovenia
10 Belgium
11 Greece

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.522 kt/Mil €	0.013 Mm³/Mil €	0.839 km²/Mil €	0.956 kt/Mil €		
Per capita footprints relative to world average	2.88	1.64	1.99	3.05		
Contribution to global total	0.46 %	0.26 %	0.32 %	0.49 %	0.82 %	0.16 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Brazil

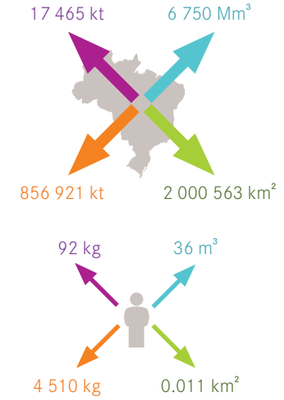
Population: 189 996 976 | Land area: 8 514 880 km² | GDP: 996 704 Mil. €

Apart from land use, Brazil's environmental footprint is around or below the world average. Brazil's carbon footprint is especially low, reflecting a high level of reliance on biofuels and hydropower. Brazil exports carbon, water, land and materials embodied in trade, but the ratios between the embodied exports and footprints of national consumption are not as high as they are for smaller economies.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	565 436 kt	32 295 Mm³	5 705 489 km²	2 058 956 kt
per capita	2 976 kg	170 m³	0.030 km²	10 837 kg

NET TRADE



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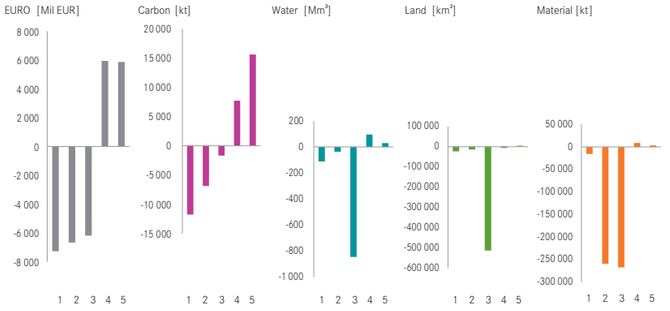


1 Motor vehicles, trailers and semi-trailers
2 Iron ores
3 Crops nec
4 Radio, television and communication equipment and apparatus
5 Sea and coastal water transportation services

RANKING

World average per capita

Carbon
43 RoW LAM
44 Brazil
45 RoW APAC

Water
40 RoW ME
41 Brazil
42 Lithuania

Land
10 Netherlands
11 Brazil
12 Estonia

Material
39 Mexico
40 Brazil
41 RoW EU

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.567 kt/Mil €	0.032 Mm³/Mil €	5.724 km²/Mil €	2.066 kt/Mil €		
Per capita footprints relative to world average	0.52	0.68	2.26	1.10		
Contribution to global total	1.49 %	1.94 %	6.48 %	3.14 %	2.45 %	2.86 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Bulgaria

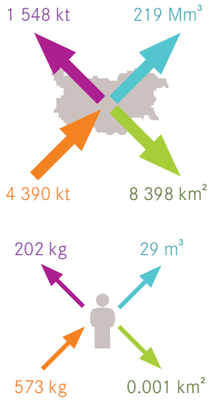
Population: 7 659 764 | Land area: 111 000 km² | GDP: 30 729 Mil. €

Bulgaria, a developing economy, joined the EU in 2007. Its GDP per capita is the lowest among European countries. Mining is an important economic activity. Although Bulgaria ranks relatively low in terms of carbon and material footprint, its per capita levels are higher than the world average. With regard to water and land footprint, however, Bulgaria's performance is better than the world average. Bulgaria is a net exporter of carbon, water and land footprint, although in relative terms, this net export is only a fraction of the total footprint.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	63 331 kt	1 734 Mm^3	74 676 km^2	127 985 kt
per capita	8 268 kg	226 m^3	0.010 km^2	16 709 kg

NET TRADE



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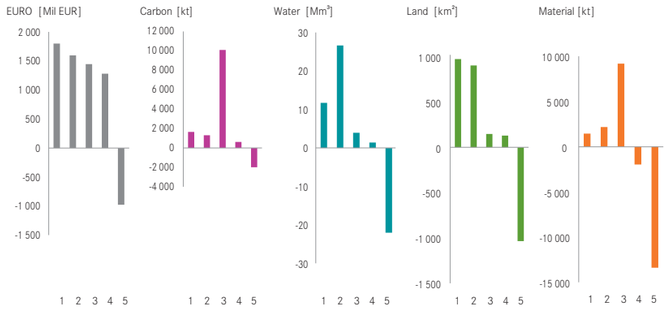


1 Motor vehicles, trailers and semi-trailers
2 Plastics, basic
3 Crude petroleum and services related to crude oil extraction, excluding surveying
4 Machinery and equipment n.e.c.
5 Copper products

RANKING

World average per capita

Carbon
34 Hungary
35 Bulgaria
36 RoW EU

Water
30 Taiwan
31 Bulgaria
32 Slovakia

Land
40 Hungary
41 Bulgaria
42 RoW EU

Material
29 Slovakia
30 Bulgaria
31 Lithuania

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	2.061 kt/Mil €	0.056 Mm^3/Mil €	2.430 km^2/Mil €	4.165 kt/Mil €		
Per capita footprints relative to world average	1.45	0.90	0.74	1.69		
Contribution to global total	0.17 %	0.10 %	0.08 %	0.20 %	0.08 %	0.12 %
World total	37.97 Gt	1 660 560 Mm^3	88 031 435 km^2	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m^3/cap	0.013 km^2/cap	9 886 kg/cap		

Canada

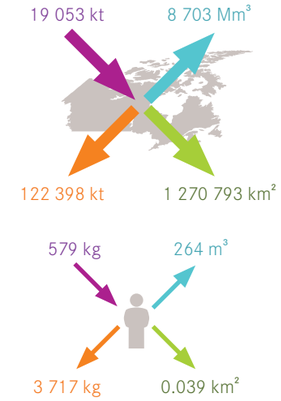
Population: 32 927 517 | Land area: 9 984 670 km² | GDP: 1 039 085 Mil. €

On a global level, Canada has one of the highest carbon and land footprints, and is very near the top 10 with regard to its water and material footprint. The high land footprint is caused by Canada's low population density. Canada is a significant exporter of land embodied in trade (land embodied in exports is around 50 % of the land footprint of final consumption).

FOOTPRINTS

	Carbon	Water	Land	Material
per country	698 696 kt	16 224 Mm^3	2 473 231 km^2	941 109 kt
per capita	21 219 kg	493 m^3	0.075 km^2	28 581 kg

NET TRADE



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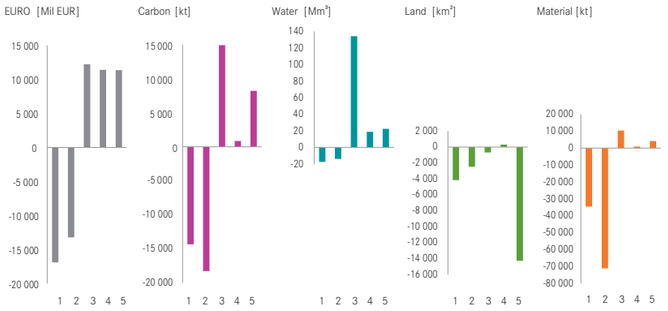


1 Crude petroleum and services related to crude oil extraction, excluding surveying
2 Natural gas and services related to natural gas extraction, excluding surveying
3 Machinery and equipment n.e.c.
4 Services auxiliary to financial intermediation
5 Motor vehicles, trailers and semi-trailers

RANKING

World average per capita

Carbon
3 United States
4 Canada
5 Ireland

Water
9 Netherlands
10 Canada
11 Turkey

Land
1 Australia
2 Canada
3 Russia

Material
12 United States
13 Canada
14 Estonia

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.672 kt/Mil €	0.016 Mm^3/Mil €	2.380 km^2/Mil €	0.906 kt/Mil €		
Per capita footprints relative to world average	3.71	1.97	5.66	2.89		
Contribution to global total	1.84 %	0.98 %	2.81 %	1.43 %	2.55 %	0.50 %
World total	37.97 Gt	1 660 560 Mm^3	88 031 435 km^2	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m^3/cap	0.013 km^2/cap	9 886 kg/cap		

China

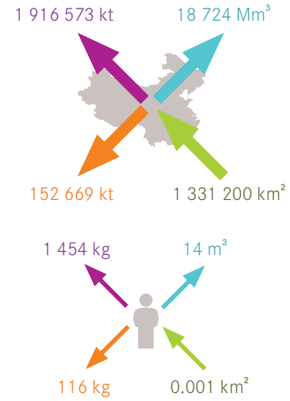
Population: 1 317 885 000 | Land area: 9 562 044 km² | GDP: 2 549 475 Mil. €

China's carbon and material footprint are around the world average, while its land and water footprint are well below the world average. China is a net exporter of carbon, water, land and materials embodied in trade. The trend is most prominent for carbon (the carbon embodied in exports is over 25 % of the carbon footprint).

FOOTPRINTS

	Carbon	Water	Land	Material
per country	7 338 999 kt	239 967 Mm³	8 829 169 km²	17 038 305 kt
per capita	5 569 kg	182 m³	0.007 km²	12 929 kg

NET TRADE



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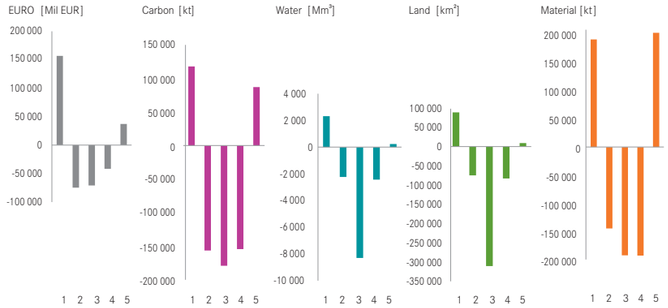


1 Plastics, basic
2 Office machinery and computers
3 Textiles
4 Radio, television and communication equipment and apparatus
5 Crude petroleum and services related to crude oil extraction, excluding surveying

RANKING

World average per capita

Carbon
40 RoW ME
41 China
42 Mexico

Water
36 Czech Republic
37 China
38 Latvia

Land
43 Taiwan
44 China
45 Cyprus

Material
36 Russia
37 China
38 Turkey

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	2.879 kt/Mil €	0.094 Mm³/Mil €	3.463 km²/Mil €	6.683 kt/Mil €		
Per capita footprints relative to world average	0.97	0.73	0.51	1.31		
Contribution to global total	19.33 %	14.45 %	10.03 %	25.96 %	6.26 %	19.85 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Cyprus

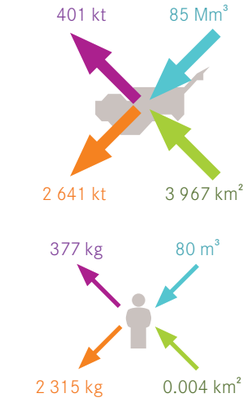
Population: 1 063 095 | Land area: 9 250 km² | GDP: 15 937 Mil. €

Cyprus, a developed, high income country has a per capita GDP just above the European average. The economy of Cyprus is service-oriented, with tourism, financial and real estate services playing a major role. Cyprus has one of the lowest water and land footprints, with per capita values between one-third and one-half of the corresponding world per capita average. Its low ranking is explained by its position as a net exporter of environmental footprint. In terms of carbon and material footprint, Cyprus ranks somewhere in the middle, with per capita levels as least twice as high as the world average.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	14 096 kt	120 Mm³	7 005 km²	25 792 kt
per capita	13 260 kg	113 m³	0.007 km²	24 261 kg

NET TRADE



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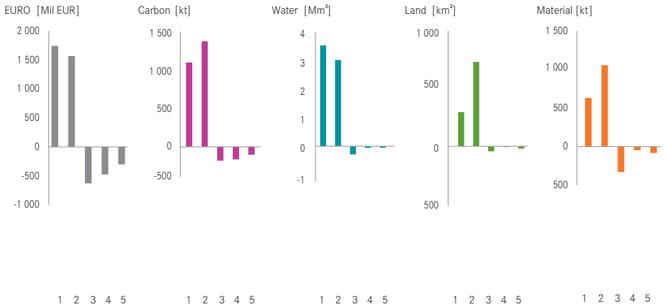


1 Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts and accessoiries
2 Distribution services of gaseous fuels through mains
3 Other business services
4 Supporting and auxiliary transport services; travel agency services
5 Wholesale trade and commission trade services, except of motor vehicles and motorcycles

RANKING

World average per capita

Carbon
22 Italy
23 Cyprus
24 Spain

Water
46 Poland
47 Cyprus
48 Indonesia

Land
44 China
45 Cyprus
46 Indonesia

Material
17 Germany
18 Cyprus
19 Romania

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.884 kt/Mil €	0.008 Mm³/Mil €	0.440 km²/Mil €	1.618 kt/Mil €		
Per capita footprints relative to world average	2.32	0.45	0.50	2.45		
Contribution to global total	0.04 %	0.01 %	0.01 %	0.04 %	0.04 %	0.02 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Czech Republic

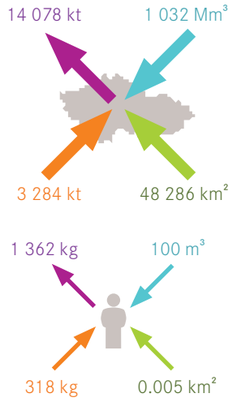
Population: 10 334 160 | Land area: 78 870 km² | GDP: 127 118 Mil. €

The Czech Republic joined the EU in 2004, but is already closely integrated with the other European economies. The automotive industry and related manufacturing are the driving force of the Czech industrial sector. The economy of the Czech Republic is dependent on its trade connections, especially with neighbouring Germany. The country's land footprint per capita is on the same level as the world average, while its water footprint is below the world average. The country records its worst performance in terms of its carbon footprint. Its material footprint is also nearly twice the global average.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	142 610 kt	1 887 Mm³	116 986 km²	204 201 kt
per capita	13 800 kg	183 m³	0.011 km²	19 760 kg

NET TRADE



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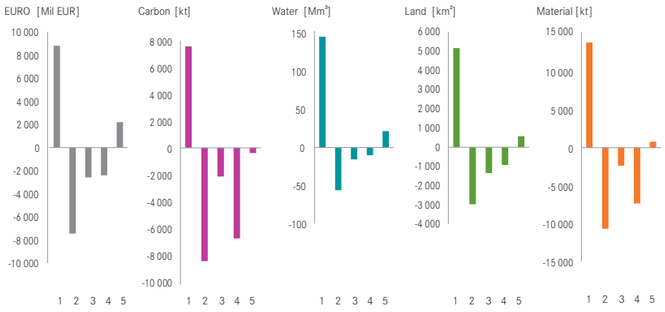


1 Plastics, basic
2 Motor vehicles, trailers and semi-trailers
3 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
4 Machinery and equipment n.e.c.
5 Basic iron and steel and of ferro-alloys and first products thereof

RANKING

World average per capita

Carbon
20 Japan
21 Czech Republic
22 Italy

Water
35 Hungary
36 Czech Republic
37 China

Land
35 Slovakia
36 Czech Republic
37 Romania

Material
24 France
25 Czech Republic
26 South Korea

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.122 kt/Mil €	0.015 Mm³/Mil €	0.920 km²/Mil €	1.606 kt/Mil €		
Per capita footprints relative to world average	2.41	0.73	0.85	2.00		
Contribution to global total	0.38 %	0.11 %	0.13 %	0.31 %	0.31 %	0.16 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Denmark

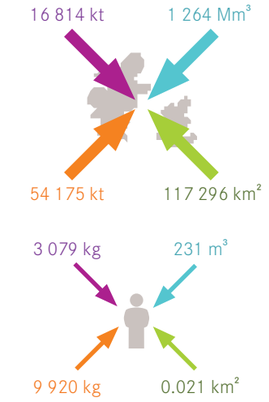
Population: 5 461 438 | Land area: 43 090 km² | GDP: 227 229 Mil. €

Denmark, one of the most prosperous and developed countries in the EU has an open and trade-dependent economy. The country is strong in high-tech manufacturing – biotechnology, pharmaceuticals and renewable energy. Denmark ranks high on carbon and material footprints, with the land and water footprint being slightly closer to the world per capita average. It imports a lot of raw materials for its high-tech manufacturing sectors, which explains its net import footprint figures.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	103 951 kt	2 909 Mm³	149 196 km²	184 298 kt
per capita	19 034 kg	533 m³	0.027 km²	33 745 kg

NET TRADE



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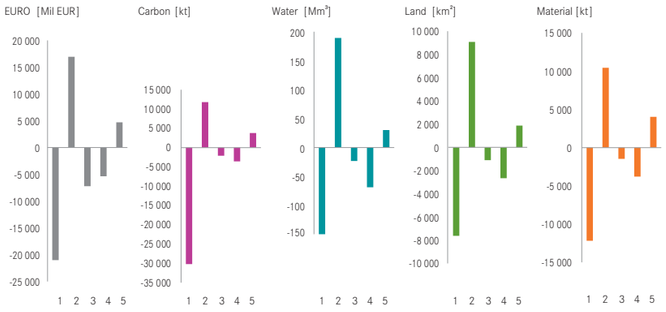

1 Sea and coastal water transportation services
2 Supporting and auxiliary transport services; travel agency services
3 Wholesale trade and commission trade services, except of motor vehicles and motorcycles"
4 Plastics, basic
5 Motor vehicles, trailers and semi-trailers

RANKING

World average per capita

Carbon
6 Finland
7 Denmark
8 Greece

Water
7 Portugal
8 Denmark
9 Netherlands

Land
13 Switzerland
14 Denmark
15 Ireland

Material
4 Finland
5 Denmark
6 Norway

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.457 kt/Mil €	0.013 Mm³/Mil €	0.657 km²/Mil €	0.811 kt/Mil €		
Per capita footprints relative to world average	3.33	2.13	2.06	3.41		
Contribution to global total	0.27 %	0.18 %	0.17 %	0.28 %	0.56 %	0.08 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Estonia

Population: 1 341 672 | Land area: 45 230 km² | GDP: 15 804 Mil. €

Estonia joined the EU in 2004. The Estonian economy is characterized by one of the highest levels of GDP per capita in Eastern and Central Europe. The country has strong trade relations with neighbouring countries – Finland, Germany, Russia and Sweden. Estonia ranks relatively high in terms of carbon, land and material footprint, but falls well below the world average with regard to water footprint.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	21 397 kt	239 Mm³	40 025 km²	38 145 kt
per capita	15 948 kg	178 m³	0.030 km²	28 431 kg

NET TRADE

TRADE FLOWS BY PRODUCT

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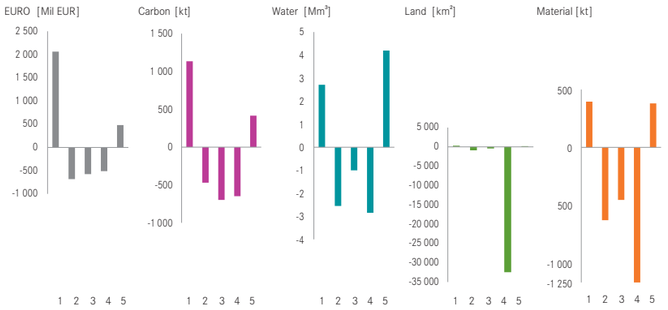


1 Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts and accessoiries
2 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
3 Supporting and auxiliary transport services; travel agency services
4 Wood and products of wood and cork (except furniture); articles of straw and plaiting materials
5 Machinery and equipment n.e.c.

RANKING

World average per capita

Carbon
14 Germany
15 Estonia
16 Switzerland

Water
38 Latvia
39 Estonia
40 RoW ME

Land
11 Brazil
12 Estonia
13 Switzerland

Material
13 Canada
14 Estonia
15 Netherlands

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.354 kt/Mil €	0.015 Mm³/Mil €	2.533 km²/Mil €	2.414 kt/Mil €		
Per capita footprints relative to world average	2.79	0.71	2.25	2.88		
Contribution to global total	0.06 %	0.01 %	0.05 %	0.06 %	0.04 %	0.02 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Finland

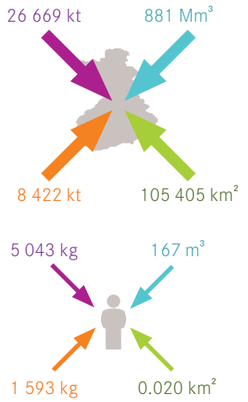
Population: 5 288 720 | Land area: 338 440 km² | GDP: 179 589 Mil. €

Finland is a highly industrialized country. Due to its geographical position, the Finnish economy is heavily dependent on its forestry sector. Finland's industrial sector is highly competitive in the international market, notably in wood processing, engineering and electronics. Its economy is, therefore, driven by export of these commodities. The country's dependence on import of raw materials and energy is reflected in the inward direction of the net trade of its environmental footprint. As in the case of most developed countries, Finland ranks quite high in terms of its carbon, land and material footprint.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	111 344 kt	1 726 Mm³	340 110 km²	213 314 kt
per capita	21 053 kg	326 m³	0.064 km²	40 334 kg

NET TRADE



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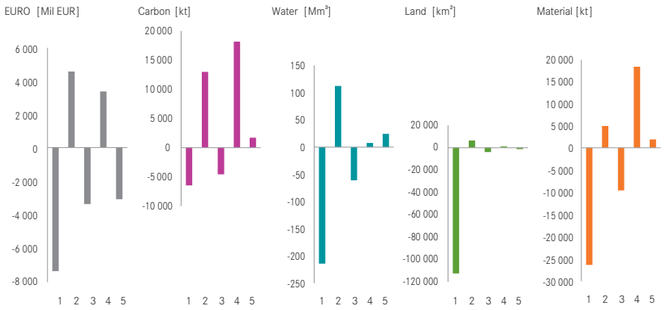


1 Paper and paper products
2 Chemicals nec
3 Plastics, basic
4 Crude petroleum and services related to crude oil extraction, excluding surveying
5 Radio, television and communication equipment and apparatus

RANKING

World average per capita

Carbon
5 Ireland
6 Finland
7 Denmark

Water
19 Romania
20 Finland
21 Russia

Land
3 Russia
4 Finland
5 Luxembourg

Material
3 Luxembourg
4 Finland
5 Denmark

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.620 kt/Mil €	0.010 Mm³/Mil €	1.894 km²/Mil €	1.188 kt/Mil €		
Per capita footprints relative to world average	3.68	1.30	4.85	4.08		
Contribution to global total	0.29 %	0.10 %	0.39 %	0.33 %	0.44 %	0.08 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

France

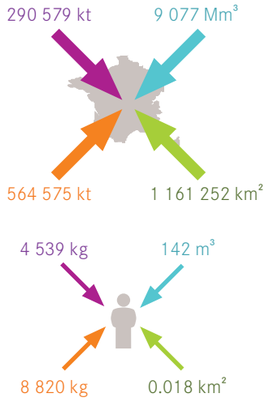
Population: 64 012 572 | Land area: 549 190 km² | GDP: 1 884 268 Mil. €

France is the second largest economy in the EU. The economy is highly developed and diversified. France ranks high in terms of carbon, land and material footprint, with the size of its footprints per capita approximately twice as high as the world average. The size of water footprint per capita is slightly higher than the world average. France is a net importer of all four types of environmental impacts.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	759 312 kt	23 693 Mm³	1 601 331 km²	1 354 688 kt
per capita	11 862 kg	370 m³	0.025 km²	21 163 kg

NET TRADE



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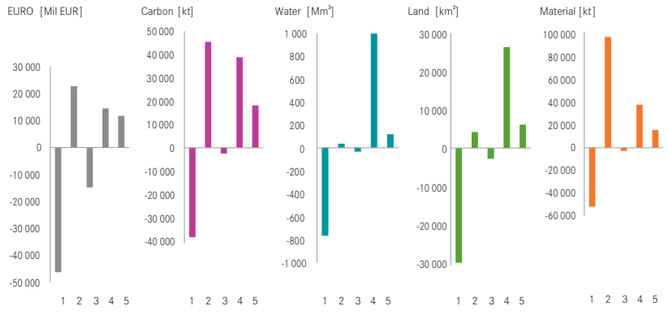


1 Plastics, basic
2 Crude petroleum and services related to crude oil extraction, excluding surveying
3 Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods
4 Chemicals nec
5 Motor vehicles, trailers and semi-trailers

RANKING

World average per capita

Carbon	Water	Land	Material
26 Malta	17 Switzerland	16 Belgium	23 Portugal
27 France	18 France	17 France	24 France
28 Russia	19 Romania	18 Germany	25 Czech Republic

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.403 kt/Mil €	0.013 Mm³/Mil €	0.850 km²/Mil €	0.719 kt/Mil €		
Per capita footprints relative to world average	2.07	1.48	1.89	2.14		
Contribution to global total	2.00 %	1.43 %	1.82 %	2.06 %	4.62 %	0.96 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Germany

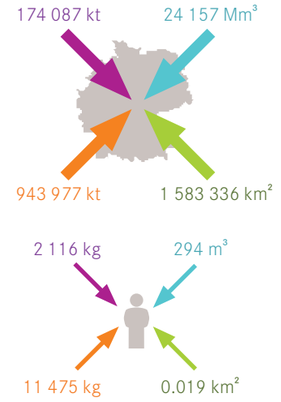
Population: 82 266 372 | Land area: 357 120 km² | GDP: 2 425 252 Mil. €

The German economy is the largest in Europe and the fifth largest in the world. Germany is highly competitive in high-end manufacturing and exports its products all over the world. Like most of the other high income countries, Germany ranks relatively high on all the environmental footprints, with carbon and material footprints per capita being more than two times the world average. Germany imports most of its water and land footprint, which is consistent with its low level of domestic agricultural activity.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	1 340 194 kt	30 810 Mm³	1 857 116 km²	2 044 128 kt
per capita	16 291 kg	375 m³	0.023 km²	24 848 kg

NET TRADE



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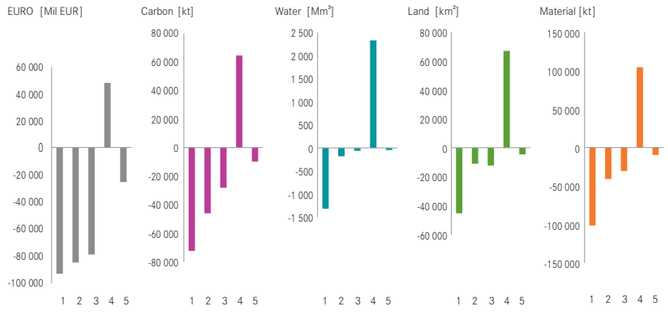


1 Plastics, basic
2 Motor vehicles, trailers and semi-trailers
3 Machinery and equipment n.e.c.
4 Chemicals nec
5 Wholesale trade and commission trade services, except of motor vehicles and motorcycles

RANKING

World average per capita

Carbon	Water	Land	Material
13 Belgium	15 United Kingdom	17 France	16 Spain
14 Germany	16 Germany	18 Germany	17 Germany
15 Estonia	17 Switzerland	19 United Kingdom	18 Cyprus

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.553 kt/Mil €	0.013 Mm³/Mil €	0.766 km²/Mil €	0.843 kt/Mil €		
Per capita footprints relative to world average	2.85	1.50	1.70	2.51		
Contribution to global total	3.53 %	1.86 %	2.11 %	3.11 %	5.95 %	1.24 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Greece

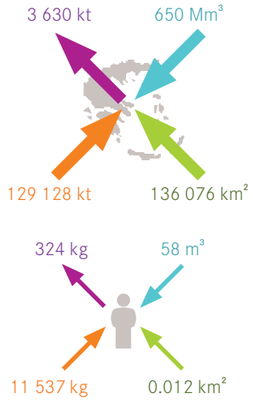
Population: 11 192 763 | Land area: 131 960 km² | GDP: 222 473 Mil. €

Greece has one of the highest per capita incomes among the countries in the Balkan region. Its economy is dependent upon tourism, trade and shipping. Greece imports a considerable amount of its total land and material footprint. Although the country is also a net importer of water footprint, the major part of the footprint is due to domestic production.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	209 372 kt	7 253 Mm³	218 992 km²	330 799 kt
per capita	18 706 kg	648 m³	0.020 km²	29 555 kg

NET TRADE



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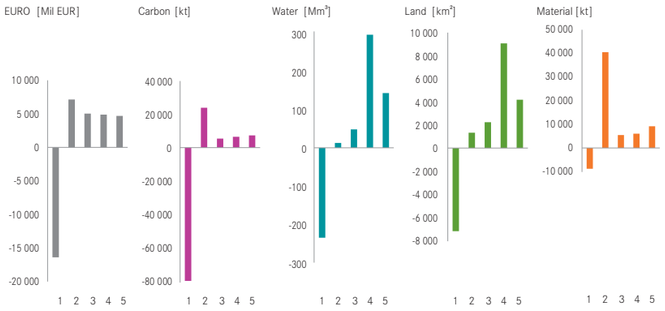


1 Sea and coastal water transportation services
2 Crude petroleum and services related to crude oil extraction, excluding surveying
3 Machinery and equipment n.e.c.
4 Supporting and auxiliary transport services; travel agency services
5 Chemicals nec

Carbon

World average per capita

Emission

7 Denmark
8 Greece
9 Norway

Water

3 United States
4 Greece
5 Malta

Land

25 RoW LAM
26 Greece
27 Mexico

Material

10 Belgium
11 Greece
12 United States

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.941kt/Mil €	0.033 Mm³/Mil €	0.984 km²/Mil €	1.487 kt/Mil €		
Per capita footprints relative to world average	3.27	2.59	1.48	2.99		
Contribution to global total	0.55 %	0.44 %	0.25 %	0.50 %	0.55 %	0.17 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Hungary

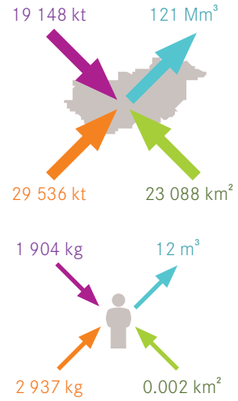
Population: 10 055 780 | Land area: 93 030 km² | GDP: 99 308 Mil. €

Hungary, with its per capita income at about two thirds of the EU average, is rated as an upper middle income country by the OECD. It ranks relatively low in terms of carbon, water, land and material footprint, compared to both the world per capita average and to the other European countries. Agriculture and food processing are important industries for export, which explains its net export of the water consumption footprint.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	90 266 kt	2 162 Mm³	99 574 km²	136 787 kt
per capita	8 976 kg	215 m³	0.010 km²	13 603 kg

NET TRADE



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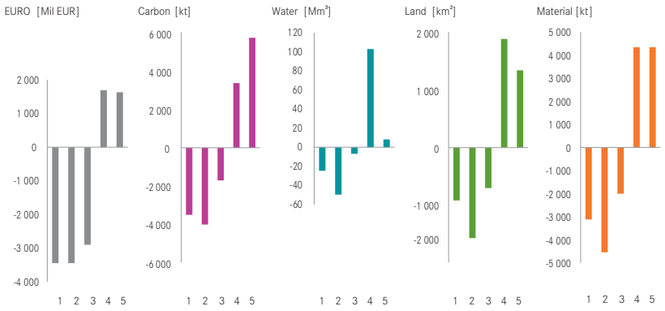


1 Motor vehicles, trailers and semi-trailers
2 Plastics, basic
3 Radio, television and communication equipment and apparatus
4 Chemicals nec
5 Other Bituminous Coal

RANKING

World average per capita

Carbon

33 Latvia
34 Hungary
35 Bulgaria

Water

34 RoW EU
35 Hungary
36 Czech Republic

Land

39 RoW ME
40 Hungary
41 Bulgaria

Material

34 Taiwan
35 Hungary
36 Russia

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.909 kt/Mil €	0.022 Mm³/Mil €	1.002 km²/Mil €	1.377 kt/Mil €		
Per capita footprints relative to world average	1.57	0.86	0.75	1.38		
Contribution to global total	0.24 %	0.13 %	0.11 %	0.21 %	0.24 %	0.15 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

India

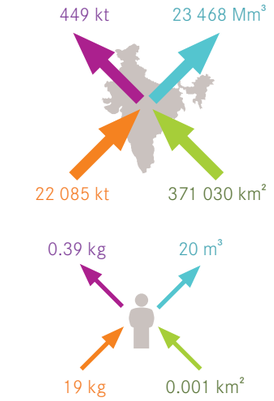
Population: 1 159 095 250 | Land area: 3 287 260 km² | GDP: 906 550 Mil. €

India has a very low per capita carbon, land and material footprint– among the lowest for the countries in the database. The relatively high water footprint deviates from this picture, reflecting the need to use ground and surface water for agricultural purposes (i.e. irrigation) instead of being able to apply rain-fed agriculture . In this context, the export of water embodied in trade is somewhat surprising, although it encompasses only a small fraction of India's water footprint. Further, India is a net exporter of carbon embodied in trade and a net importer of materials and land embodied in trade.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	1 676 458 kt	344 898 Mm³	2 588 380 km²	4 300 979 kt
per capita	1 446 kg	298 m³	0.002 km²	3 711 kg

NET TRADE



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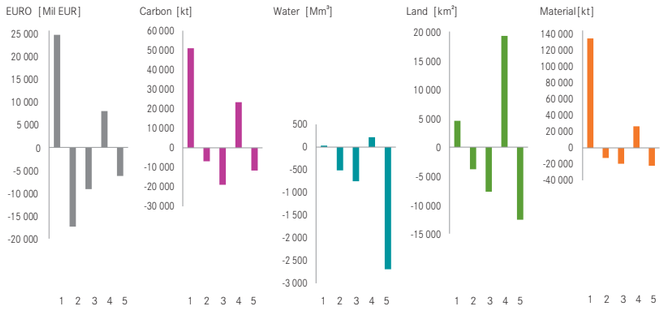


1 Crude petroleum and services related to crude oil extraction, excluding surveying
2 Computer and related services
3 Wearing apparel; furs
4 Furniture; other manufactured goods n.e.c.
5 Chemicals nec

RANKING

World average per capita

Carbon
46 Indonesia
47 India
48 RoW AFR

Water
25 Ireland
26 India
27 South Korea

Land
47 RoW APAC
48 India

Material
45 Indonesia
46 India
47 RoW APAC

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.849 kt/Mil €	0.380 Mm³/Mil €	2.855 km²/Mil €	4.744 kt/Mil €		
Per capita footprints relative to world average	0.25	1.19	0.17	0.38		
Contribution to global total	4.41 %	20.77 %	2.94 %	6.55 %	2.22 %	17.46 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Indonesia

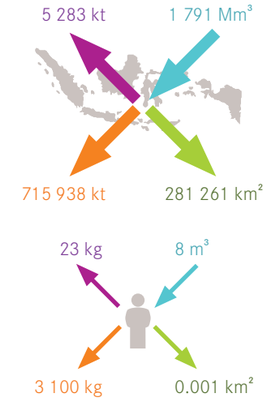
Population: 230 972 808 | Land area: 1 904 570 km² | GDP: 315 372 Mil. €

Indonesia exhibits the typical pattern of rather densely populated developing countries. All its environmental footprints are significantly lower than the world average (such as a carbon footprint of just 1.9 tonne CO_2-eq per capita). Indonesia is a net exporter of carbon, materials and land embodied in trade. The amount of materials embodied in exports is particularly significant as compared to the material footprint of Indonesian consumption.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	436 769 kt	20 420 Mm³	1 058 415 km²	951 810 kt
per capita	1 891 kg	88 m³	0.005 km²	4 121 kg

NET TRADE



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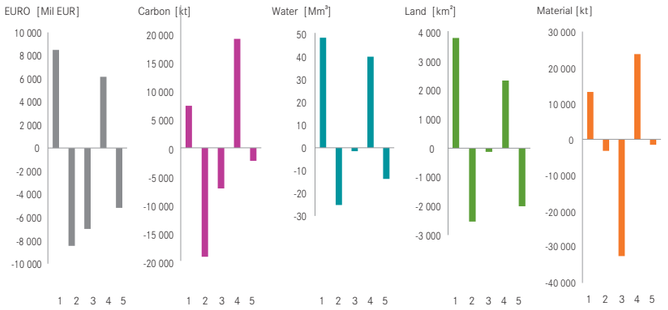


1 Plastics, basic
2 Other Bituminous Coal
3 Natural gas and services related to natural gas extraction, excluding surveying
4 Gas/Diesel Oil
5 Wholesale trade and commission trade services, except of motor vehicles and motorcycles

RANKING

World average per capita

Carbon
45 RoW APAC
46 Indonesia
47 India

Blue Water
47 Cyprus
48 Indonesia

Land
45 Cyprus
46 Indonesia
47 RoW APAC

Material
44 South Africa
45 Indonesia
46 India

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.385 kt/Mil €	0.065 Mm³/Mil €	3.356 km²/Mil €	3.018 kt/Mil €		
Per capita footprints relative to world average	0.33	0.35	0.35	0.42		
Contribution to global total	1.15 %	1.23 %	1.20 %	1.45 %	0.77 %	3.48 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³	0.013 km²	9 886 kg		

Ireland

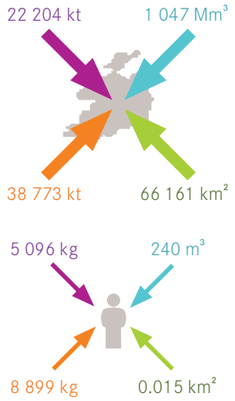
Population: 4 356 931 | Land area: 70 280 km² | GDP: 189 679 Mil. €

Ireland is a small, highly-developed country with a strong dependence on its trade relationships with the United Kingdom and other European countries. Ireland's land footprint per capita is approximately twice as high as the world average, but lower than that of most highly developed countries. Ireland is a net importer of carbon, land and material footprint. Around 80 % of the total water footprint is due to imported products.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	92 266 kt	1 326 Mm³	115 984 km²	256 819 kt
per capita	21 177 kg	304 m³	0.027 km²	58 945 kg

NET TRADE



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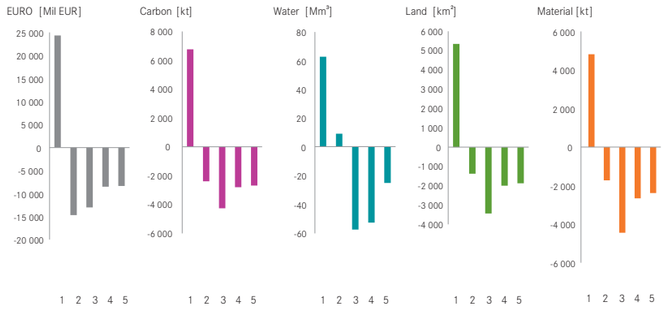


1 Other business services
2 Chemicals nec
3 Printed matter and recorded media
4 Plastics, basic
5 Computer and related services

RANKING

World average per capita

Carbon		Water		Land		Material	
4	Canada	24	Austria	14	Denmark	1	Ireland
5	Ireland	25	Ireland	15	Ireland	2	Australia
6	Finland	26	India	16	Belgium		

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.486 kt/Mil €	0.007 Mm³/Mil €	0.611 km²/Mil €	1.354 kt/Mil €		
Per capita footprints relative to world average	3.70	1.22	2.01	5.96		
Contribution to global total	0.24 %	0.08 %	0.13 %	0.39 %	0.47 %	0.07 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Italy

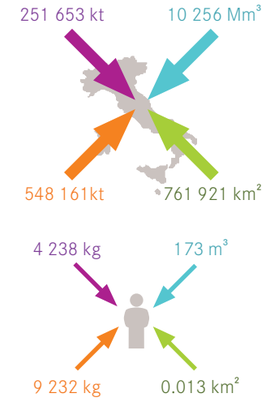
Population: 59 375 289 | Land area: 301 340 km² | GDP: 1 522 120 Mil. €

Italy belongs to the group of the five largest economies of the EU. A division into a developed, industrial north and a less developed, subsidised, agricultural south characterizes the Italian economy. As in the case of most EU countries, Italy is a net importer of embodied GHG, water, land and material. The economy depends heavily on imports of crude petroleum, which is one of the main sources of GHG embodied in trade. Compared to its carbon, land and material footprint, Italy exhibits a high water footprint, partly due to the necessity of irrigation in the south.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	793 113 kt	24 179 Mm³	1 012 161 km²	1 147 948 kt
per capita	13 358 kg	407 m³	0.017 km²	19 334 kg

NET TRADE



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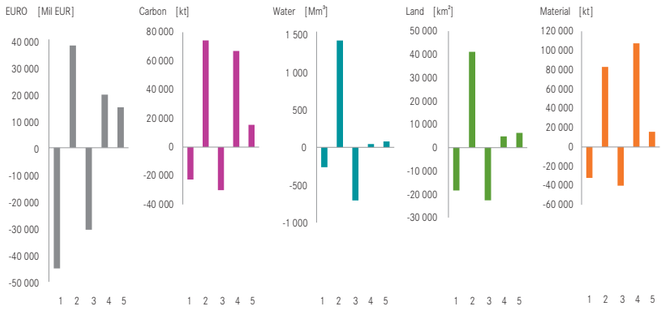


1 Machinery and equipment n.e.c.
2 Chemicals nec
3 Plastics, basic
4 Crude petroleum and services related to crude oil extraction, excluding surveying
5 Motor vehicles, trailers and semi-trailers

RANKING

World average per capita

Carbon		Water		Land		Material	
21	Czech Republic	13	Norway	28	Japan	26	South Korea
22	Italy	14	Italy	29	Italy	27	Italy
23	Cyprus	15	United Kingdom	30	Lithuania	28	Malta

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.511 kt/Mil €	0.016 Mm³/Mil €	0.652 km²/Mil €	0.740 kt/Mil €		
Per capita footprints relative to world average	2.34	1.63	1.29	1.96		
Contribution to global total	2.09 %	1.46 %	1.15 %	1.75 %	3.81 %	0.89 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Japan

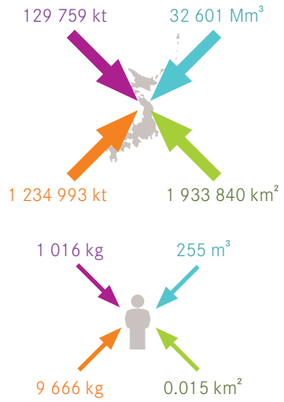
Population: 127 770 750 | Land area: 377 920 km² | GDP: 3 194 414 Mil. €

Japan's material and land footprint is slightly above the world average, while its carbon footprint is several times above the world average. The water footprint of Japan is slightly above the world average. Like all developed countries without a major mining industry, Japan has a net import of carbon, water, land and materials embodied in trade. Japan's net embodied imports make a major contribution to the footprint of Japanese consumption, particularly in the case of water, land and materials (80 % or more).

FOOTPRINTS

	Carbon	Water	Land	Material
per country	1 799 009 kt	36 398 Mm³	2 226 382 km²	1 921 761 kt
per capita	14 080 kg	285 m³	0.017 km²	15 041 kg

NET TRADE



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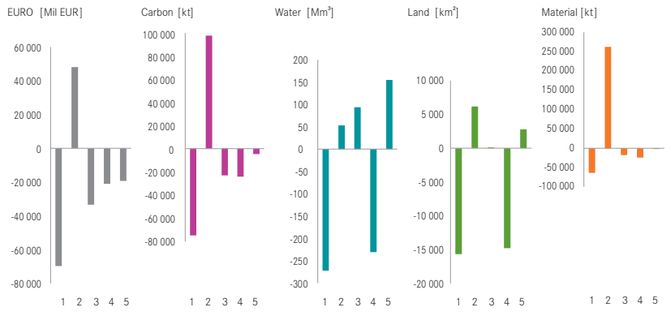


1 Motor vehicles, trailers and semi-trailers
2 Crude petroleum and services related to crude oil extraction, excluding surveying
3 Machinery and equipment n.e.c.
4 Chemicals nec
5 Radio, television and communication equipment and apparatus

RANKING

World average per capita

Carbon	Water	Land	Material
19 Sweden	27 South Korea	27 Mexico	31 Lithuania
20 Japan	28 Japan	28 Japan	32 Japan
21 Czech Republic	29 Slovenia	29 Italy	33 Poland

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.563 kt/Mil €	0.011 Mm³/Mil €	0.697 km²/Mil €	0.602 kt/Mil €		
Per capita footprints relative to world average	2.46	1.14	1.31	1.52		
Contribution to global total	4.74 %	2.19 %	2.53 %	2.93 %	7.84 %	1.92 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Latvia

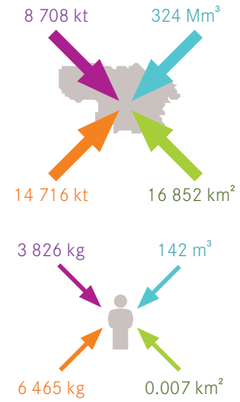
Population: 2 276 100 | Land area: 64 590 km² | GDP: 20 989 Mil. €

Before the global financial crisis in 2008, Latvia was one of the fastest growing economies in the EU. As with many other East European countries, Latvia's GDP comes at the cost of high levels of GHG emissions. The forestry and wood processing industry is one of the mainstays of Latvia's economy. The dependence of the economy on timber is reflected in a high land footprint per capita as well as per GDP. At the same time, the humid climate in the Baltic region makes its lower water footprint per capita possible.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	21 165 kt	413 Mm³	71 281 km²	48 363 kt
per capita	9 299 kg	181 m³	0.031 km²	21 248 kg

NET TRADE



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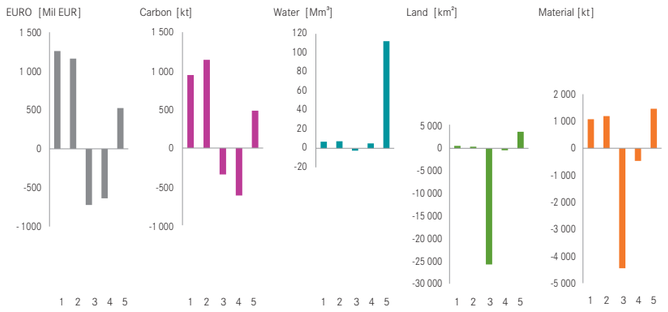


1 Motor vehicles, trailers and semi-trailers
2 Machinery and equipment n.e.c.
3 Wood and products of wood and cork (except furniture); articles of straw and plaiting materials
4 Other land transportation services
5 Food products nec

RANKING

World average per capita

Carbon	Water	Land	Material
32 Lithuania	37 China	8 United States	21 Sweden
33 Latvia	38 Latvia	9 Latvia	22 Latvia
34 Hungary	39 Estonia	10 Netherlands	23 Portugal

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.008 kt/Mil €	0.020 Mm³/Mil €	3.396 km²/Mil €	2.304 kt/Mil €		
Per capita footprints relative to world average	1.63	0.73	2.36	2.15		
Contribution to global total	0.06 %	0.02 %	0.08 %	0.07 %	0.05 %	0.03 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Lithuania

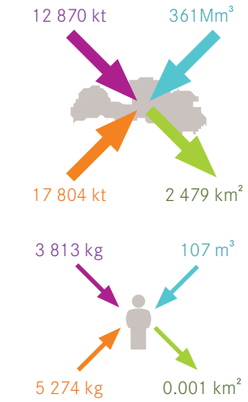
Population: 3 375 618 | Land area: 65 300 km² | GDP: 28 533 Mil. €

Lithuania joined the EU in 2004 and has strong trade connections with Russia. Lithuania is a net exporter of land embodied in products and the water footprint per capita is one of the lowest in the EU. However, Lithuania can be classified as one of the economies with the lowest environmental efficiency when looking at the carbon footprint per GDP. A high dependence on fossil fuels for electricity production and a well-established manufacturing sector contributes to its high emissions levels.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	32 546 kt	541 Mm^3	55 552 km^2	54 063 kt
per capita	9 642 kg	160 m^3	0.017 km^2	16 016 kg

NET TRADE



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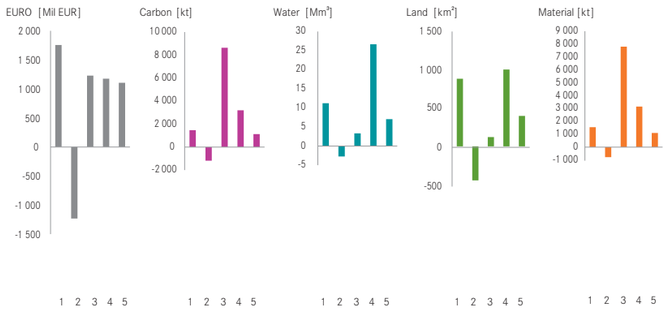

1 Motor vehicles, trailers and semi-trailers
2 Other land transportation services
3 Crude petroleum and services related to crude oil extraction, excluding surveying
4 Chemicals nec
5 Machinery and equipment n.e.c.

RANKING

World average per capita

Carbon
31 Portugal
32 Lithuania
33 Latvia

Water
41 Brazil
42 Lithuania
43 RoW AFR

Land
29 Italy
30 Lithuania
31 Malta

Material
30 Bulgaria
31 Lithuania
32 Japan

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.141 kt/Mil €	0.019 Mm^3/Mil €	1.947 km^2/Mil €	1.895 kt/Mil €		
Per capita footprints relative to world average	1.69	0.64	1.24	1.62		
Contribution to global total	0.09 %	0.03 %	0.06 %	0.08 %	0.07 %	0.05 %
World total	37.97 Gt	1 660 560 Mm^3	88 031 435 km^2	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m^3/cap	0.013 km^2/cap	9 886 kg/cap		

Luxembourg

Population: 479 993 | Land area: 2 590 km^2 | GDP: 37 440 Mil. €

Luxembourg enjoys one of the highest standards of living globally. As in most high income countries, however, Luxembourg has limited success in decoupling its high income level from its environmental impact: the carbon, water, land and material footprints of Luxembourg are among the highest in the world. The economy is driven by a diversified industrial and a large financial sector. Accordingly, most embodied impacts in trade flows are linked to these sectors. In terms of the footprint per GDP, Luxembourg emerges as one of the most environmentally efficient economies at the global level.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	12 840 kt	334 Mm^3	21 304 km^2	21 498 kt
per capita	26 751 kg	697 m^3	0.044 km^2	44 788 kg

NET TRADE

TRADE FLOWS BY PRODUCT

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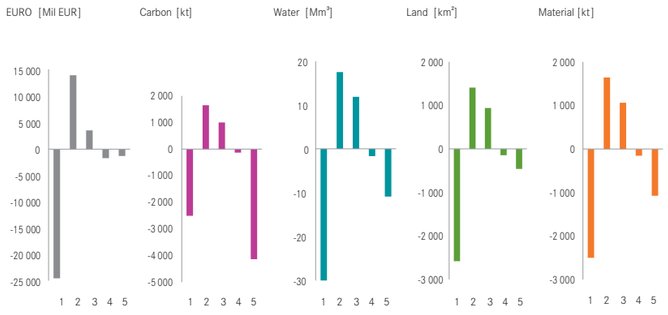


1 Financial intermediation services, except insurance and pension funding services
2 Services auxiliary to financial intermediation
3 Other business services
4 Insurance and pension funding services, except compulsory social security services
5 Air transport services

RANKING

World average per capita

Carbon
1 Australia
2 Luxembourg
3 United States

Water
1 Australia
2 Luxembourg
3 United States

Land
4 Finland
5 Luxembourg
6 Norway

Material
2 Australia
3 Luxembourg
4 Finland

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.343 kt/Mil €	0.009 Mm^3/Mil €	0.569 km^2/Mil €	0.574 kt/Mil €		
Per capita footprints relative to world average	4.68	2.78	3.35	4.53		
Contribution to global total	0.03 %	0.02 %	0.02 %	0.03 %	0.09 %	0.01 %
World total	37.97 Gt	1 660 560 Mm^3	88 031 435 km^2	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m^3/cap	0.013 km^2/cap	9 886 kg/cap		

Malta

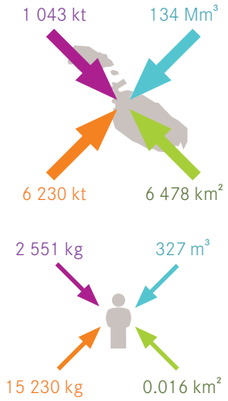
Population: 409 050 | Land area: 320 km² | GDP: 5 498 Mil. €

Malta is one of the most densely populated countries in the world and also the smallest economy in the EU. Due to its geographic constraints, Malta has very limited freshwater resources and produces less than a quarter of its food needs. Accordingly, more than half of its total water needs and almost all required land is embodied in imports. Malta also exhibits an exceptionally high water footprint per capita. Despite its large business and financial sector, Malta requires a large amount of GHG emissions to obtain its GDP.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	4 989 kt	249 Mm^3	6 567 km^2	7 875 kt
per capita	12 195 kg	610 m^3	0.016 km^2	19 251 kg

NET TRADE



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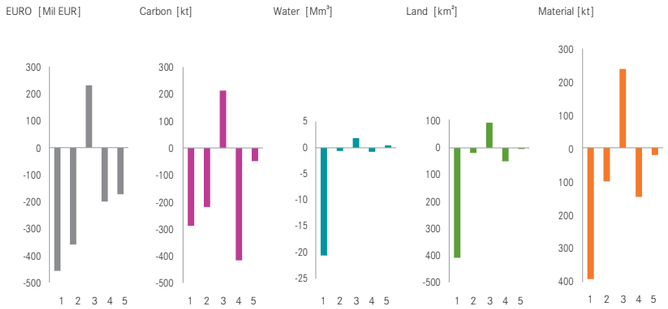


1 Hotel and restaurant services
2 Radio, television and communication equipment and apparatus
3 Machinery and equipment n.e.c.
4 Air transport services
5 Recreational, cultural and sporting services

RANKING

World average per capita

Carbon	Water	Land	Material
25 Taiwan	4 Greece	30 Lithuania	27 Italy
26 Malta	5 Malta	31 Malta	28 Malta
27 France	6 Spain	32 RoW AFR	29 Slovakia

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.907 kt/Mil €	0.045 Mm^3/Mil €	1.194 km^2/Mil €	1.432 kt/Mil €		
Per capita footprints relative to world average	2.13	2.44	1.21	1.95		
Contribution to global total	0.01 %	0.02 %	0.01 %	0.01 %	0.01 %	0.01 %
World total	37.97 Gt	1 660 560 Mm^3	88 031 435 km^2	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m^3/cap	0.013 km^2/cap	9 886 kg/cap		

Mexico

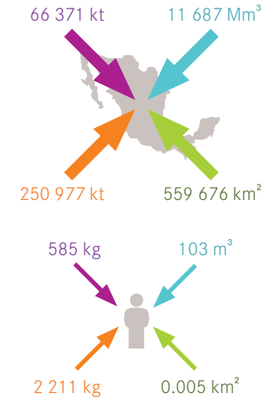
Population: 113 529 819 | Land area: 1 964 380 km^2 | GDP: 755 877 Mil. €

Mexico's carbon, water, and material footprints are about the world average, while its land footprint is of the same order of magnitude as that of Greece or Japan. Mexico has a net import of carbon, water, land and materials embodied in trade. About 20 to 25 % of its water, material and land footprint and a little over 10 % of its carbon footprint is imported.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	612 836 kt	35 334 Mm^3	2 162 382 km^2	1 308 684 kt
per capita	5 398 kg	311 m^3	0.019 km^2	11 527 kg

NET TRADE



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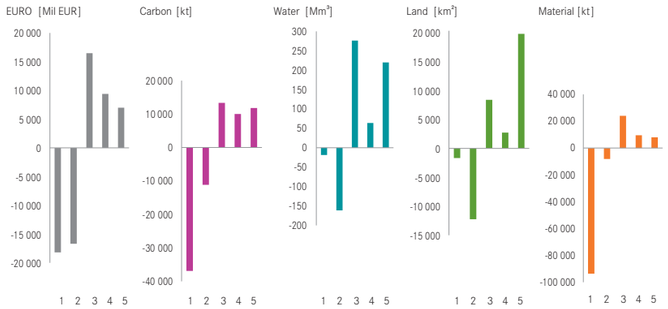


1 Crude petroleum and services related to crude oil extraction, excluding surveying
2 Motor vehicles, trailers and semi-trailers
3 Plastics, basic
4 Machinery and equipment n.e.c.
5 Rubber and plastic products

RANKING

World average per capita

Carbon	Water	Land	Material
41 China	22 Sweden	26 Greece	38 Turkey
42 Mexico	23 Mexico	27 Mexico	39 Mexico
43 RoW LAM	24 Austria	28 Japan	40 Brazil

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.811 kt/Mil €	0.047 Mm^3/Mil €	2.861 km^2/Mil €	1.731 kt/Mil €		
Per capita footprints relative to world average	0.94	1.24	1.44	1.17		
Contribution to global total	1.61 %	2.13 %	2.46 %	1.99 %	1.86 %	1.71 %
World total	37.97 Gt	1 660 560 Mm^3	88 031 435 km^2	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m^3/cap	0.013 km^2/cap	9 886 kg/cap		

Netherlands

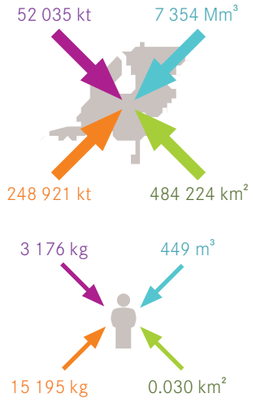
Population: 16 381 696 | Land area: 41 530 km² | GDP: 571 008 Mil. €

The Netherlands are among the world's leading exporting countries. However, in terms of the resources and environmental impact embodied in their products, the Netherlands are a net importer. This coupled with the high standard of living, explains its high environmental footprint per capita. However, the low footprint per GDP highlights the environmental efficiency of the economy. This fact is noteworthy given the high dependence of the economy on crude petroleum and its mainly fossil fuel based energy production.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	274 897 kt	8 605 Mm³	510 065 km²	419 537 kt
per capita	16 781 kg	525 m³	0.031 km²	25 610 kg

NET TRADE



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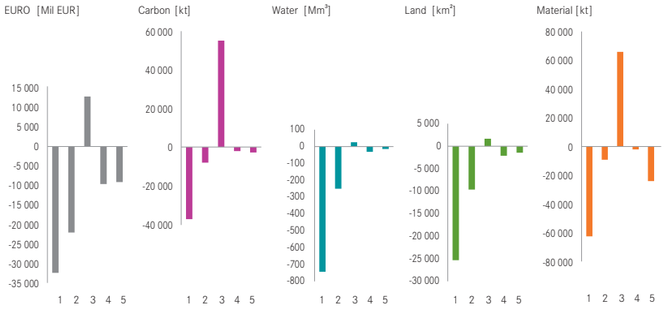


1 Plastics, basic
2 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
3 Crude petroleum and services related to crude oil extraction, excluding surveying
4 Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods
5 Natural gas and services related to natural gas extraction, excluding surveying

RANKING

World average per capita

Carbon
10 Austria
11 Netherlands
12 United Kingdom

Water
8 Denmark
9 Netherlands
10 Canada

Land
9 Latvia
10 Netherlands
11 Brazil

Material
14 Estonia
15 Netherlands
16 Spain

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.481kt/Mil €	0.015 Mm³/Mil €	0,893 km²/Mil €	0,735 kt/Mil €		
Per capita footprints relative to world average	2.93	2.10	2.35	2.59		
Contribution to global total	0.72 %	0.52 %	0.58 %	0.64 %	1.40 %	0.25 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Norway

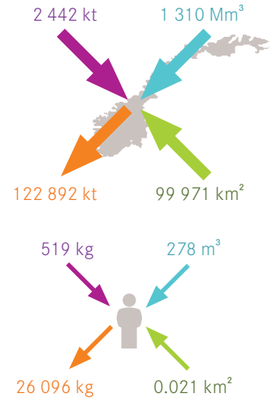
Population: 4 709 153 | Land area: 323 800 km² | GDP: 287 106 Mil. €

Norway is among the top 10 countries of the world in terms of its carbon, land and material footprint, which are typically 3 or more times the world average. The water footprint is a little higher than the world average. Norway is a net importer of carbon, water, and land embodied in trade but a net exporter of materials embodied in trade. Its imports of water embodied in trade are especially relevant, as they are about 65 % of its total water footprint and reflect the import of agricultural products.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	84 061 kt	1 927 Mm³	208 632 km²	150 334 kt
per capita	17 851 kg	409 m³	0.044 km²	31 924 kg

NET TRADE



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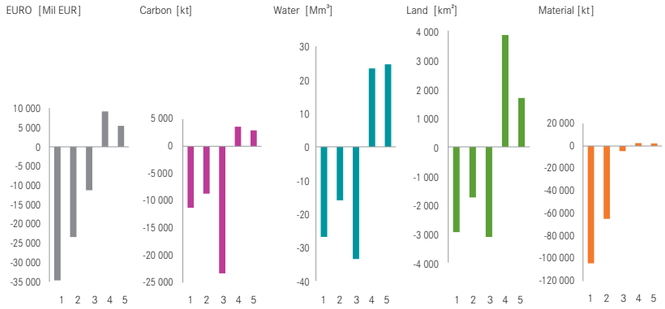


1 Crude petroleum and services related to crude oil extraction, excluding surveying
2 Natural gas and services related to natural gas extraction, excluding surveying
3 Sea and coastal water transportation services
4 Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts and accessoiries
5 Supporting and auxiliary transport services; travel agency services

RANKING

World average per capita

Carbon
8 Greece
9 Norway
10 Austria

Water
12 Belgium
13 Norway
14 Italy

Land
5 Luxembourg
6 Norway
7 Sweden

Material
5 Denmark
6 Norway
7 Austria

KEY INDICATORS

	Cabon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.293 kt/Mil €	0.007 Mm³/Mil €	0.727 km²/Mil €	0.524 kt/Mil €		
Per capita footprints relative to world average	3.12	1.64	3.34	3.23		
Contribution to global total	0.22 %	0.12%	0.24 %	0.23 %	0.70 %	0.07 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³	0.013 km²	9 886 kg		

Poland

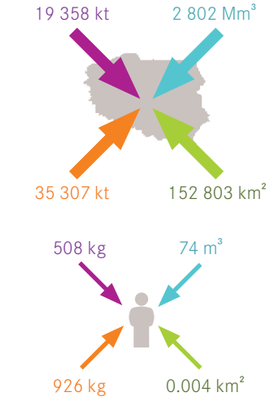
Population: 38 120 560 | Land area: 312 680 km² | GDP: 310 340 Mil. €

The per capita GDP of Poland is lower than the EU average. This is reflected in its relatively low water, land and material footprint per capita. However, Poland has a high carbon footprint per capita, mainly because of its almost completely fossil fuel powered energy production. This also explains the high GHG emissions per GDP. Given the high absolute levels of its GHG emissions, this would also result in a significant reduction in the total emissions in the EU.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	403 180 kt	5 098 Mm³	402 991 km²	549 640 kt
per capita	10 576 kg	134 m³	0.011 km²	14 418 kg

NET TRADE



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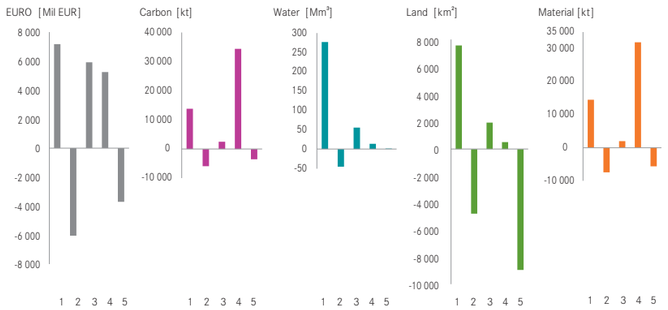


1 Chemicals nec
2 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
3 Machinery and equipment n.e.c.
4 Crude petroleum and services related to crude oil extraction, excluding surveying
5 Furniture; other manufactured goods n.e.c.

RANKING

World average per capita

Carbon
29 Slovakia
30 Poland
31 Portugal

Water
45 South Africa
46 Poland
47 Cyprus

Land
37 Romania
38 Poland
39 RoW ME

Material
32 Japan
33 Poland
34 Taiwan

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.299 kt/Mil €	0.016 Mm³/Mil €	1.299 km²/Mil €	1.771 kt/Mil €		
Per capita footprints relative to world average	1.85	0.53	0.80	1.46		
Contribution to global total	1.06 %	0.31 %	0.46 %	0.84 %	0.76 %	0.57 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Portugal

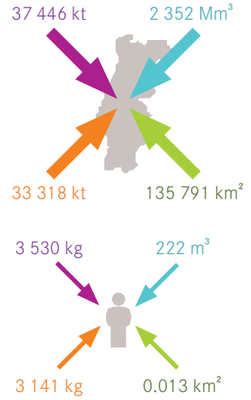
Population: 10 608 335 | Land area: 92 120 km² | GDP: 169 093 Mil. €

Portugal has the lowest GDP per capita in Western Europe. Its relatively low level of affluence results in low carbon, land and material footprint per capita. However, being one of the warmest countries in Europe, with significant irrigation requirements for agriculture, Portugal has a high water footprint per capita. Almost half the demand for electricity in Portugal is met by renewable energy sources. As a consequence, the Portuguese economy is fairly efficient in terms of GHG emissions per GDP.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	106 889 kt	5 677 Mm³	210 346 km²	225 279 kt
per capita	10 076 kg	535 m³	0.020 km²	21 236 kg

NET TRADE



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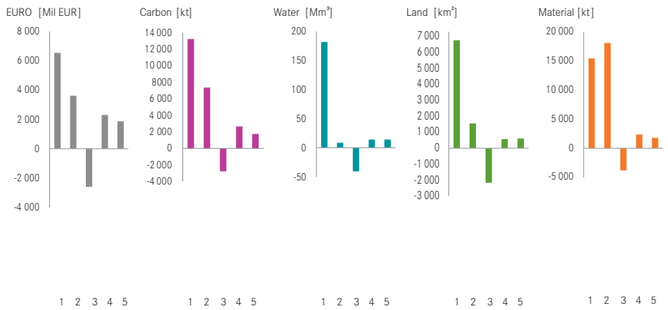


1 Chemicals nec
2 Crude petroleum and services related to crude oil extraction, excluding surveying
3 Plastics, basic
4 Motor vehicles, trailers and semi-trailers
5 Machinery and equipment n.e.c.

RANKING

World average per capita

Carbon
30 Poland
31 Portugal
32 Lithuania

Water
6 Spain
7 Portugal
8 Denmark

Land
23 South Africa
24 Portugal
25 RoW LAM

Material
22 Latvia
23 Portugal
24 France

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.632 kt/Mil €	0.034 Mm³/Mil €	1.244 km²/Mil €	1.332 kt/Mil €		
Per capita footprints relative to world average	1.76	2.14	1.50	2.15		
Contribution to global total	0.28 %	0.34 %	0.24 %	0.34 %	0.42 %	0.16 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Romania

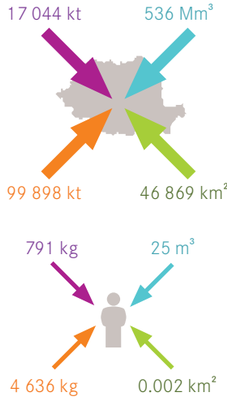
Population: 21 546 873 | Land area: 238 390 km² | GDP: 123 519 Mil. €

Romania joined the EU in 2007. The per capita GDP of Romania is half the EU average. Accordingly, the carbon, water and land footprints of Romania are relatively low and around the global average. However, given the GDP figure, Romania has a high material footprint. Like other East European countries, the Romanian economy requires a huge amount of GHG emissions to generate its GDP. Despite its moderate GDP per capita, Romania is a net importer of carbon, water, land and material embodied in its traded products.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	149 362 kt	7 417 Mm³	238 498 km²	506 986 kt
per capita	6 932 kg	344 m³	0.011 km²	23 529 kg

NET TRADE



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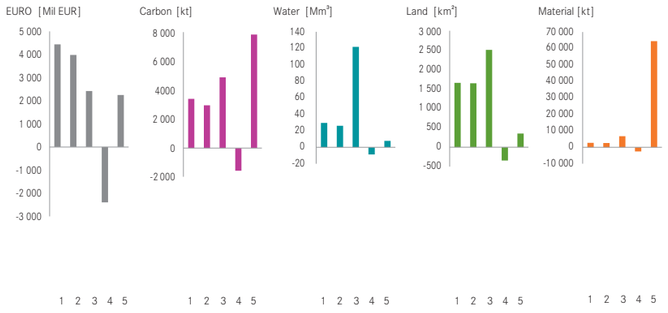


1 Machinery and equipment n.e.c.
2 Motor vehicles, trailers and semi-trailers
3 Chemicals nec
4 Other land transportation services
5 Natural gas and services related to natural gas extraction, excluding surveying

RANKING

World average per capita

Carbon
37 South Africa
38 Romania
39 Turkey

Water
18 France
19 Romania
20 Finland

Land
36 Czech Republic
37 Romania
38 Poland

Material
18 Cyprus
19 Romania
20 United Kingdom

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.209 kt/Mil €	0.060 Mm³/Mil €	1.931 km²/Mil €	4.105 kt/Mil €		
Per capita footprints relative to world average	1.21	1.38	0.83	2.38		
Contribution to global total	0.39 %	0.45 %	0.27 %	0.77 %	0.30 %	0.32 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Russia

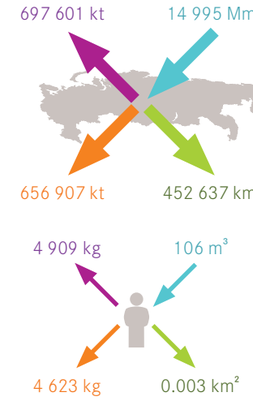
Population: 142 100 000 | Land area: 17 098 240 km² | GDP: 948 344 Mil. €

Russia has a carbon and land footprint that is significantly above the world average. Russia is a net exporter of carbon, materials and land in trade. Particularly in the case of carbon, the territorial emissions are significantly high, as is the carbon footprint of consumption, which is reflected by the high amount of carbon embodied in exports. Russia's GHG emissions per GDP (in Euro) are very high, suggesting an energy-intensive production system.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	1 618 308 kt	45 633 Mm³	9 391 093 km²	1 913 789 kt
per capita	11 389 kg	321 m³	0.066 km²	13 468 kg

NET TRADE



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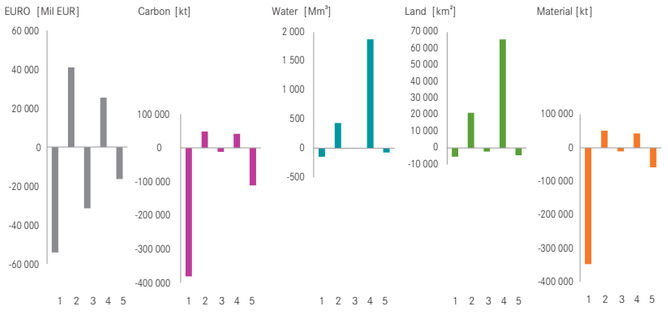


1 Crude petroleum and services related to crude oil extraction, excluding surveying
2 Machinery and equipment n.e.c.
3 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
4 Wearing apparel; furs
5 Basic iron and steel and of ferro-alloys and first products thereof

RANKING

World average per capita

Carbon
27 France
28 Russia
29 Slovakia

Water
20 Finland
21 Russia
22 Sweden

Land
2 Canada
3 Russia
4 Finland

Material
35 Hungary
36 Russia
37 China

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.706 kt/Mil €	0.048 Mm³/Mil €	9.903 km²/Mil €	2.018 kt/Mil €		
Per capita footprints relative to world average	1.99	1.28	4.98	1.36		
Contribution to global total	4.26 %	2.75 %	10.67 %	2.92 %	2.33 %	2.14 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Slovakia

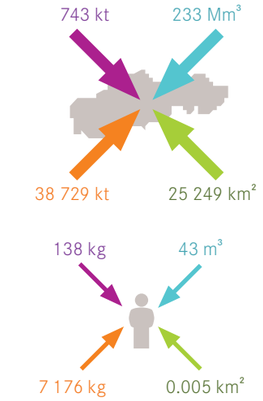
Population: 5 397 318 | Land area: 49 030 km² | GDP: 61 371 Mil. €

As in the case of most other EU countries, Slovakia is a net importer of GHG emissions, water and land use, as well as material embodied in traded products. However, the land and water use footprint of Slovakia are considerably below the global average. With regard to all upstream requirements, carbon emissions embodied in crude petroleum and retail trade services are the main sources of imported GHG emissions. Material extraction embodied in crude petroleum contributes significantly to the total material footprint of Slovakia.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	58 355 kt	1 212 Mm³	63 716 km²	96 308 kt
per capita	10 812 kg	224 m³	0.012 km²	17 844 kg

NET TRADE



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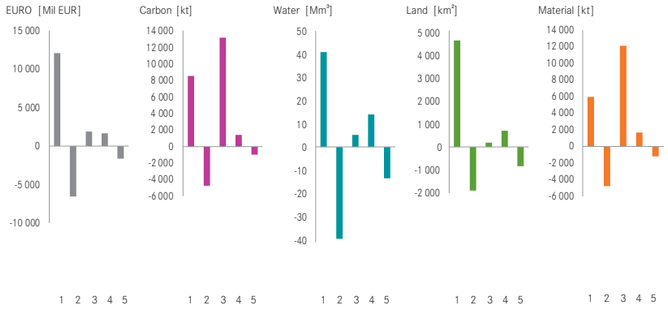


1 Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods
2 Motor vehicles, trailers and semi-trailers
3 Crude petroleum and services related to crude oil extraction, excluding surveying
4 Medical, precision and optical instruments, watches and clocks
5 Wholesale trade and commission trade services, except of motor vehicles and motorcycles

RANKING

World average per capita

Carbon
28 Russia
29 Slovakia
30 Poland

Water
31 Bulgaria
32 Slovakia
33 RoW APAC

Land
34 Turkey
35 Slovakia
36 Czech Republic

Material
28 Malta
29 Slovakia
30 Bulgaria

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.951 kt/Mil €	0.020 Mm³/Mil €	1.038 km²/Mil €	1.569 kt/Mil €		
Per capita footprints relative to world average	1.89	0.90	0.89	1.80		
Contribution to global total	0.15 %	0.07%	0.07 %	0.15 %	0.15 %	0.08 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Slovenia

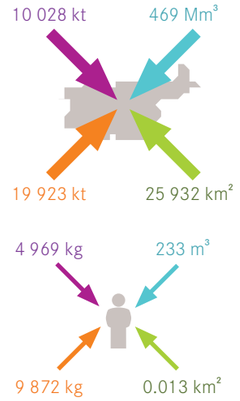
Population: 2 018 122 | Land area: 20 270 km² | GDP: 34 518 Mil. €

Slovenia has the highest GDP per capita among the East European countries within the EU. This relatively high level of affluence is associated with a high carbon footprint per capita. For GHG, water, land and material embodied in traded products, the imports outweigh exports. Compared to other East European countries, the Slovenian economy is reasonably efficient in terms of emissions and resource use per GDP. Slovenia exhibits a relatively low water footprint per capita, which is slightly above the global average.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	30 099 kt	549 Mm³	44 178 km²	61 003 kt
per capita	14 915 kg	272 m³	0.022 km²	30 228 kg

NET TRADE



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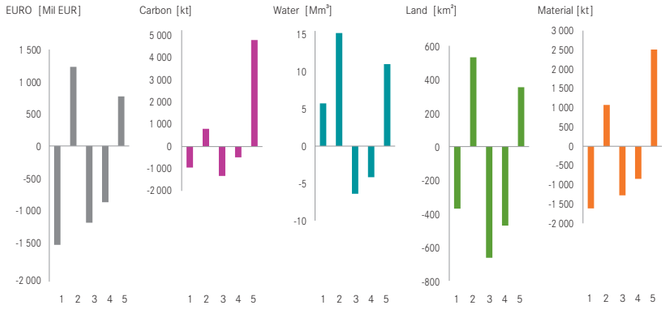


1 Chemicals nec
2 Plastics, basic
3 Motor vehicles, trailers and semi-trailers
4 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
5 Basic iron and steel and of ferro-alloys and first products thereof

RANKING

World average per capita

Carbon
16 Switzerland
17 Slovenia
18 South Korea

Water
28 Japan
29 Slovenia
30 Taiwan

Land
21 Spain
22 Slovenia
23 South Africa

Material
8 Switzerland
9 Slovenia
10 Belgium

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.872 kt/Mil €	0.016 Mm³/Mil €	1.280 km²/Mil €	1.767 kt/Mil €		
Per capita footprints relative to world average	2.61	1.09	1.65	3.06		
Contribution to global total	0.08 %	0.03 %	0.05 %	0.09 %	0.08 %	0.03 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

South Africa

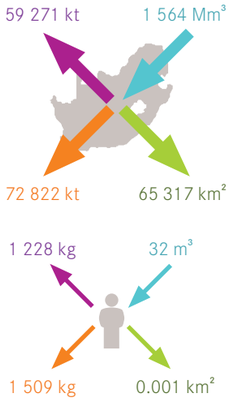
Population: 48 257 282 | Land area: 1 219 090 km² | GDP: 208 806 Mil. €

South Africa exhibits an unusual pattern with a carbon and land footprint above the world average, but a water and material footprint below the world average. South Africa is a net exporter of carbon, water, land and materials embodied in trade, of the order of magnitude of 10 to 20 % of the footprint of its final consumption.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	351 627 kt	7 396 Mm³	1 020 873 km²	357 259 kt
per capita	7 287 kg	153 m³	0.021 km²	7 403 kg

NET TRADE



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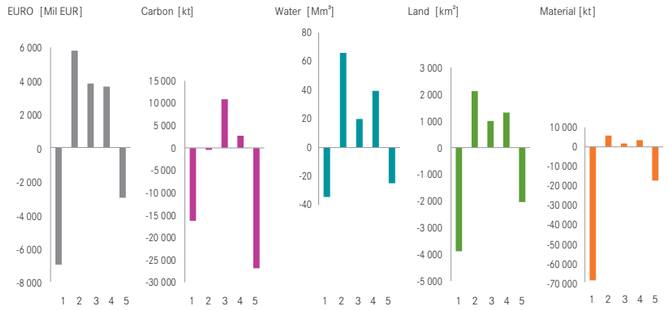


1 Precious metal ores and concentrates
2 Plastics, basic
3 Sea and coastal water transportation services
4 Machinery and equipment n.e.c.
5 Basic iron and steel and of ferro-alloys and first products thereof

RANKING

World average per capita

Carbon	Water	Land	Material
36 RoW EU	44 RoW LAM	22 Slovenia	43 RoW LAM
37 South Africa	45 South Africa	23 South Africa	44 South Africa
38 Romania	46 Poland	24 Portugal	45 Indonesia

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.684 kt/Mil €	0.035 Mm³/Mil €	4.890 km²/Mil €	1.711 kt/Mil €		
Per capita footprints relative to world average	1.27	0.61	1.60	0.75		
Contribution to global total	0.93 %	0.45 %	1.16 %	0.54 %	0.51 %	0.73 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³	0.013 km²	9 886 kg		

South Korea

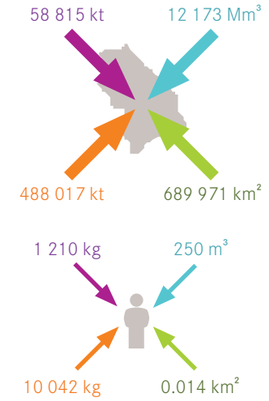
Population: 48 598 000 | Land area: 99 680 km² | GDP: 765 586 Mil. €

The Republic of Korea has a pattern similar to that of Japan – a carbon footprint several times the world average, and the land and water footprints slightly above the world average. The material footprint is twice the world average, as in the case of Japan. Korea is a net importer of carbon, water, land and materials embodied in trade – over 80 % of the footprint in case of water and land, and over 50 % of the material footprint.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	714 225 kt	14 035 Mm³	770 419 km²	959 519 kt
per capita	14 697 kg	289 m³	0.016 km²	19 744 kg

NET TRADE



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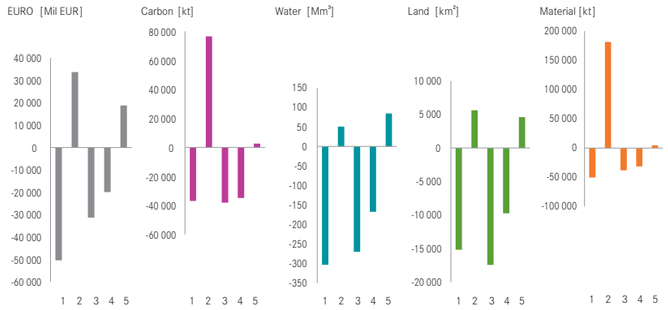


1 Radio, television and communication equipment and apparatus
2 Crude petroleum and services related to crude oil extraction, excluding surveying
3 Motor vehicles, trailers and semi-trailers
4 Other transport equipment
5 Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods

RANKING

World average per capita

Carbon	Water	Land	Material
17 Slovenia	26 India	32 RoW AFR	25 Czech Republic
18 South Korea	27 South Korea	33 South Korea	26 South Korea
19 Sweden	28 Japan	34 Turkey	27 Italy

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.933 kt/Mil €	0.018 Mm³/Mil €	1.006 km²/Mil €	1.253 kt/Mil €		
Per capita footprints relative to world average	2.57	1.15	1.95	2.00		
Contribution to global total	1.88 %	0.85 %	0.88 %	1.46 %	1.88 %	0.73 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Spain

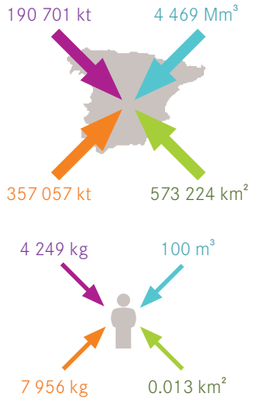
Population: 44 878 945 | Land area: 505 370 km² | GDP: 1 052 128 Mil. €

The Spanish economy is the fifth largest of the EU. In absolut numbers, Spain has relativly high environmental footprints. The country is a net importer of environmental footprints. Due to its dry climate, Spain has one of the highest water footprints per capita. The carbon, land and material footprints of Spain are also higher than the world average.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	576 954 kt	26 632 Mm³	990 766 km²	1 145 691 kt
per capita	12 856 kg	593 m³	0.022 km²	25 528 kg

NET TRADE



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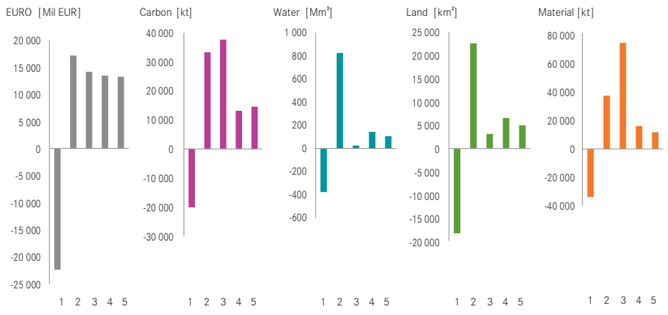


1 Plastics, basic
2 Chemicals nec
3 Crude petroleum and services related to crude oil extraction, excluding surveying
4 Radio, television and communication equipment and apparatus
5 Machinery and equipment n.e.c.

RANKING

World average per capita

Carbon
23 Cyprus
24 Spain
25 Taiwan

Water
5 Malta
6 Spain
7 Portugal

Land
20 Austria
21 Spain
22 Slovenia

Material
15 Netherlands
16 Spain
17 Germany

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.548 kt/Mil €	0.025 Mm³/Mil €	0.942 km²/Mil €	1.089 kt/Mil €		
Per capita footprints relative to world average	2.25	2.37	1.66	2.58		
Contribution to global total	1.52 %	1.60 %	1.13 %	1.75 %	2.58 %	0.68 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Sweden

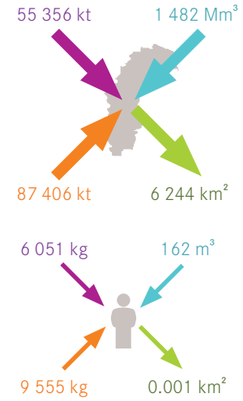
Population: 9 148 092 | Land area: 450 290 km² | GDP: 337 477 Mil. €

Sweden has one of the cleanest and most resource efficient economies within the EU. This is partly due to the fact that most of its electricity is produced from renewable energy sources. However, the economy depends heavily on imports of crude petroleum, which are the main source of GHG embodied in trade. Sweden has a water footprint per capita only slightly above the world average. In contrast, the availability of land results in a high land footprint.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	129 166 kt	2 924 Mm³	304 336 km²	201 800 kt
per capita	14 119 kg	320 m³	0.033 km²	22 059 kg

NET TRADE



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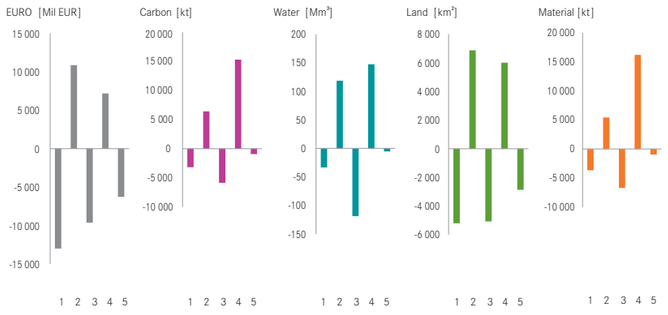


1 Research and development services
2 Other business services
3 Plastics, basic
4 Chemicals nec
5 Machinery and equipment n.e.c.

RANKING

World average per capita

Carbon
18 South Korea
19 Sweden
20 Japan

Water
21 Russia
22 Sweden
23 Mexico

Land
6 Norway
7 Sweden
8 United States

Material
20 United Kingdom
21 Sweden
22 Latvia

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.383 kt/Mil €	0.009 Mm³/Mil €	0.902 km²/Mil €	0.598 kt/Mil €		
Per capita footprints relative to world average	2.47	1.28	2.51	2.23		
Contribution to global total	0.34 %	0.18 %	0.35 %	0.31 %	0.83 %	0.14 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Switzerland

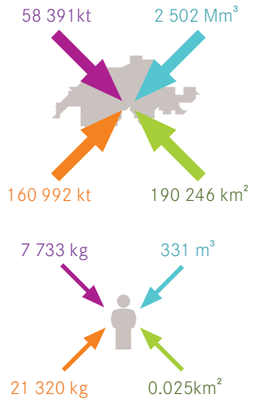
Population: 7 551 117 | Land area: 41 280 km² | GDP: 316 758 Mil. €

Switzerland is among the top 20 countries in the world with regard to the size of its carbon, water, land and material footprint. All its footprints, with the exception of water, are at least two times the world average. Switzerland is a net importer of carbon, water, land and materials embodied in trade. Almost 50 % of its carbon footprint, some 70 % of its material footprint and 90 % of its land footprint is embodied in imports, reflecting Switzerland's high population density as well as highly developed service sectors.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	118 105 kt	2 824 Mm³	217 727 km²	235 038 kt
per capita	15 641 kg	374 m³	0.029 km²	31 126 kg

NET TRADE



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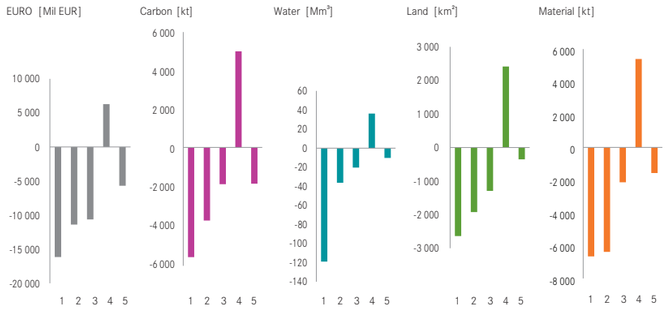


1 Chemicals nec
2 Medical, precision and optical instruments, watches and clocks
3 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
4 Motor vehicles, trailers and semi-trailers
5 Machinery and equipment n.e.c.

RANKING

World average per capita

Carbon	Water	Land	Material
15 Estonia	16 Germany	12 Estonia	7 Austria
16 Switzerland	17 Switzerland	13 Switzerland	8 Switzerland
17 Slovenia	18 France	14 Denmark	9 Slovenia

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.373 kt/Mil €	0.009 Mm³/Mil €	0.687 km²/Mil €	0.742 kt/Mil €		
Per capita footprints relative to world average	2.73	1.49	2.17	3.15		
Contribution to global total	0.31 %	0.17 %	0.25 %	0.36 %	0.78 %	0.11 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

Taiwan

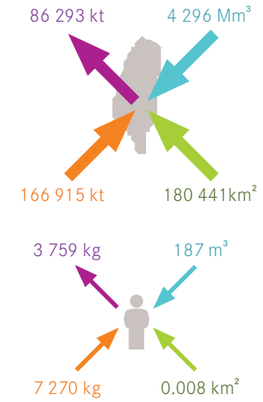
Population: 22 958 000 | Land area: 36 006 km² | GDP: 286 831 Mil. €

Taiwan has a moderate carbon, water, land and material footprint. Its water and land footprint are below the world average. Taiwan is a net importer of water, land and materials embodied in trade on one hand and a net exporter of carbon embodied in trade on the other. As is the case with other densely populated countries, the land use embodied in Taiwan's imports is in the range of 80 to 90 % of its land footprint.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	280 877 kt	5 648 Mm³	211 373 km²	318 836 kt
per capita	12 234 kg	246 m³	0.009 km²	13 888 kg

NET TRADE



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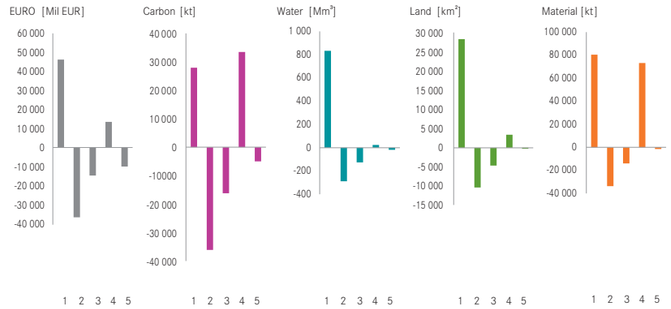


1 Plastics, basic
2 Radio, television and communication equipment and apparatus
3 Medical, precision and optical instruments, watches and clocks
4 Crude petroleum and services related to crude oil extraction, excluding surveying
5 Wholesale trade and commission trade services, except of motor vehicles and motorcycles

RANKING

World average per capita

Carbon	Water	Land	Material
24 Spain	29 Slovenia	42 RoW EU	33 Poland
25 Taiwan	30 Taiwan	43 Taiwan	34 Taiwan
26 Malta	31 Bulgaria	44 China	35 Hungary

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.979 kt/Mil €	0.020 Mm³/Mil €	0.737 km²/Mil €	1.112 kt/Mil €		
Per capita footprints relative to world average	2.14	0.98	0.69	1.40		
Contribution to global total	0.74 %	0.34 %	0.24 %	0.49 %	0.70 %	0.35 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³	0.013 km²	9 886 kg		

Turkey

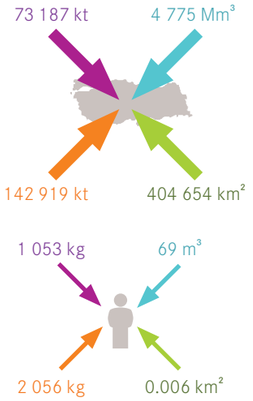
Population: 69 496 513 | Land area: 783 560 km² | GDP: 472 204 Mil. €

Turkey has a moderate carbon, land and material footprint, but its water footprint per capita is almost in the top 10. This reflects the significant domestic use of ground water and river water for agriculture. Turkey is a net importer of carbon, water, land and materials embodied in trade. This is particularly for land since land use embodied in imports accounts for just under 50 % of the total footprint.

FOOTPRINTS

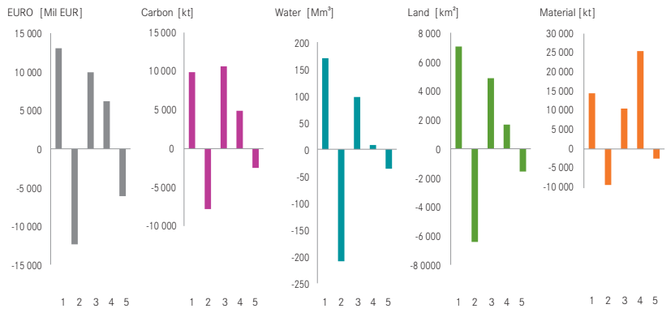
	Carbon	Water	Land	Material
per country	479 826 kt	28 633 Mm³	867 290 km²	832 839 kt
per capita	6 904 kg	412 m³	0.012 km²	11 984 kg

NET TRADE



TRADE FLOWS BY PRODUCT

Shown below are the net trade of products imported/exported to/from a country (imports minus exports) – the products include products for both further processing into more advanced goods/services (that may be later exported) and for final consumption. Environmental impacts are shown for the complete up-stream international supply chain of each product.



1 Plastics, basic
2 Wearing apparel; furs
3 Machinery and equipment n.e.c.
4 Natural gas and services related to natural gas extraction, excluding surveying
5 Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods

RANKING

World average per capita

Carbon
38 Romania
39 Turkey
40 RoW ME

Water
10 Canada
11 Turkey
12 Belgium

Land
33 South Korea
34 Turkey
35 Slovakia

Material
37 China
38 Turkey
39 Mexico

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	1.016 kt/Mil €	0.061 Mm³/Mil €	1.837 km²/Mil €	1.764 kt/Mil €		
Per capita footprints relative to world average	1.21	1.65	0.94	1.21		
Contribution to global total	1.26 %	1.72 %	0.99 %	1.27 %	1.16 %	1.05 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³	0.013 km²	9 886 kg		

United Kingdom

Population: 60 986 649 | Land area: 243 610 km² | GDP: 2 052 444 Mil. €

The United Kingdom of Great Britain and Northern Ireland belongs to the group of the largest economies of the EU. Due to its own crude oil reserves, GHG emissions embodied in traded products are dominated by other products. However, the United Kingdom is still a net importer of emissions embodied in products, as well as for embodied water, land and material. Electricity production in the UK is mainly based on fossil fuels. As a consequence, the United Kingdom scores relatively high on the carbon footprint per capita ranking.

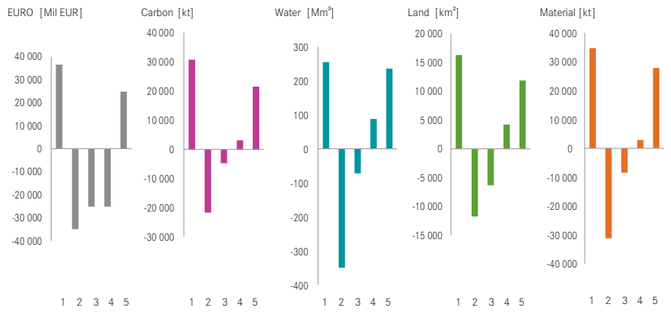
FOOTPRINTS

	Carbon	Water	Land	Material
per country	1 007 820 kt	23 997 Mm³	1 371 044 km²	1 415 167 kt
per capita	16 525 kg	393 m³	0.022 km²	23 205 kg

NET TRADE

TRADE FLOWS BY PRODUCT

Shown below are the net trade of products imported/exported to/from a country (imports minus exports) – the products include products for both further processing into more advanced goods/services (that may be later exported) and for final consumption. Environmental impacts are shown for the complete up-stream international supply chain of each product.



1 Motor vehicles, trailers and semi-trailers
2 Plastics, basic
3 Wholesale trade and commission trade services, except of motor vehicles and motorcycles
4 Other business services
5 Radio, television and communication equipment and apparatus

RANKING

World average per capita

Carbon
11 Netherlands
12 United Kingdom
13 Belgium

Water
14 Italy
15 United Kingdom
16 Germany

Land
18 Germany
19 United Kingdom
20 Austria

Material
19 Romania
20 United Kingdom
21 Sweden

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.491 kt/Mil €	0.012 Mm³/Mil €	0.668 km²/Mil €	0.690 kt/Mil €		
Per capita footprints relative to world average	2.89	1.57	1.70	2.35		
Contribution to global total	2.65 %	1.45 %	1.56 %	2.16 %	5.04 %	0.92 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

USA

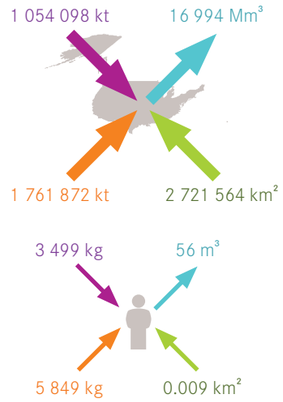
Population: 301 231 207 Land area: 9 632 030 km² GDP: 10 211 602 Mil. €

The United States of America (USA) are the world's largest economy. In absolute terms, the USA also exhibit the largest carbon footprint in the world. In terms of GHG emissions per capita, the country is among the three top countries and is a net importer of GHG, land and material embodied in traded products. However, exports outstrip the imports in the case of embodied water. A predominant part of the electricity production is based on fossil fuels. Consequently, the USA have a high GHG footprint per GDP.

FOOTPRINTS

	Carbon	Water	Land	Material
per country	7 479 646 kt	200 052 Mm³	9 621 440 km²	8 879 099 kt
per capita	24 830 kg	664 m³	0.032 km²	29 476 kg

NET TRADE



TRADE FLOWS BY PRODUCT

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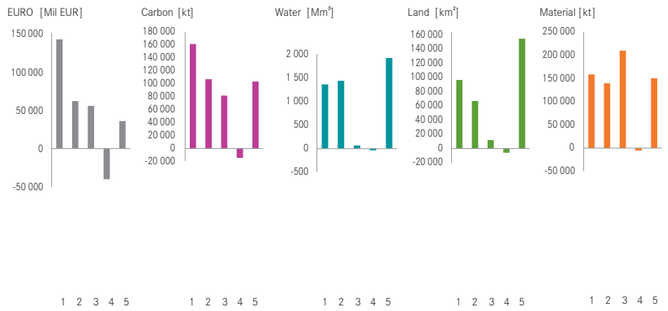

1 Motor vehicles, trailers and semi-trailers
2 Radio, television and communication equipment and apparatus
3 Crude petroleum and services related to crude oil extraction, excluding surveying
4 Renting services of machinery and equipment without operator and of personal and household goods
5 Furniture; other manufactured goods n.e.c.

RANKING

World average per capita

Carbon
2 Luxembourg
3 United States
4 Canada

Water
2 Luxembourg
3 United States
4 Greece

Land
7 Sweden
8 United States
9 Latvia

Material
11 Greece
12 United States
13 Canada

KEY INDICATORS

	Carbon	Water	Land	Material	GDP	Population
Resource footprints per € GDP	0.732 kt/Mil €	0.020 Mm³/Mil €	0.942 km²/Mil €	0.870 kt/Mil €		
Per capita footprints relative to world average	4.34	2.65	2.41	2.98		
Contribution to global total	19.70 %	12.05 %	10.93 %	13.53 %	25.06 %	4.54 %
World total	37.97 Gt	1 660 560 Mm³	88 031 435 km²	65 627 314 kt	40 744 556 Mil €	6 638 184 044
World average per capita	5 721 kg/cap	250 m³/cap	0.013 km²/cap	9 886 kg/cap		

This booklet, for the first time, provides a comprehensive insight into the global environmental footprints of final consumption. Using a detailed, consistent and comprehensive global economic-environmental database, the EXIOBASE, it presents 43 country factsheets encapsulating the carbon, water, land and material footprint of final consumption in the countries covered by EXIOBASE, i.e. the EU-27 plus the 16 main EU trading partners. The booklet further showcases the interconnectedness of the global economic system and the links between production and consumption as well as its relation to global environmental impacts. It illustrates that a large share of the carbon, water, land and material footprint of many developed countries is located abroad. Also, a number of comparative analyses, such as how environmental pressures correlate to GDP or the Human Development Index (HDI) of a country are provided. By that means, the booklet provides indications where hot spots of necessary (political) action can be identified.

Part I– 8 Thematic Pages:
The Interconnected World | The EU, USA and China as Global Consumers | From a Production to a Consumption Perspective
The Uneven Distribution of Global Resource Consumption | Comparing the Worlds Environmental Footprints
Our Interlinked Economy – Part I | Our Interlinked Economy – Part II | Relations Between Wealth, Well-Being and Footprint

Part II– 43 Country Factsheets:
Footprints Per Country and Per Capita | Net Trade Per Country and Per Capita | Trade Flows by Product | Ranking Key Indicators

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