

HUMAN IMPACTS by the numbers

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ABSTRACT

The greatest experiment of the last 10,000 years is the presence and action of modern human beings on planet Earth. At this point, the consequences of this experiment are being felt on many fronts. Yet, many people still hold the view that because the world is so "huge", humans cannot really make a substantial impact. One way to organize our thinking about what these impacts might be, with tongue in cheek, is to focus on Empedocles's classic elements, earth, air, water and fire, with the idea being to explore how humans have altered the land and its inhabitants, the atmosphere, the oceans and how our quest for cheaper and cheaper energy (fire) from the world around us has altered that world. This snapshot represents a small collection of numbers that summarize the broad reach of human action across the planet, presenting a view of the impact of human presence on Earth.

UNITS OF REFERENCE

human population = $\approx 7 \times 10^9$ mass of an elephant = ≈ 5000 kg

area of soccer pitch = ≈ 3000 m² power of a lightbulb = ≈ 100 W

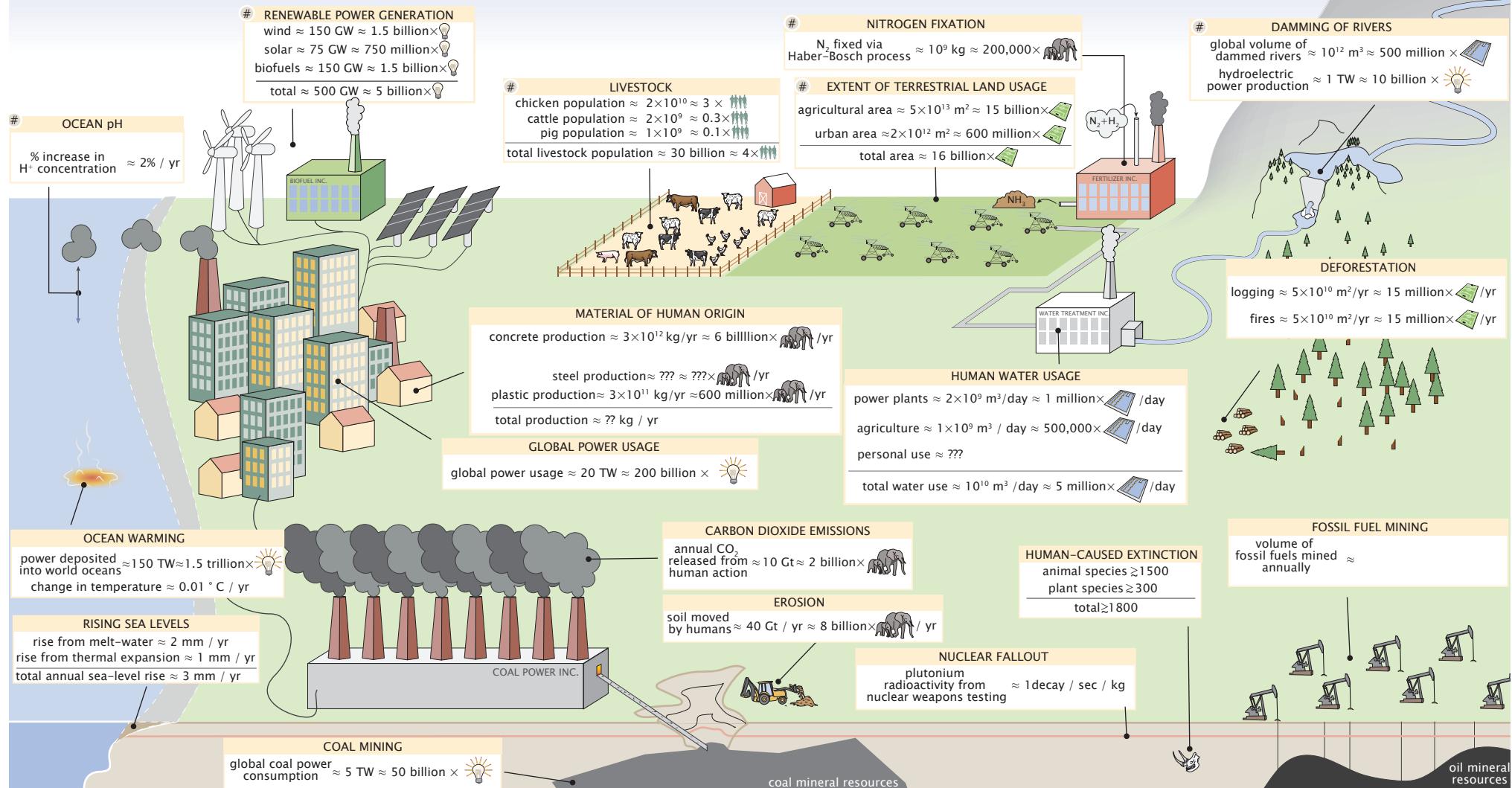
volume of olympic pool = ≈ 2000 m³

MELT WATER

glacial melt volume $\approx 3 \times 10^{11}$ m³/yr ≈ 150 million /yr

ice-sheet melt volume $\approx 5 \times 10^{11}$ m³/yr ≈ 250 million /yr

total melt volume $\approx 10^{12}$ m³/yr ≈ 5000 million /yr



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SUPPORTING INFORMATION

MELTWATER

#	MELTWATER	HuID:
glacial melt rate	000000	000000
ice-sheet melt rate	000000	000000
total melt rate	000000	000000

Data Source(s): Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exercit ullamcorper suscipit lobortis nisl ut

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RENEWABLE POWER GENERATION

#	RENEWABLE POWER GENERATION	HuID:
wind	30581	30581
solar	99885	99885
biofuels	89570	89570
total	20246	20246

Data Source(s): bp Statistical Review of World Energy, 2020.

Notes: Reported values correspond to estimates for the 2019 calendar year. Renewable resources are defined as wind, geothermal, solar, biomass and waste, and does not include hydroelectric power generation.

Links: See <https://bp.com/statisticalreview> and <https://rpgroup.caltech.edu/hi-vignettes> for further information.

NITROGEN FIXATION

#	NITROGEN FIXATION	HuID:
N_2 flux through Haber-Bosch	000000	000000

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DAMMING OF RIVERS

#	DAMMING OF RIVERS	HuID:
dammed river volume	000000	000000
hydroelectric consumption	000000	000000

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LIVESTOCK POPULATION

#	LIVESTOCK POPULATION	HuID:
chicken	94934	94934
cattle	92006	92006
swine	21368	21368
total	15765	15765

Data Source(s): Food and Agriculture Organization of the United Nations Statistical Database (FAOSTAT).

Notes: Counts correspond to the approximate average of the standing populations reported between 2010 – 2018. Values are reported directly by countries, yet the FAO uses non-governmental statistical sources to address uncertainty and missing (non-reported) data.

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THE ANTHROPOCENE

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THE MAGNITUDE OF HUMAN WATER USAGE

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HUMANS AS THE EARTH'S GREATEST EVOLUTIONARY FORCE

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HUMAN IMPACTS ON ATMOSPHERIC AND BIOGEOCHEMICAL CYCLES

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THE MAGNITUDE OF HUMAN ENERGY USAGE

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