

Geografie delle risorse e sfide globali



Ginevra Balletto _ Università di Cagliari
Giuseppe Borruso _ Università di Trieste



<https://www.reuters.com/graphics/EGYPT-SUEZCANAL/SHIP/jzmvngokdpl/>

Domains of Maritime Circulation



Types of Resources

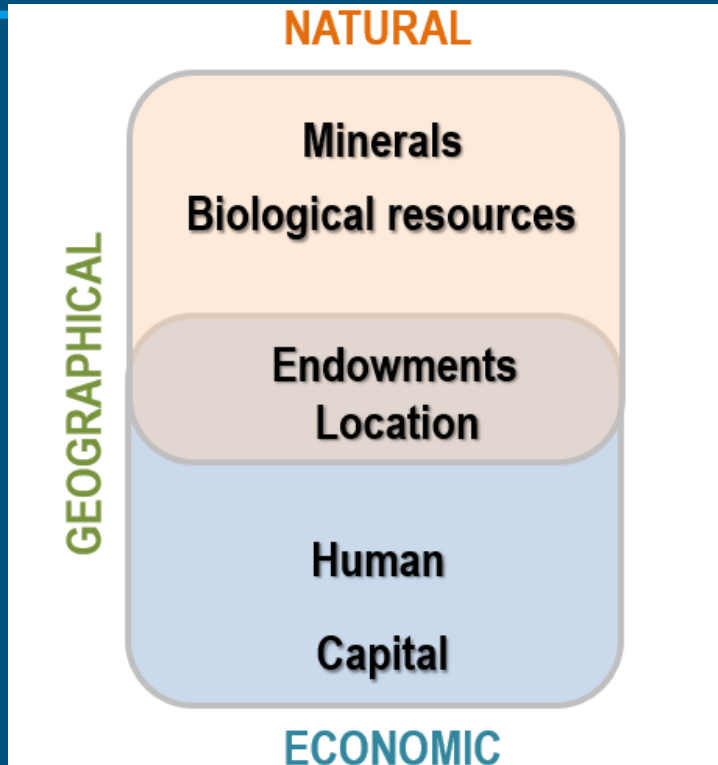
Resources and Reserves

The Renewable / Non-Renewable Dichotomy

Resources, Technology and Society

Minerals

Resources and Reserves



Three major categories of resources.

Natural resources

Derived from physiographical conditions.

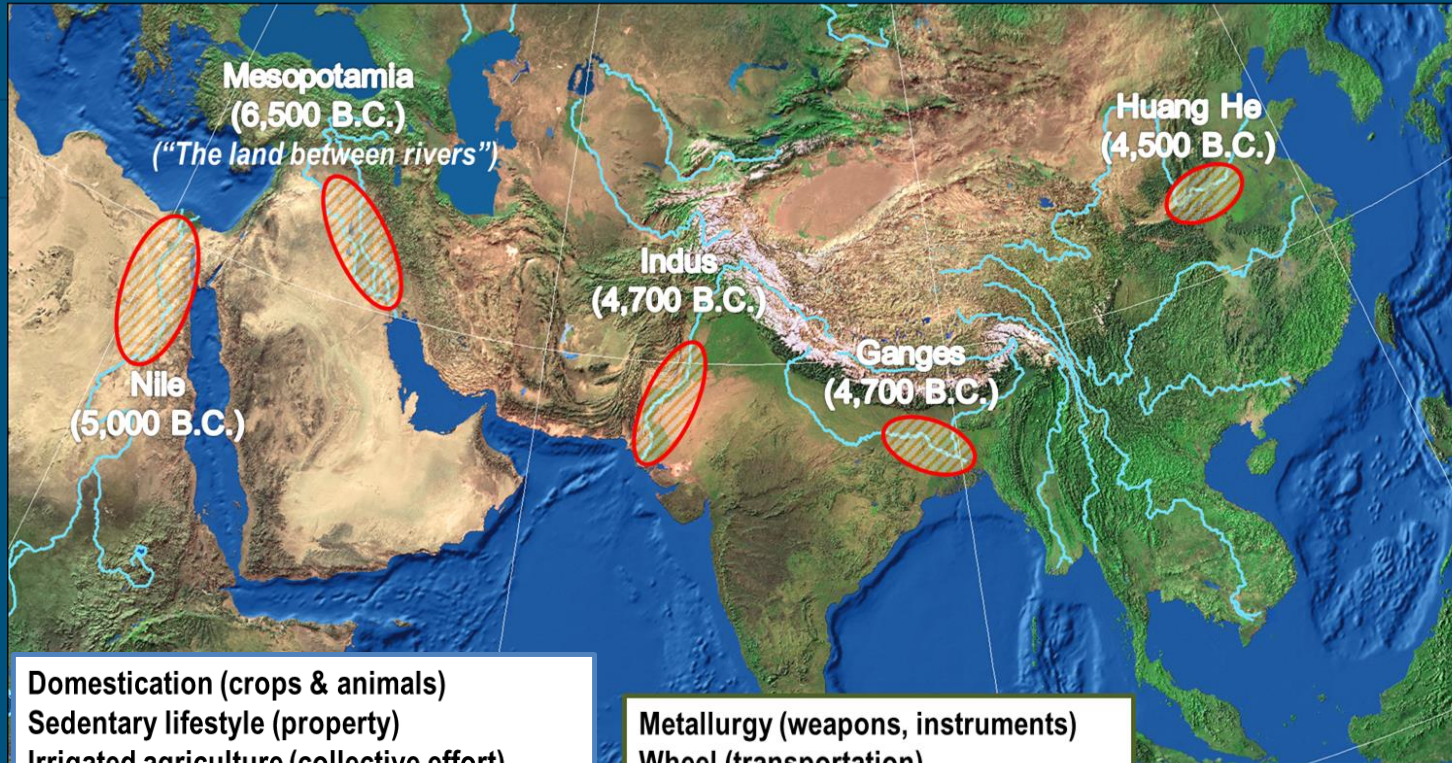
Economic resources

Derived from human activities.

Geographical resources

Derived by spatial characteristics.

The Agricultural Revolution (Neolithic Revolution), 10,000 BC



Domestication (crops & animals)
Sedentary lifestyle (property)
Irrigated agriculture (collective effort)
Agricultural surpluses (specialization)
Governments (states / stratification)

Metallurgy (weapons, instruments)
Wheel (transportation)
Pottery (storage)
Writing and numbers (taxation)

World's population (5-10 million mostly nomadic)

Agricultural Revolution

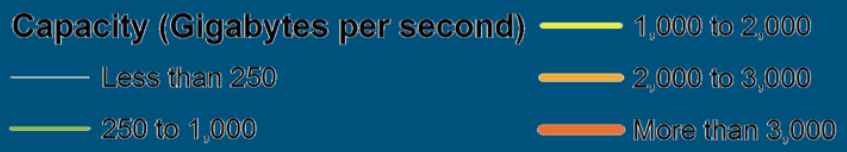
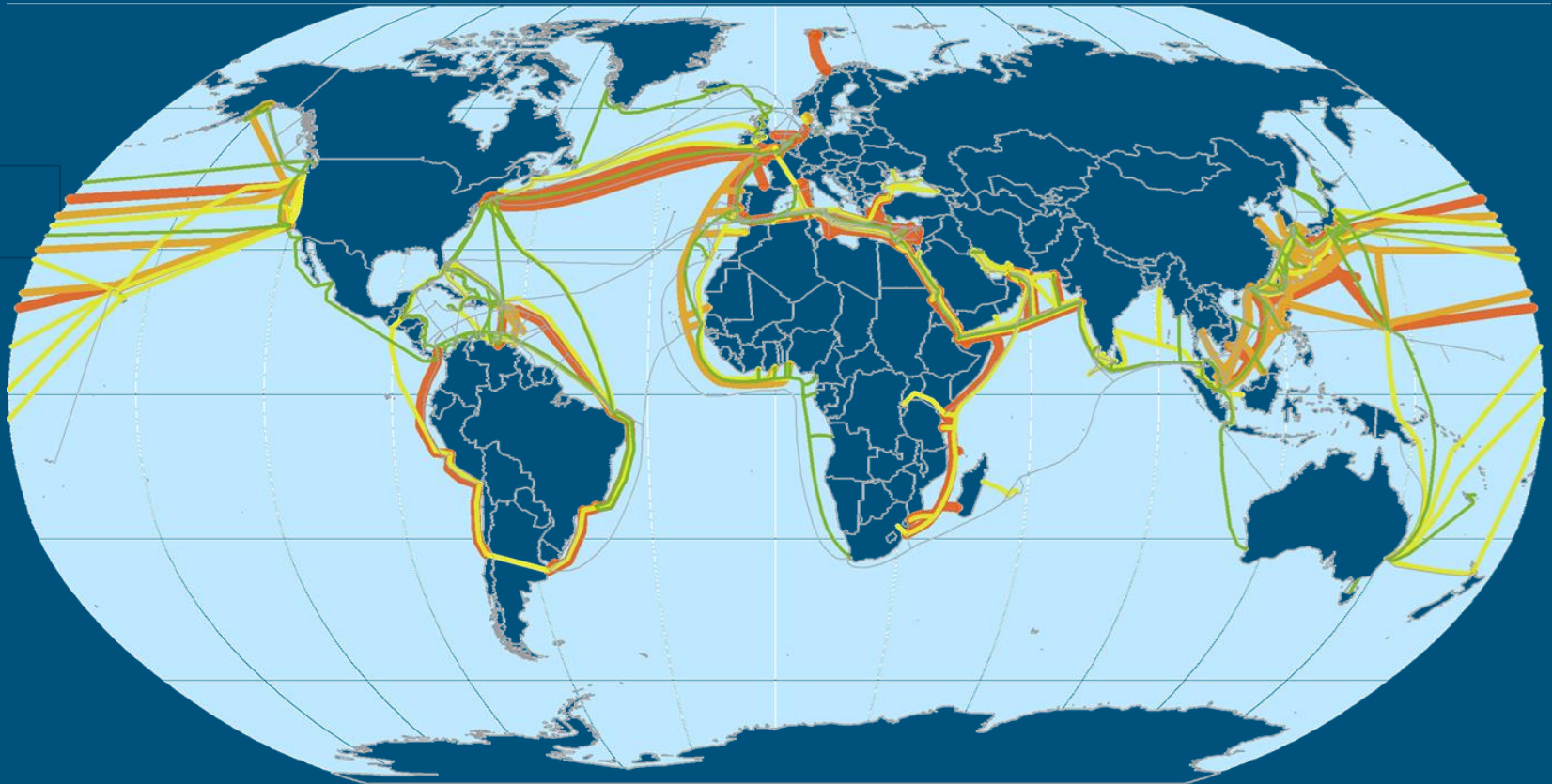
12,000 years

Industrial Revolution

200 years


Post-Industrial Revolution

- ◆ Agricultural Revolution
 - Feudal society.
 - Wealth from agriculture and land ownership.
 - Slow demographic growth.
- ◆ Industrial Revolution
 - Wage labor society.
 - Wealth from industry and capital ownership.
 - Fast demographic growth.
- ◆ Post-Industrial Revolution
 - Information society.
 - Wealth from technological development.
 - Slow demographic growth.

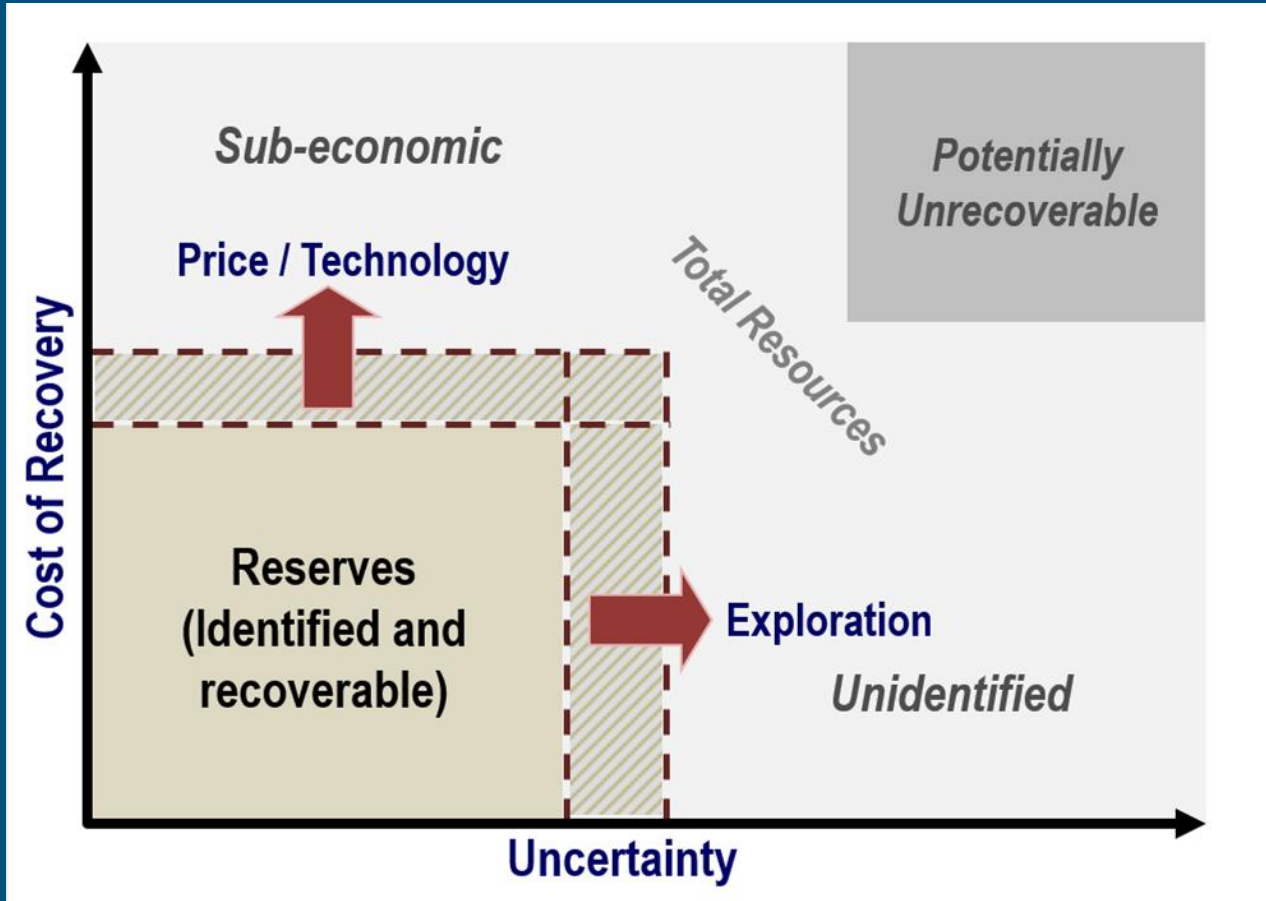


Resources and Reserves

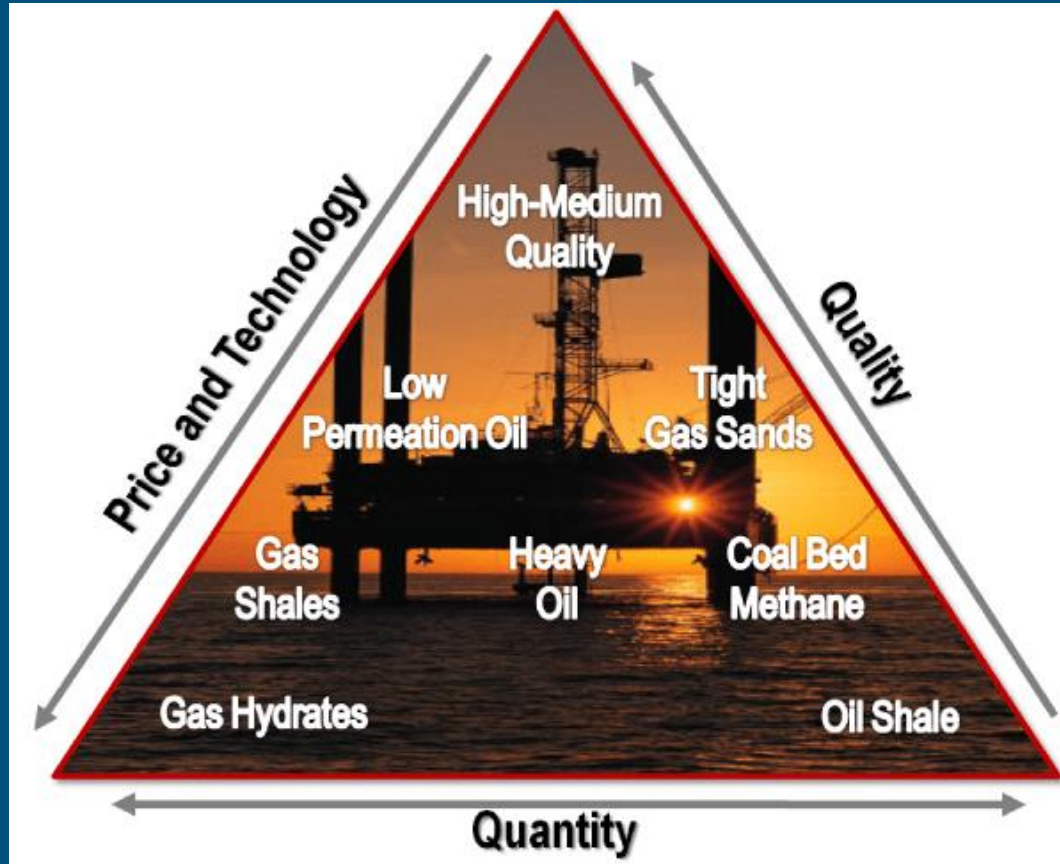
Economic	Human resources	Population and level of qualification. Commonly referred as the workforce.
	Capital (money)	"Portable resource". Measure the amount of resources available to an economy.
Geographical	Location	Grants access to markets and resources. Derive wealth acting as intermediary places (Panama, Singapore, Hong Kong, the Netherlands).
	Endowments	Scenery, mountains, beaches and coral reefs. Resources when tourism is involved.
Natural	Biological resources	Used to sustain life. Can be converted. Soil, water, and forestry resources.
	Mineral resources	Fossil fuels (coal, natural gas, oil), metallic minerals (iron, aluminum, copper) and non-metallic minerals (Nitrogen, calcium, potash, sulfur, salt, sand).



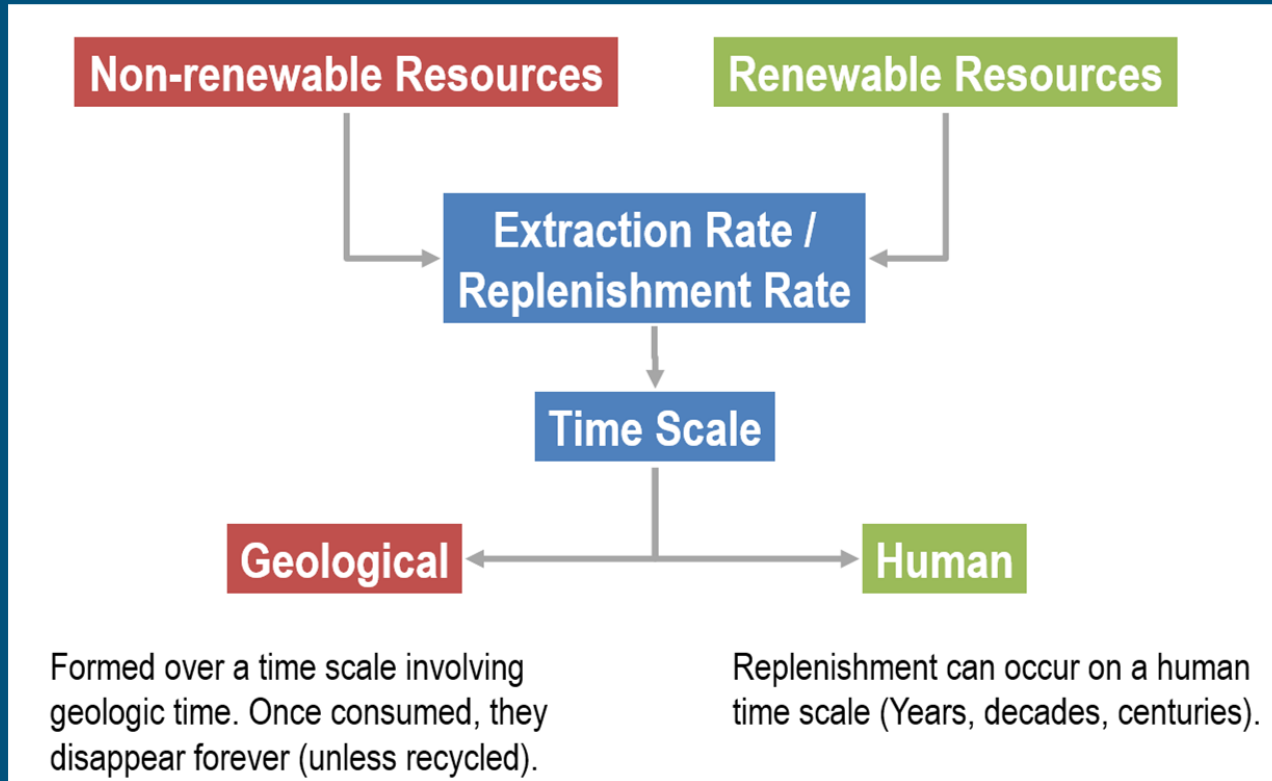
Reserves and Total Resources



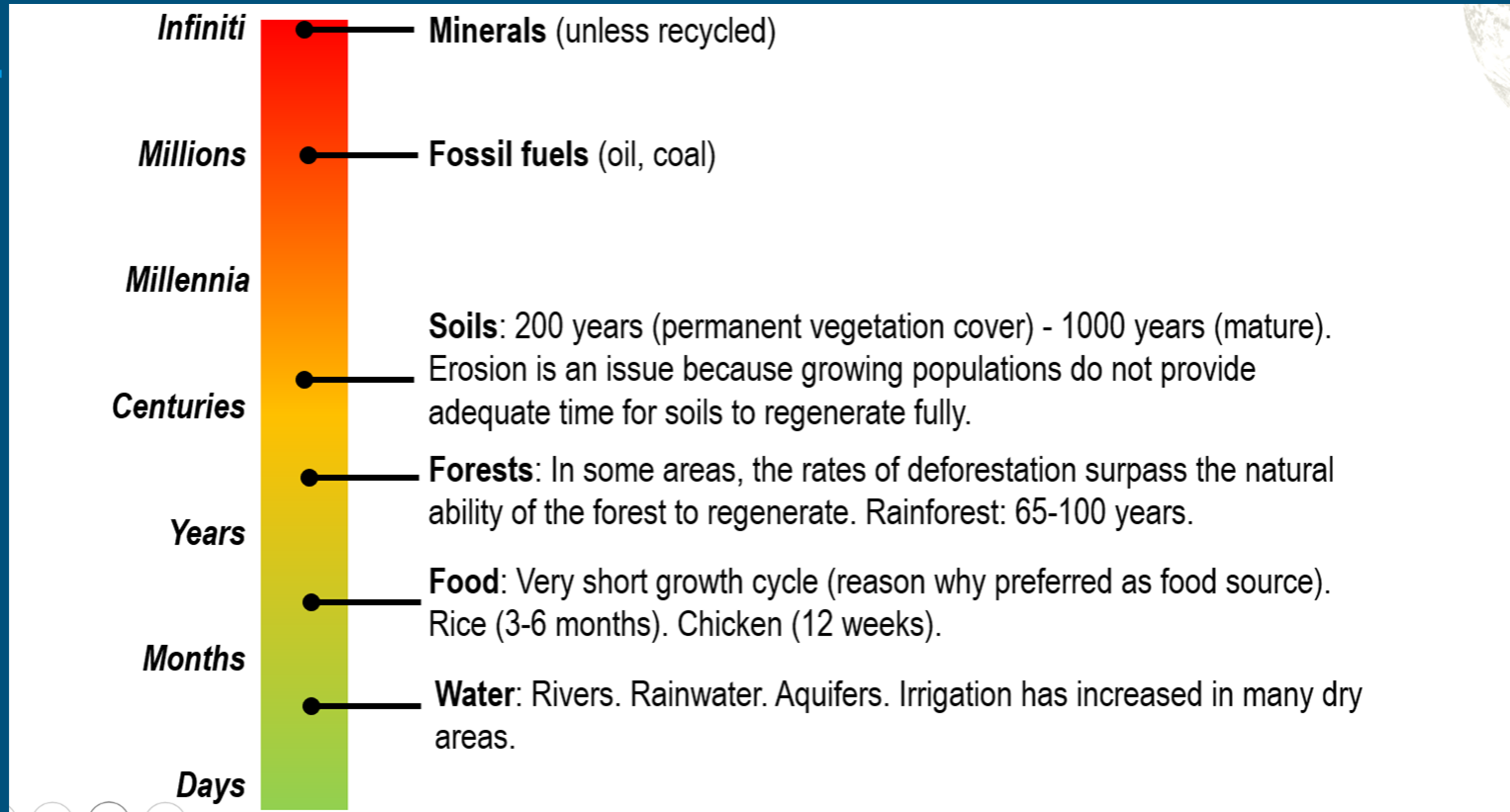
Types of Oil and Gas Reserves



The Renewable / Non-renewable Dichotomy

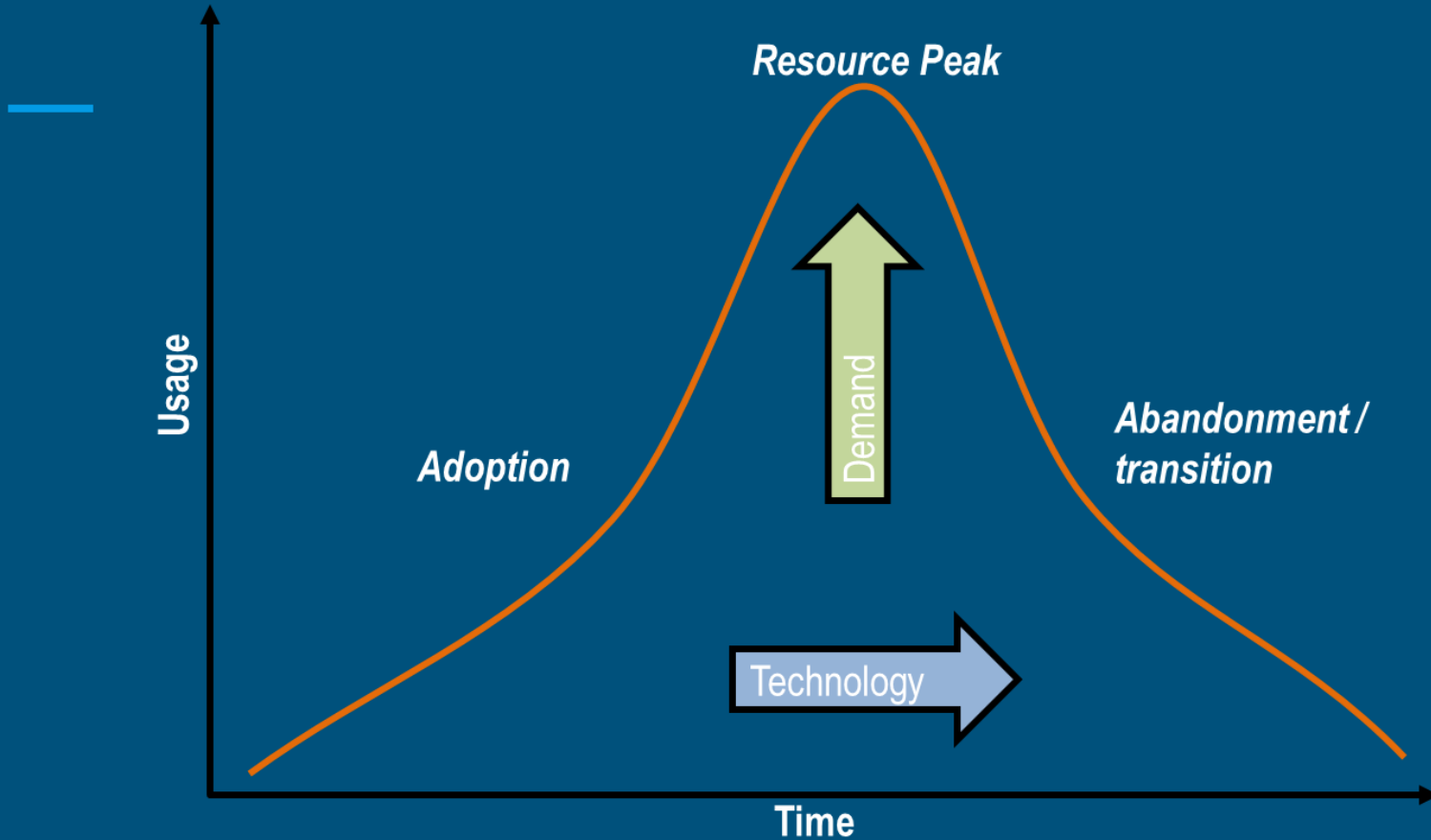


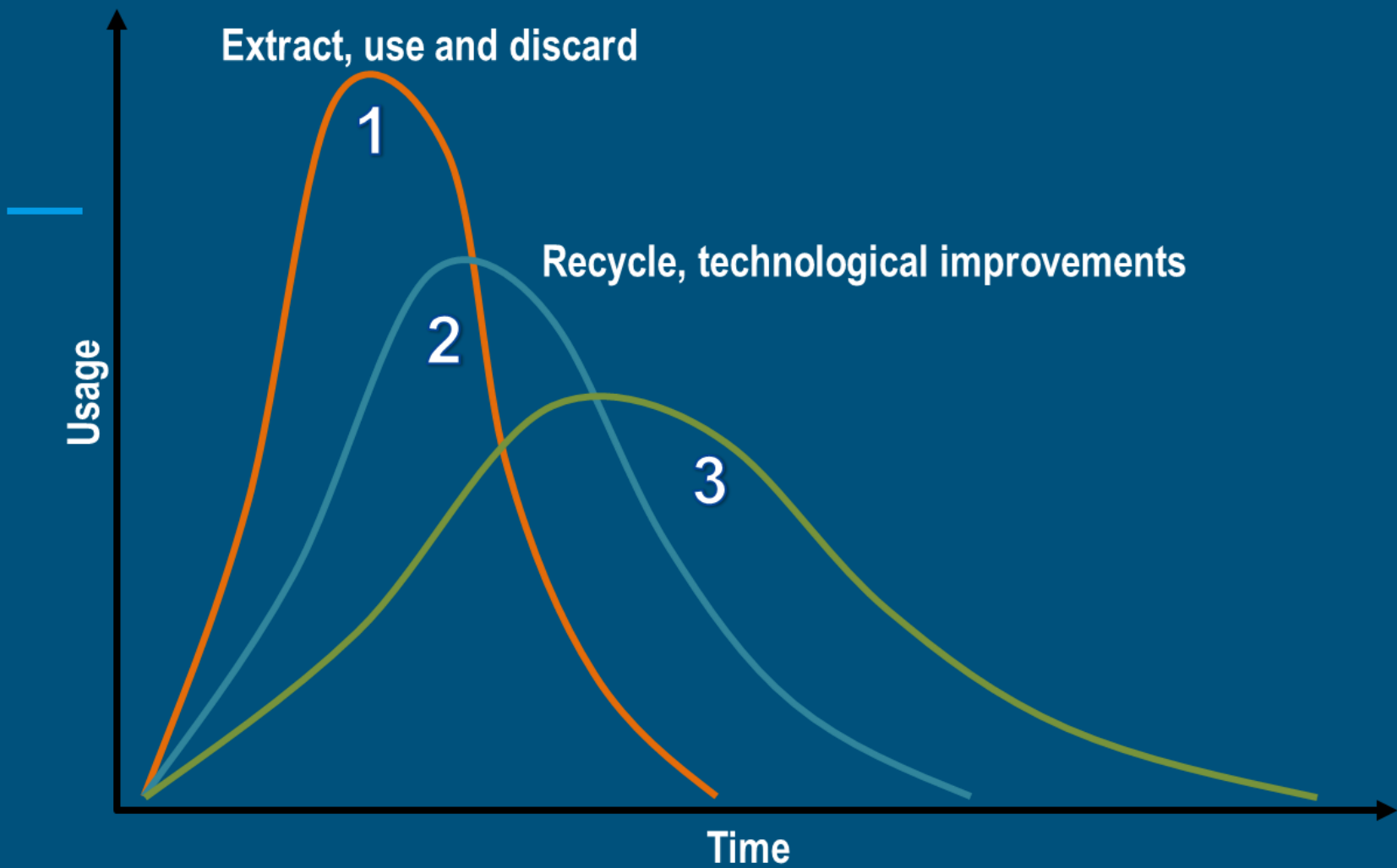
The Renewable / Non-renewable Dichotomy



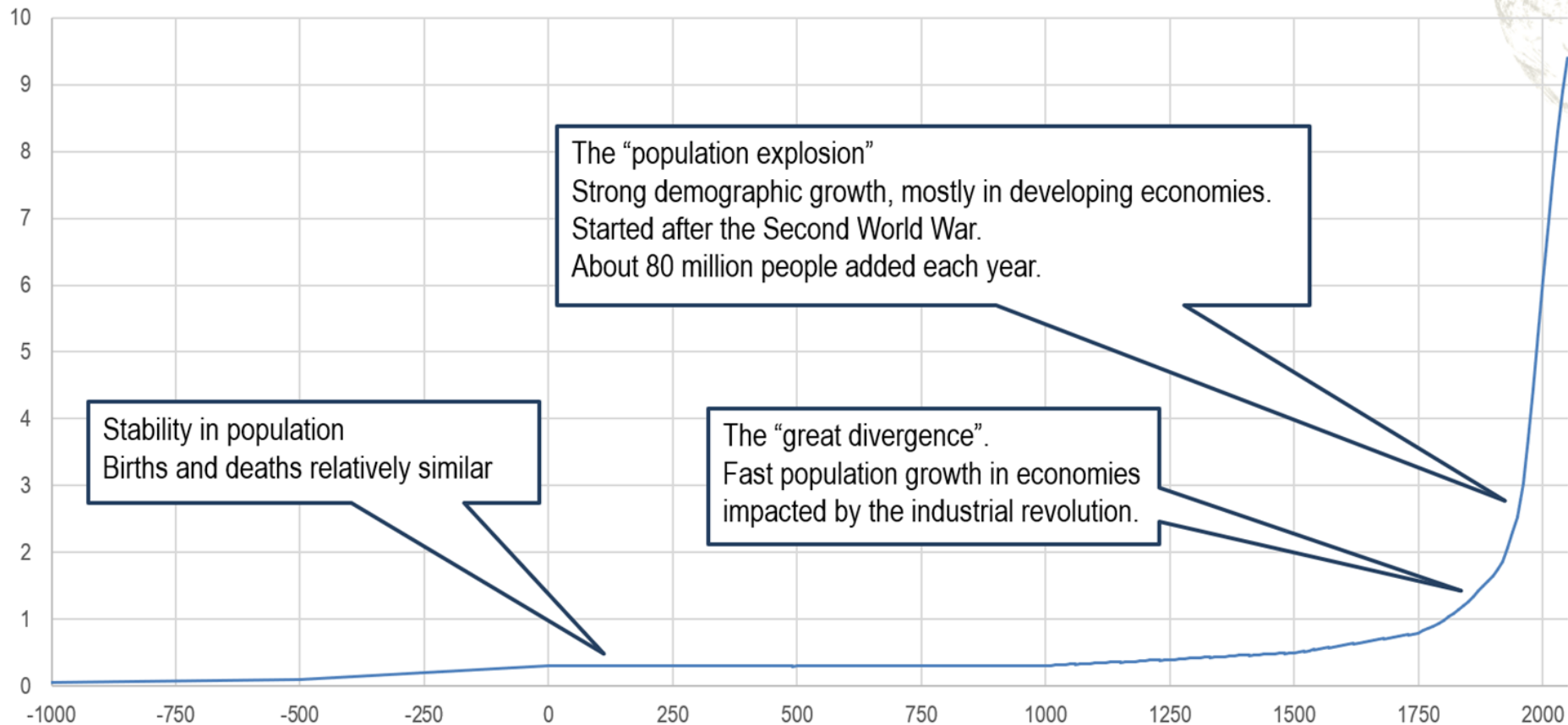
CHARACTERISTIC	OIL	WATER
Quantity of resource	Finite	Literally finite; but practically unlimited at a cost
Renewable or Non-Renewable	Non-renewable resource	Renewable overall, but with locally non-renewable stocks
Flow	Only as withdrawals from fixed stocks	Water cycle renews natural flows
Transportability	Long-distance transport is economically viable	Long distance transport is not economically viable
Consumptive versus non-consumptive use	Almost all use of petroleum is consumptive, converting high-quality fuel into lower quality heat	Some uses of water are consumptive, but many are not. Overall, water is not "consumed" from the hydro-logic cycle
Substitutability	The energy provided by the combustion of oil can be provided by a wide range of alternatives	Water has no substitute for a wide range of functions and purposes
Prospects	Alternative oil sources of oil being tapped (tar sands and shale oil); substitution inevitable by a backstop renewable source	Locally limited, but globally unlimited after backstop source (e.g. desalination of oceans) is economically and environmentally developed

Non-Renewable Resources Curve

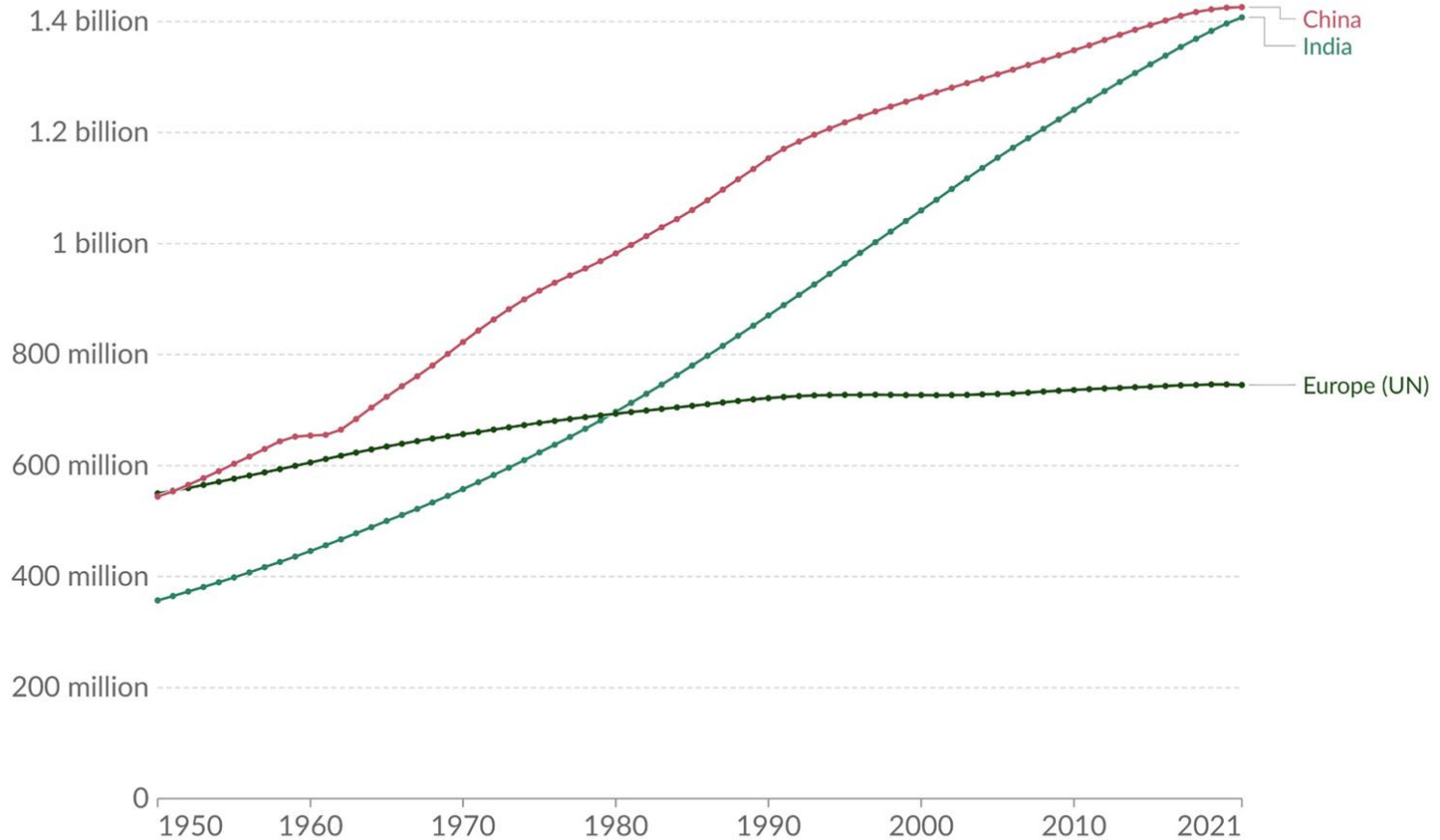




World Population, 1000BC-2050AD (in billions)



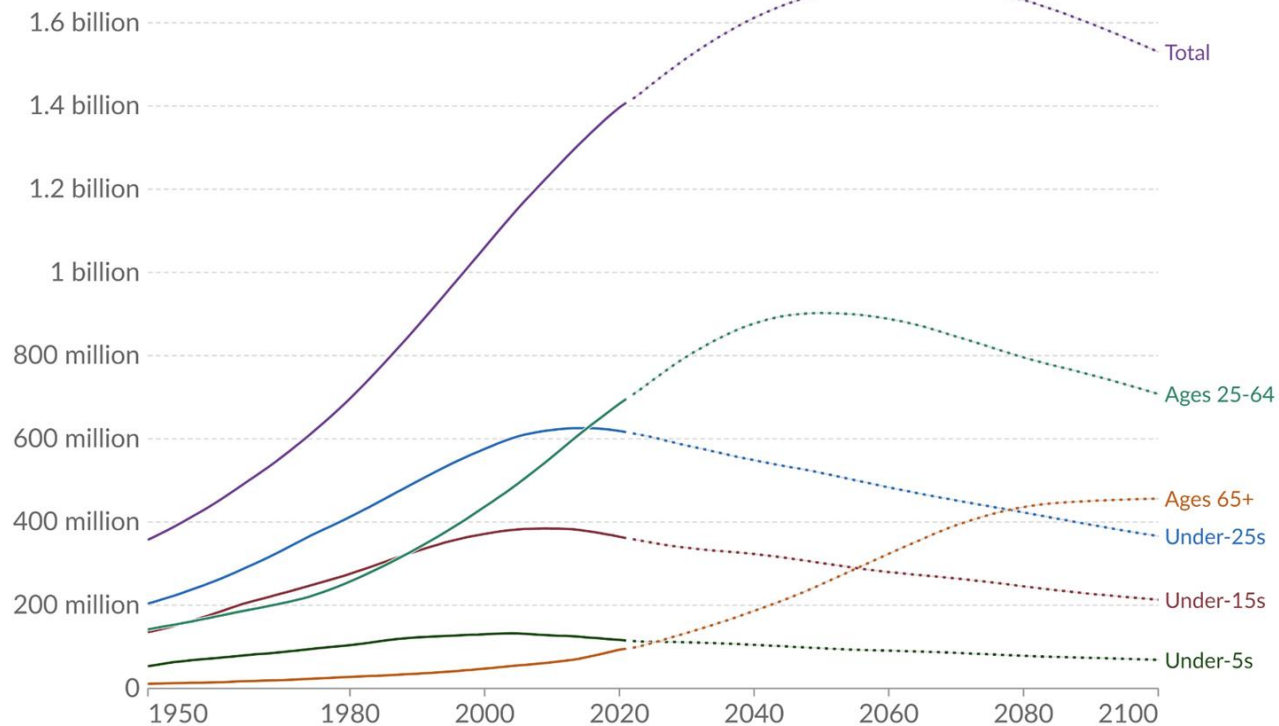
Population, 1950 to 2021



Data source: United Nations, World Population Prospects (2022)

Population by age group, India

Historic estimates from 1950 to 2021, and projected to 2100 based on the UN medium-fertility scenario¹.



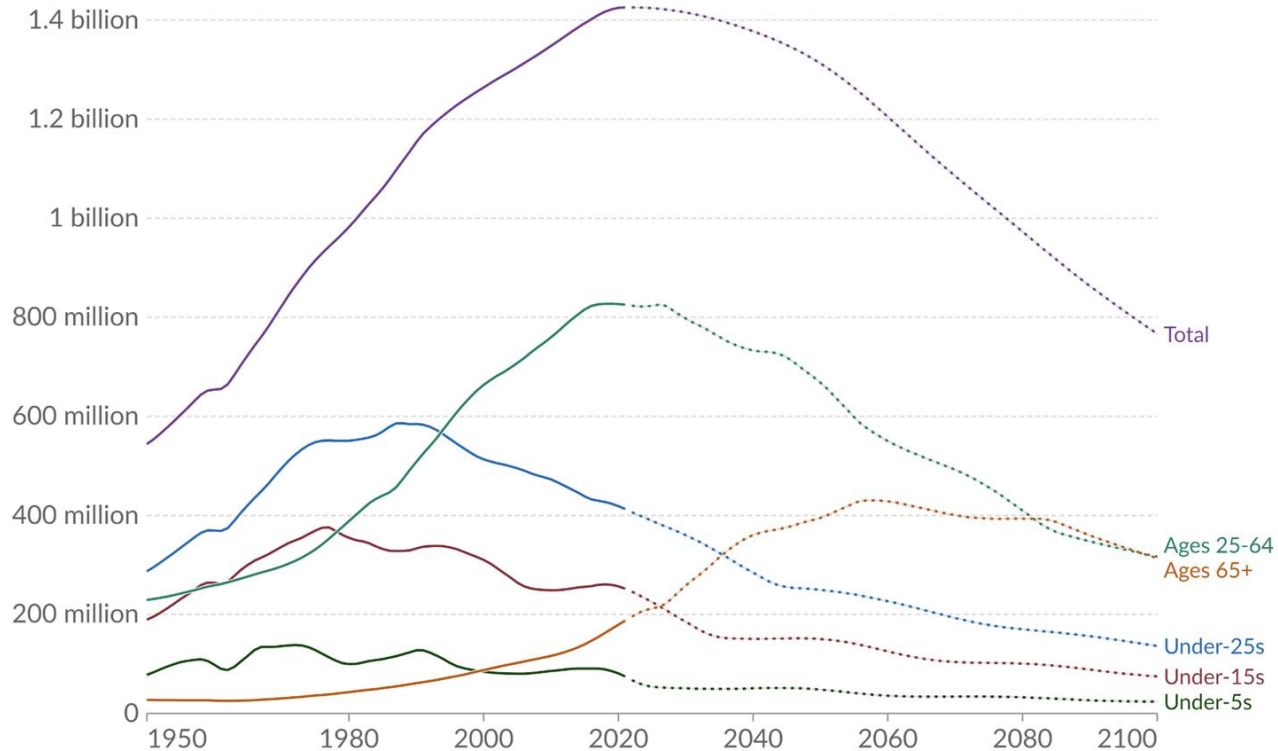
Data source: United Nations, World Population Prospects (2022)

OurWorldInData.org/population-growth | CC BY

1. **UN projection scenarios:** The UN's World Population Prospects provides a range of projected scenarios of population change. These rely on different assumptions in fertility, mortality and/or migration patterns to explore different demographic futures. [Read more: Definition of Projection Scenarios \(UN\)](#)

Population by age group, China

Historic estimates from 1950 to 2021, and projected to 2100 based on the UN medium-fertility scenario¹.



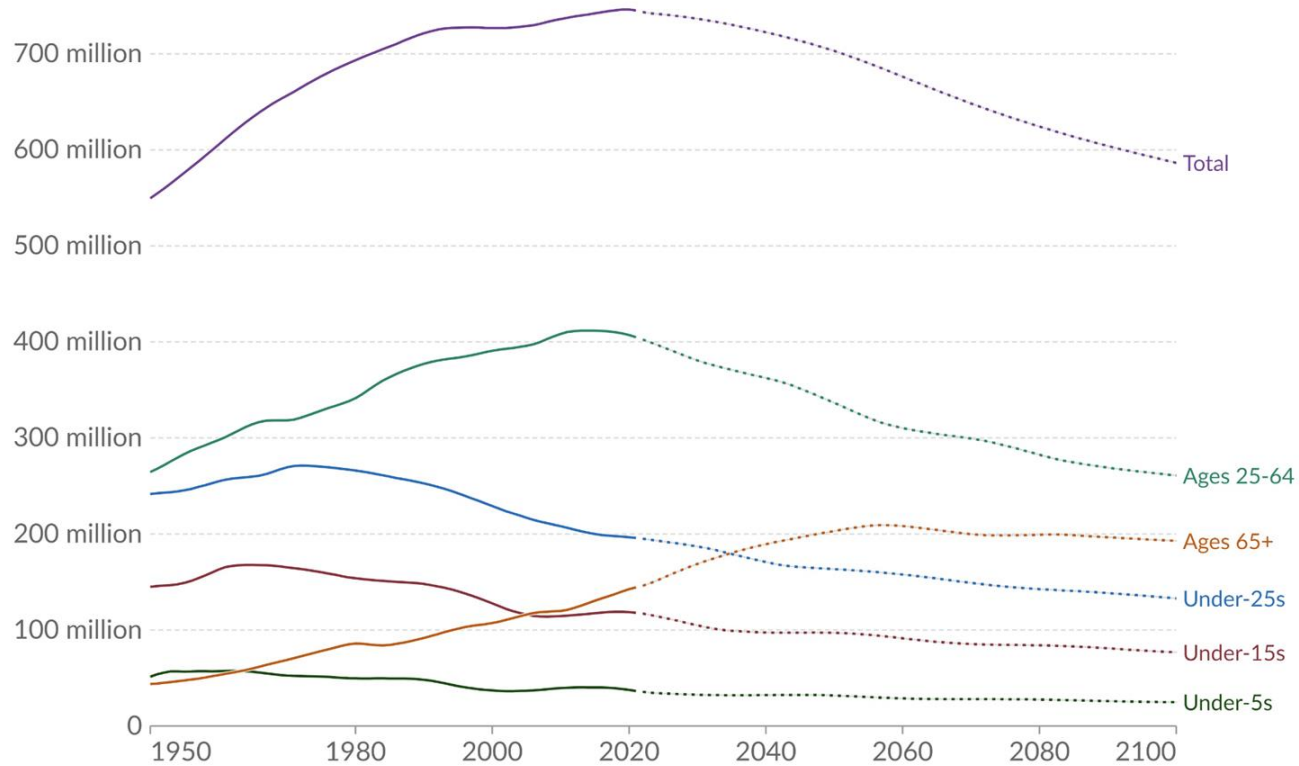
Data source: United Nations, World Population Prospects (2022)

OurWorldInData.org/population-growth | CC BY

1. **UN projection scenarios:** The UN's World Population Prospects provides a range of projected scenarios of population change. These rely on different assumptions in fertility, mortality and/or migration patterns to explore different demographic futures. [Read more: Definition of Projection Scenarios \(UN\)](#)

Population by age group, Europe (UN)

Historic estimates from 1950 to 2021, and projected to 2100 based on the UN medium-fertility scenario¹.



Data source: United Nations, World Population Prospects (2022)

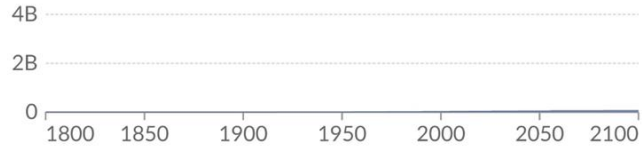
OurWorldInData.org/population-growth | CC BY

1. **UN projection scenarios:** The UN's World Population Prospects provides a range of projected scenarios of population change. These rely on different assumptions in fertility, mortality and/or migration patterns to explore different demographic futures. [Read more: Definition of Projection Scenarios \(UN\)](#)

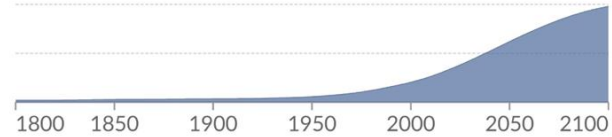
Population by world region

Historic estimates with future projections based on the UN medium-fertility scenario¹.

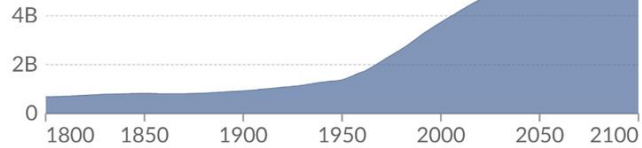
Oceania



Africa



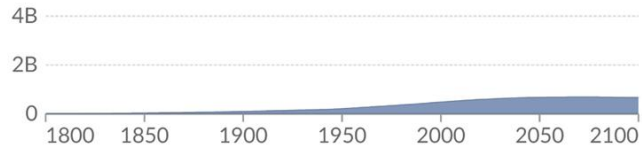
Asia



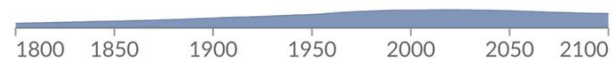
South America



North America



Europe



Data source: HYDE (2017); Gapminder (2023); UN (2022)

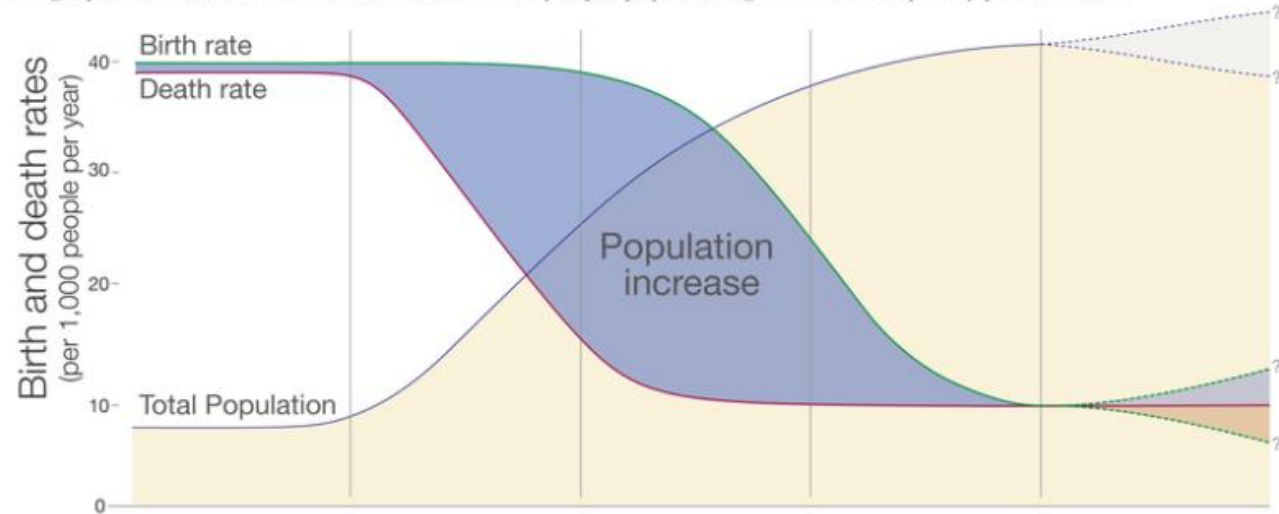
Note: Historical country data is shown based on today's geographical borders.

OurWorldInData.org/population-growth | CC BY

1. **UN projection scenarios:** The UN's World Population Prospects provides a range of projected scenarios of population change. These rely on different assumptions in fertility, mortality and/or migration patterns to explore different demographic futures. [Read more: Definition of Projection Scenarios \(UN\)](#)

The five stages of the demographic transition

The demographic transition is a model that describes why rapid population growth is a temporary phenomenon.



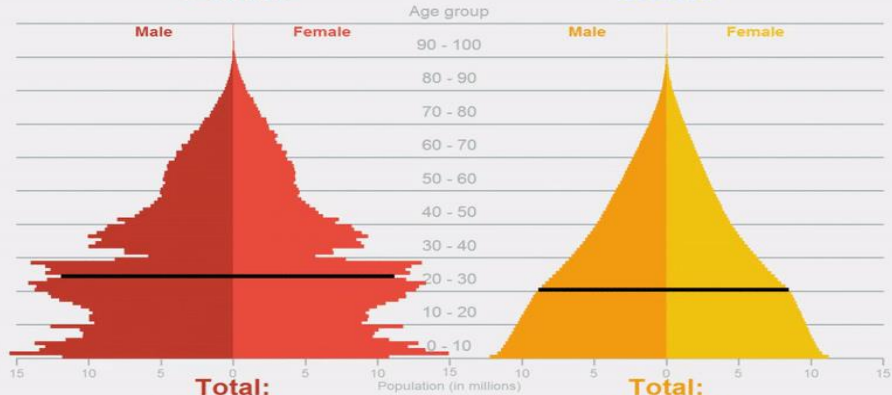
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Birth rate	High	High	Falling	Low	Yet to be seen possibly falling further, possibly rising again
Death rate	High	Falling rapidly	Falling slowly	Low	Low
Population change	Stable or slowly increasing	Rapidly increasing	Increase slows down	Falling and then stable	Little change
Population pyramid					
	Men Women	Men Women	Men Women	Men Women	Men Women

Population projection

1991

China

India



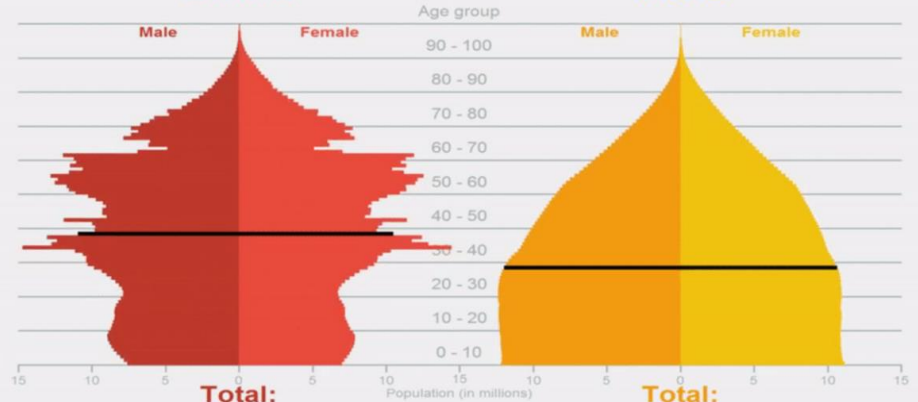
Data source: US Census Bureau IDB
Visualization by @aronstrandberg

Population projection

2024

China

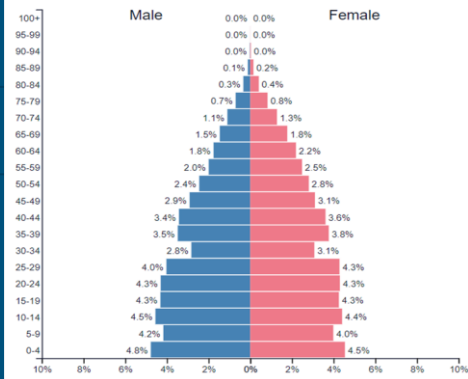
India



Data source: US Census Bureau IDB
Visualization by @aronstrandberg

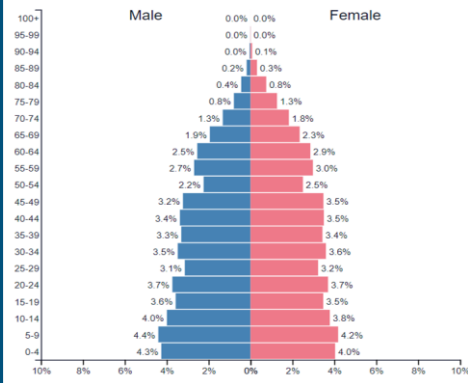
Italy ▼
1951

Population: 46,750,760



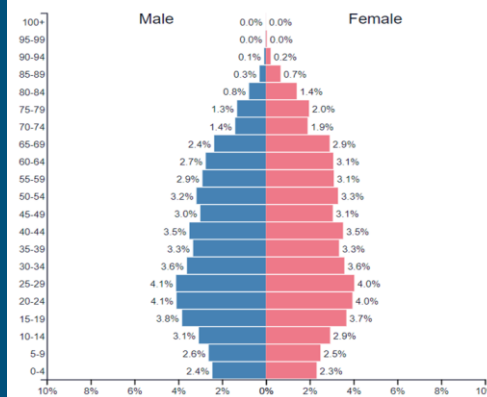
Italy ▼
1971

Population: 53,636,098



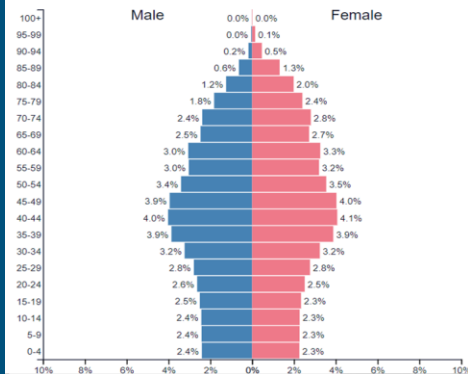
Italy ▼
1991

Population: 56,794,488



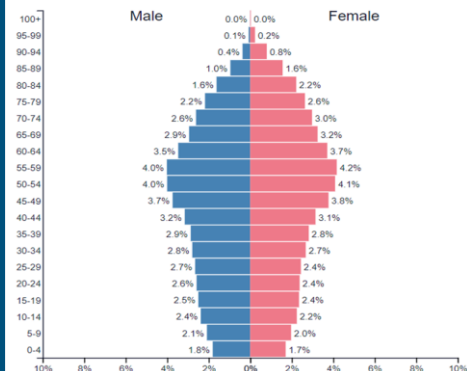
Italy ▼
2011

Population: 60,025,951



Italy ▼
2023

Population: 58,870,762

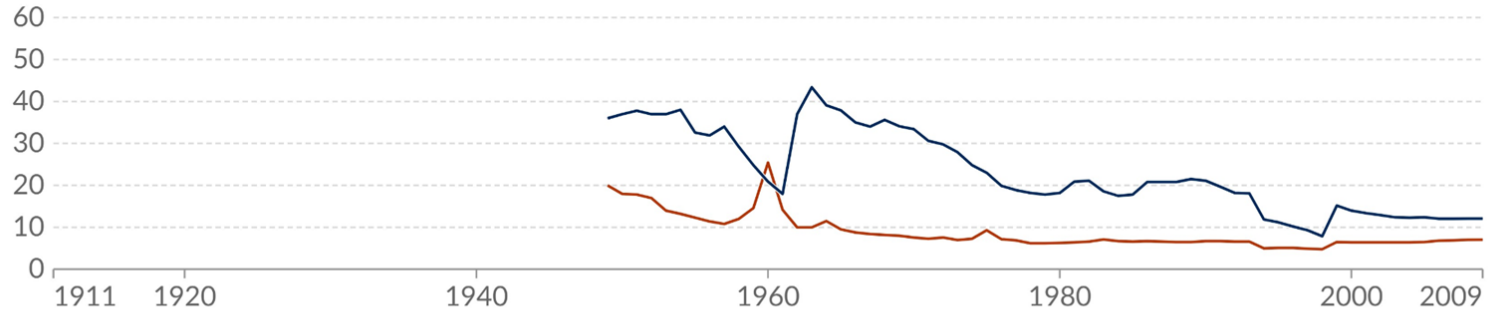


The demographic transition, 1911 to 2009

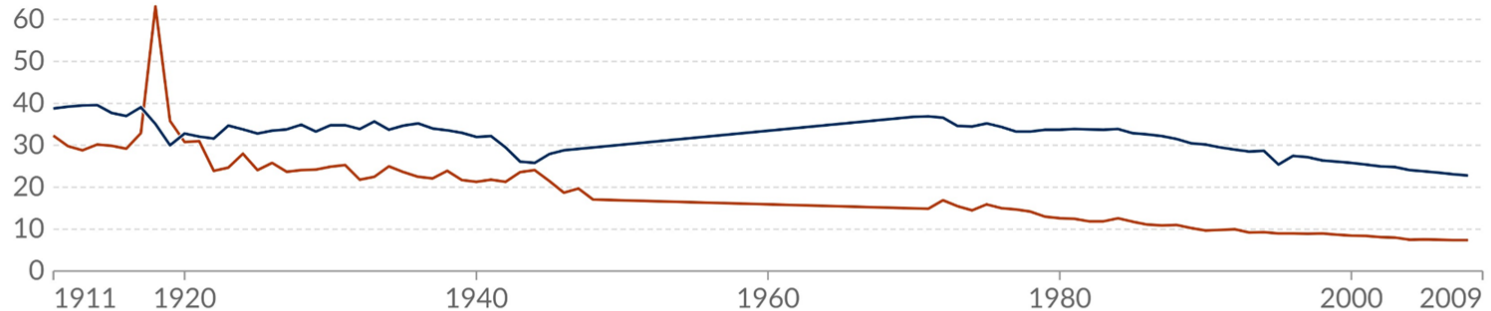
Birth and death rates are expressed per 1,000 of the population.

■ Crude birth rate ■ Crude death rate

China

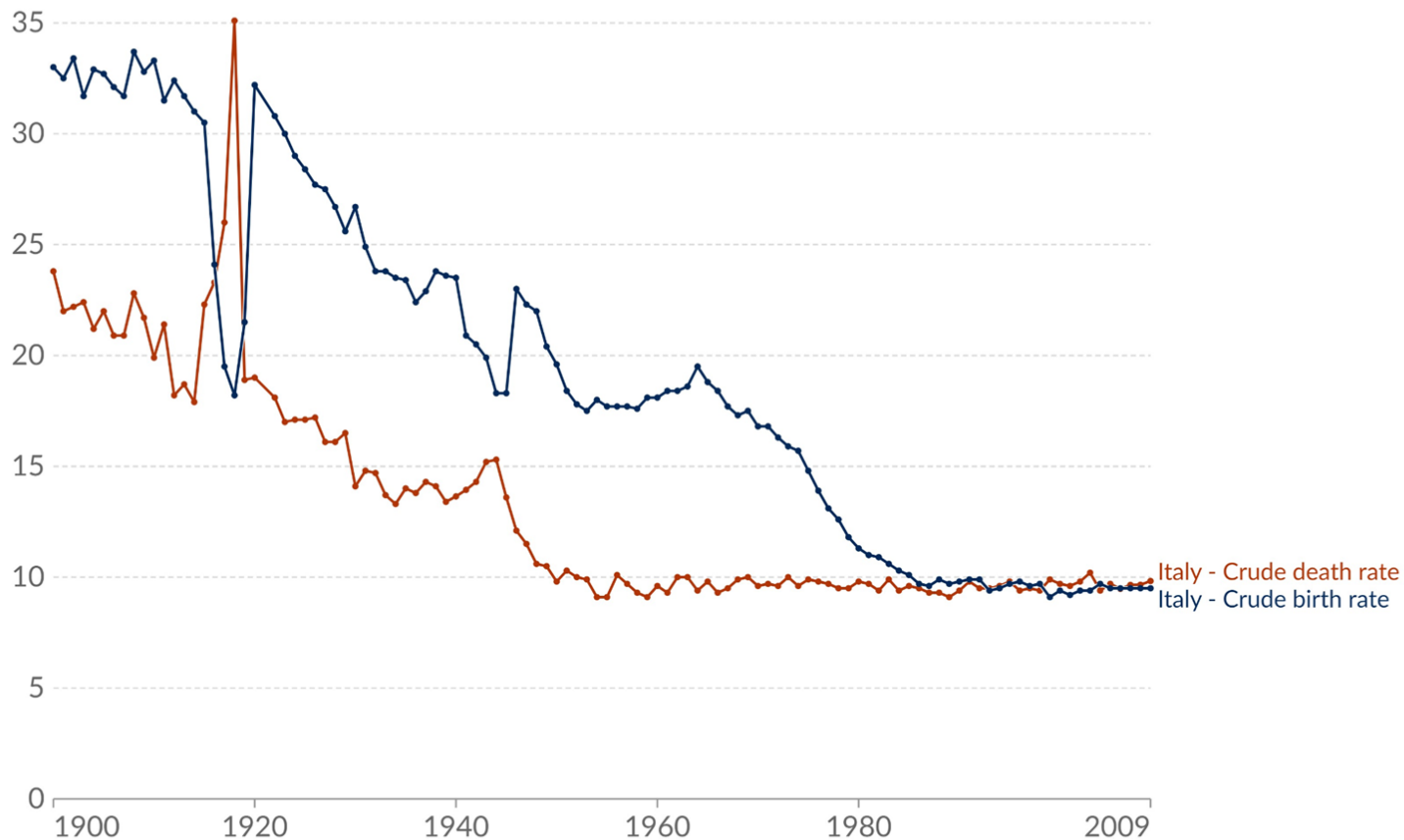


India



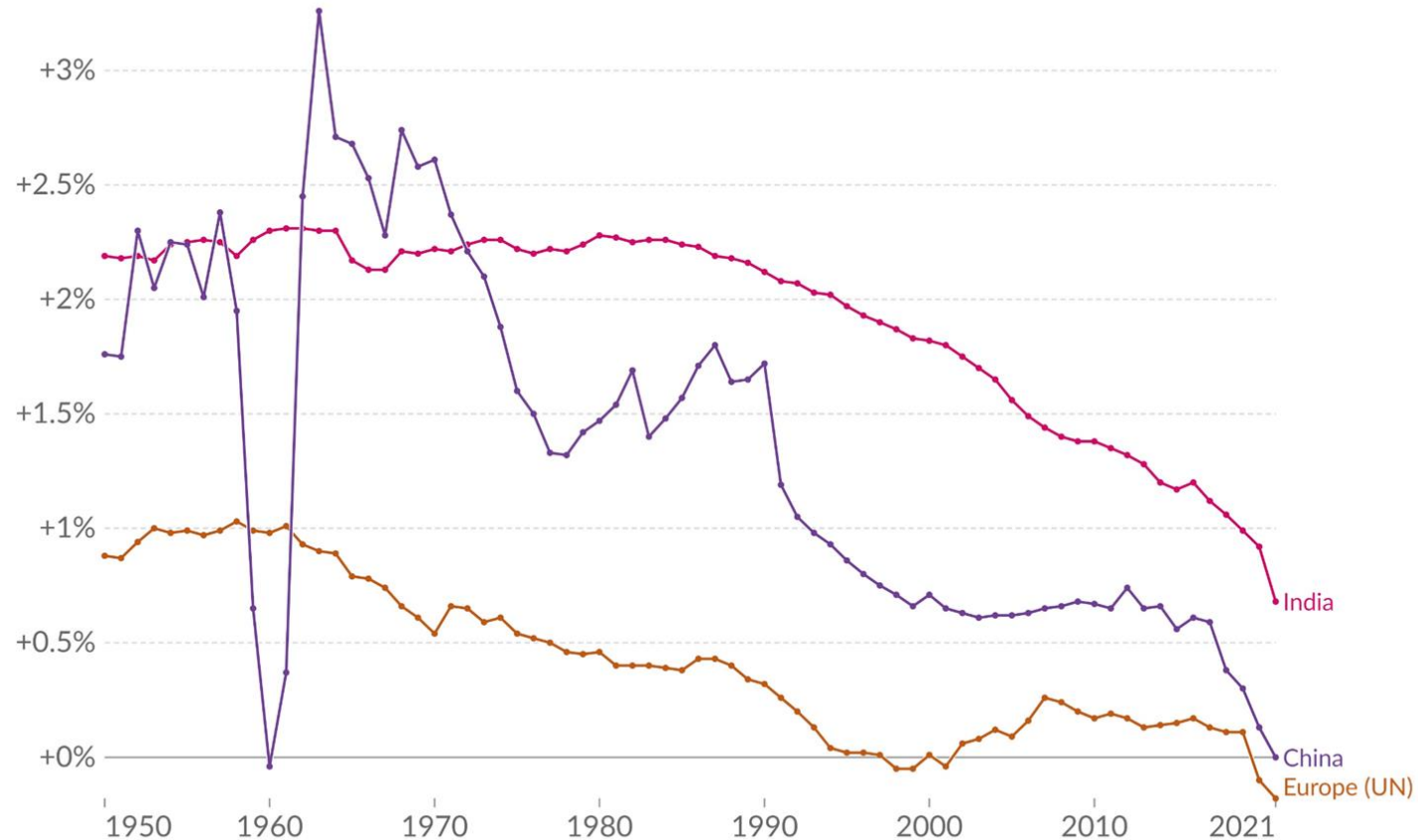
The demographic transition, Italy, 1900 to 2009

Birth and death rates are expressed per 1,000 of the population.



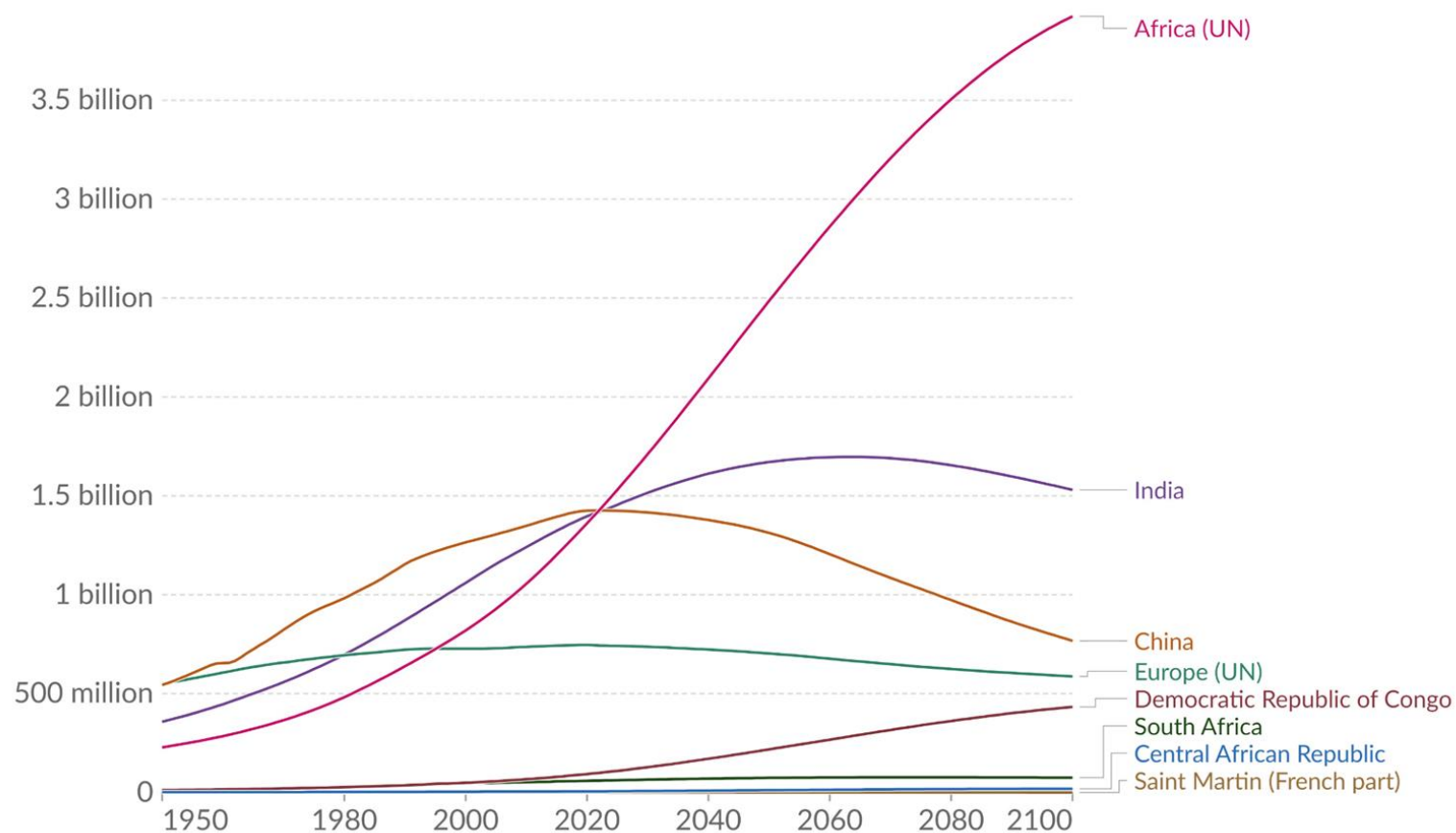
Population growth rate, 1950 to 2021

The growth rate is the population change determined by births, deaths, and migration flows.



Population, 1950 to 2100

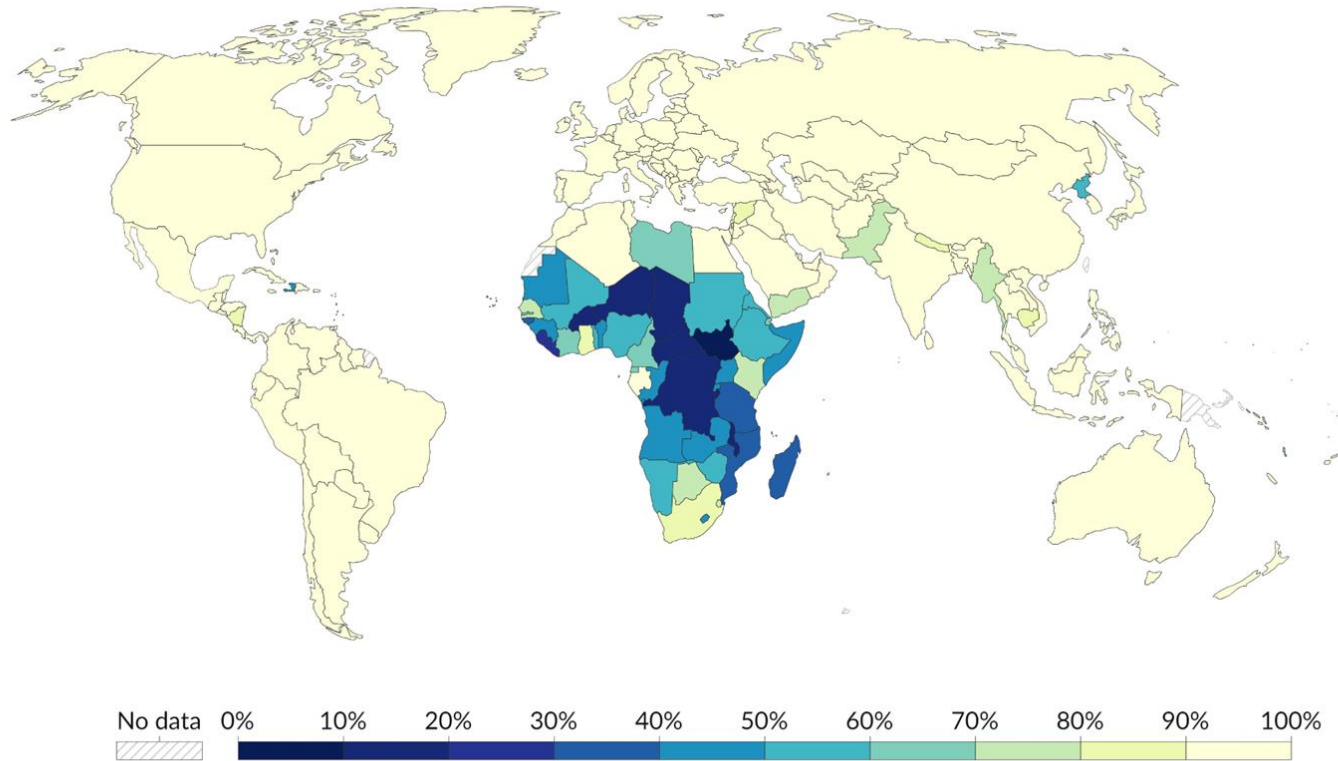
Projections from 2022 onwards are based on the UN's medium-fertility scenario.



Data source: United Nations, World Population Prospects (2022)

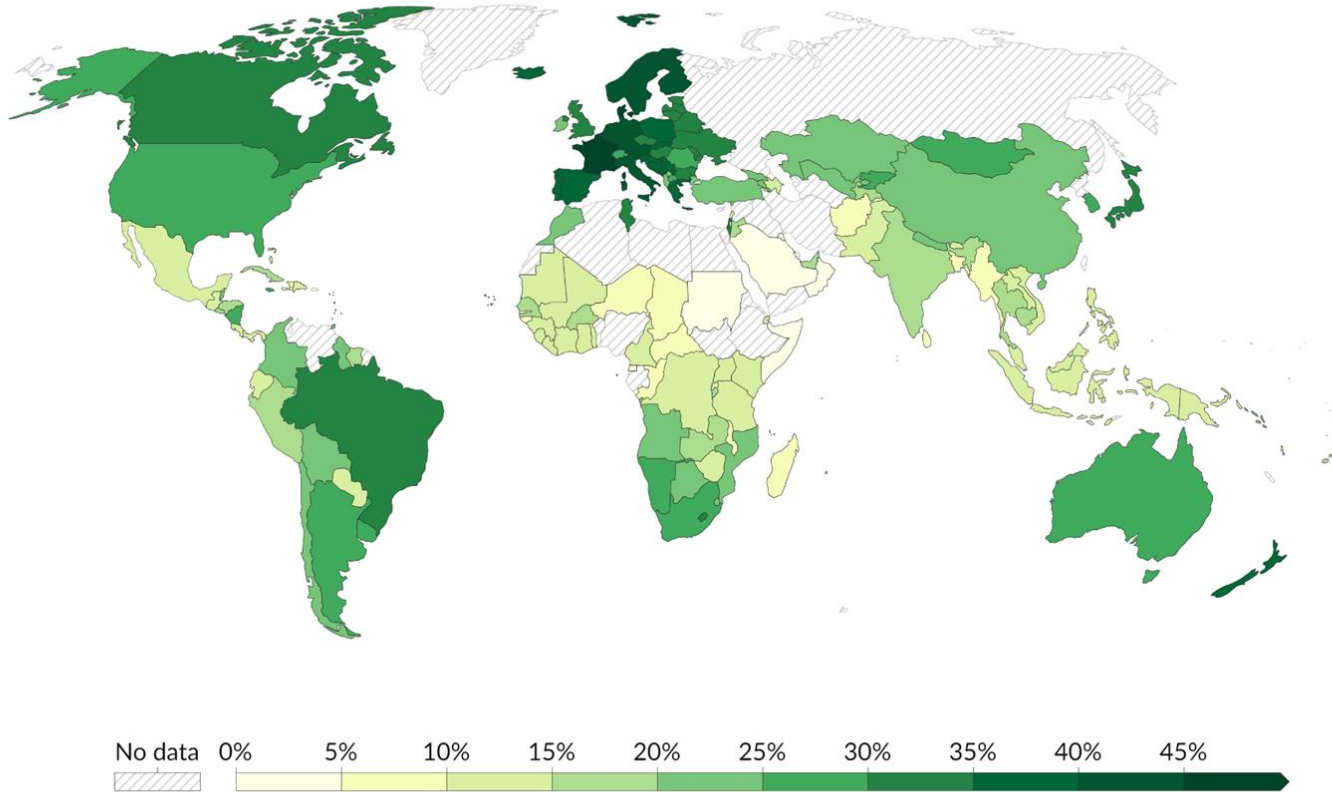
Electricity access, 2020

Share of the population with access to electricity. The definition used in international statistics adopts a very low cutoff for what it means to 'have access to electricity'. It is defined as having an electricity source that can provide very basic lighting, and charge a phone or power a radio for 4 hours per day.



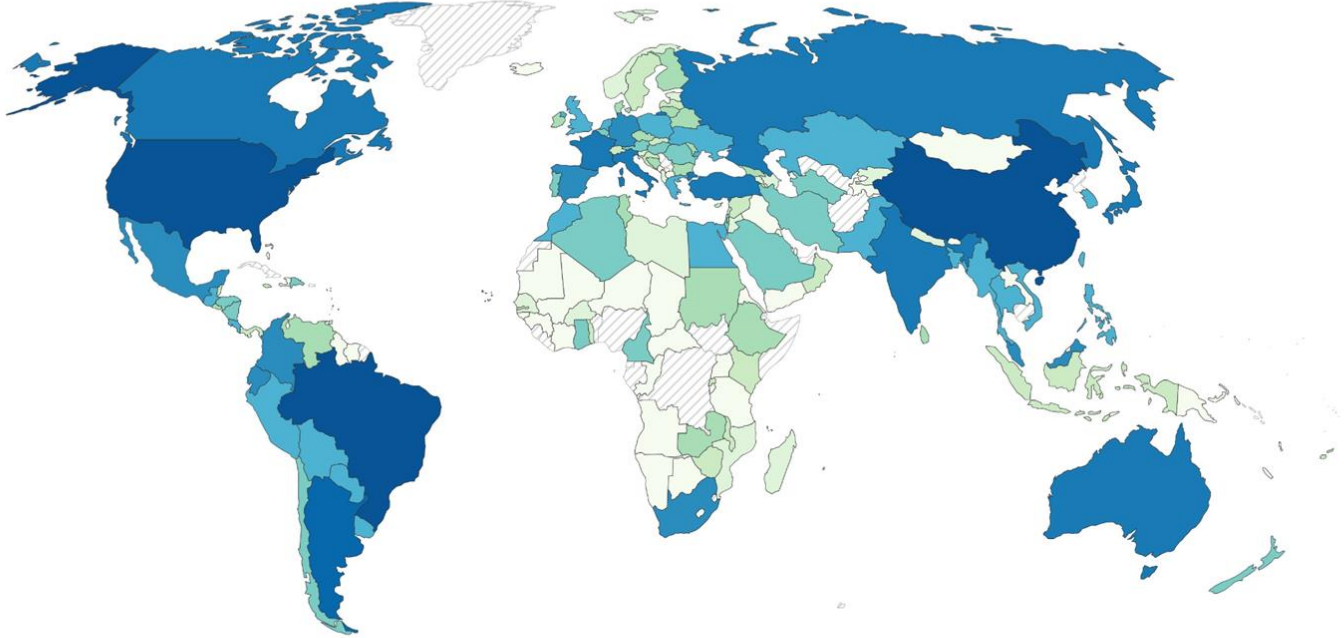
Tax revenues as a share of GDP, 2022

Direct and indirect taxes as well as social contributions included.



Pesticide use, 2020

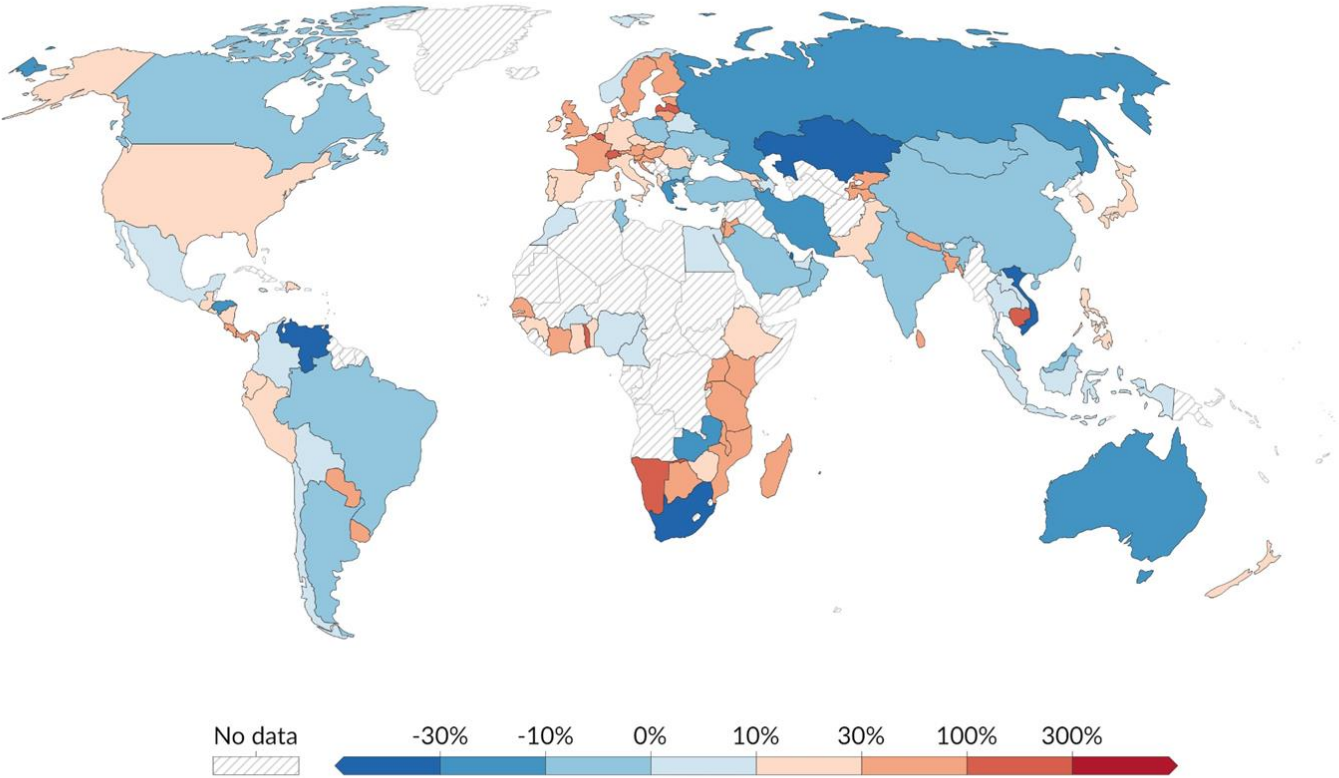
Total pesticide use measured in tonnes of pesticide consumption per year.



Data source: Food and Agriculture Organization of the United Nations

Share of CO₂ emissions embedded in trade, 2021

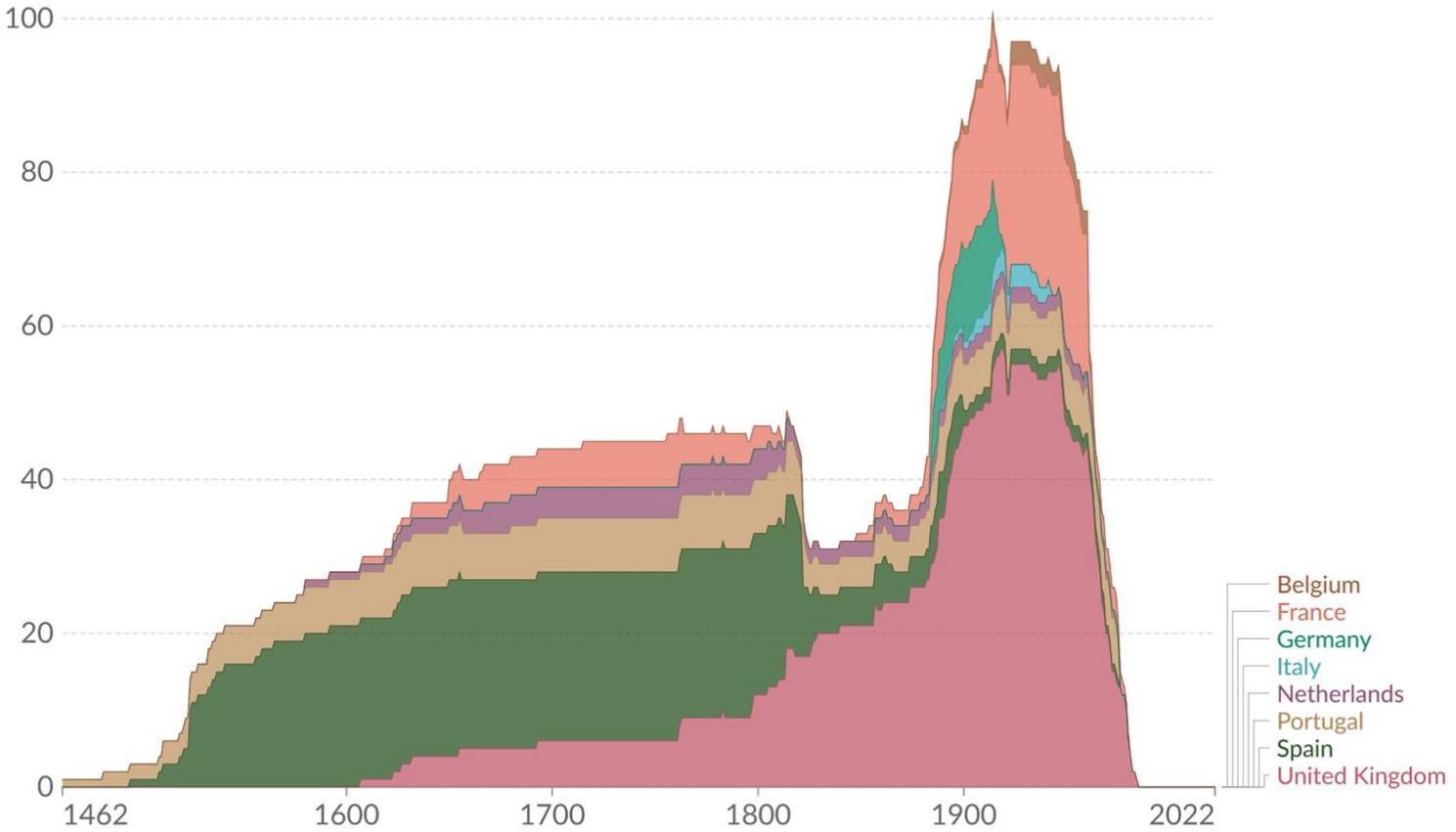
Exported or imported emissions as a percentage of domestic production emissions. Positive values (red) represent net importers of CO₂. Negative values (blue) represent net exporters of CO₂.



Data source: Global Carbon Budget (2023)

European overseas colonies by colonizer

Only countries that are independent today are considered.



Total population

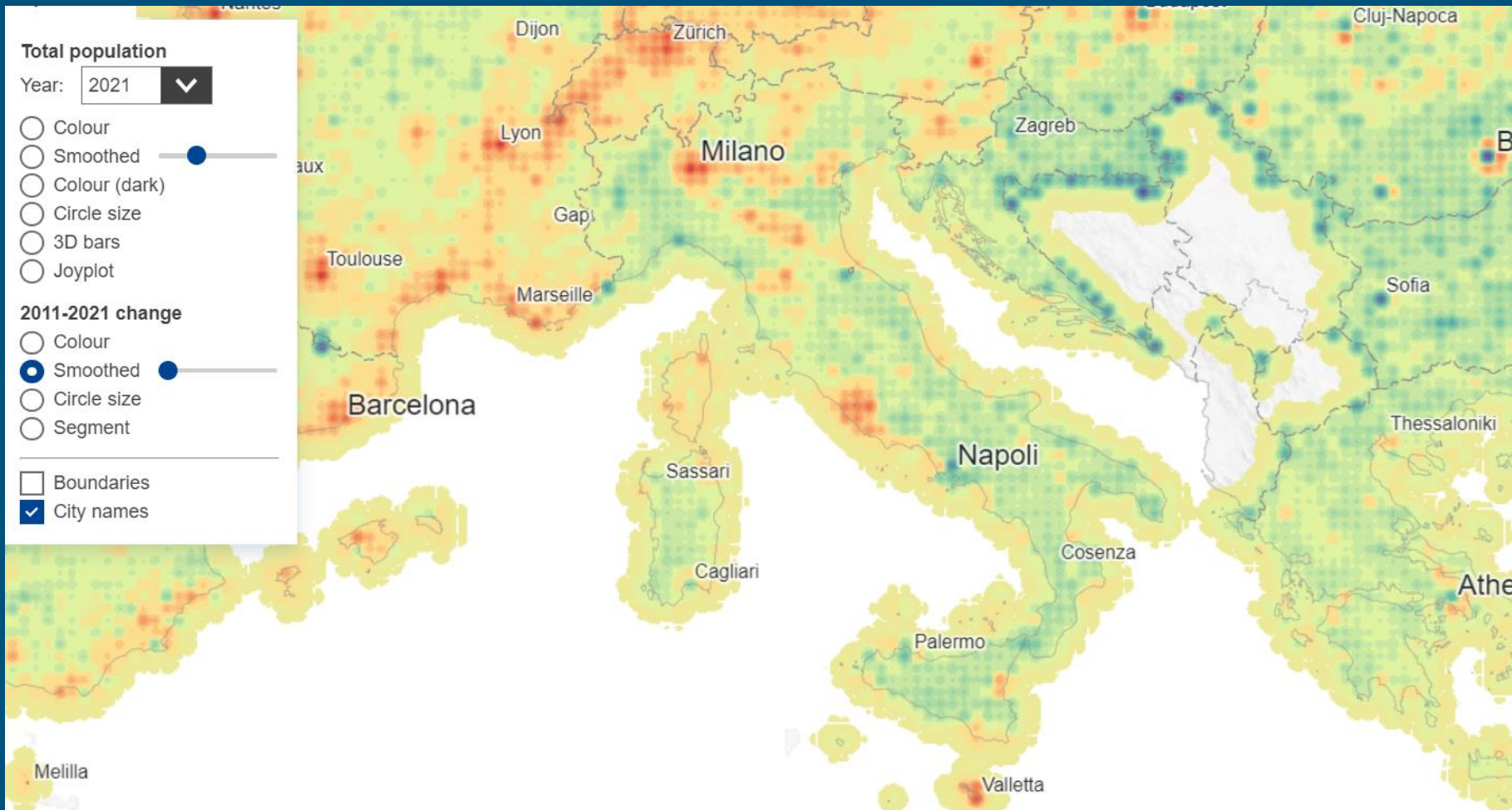
Year: 2021

- Colour
- Smoothed
- Colour (dark)
- Circle size
- 3D bars
- Joyplot

2011-2021 change

- Colour
- Smoothed
- Circle size
- Segment

- Boundaries
- City names



PROSPETTO 5. POPOLAZIONE RESIDENTE DI 65 ANNI E PIÙ NEI CAPOLUOGHI E NELLE CINTURE URBANE. Previsioni 2031, scenario mediano.

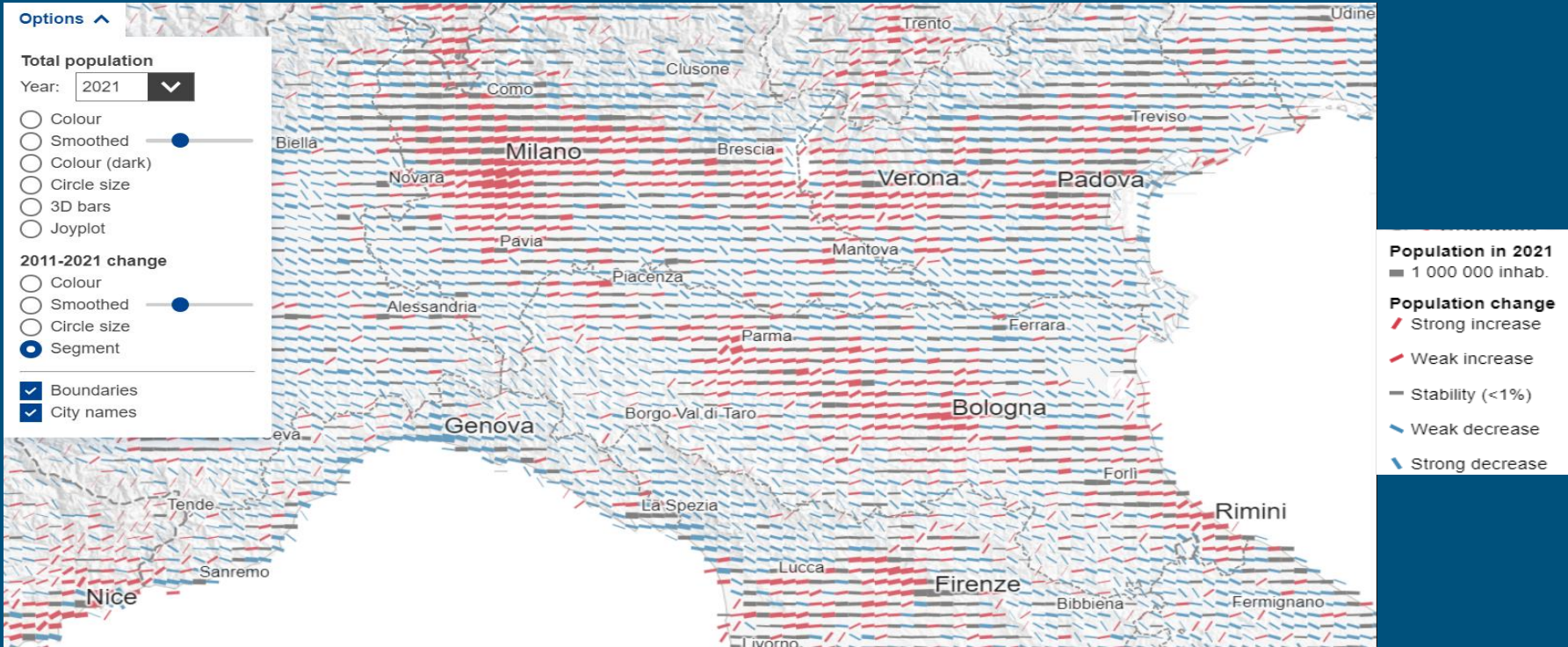
Valori percentuali sul totale popolazione dell'area (a)

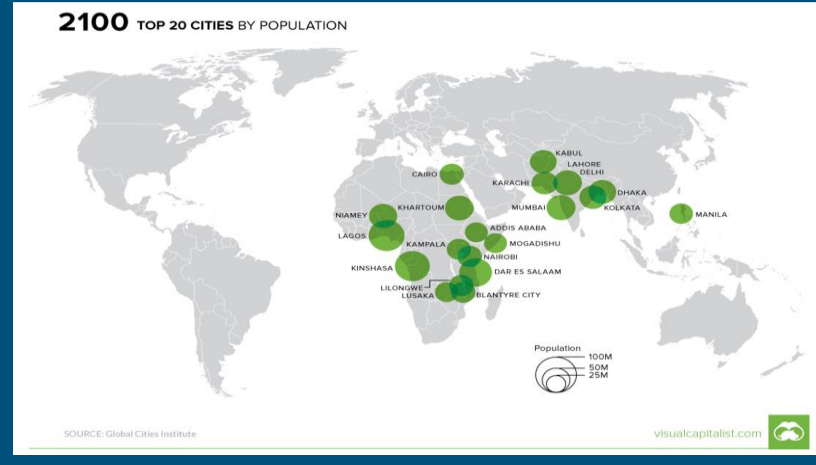
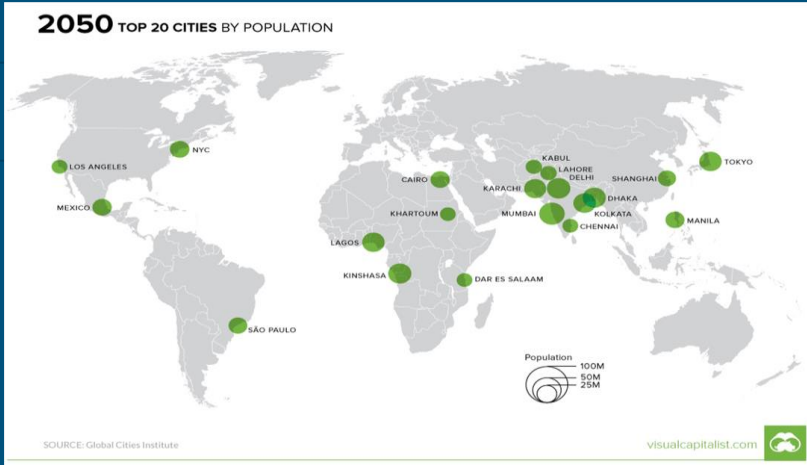
Variazioni percentuali 2023-2031

Città metropolitana	Comuni Capoluogo	Comuni I cintura	Comuni II cintura	Altri comuni CM	Totale CM	Città metropolitana	Comuni Capoluogo	Comuni I cintura	Comuni II cintura	Altri comuni CM	Totale CM
Torino	28,6	30,8	28,2	29,7	29,3	Torino	7,7	8,9	13,5	8,9	9,0
Milano	24,4	27,2	26,3	26,2	25,6	Milano	12,7	11,8	15,0	14,8	13,3
Venezia	31,5	29,3	29,4	29,1	29,9	Venezia	8,9	17,8	19,4	17,9	15,2
Genova	31,4	33,3	33,8	32,5	31,9	Genova	5,2	5,8	5,2	5,5	5,3
Bologna	26,2	28,4	27,6	27,8	27,2	Bologna	11,2	13,6	17,3	13,5	13,2
Firenze	28,9	29,0	29,1	28,6	28,9	Firenze	10,1	11,3	15,4	14,4	12,3
Roma	27,7	24,9	25,7	27,7	27,0	Roma	17,1	26,0	23,9	17,5	19,0
Napoli	26,2	24,3	22,4	23,8	24,4	Napoli	14,9	20,4	25,7	21,2	19,5
Bari	30,3	27,9	26,4	27,8	28,1	Bari	13,6	20,1	17,9	16,4	16,7
Reggio Calabria	28,8	30,1	30,3	26,5	27,7	Reggio Calabria	12,6	7,9	10,9	13,2	12,5
Palermo	27,5	23,5	25,2	29,6	27,0	Palermo	13,5	22,6	14,9	7,1	13,2
Messina	29,9	31,2	29,4	29,2	29,6	Messina	12,1	9,9	11,1	11,2	11,4
Catania	26,5	25,1	25,4	26,9	26,0	Catania	10,8	20,1	18,1	15,4	15,7
Cagliari	34,0	30,5	27,0	34,7	31,3	Cagliari	12,3	27,7	30,0	16,2	21,3
Totale	27,6	27,1	26,3	27,3	27,3	Totale	12,8	17,3	18,1	14,3	14,7

(a) Nella tabella sono evidenziati i valori superiori la media dell'area.

Fonte: Elaborazioni su dati Istat - Statistiche sperimentali, Previsioni demografiche comunali 1° gennaio 2021-2031





<https://www.visualcapitalist.com/animated-map-worlds-populous-cities-2100/>