forumvera

VERANTWORTUNG FÜR
DIE ENTSORGUNG RADIOAKTIVER ABFÄLLE

Kann die Wirtschaft ökologisch wachsen?

Bevölkerungswachstum - Energiebedarf - Umwelt.

24. Weiterbildungsseminar des Forum VERA

Freitag 11. September und Samstag 12. September 2020

Prof. Dr. Marc Achermann
Hochschule Luzern, Technik & Architektur, Horw
Sigrist Photometer AG, Ennetbürgen

Mitglied Konzeptgruppe

Wirtschaft / Wohlstand

Bevölkerung

Energie

Wirtschaft / Wohlstand

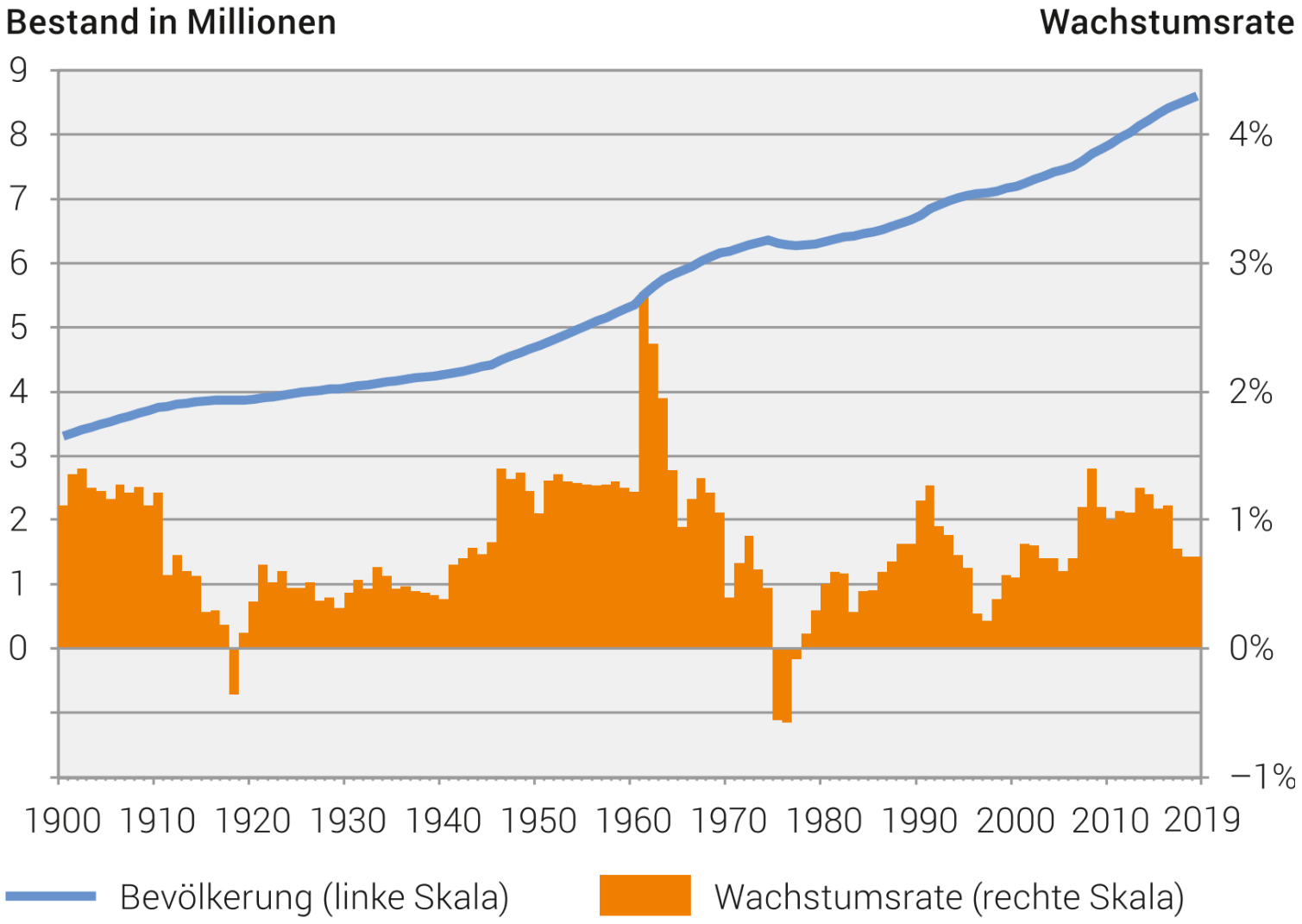
The bad guy
CO_2

?

Bevölkerung

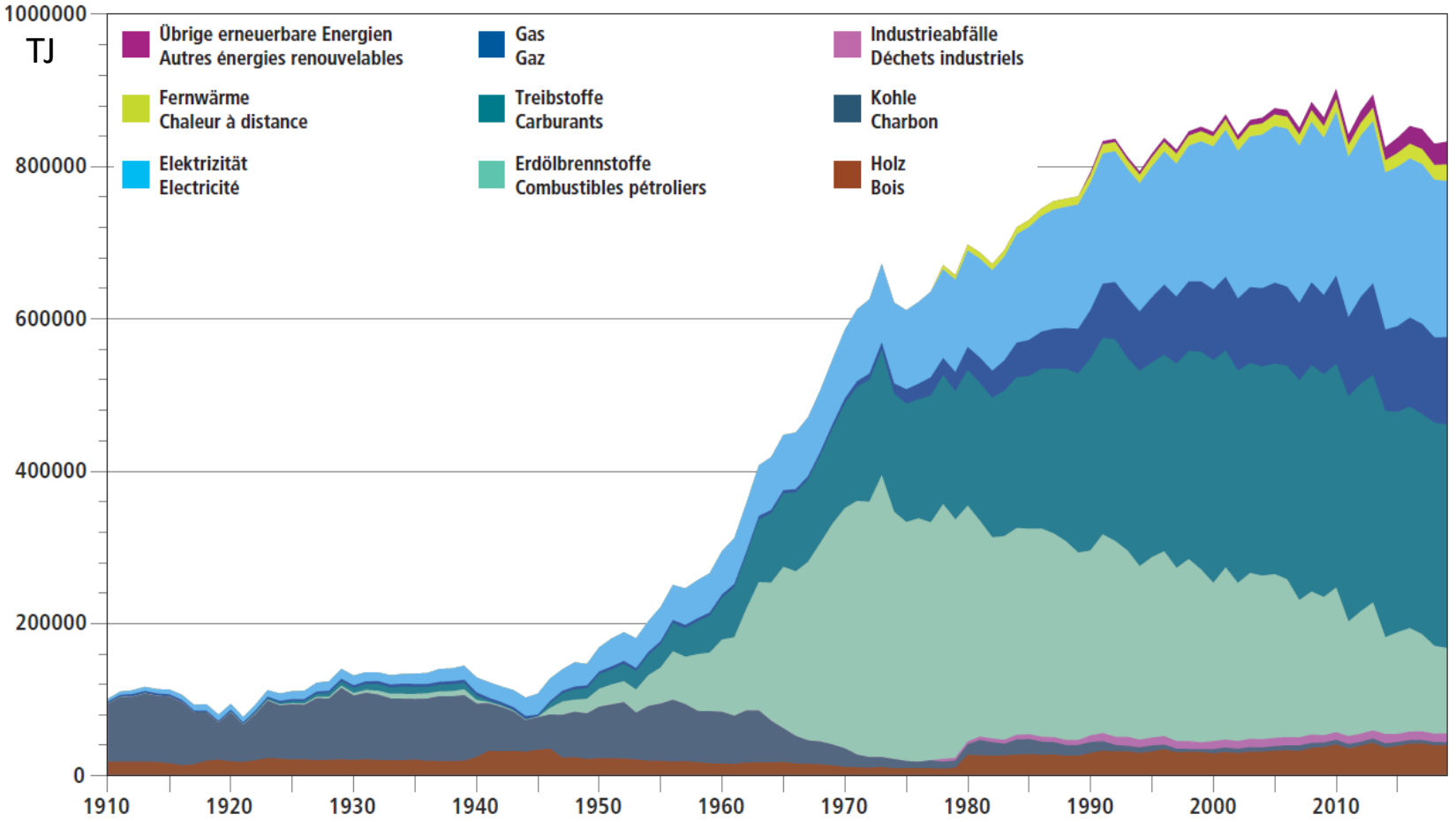
Energie

Bevölkerungsentwicklung Schweiz



Quellen: BFS – ESPOP, STATPOP, VZ

Energieverbrauch Schweiz pro Jahr bis 2019



834‘000 TJ

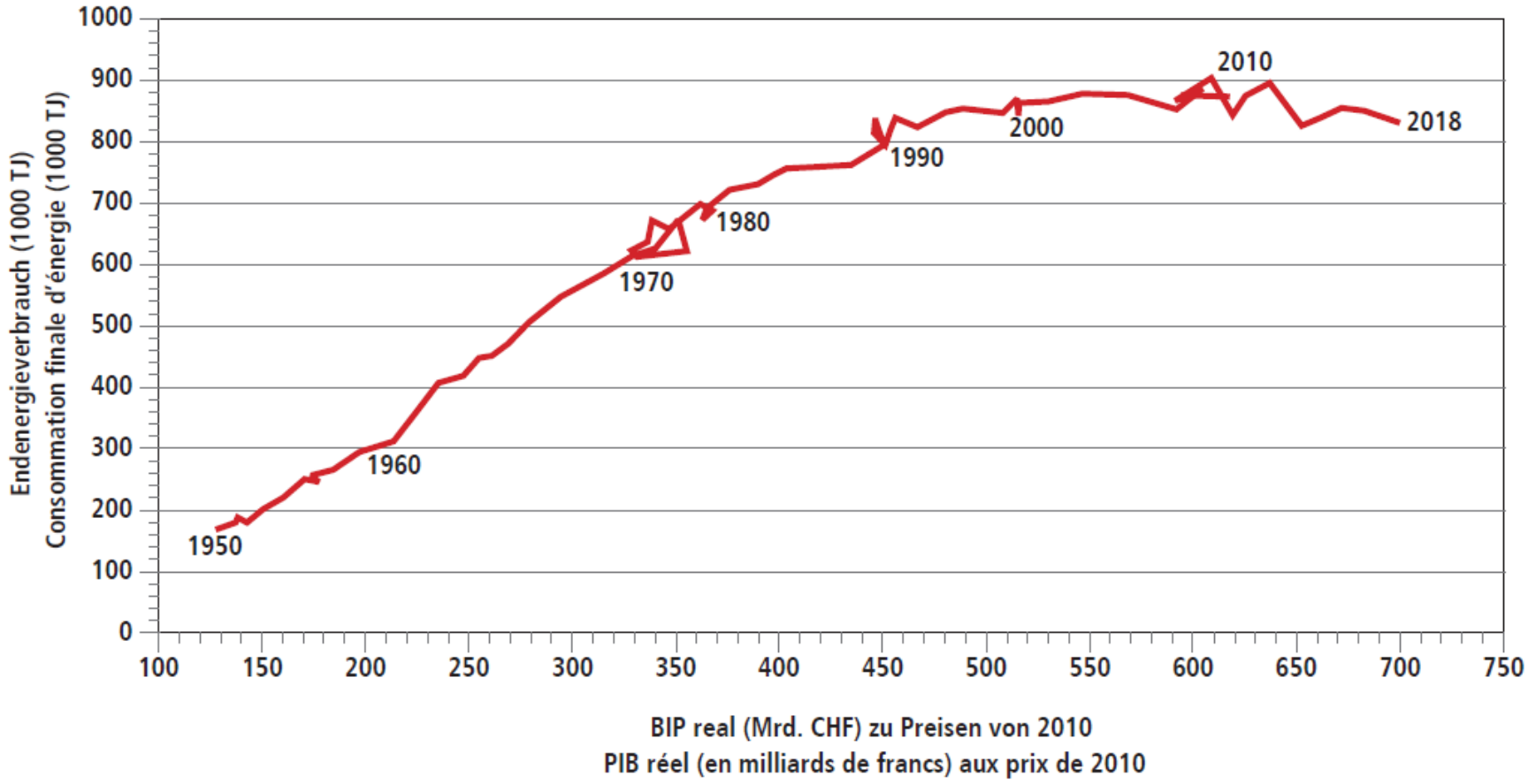
Einwohnerzahl Schweiz: ca. 8.4 Mio.

Energieverbrauch pro Einwohner pro Jahr: ca. 100 GJ pro Tag: 277 MJ = 77 kWh

Verbrauchsleistungsbedarf pro Einwohner: ca. 3200 W

x. Welcher Energieverbrauch schwankt am stärksten von Jahr zu Jahr?

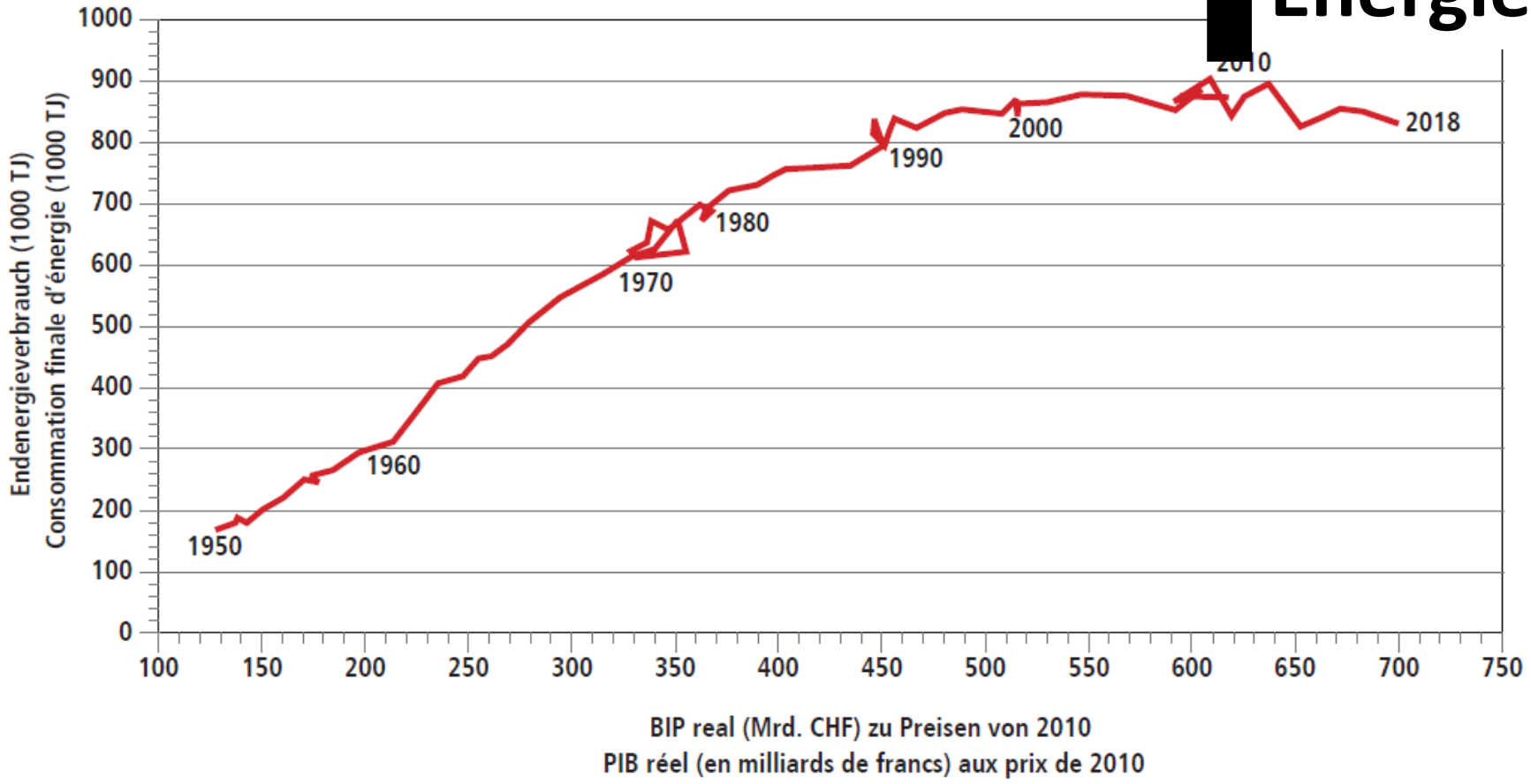
Zusammenhang Wirtschaft und Energie in der Schweiz



BFE, Schweizerische Gesamtenergiestatistik 2018 (Fig. 15)
OFEN, Statistique globale suisse de l'énergie 2018 (fig. 15)

Zusammenhang Wirtschaft und Energie in der Schweiz

Graue Energie?



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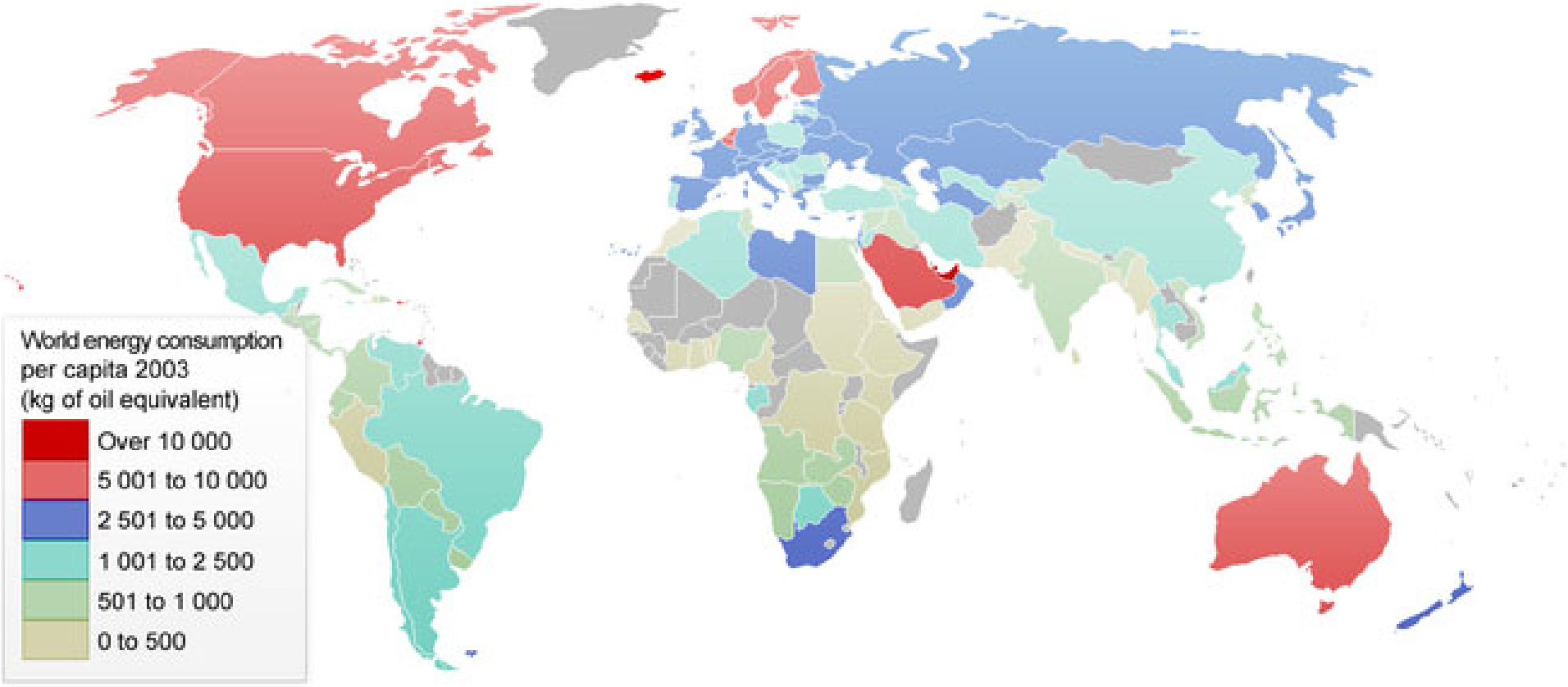
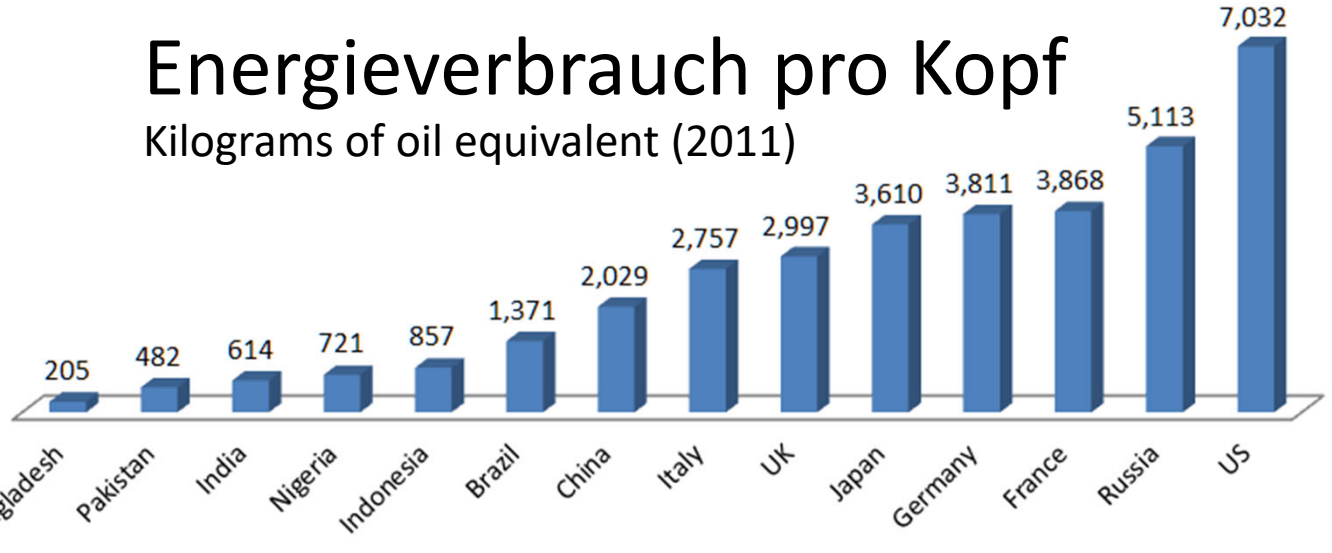


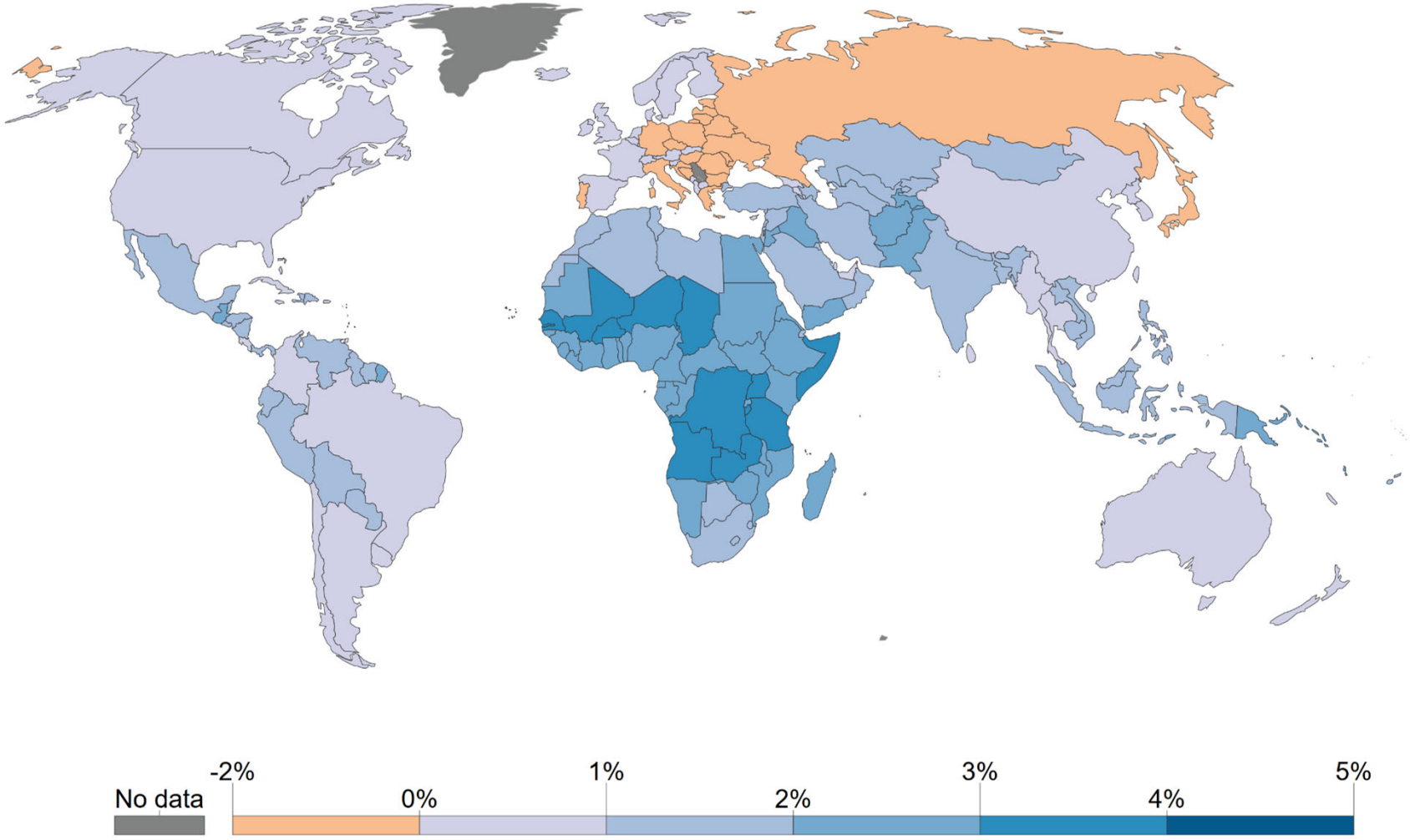
Energieverbrauch pro Kopf

Kilograms of oil equivalent (2011)



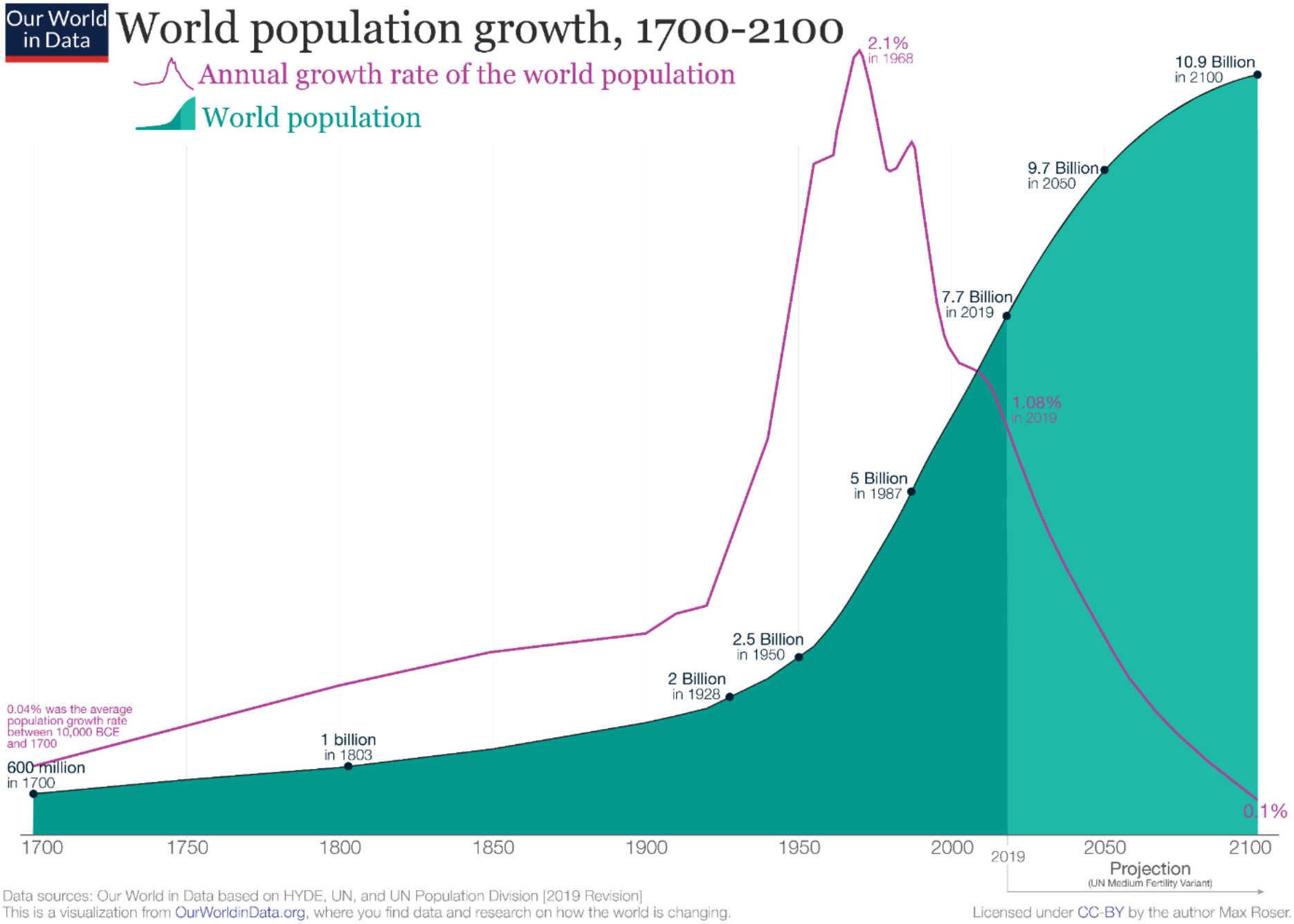
Natural population growth, 2015

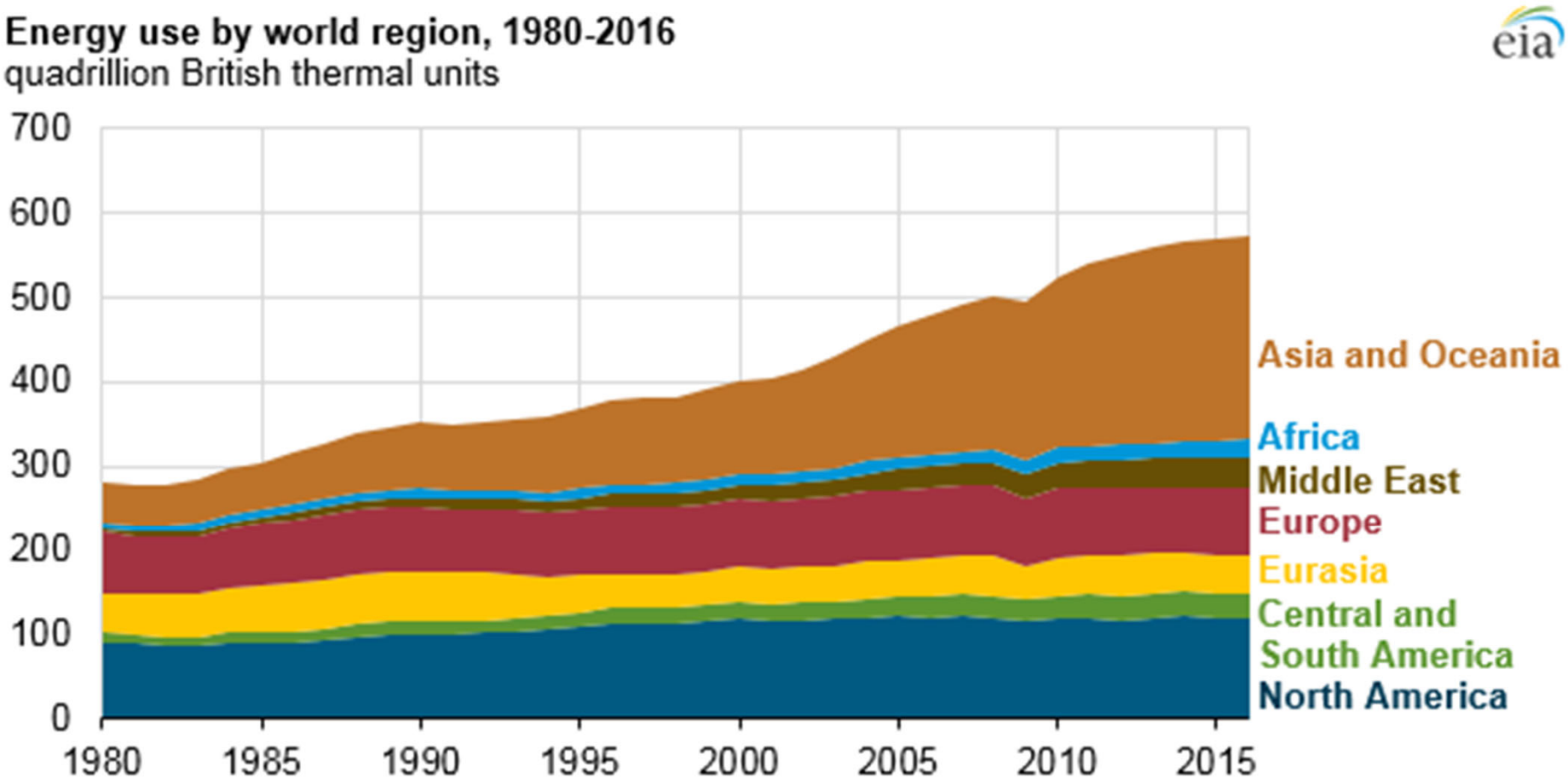
Natural population growth is the population increase determined by births and deaths. Migration flows are not taken into account. This is shown from 1950, with UN projections to 2100 based on its median scenario.



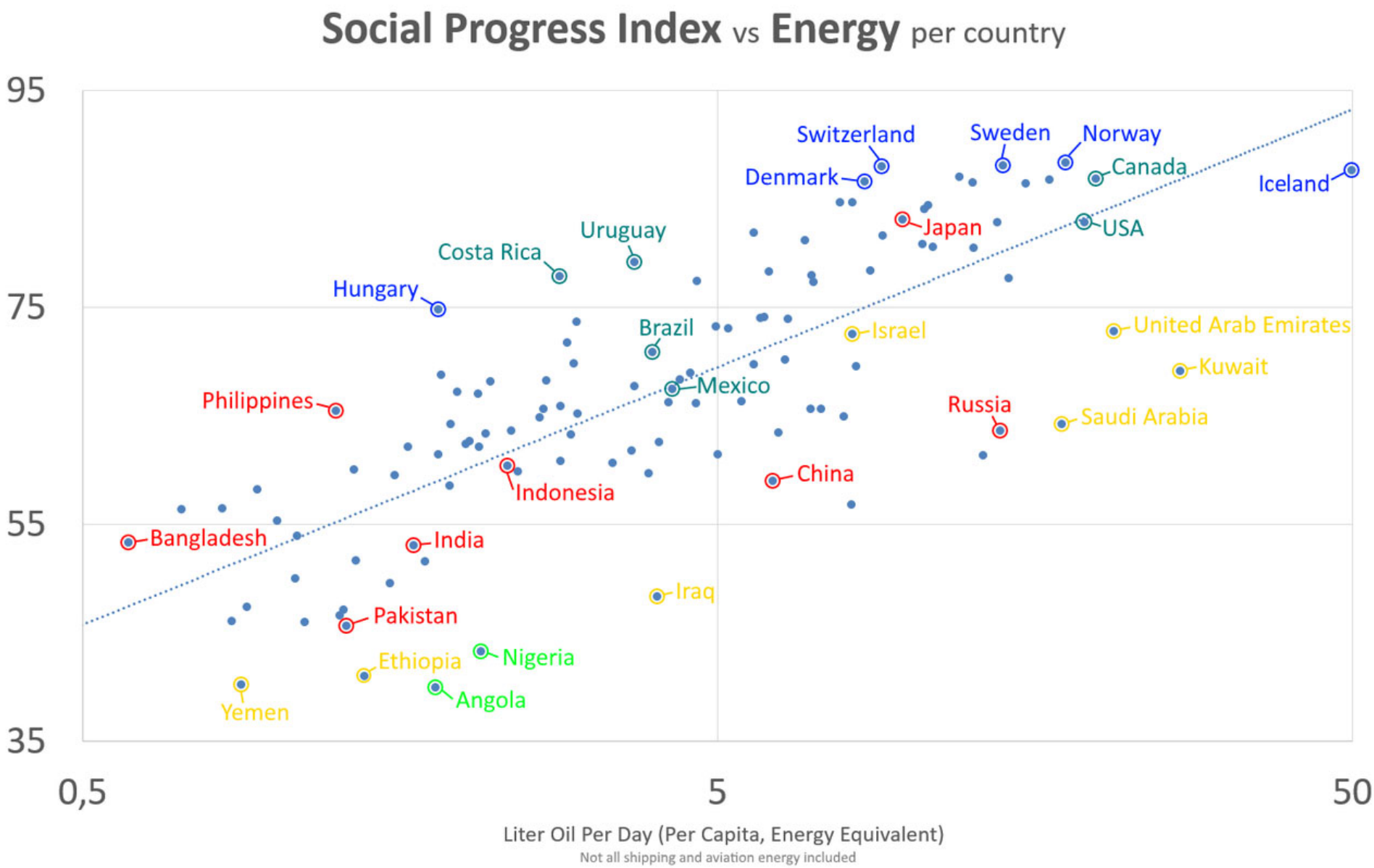
Source: UN Population Division (2017 Revision)

OurWorldInData.org/world-population-growth/ • CC BY


Our World in Data
World population growth, 1700-2100
Annual growth rate of the world population
World population
2.1%
in 1968
10.9 Billion
in 2100
9.7 Billion
in 2050
7.7 Billion
in 2019
1.08%
in 2019
5 Billion
in 1987
2.5 Billion
in 1950
2 Billion
in 1928
1 billion
in 1803
600 million
in 1700
0.04% was the average population growth rate between 10,000 BCE and 1700
0.1%
1700
1750
1800
1850
1900
1950
2000
2019
2050
2100
Projection
(UN Medium Fertility Variant)
Data sources: Our World in Data based on HYDE, UN, and UN Population Division [2019 Revision]
This is a visualization from OurWorldinData.org, where you find data and research on how the world is changing.
Licensed under CC-BY by the author Max Roser.



Wachstum Erdbevölkerung:	1 %, Tendenz abnehmend
Wachstum Energieverbrauch:	1 %, Tendenz konstant
Wachstum Wirtschaft:	3 %, Tendenz ?


Social Progress Index vs Energy per country
95
75
55
35
0,5
5
50
Switzerland
Sweden
Norway
Canada
Denmark
Iceland
Japan
USA
Uruguay
Costa Rica
Hungary
Brazil
Israel
United Arab Emirates
Kuwait
Mexico
Philippines
Russia
Saudi Arabia
China
Indonesia
Bangladesh
India
Iraq
Pakistan
Ethiopia
Nigeria
Angola
Yemen
Liter Oil Per Day (Per Capita, Energy Equivalent)
Not all shipping and aviation energy included


iter
china eu india japan korea russia usa
UNLIMITED ENERGY
Fusion, the nuclear reaction that powers the Sun and the stars, is a potential source of safe, non-carbon emitting and virtually limitless energy. Harnessing fusion's power is the goal of ITER, which has been designed as the key experimental step between today's fusion research machines and tomorrow's fusion power plants.

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