

# Technological optimisms vs. degrowth

# Fundamental problem of modern society

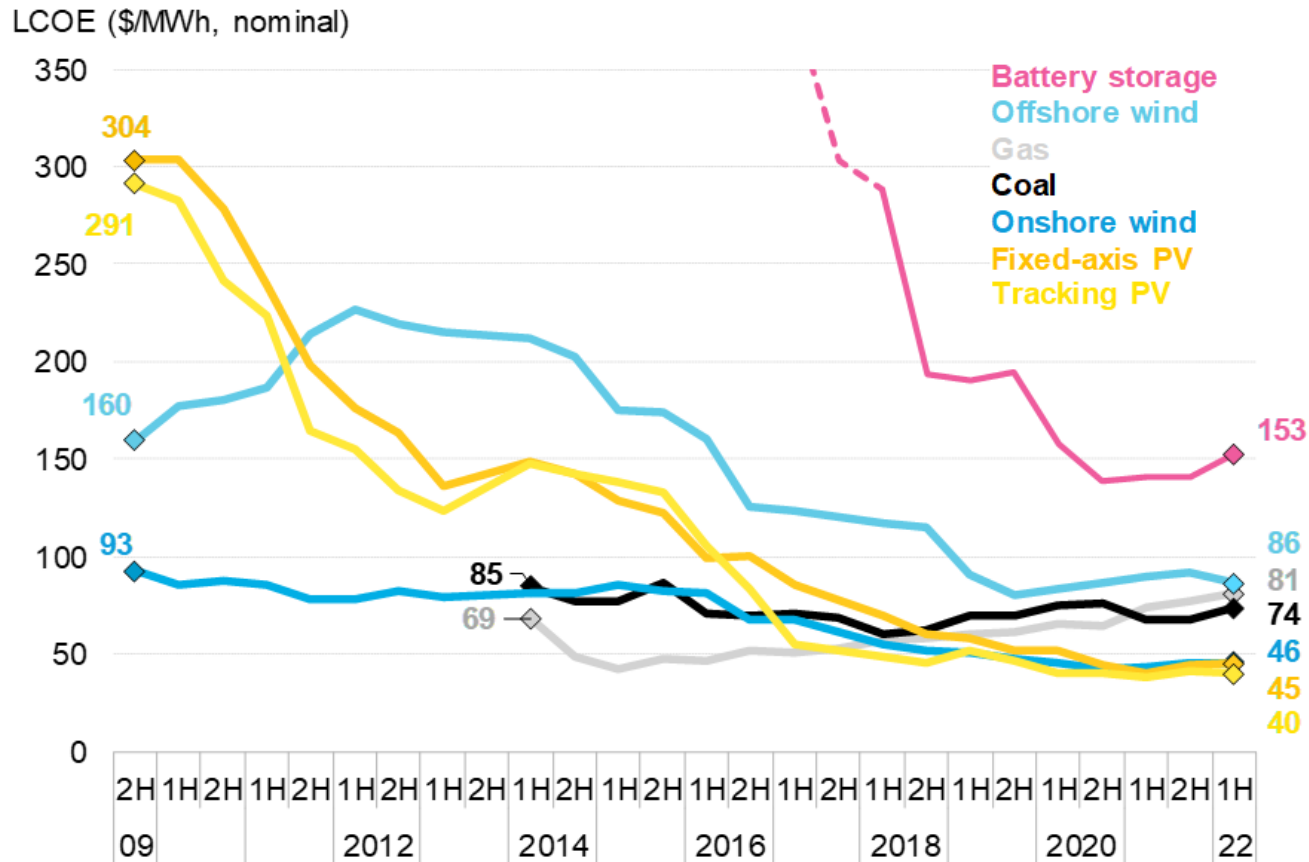
- 1) Sufficient energy is essential for the functioning of society. Without energy, society is poor and life is miserable.
- 2) Economic development driven by fossil fuels is unsustainable in its current form.
- 3) We are not choosing between the status quo and (probably unpleasant) change. We are choosing between some change and a climate catastrophe.
- 4) The only choice is what form the change will take.

# Options

- 1) Technological improvement based on low-carbon energy sources.
- 2) Degrowth
- 3) Maintaining the current course, later dramatic change forced by climate change.

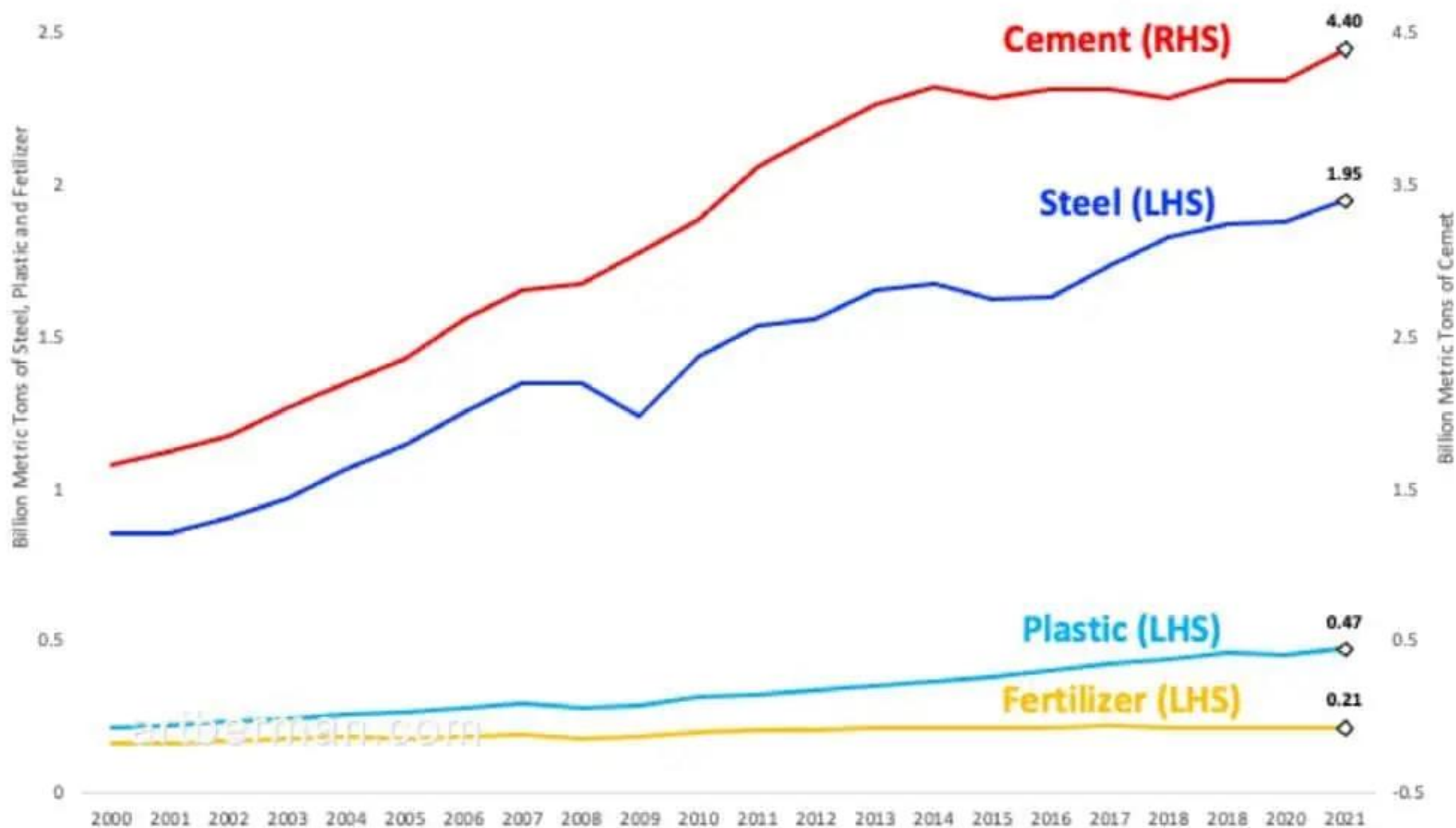
# Low carbon energy

Figure 1: Global levelized cost of electricity benchmarks, 2009-2022



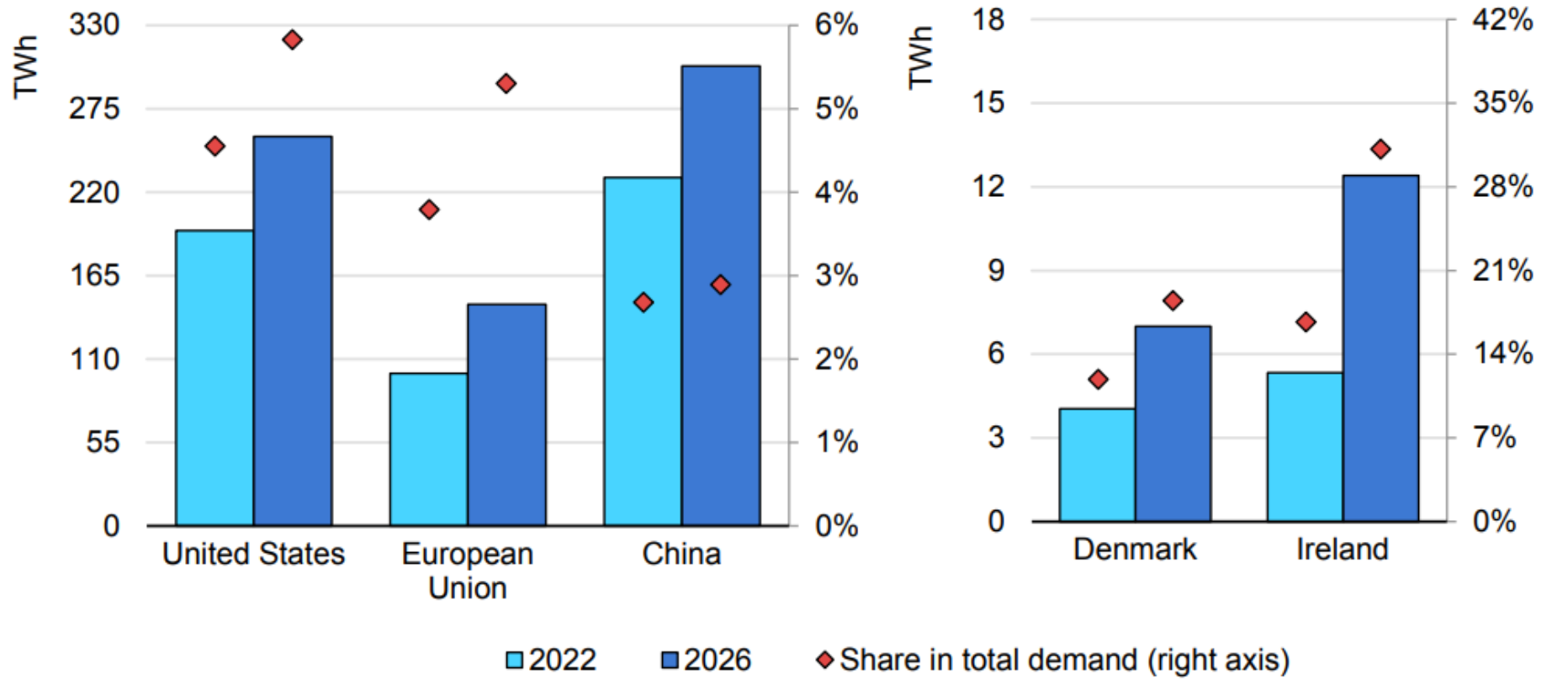
Source: BloombergNEF. Note: The global benchmark for PV, wind and storage is a country-weighted average using the latest annual capacity additions. The storage LCOE is reflective of a utility-scale Li-ion battery storage system with four-hour duration running at a daily cycle and includes charging costs.

**Four pillars of modern civilization can only be made using fossil fuels**  
**4.4 billion tons of cement, 1.95 billion tons of steel, 0.47 billion tons of plastic**  
**and 0.21 billion tons of fertilizer were produced in 2021**



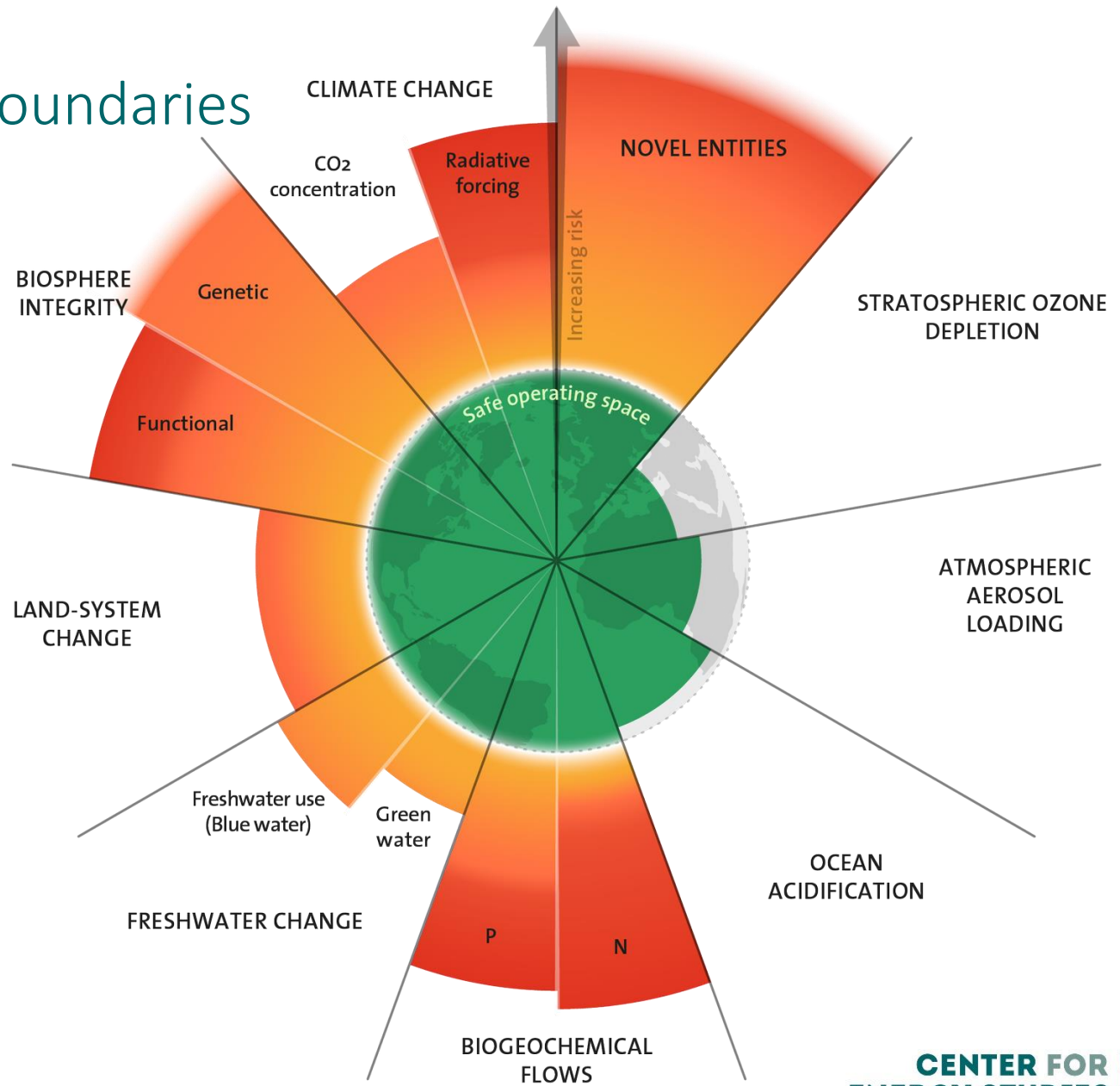
Source: Our World in Data, USGS, Statista & Labyrinth Consulting Services

# Estimated data centre electricity consumption and its share in total electricity demand in selected regions in 2022 and 2026



IEA. CC BY 4.0.

# Planetary boundaries



Holocene as a reference state

# Degrowth

- Degrowth advocates for a deliberate downscaling of production and consumption.
- It promotes a societal shift towards reduced resource use, ecological sustainability, enhanced life quality, and equality.
- Reformation of the originally negative Malthusianism. (1972 *The Limits to Growth...*).
- „*Anyone who believes that exponential growth can go on forever in a finite world is either a madman or an economist*“ (Kenneth Bouldin, economist).

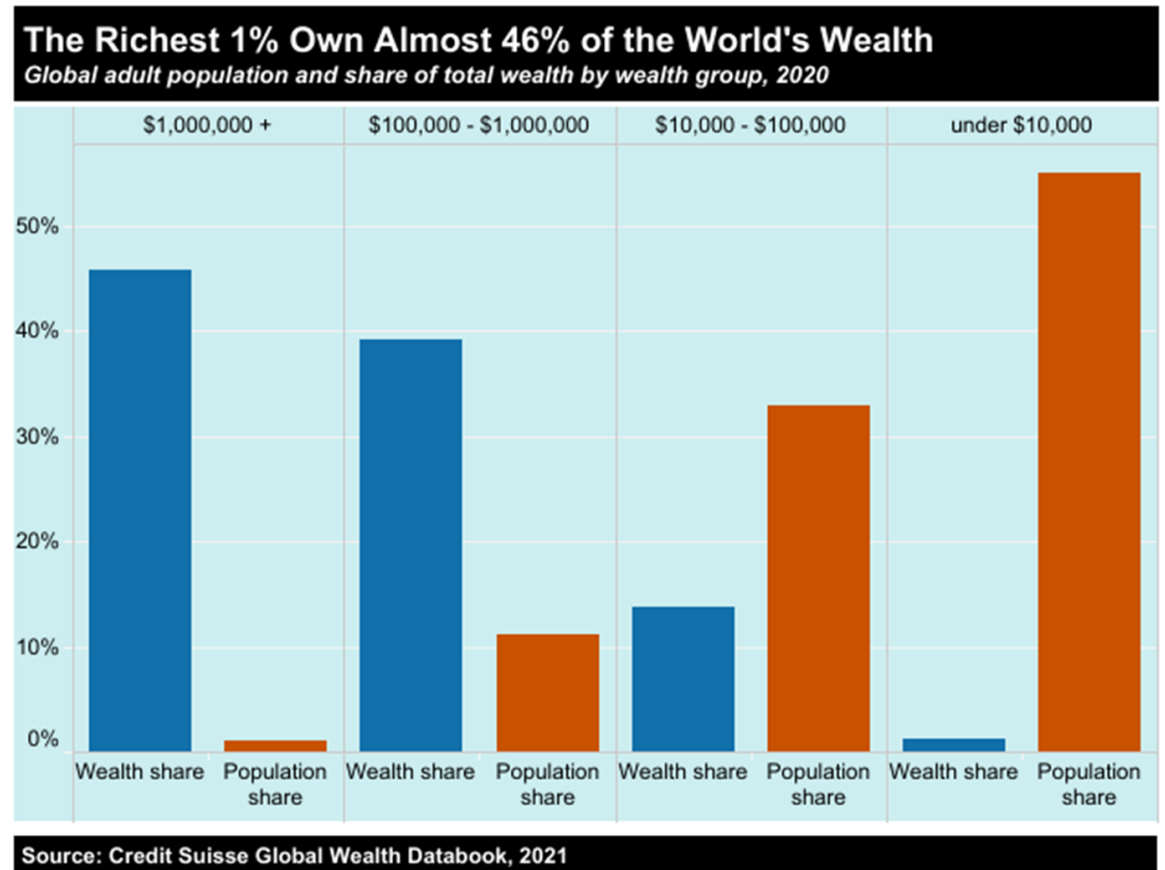


# Key principles

- Emphasizing ecological sustainability to live within planetary limits.
- Advocating for economic redistribution to promote equity and resource sharing.
- Encouraging reduced consumption, shifting from materialism to well-being and community values.
- Focusing locally on resilience through self-sufficiency and community-driven production.

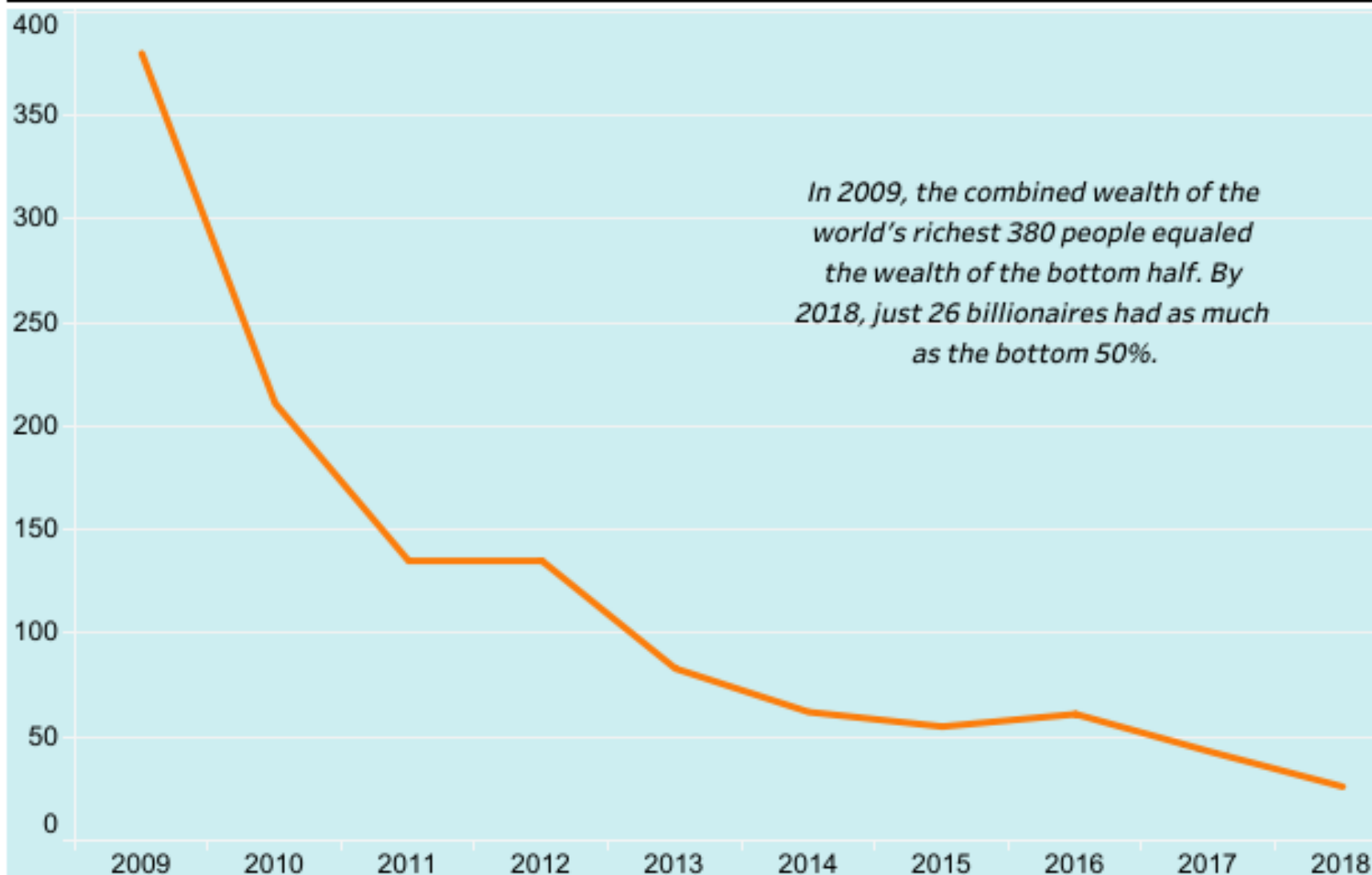
# Key principles

- Advocating for economic redistribution to promote equity and resource sharing.



# Wealth of the World's Poorest Shrinks Relative to Billionaires

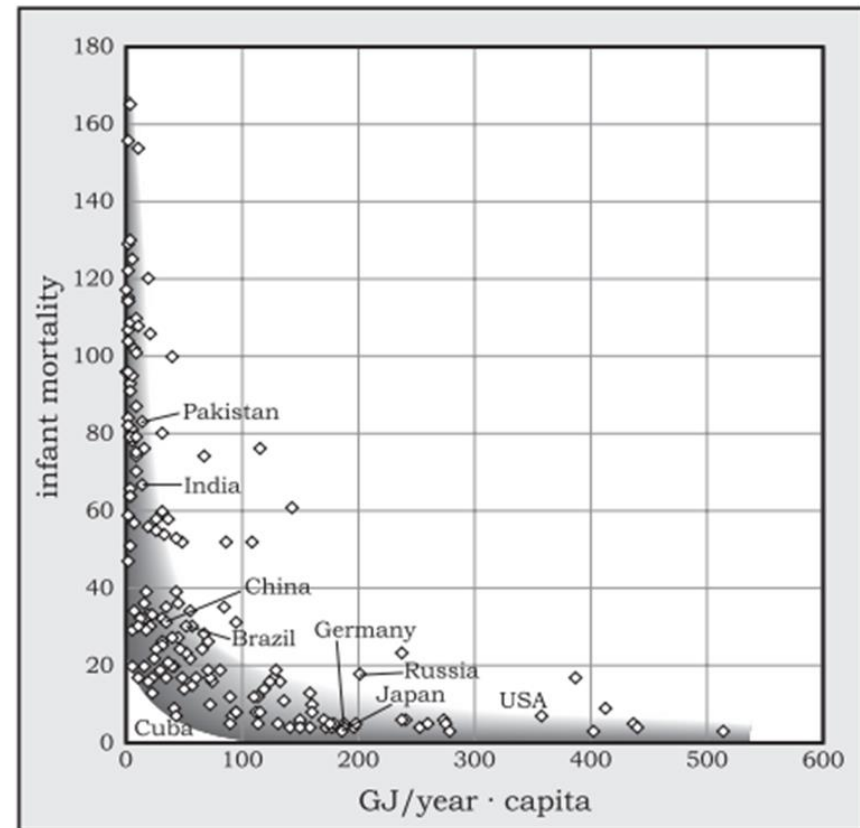
Number of billionaires it takes to equal the wealth of bottom 50% of the global population



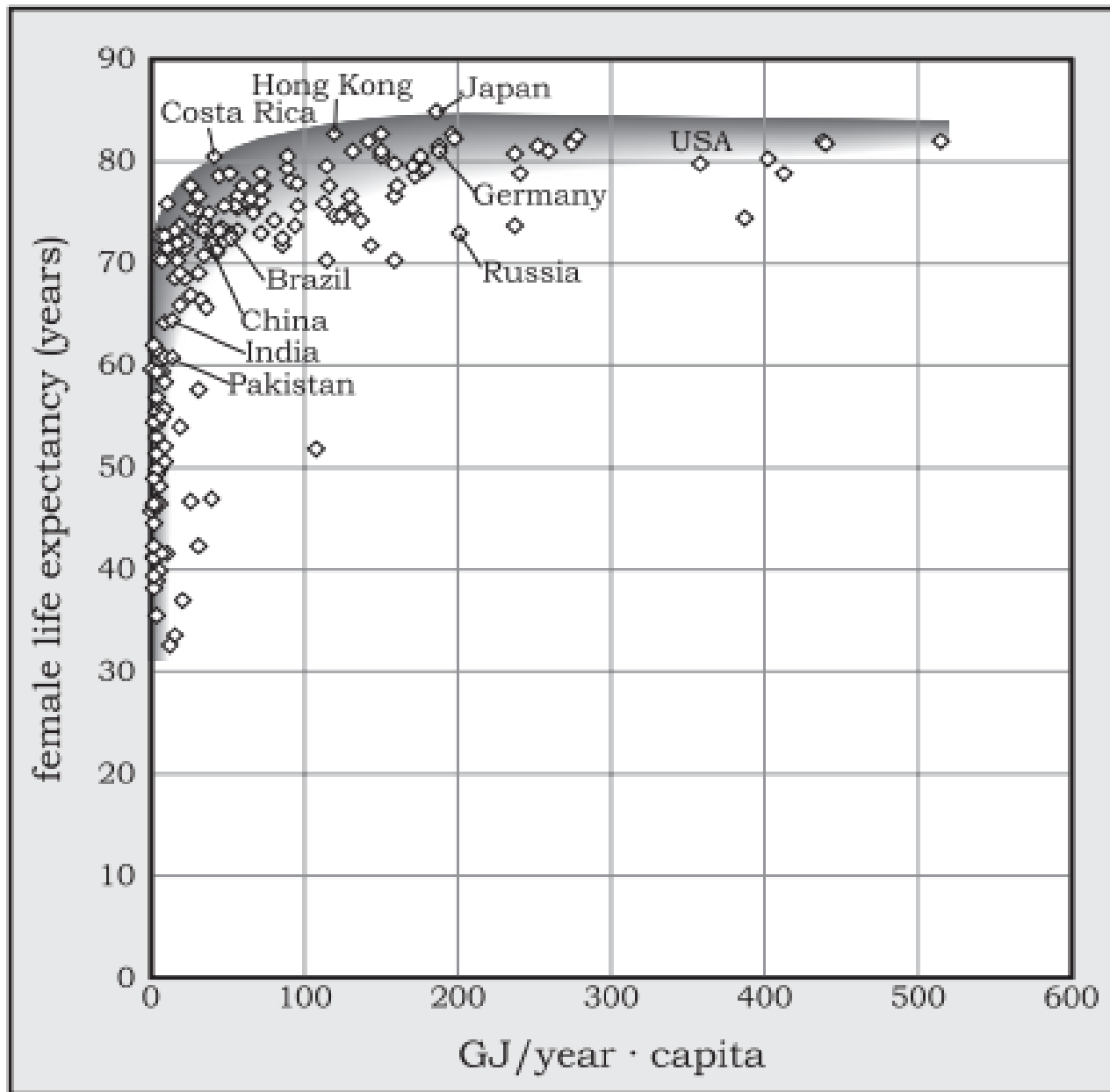
Source: Oxfam, 2019

# Growth vs. development

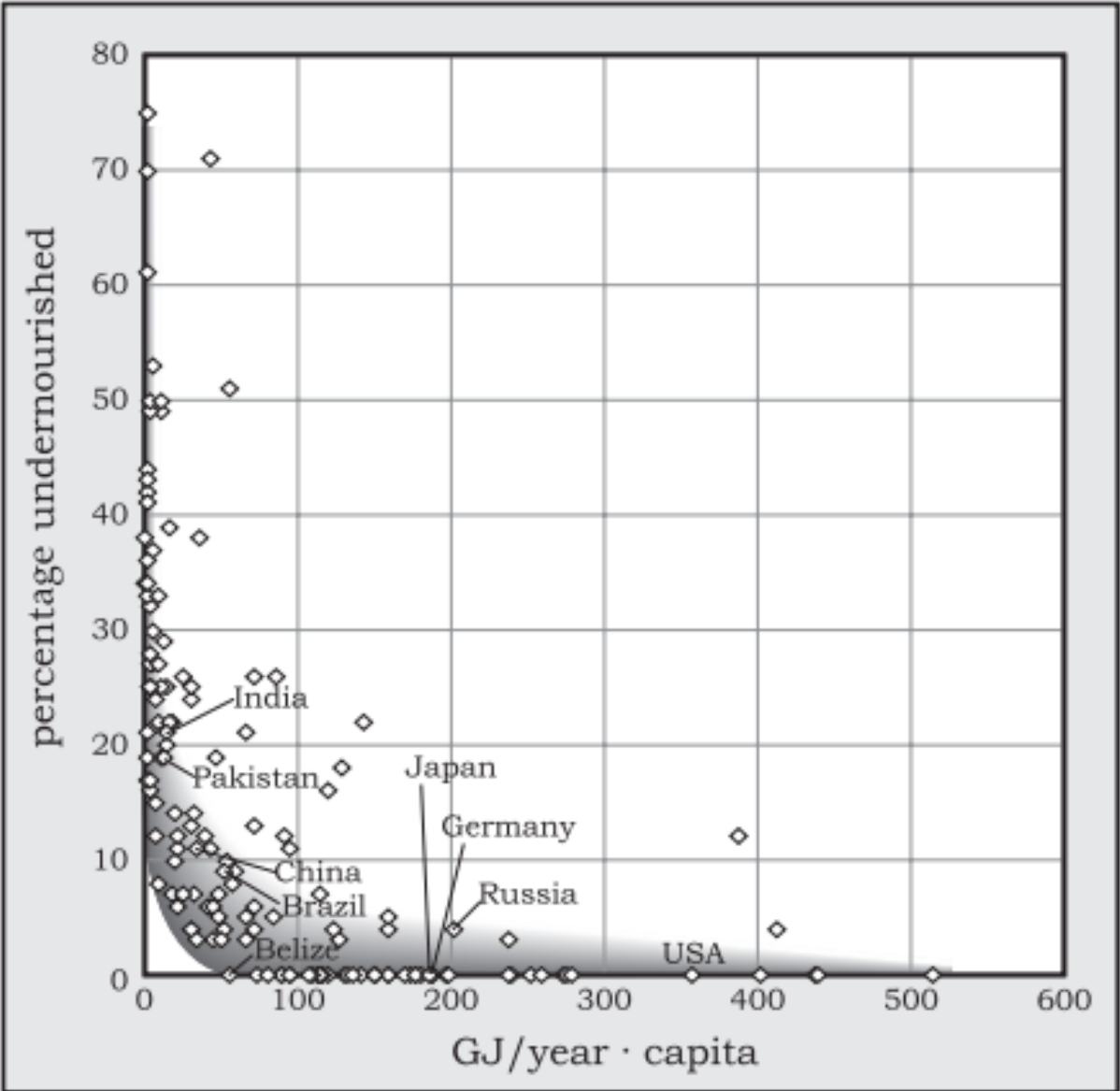
- Simple growth (increase in output, GDP) vs. development (improvement of the quality of life).



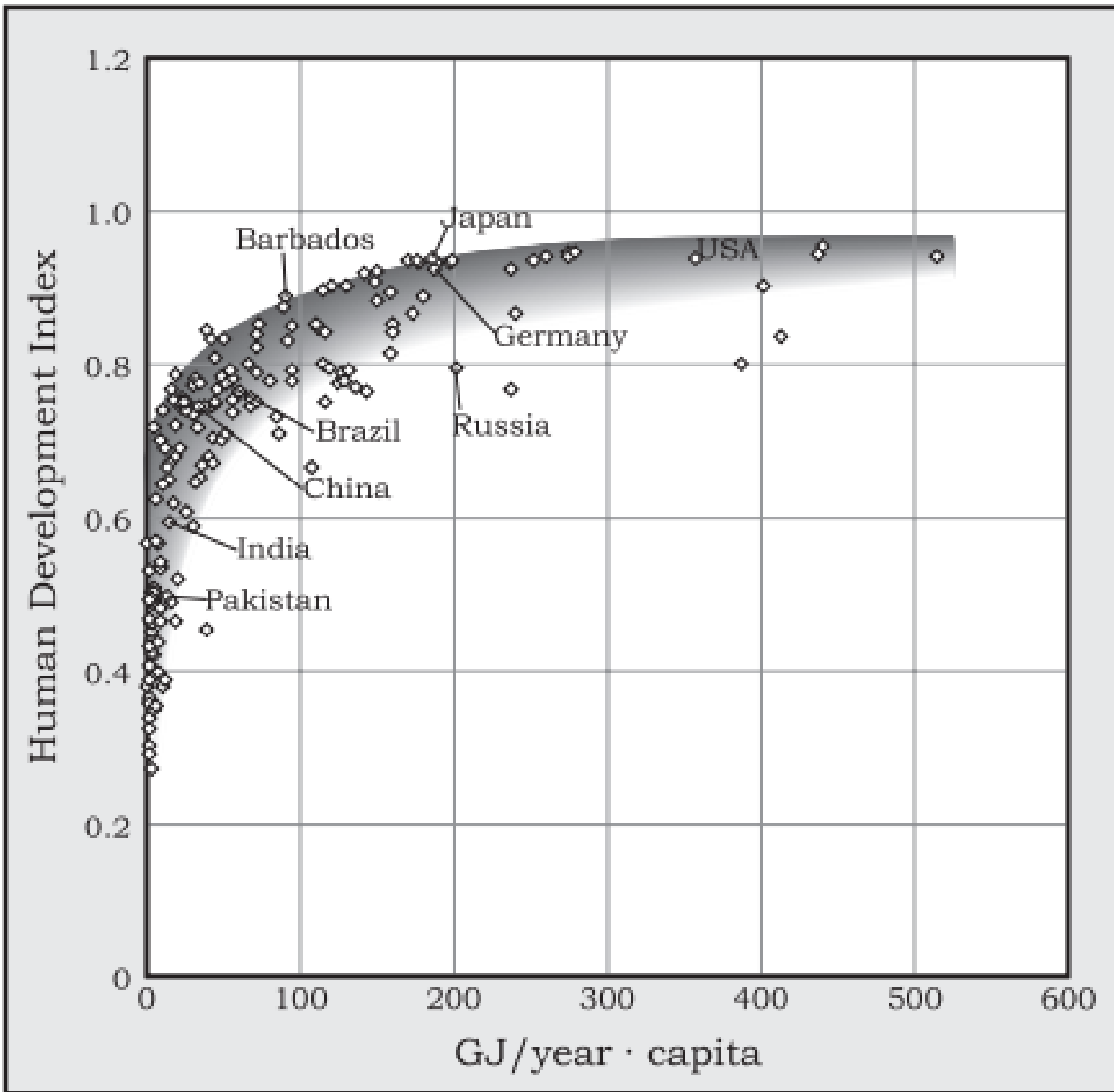
Per capita energy use and infant mortality.



Per capita energy use and female life expectancy at birth.



Per capita energy use and malnutrition.



Per capita energy use and HDI.

# Is degrowth possible?

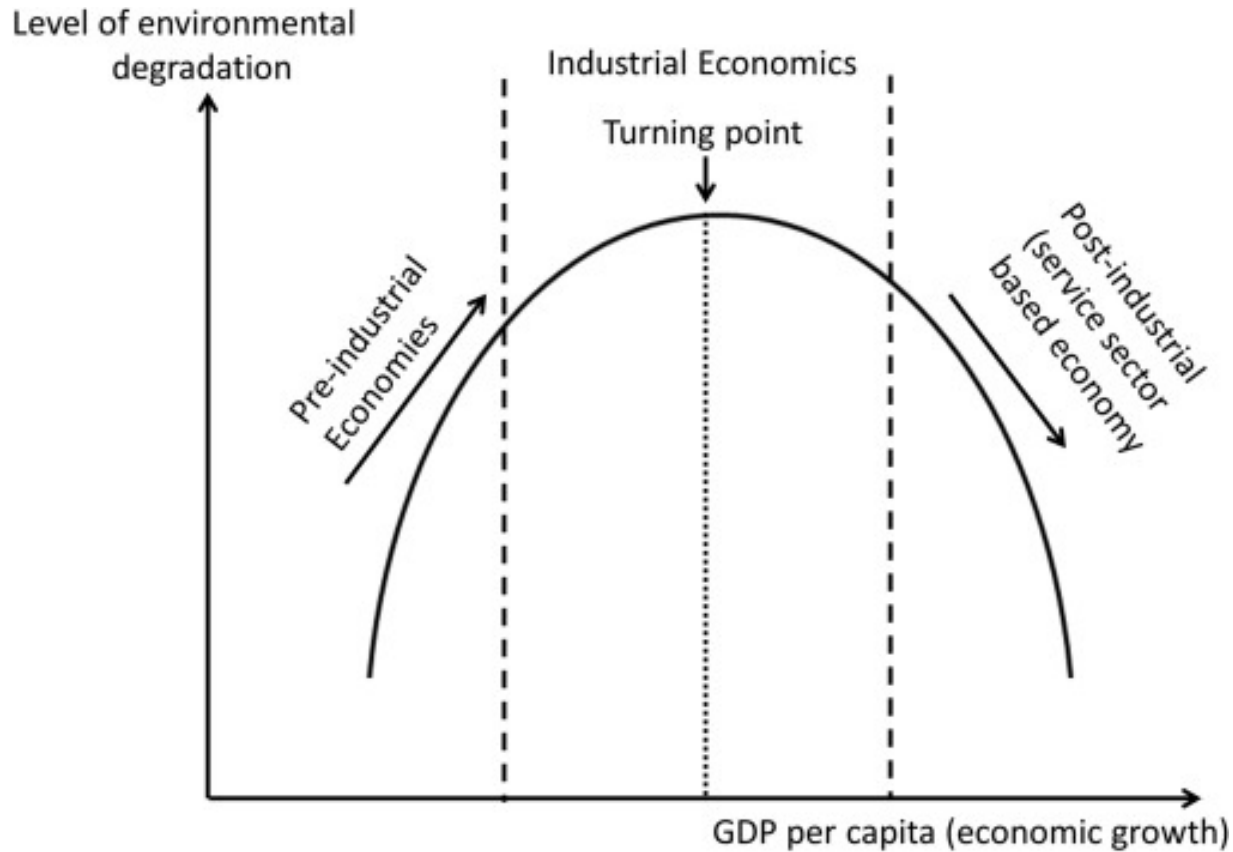
- Highly controversial for its questioning of capitalism - economic growth is essential for the repayment of debts, for the functioning of pension systems, for the stability of society.
- People would never voluntarily walk away from competitive consumerism.
- Let alone on a global level.
- Degrowth is unpleasant for developed countries, but probably unacceptable for developing ones.
- We may need economic growth to introduce more environmentally acceptable technologies.
- Utopia or violence?



# Is degrowth possible?

- People over-consume not because of their nature but because they feel compelled to do so and because our economy is structured to incentivize consumption.
- Our political system defends the interests of capital.
- There is an increasing demand for change.

# Kuznetz environmental curve



# Kuznetz environmental curve

- Economic growth fosters cleaner technologies, structural shifts to less polluting industries, and public demand for environmental regulations.
- Rising income allows investment in sustainability.
- Empirical data shows pollution reductions for some indicators in developed nations.

# Kuznetz environmental curve

- Growth could be a solution!
- It provides resources for more efficient processes, less polluting products, shift from materially intensive goods to less materially demanding services, circular economy...
- Relative vs. absolute decoupling of economy from environment.

# Kuznetz environmental curve

- Economic growth often shifts pollution to poorer regions and can cause irreversible damage.
- Evidence varies across pollutants, with CO<sub>2</sub> emissions often increasing.
- Environmental improvements rely heavily on policy, not income, and delay action during critical periods.

# What to expect?

- Degrowth seems impossible to implement. But technological optimism doesn't seem like a solution either. And continuing on the current trend spells disaster.
- Degrowth may ultimately be driven by climate change and environmental collapse themselves, as increasing portions of our economy will need to be directed toward adaptation, leaving us collectively poorer.

# What to expect?

- Coastal cities invest billions in seawalls to fight rising seas.
- Drought-stricken areas face soaring costs for water supply solutions.
- Heatwaves reduce crop yields forcing reliance on costly imports.
- Energy systems buckle under stress.
- Heat stress and air pollution increase healthcare costs and lower productivity.
- Rising seas displace coastal communities, while wildfires destroy homes.
- Overfishing depletes fish stocks, harming economies reliant on fisheries.
- Deforestation leads to loss of arable land and biodiversity, impacting agriculture and ecosystems.