NATURE AND BIODIVERSITY

This is the total weight of everything humans have created since 1990

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In 2020, the amount of human-made mass, or anthropogenic mass, exceeded for the first time the dry weight (except for water and fluids) of all life on Earth.

Image: Unsplash/ Justin Eisner

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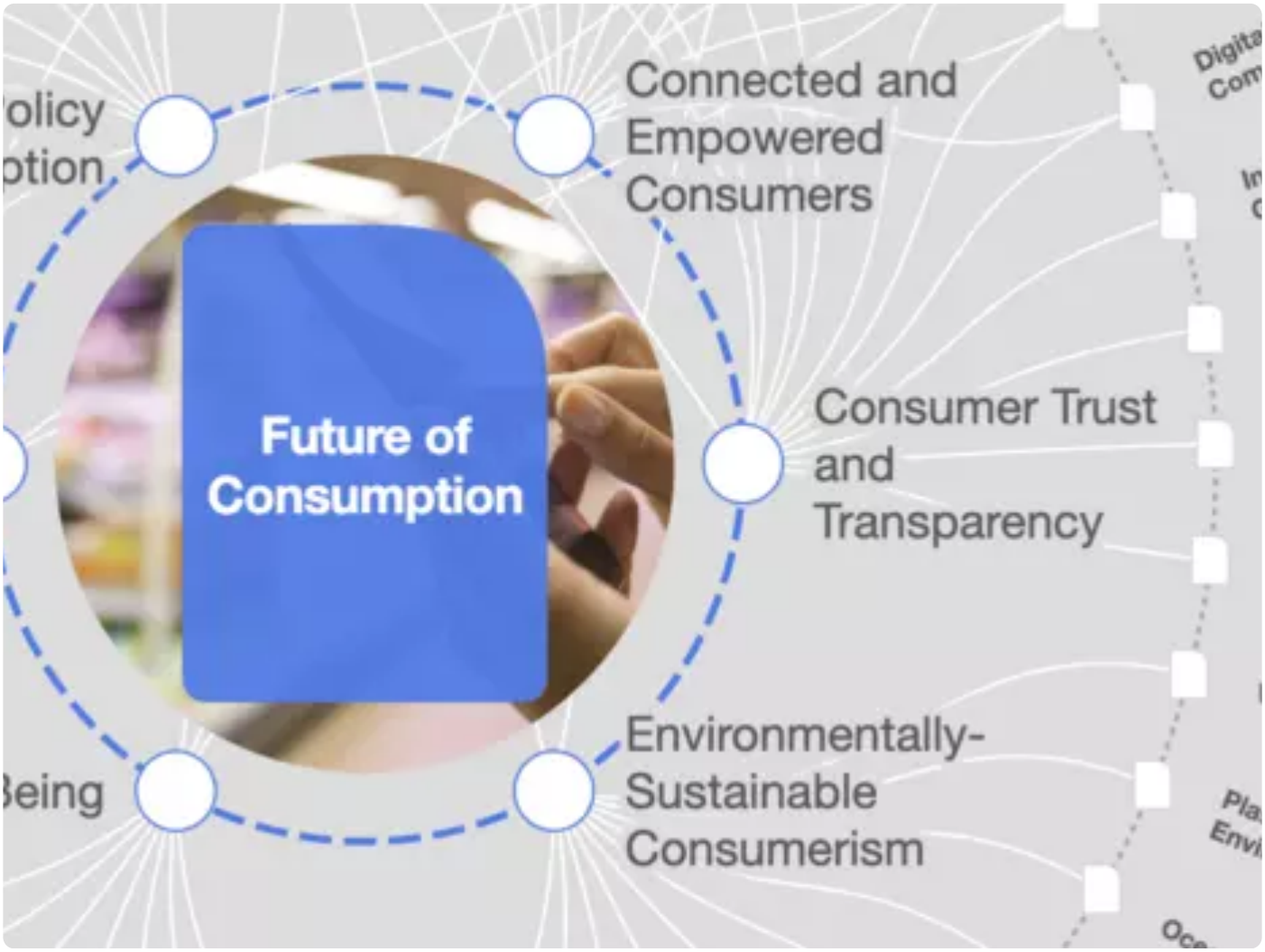

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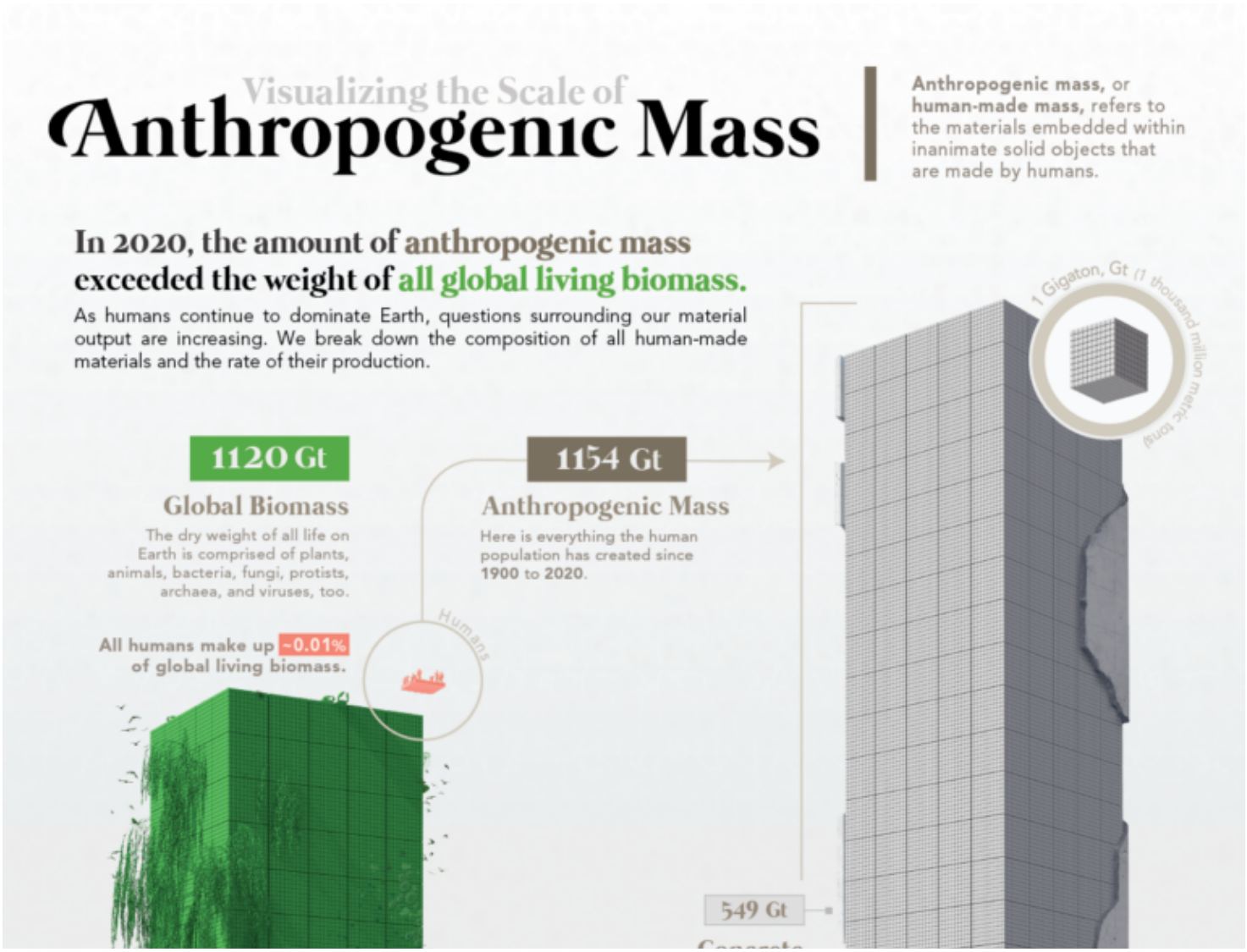
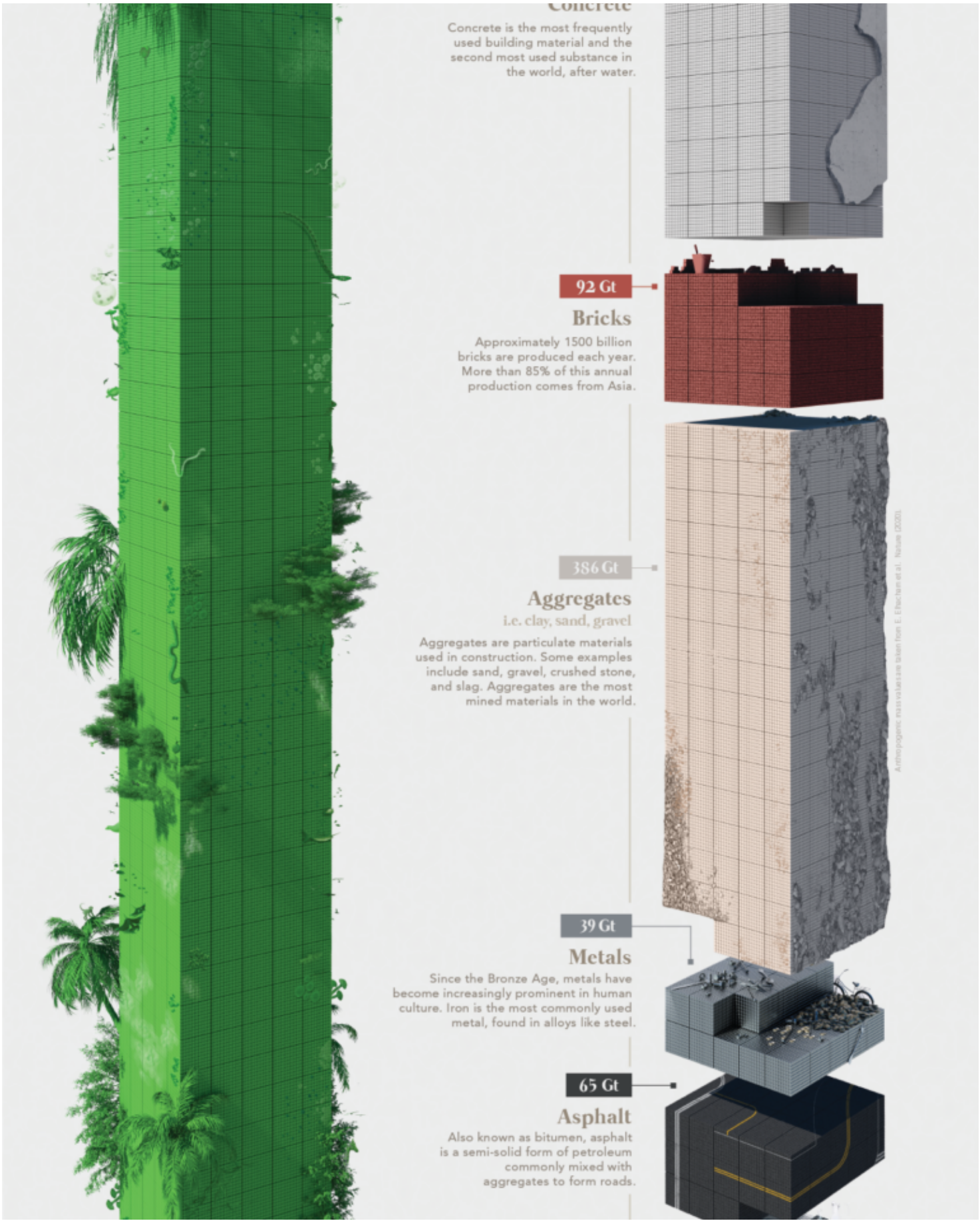
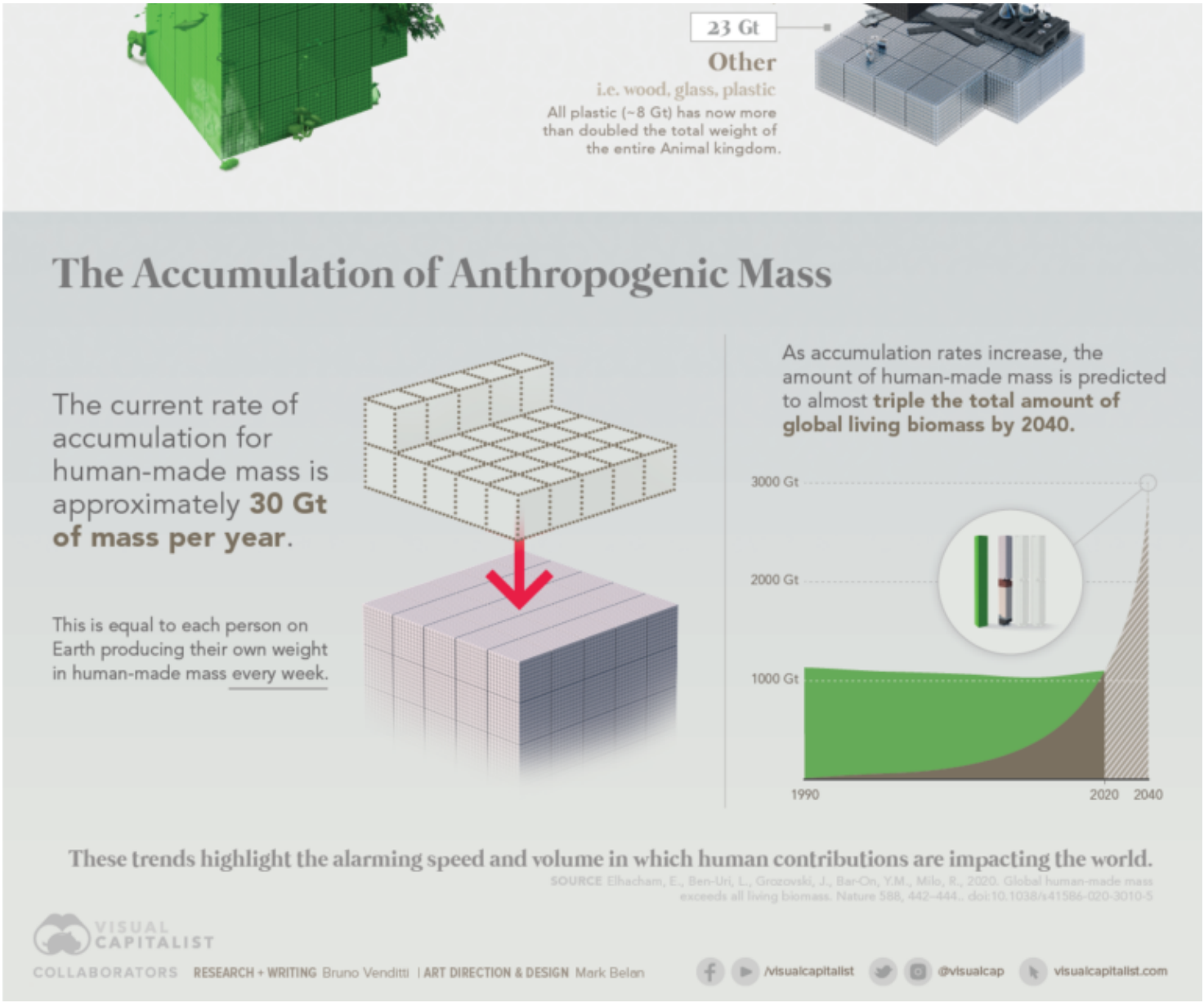
- **Anthropogenic mass is defined as the mass embedded in inanimate solid objects made by humans that have not been demolished or taken out of service.**
- **In 2020, the amount of anthropogenic mass exceeded for the first time the dry weight of all life on Earth.**
- **It's predicted that total anthropogenic mass equates to around 1,154 gigatons, with concrete attributing to over 33%.**




Concrete
Concrete is the most frequently used building material and the second most used substance in the world, after water.
92 Gt
Bricks
Approximately 1500 billion bricks are produced each year. More than 85% of this annual production comes from Asia.
386 Gt
Aggregates
i.e. clay, sand, gravel
Aggregates are particulate materials used in construction. Some examples include sand, gravel, crushed stone, and slag. Aggregates are the most mined materials in the world.
39 Gt
Metals
Since the Bronze Age, metals have become increasingly prominent in human culture. Iron is the most commonly used metal, found in alloys like steel.
65 Gt
Asphalt
Also known as bitumen, asphalt is a semi-solid form of petroleum commonly mixed with aggregates to form roads.



Concrete attribtues to 549GT of mass. Image: Visual Capitalist

The world is not getting any bigger but the human population continues to grow, consuming more and more resources and altering the very environment we rely on.

In 2020, the amount of human-made mass, or anthropogenic mass, exceeded for the first time the dry weight (except for water and fluids) of all life on Earth, including humans, animals, plants, fungi, and even microorganisms.

In this infographic based on a study published in Nature, we break down the composition of all human-made materials and the rate of their production.

A man-made planet

Anthropogenic mass is defined as the mass embedded in inanimate solid objects made by humans that have not been demolished or taken out of service—which is separately defined as anthropogenic mass waste.

Over the past century or so, human-made mass has increased rapidly, doubling approximately every 20 years. The collective mass of these materials has gone from 3% of the world's biomass in 1900 to being on par with it today.

While we often overlook the presence of raw materials, they are what make the modern economy possible. To build roads, houses, buildings, printer paper, coffee mugs, computers, and all other human-made things, it requires billions of tons of fossil fuels, metals and minerals, wood, and agricultural products.

Human-made mass

Every year, we extract almost 90 billion tons of raw materials from the Earth. A single smartphone, for example, can carry roughly 80% of the stable elements on the periodic table.

The rate of accumulation for anthropogenic mass has now reached 30 gigatons (Gt)—equivalent to 30 billion metric tons—per year, based on the average for the past five years. This corresponds to each person on the globe producing more than his or her body weight in anthropogenic mass every week.

At the top of the list is concrete. Used for building and infrastructure, concrete is

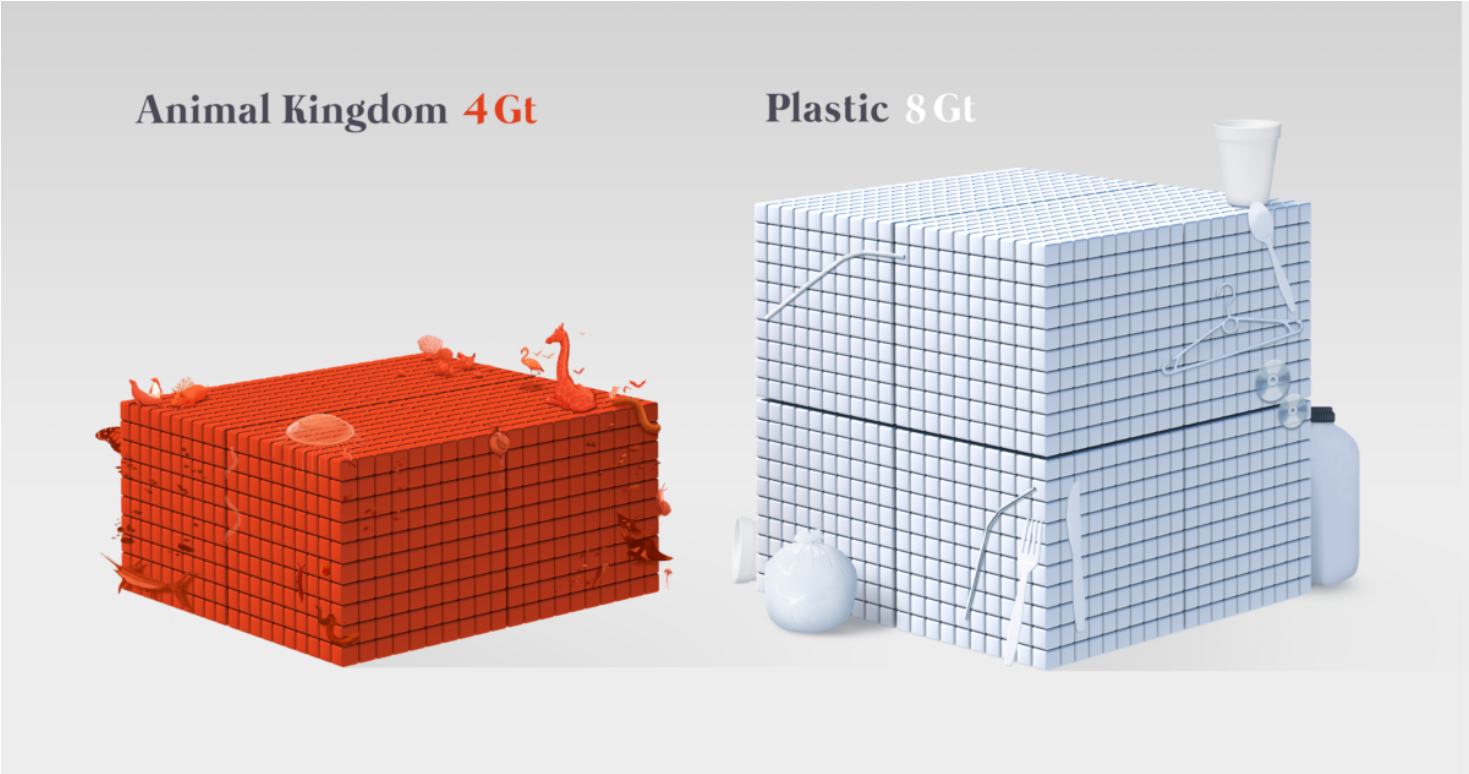
At the top of the list is concrete. Used for building and infrastructure, concrete is the second most used substance in the world, after water.

Human-Made Mass	Description	1900 (mass/Gt)	1940 (mass/Gt)	1980 (mass/Gt)	2020 (mass/Gt)
Concrete	Used for building and infrastructure, including cement, gravel and sand	2	10	86	549
Aggregates	Gravel and sand, mainly used as bedding for roads and buildings	17	30	135	386
Bricks	Mostly composed of clay and used for constructions	11	16	28	92
Asphalt	Bitumen, gravel and sand, used mainly for road construction/pavement	0	1	22	65
Metals	Mostly iron/steel, aluminum and copper	1	3	13	39
Other	Solid wood products, paper/paperboard, container and flat glass and plastic	4	6	11	23

Concrete is the second most used substance in the world, after water. Image: Visual Capitalist

Bricks and aggregates like gravel and sand also represent a big part of human-made mass.

Although small compared to other materials in our list, the mass of plastic we've made is greater than the overall mass of all terrestrial and marine animals combined.



Human-made mass could become triple the total amount of global living biomass by 2040. Image: Visual Capitalist

As the rate of growth of human-made mass continues to accelerate, it could become triple the total amount of global living biomass by 2040.

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Can we work it out?

Can we work it out?

While the mass of humans is only about 0.01% of all biomass, our impact is like no other form of life on Earth. We are one of the few species that can alter the environment to the point of affecting all life.

At the current pace, the reserves of some materials like fossil fuels and minerals could run out in less than 100 years. As a result, prospectors are widening their search as they seek fresh sources of raw materials, exploring places like the Arctic, the deep sea, and even asteroids.

DISCOVER

What is the World Economic Forum doing about plastic pollution?

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As the world population continues to increase, so does the pressure on the natural environment. It is an unavoidable fact that consumption will increase, but in an era of net-zero policies and carbon credits, accounting for the human impact on the environment will be more important than ever.

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