Renewable Energy Services in Education and Training

Component within project: Decarbonisation of the Electricity Sector in the Western Balkans

ERI SEE | Education Reform Initiative of South Eastern Europe

Implemented by

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Edu-Energy Conference: Building Bridges for Sustainable Energy Learning

ENERGY AND SOCIETY
between technical solutions and deep social debates

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15 March 2024

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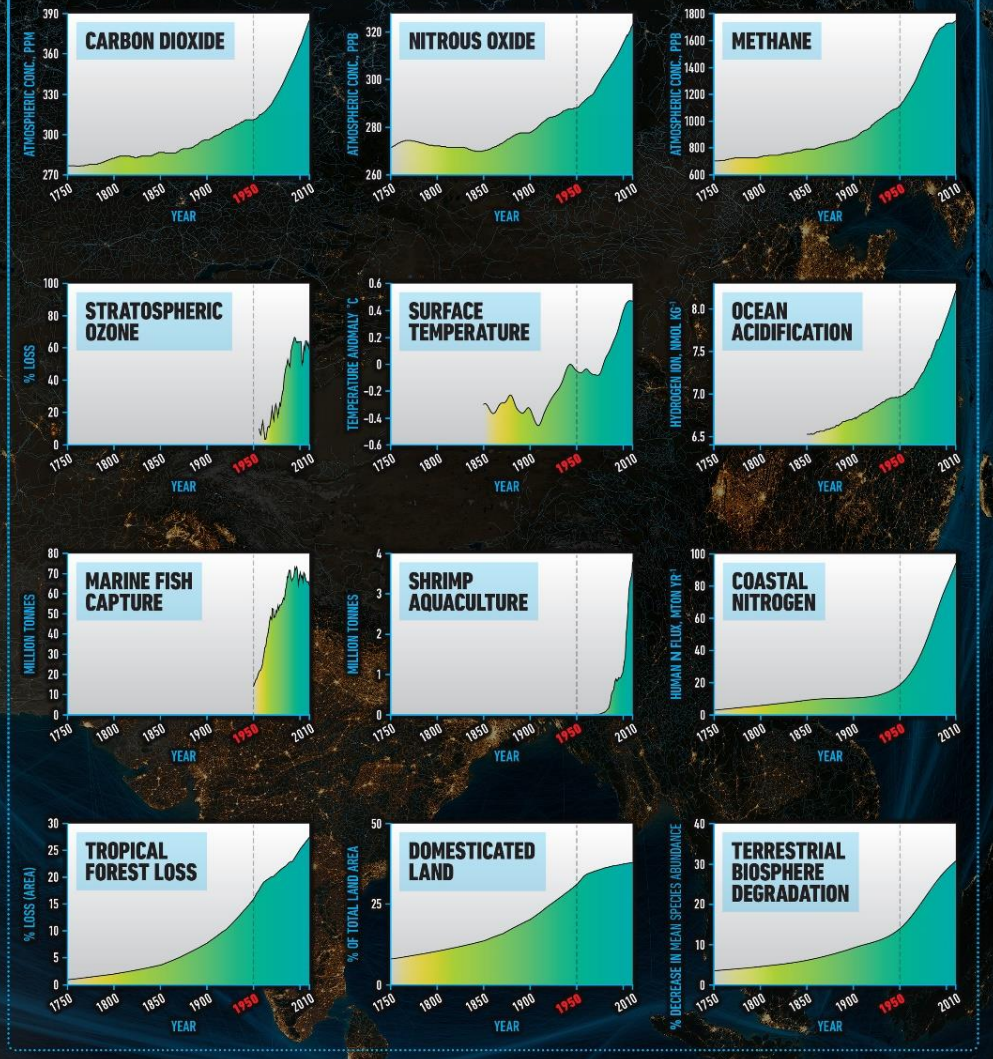
THE GREAT ACCELERATION

SOCIO-ECONOMIC TRENDS

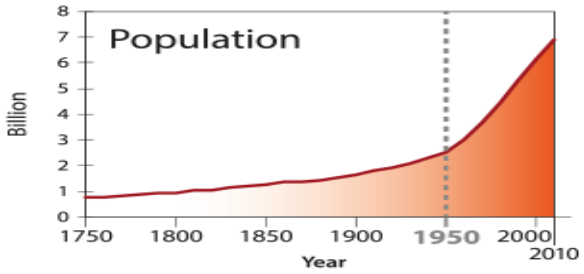
EARTH SYSTEM TRENDS

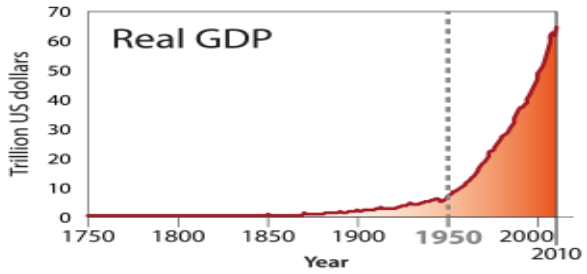


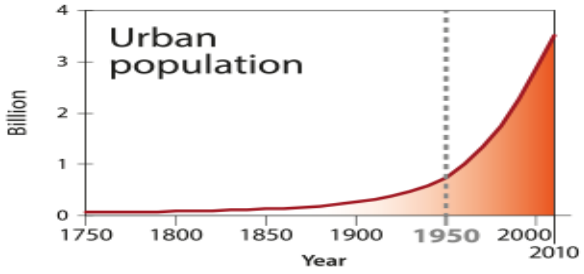
REFERENCE: Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig (2015), The Trajectory of the Anthropocene: the Great Acceleration, Submitted to *The Anthropocene Review*.

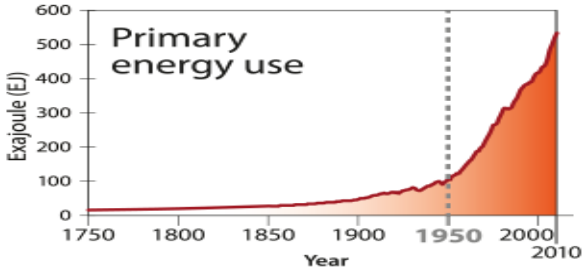
MAP & DESIGN: Félix Pharand-Deschênes / Globaïa

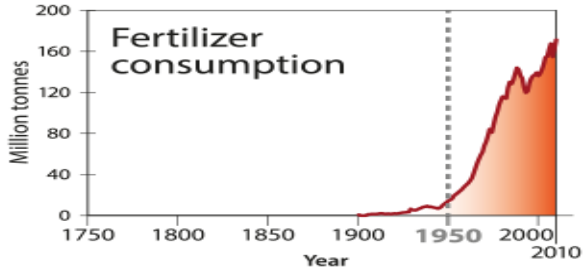
Socio-economic trends

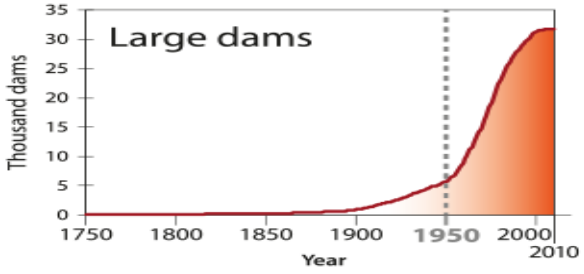


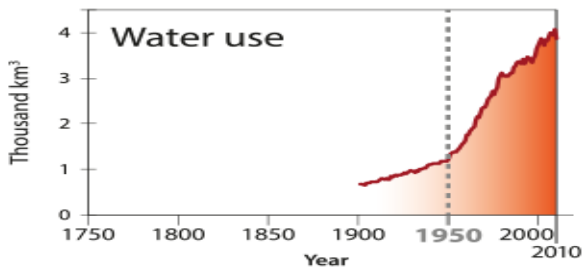


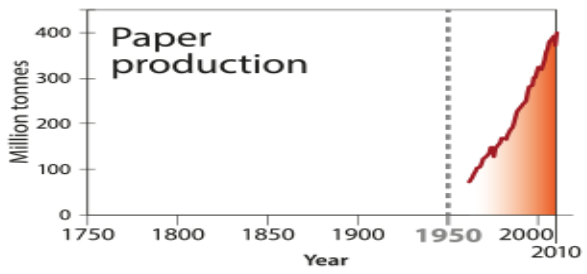


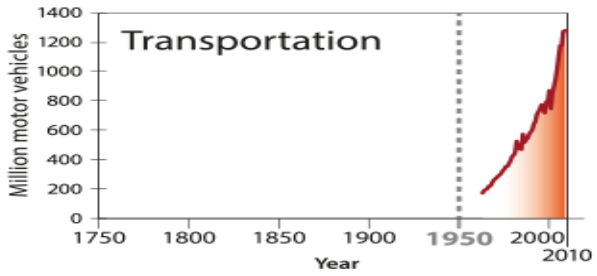


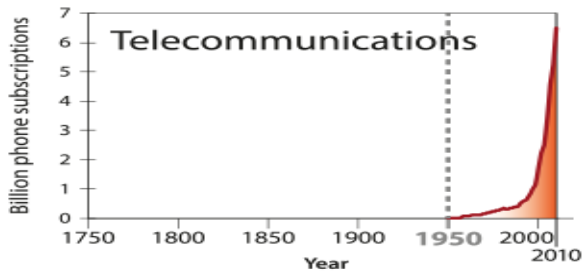


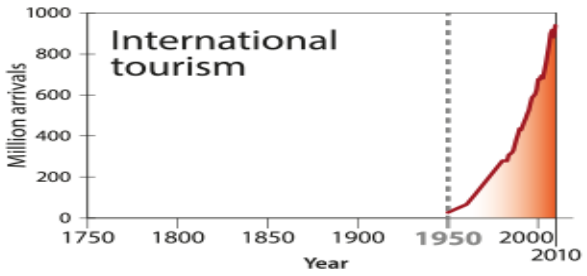




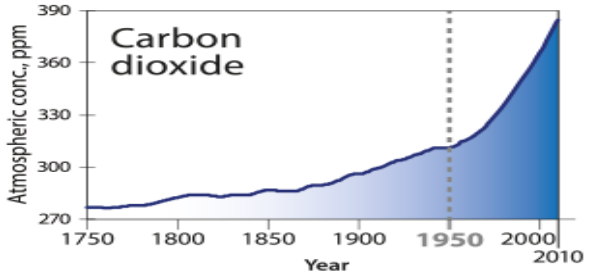


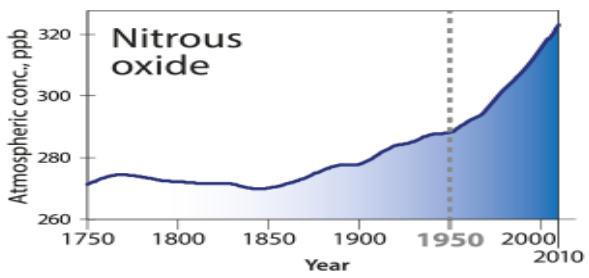


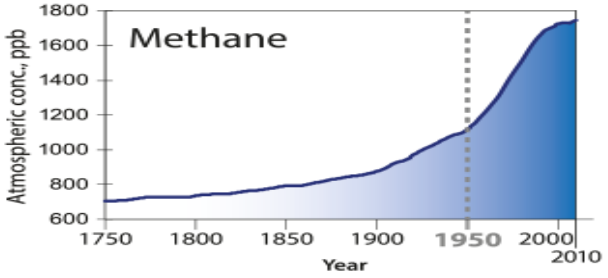


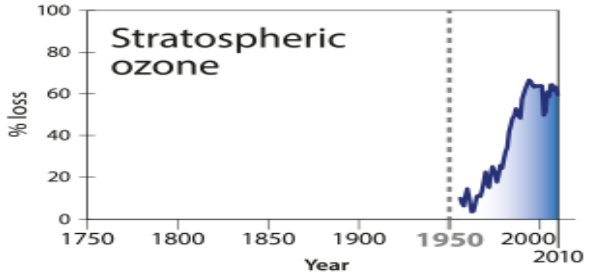


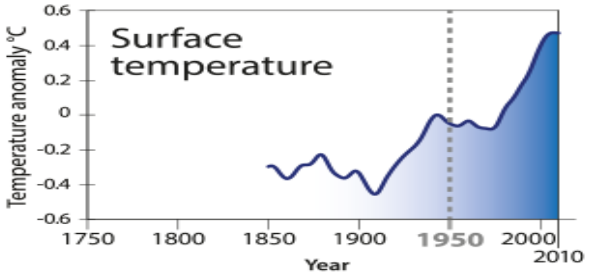
Earth system trends

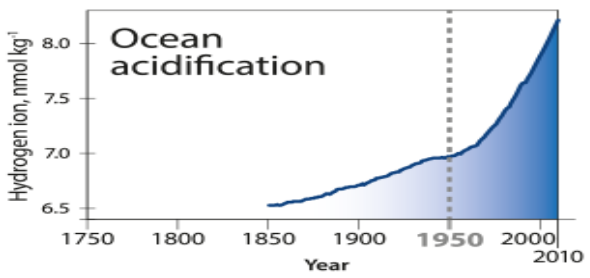


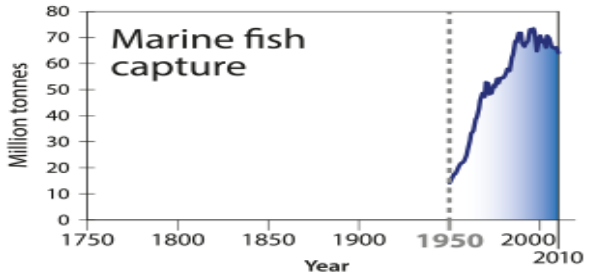


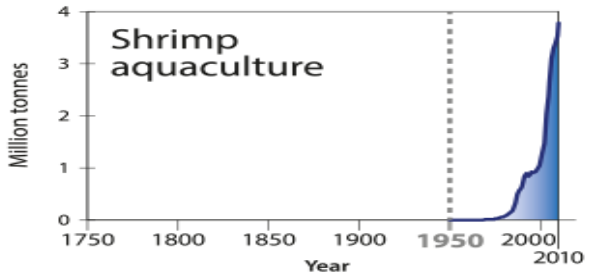


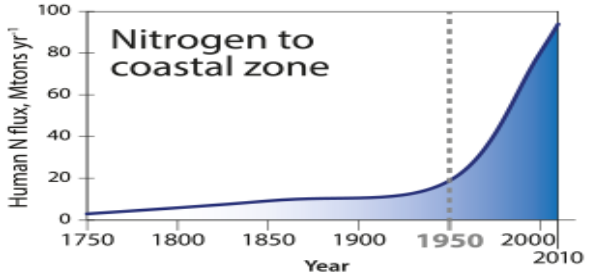


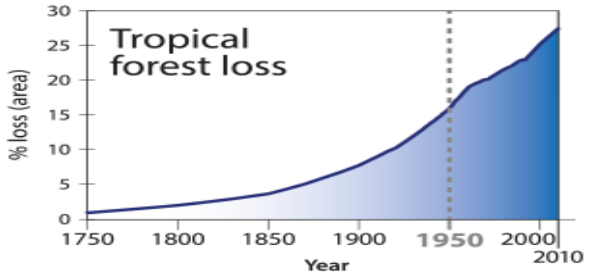


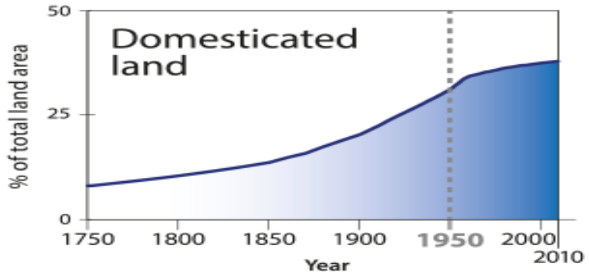


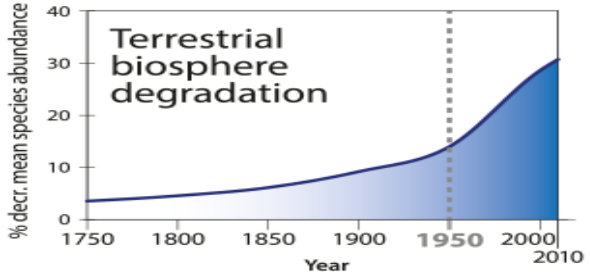








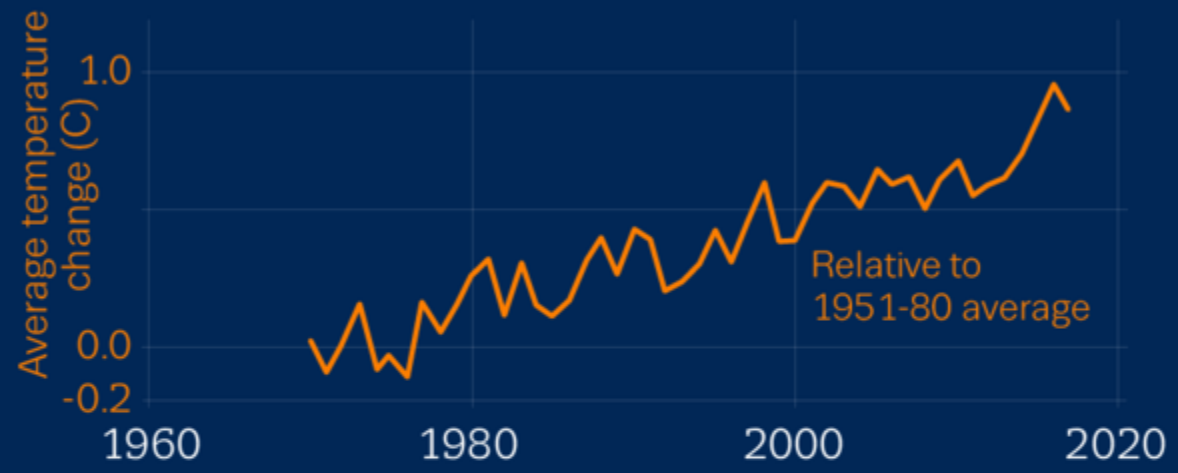




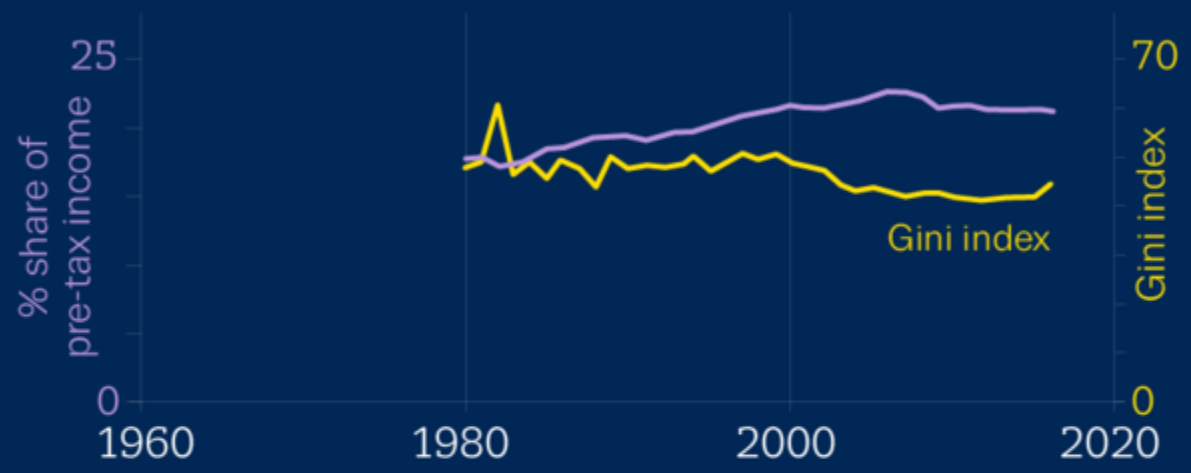
Danger signs

History suggests that when these indicators rise, the likelihood of collapse is greater.

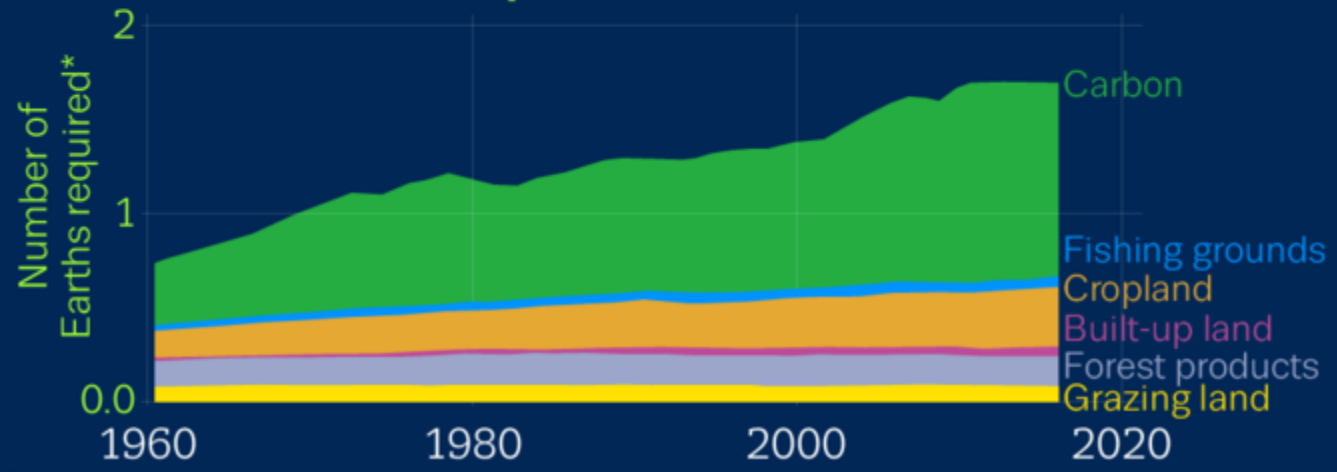
Climate change



Inequality

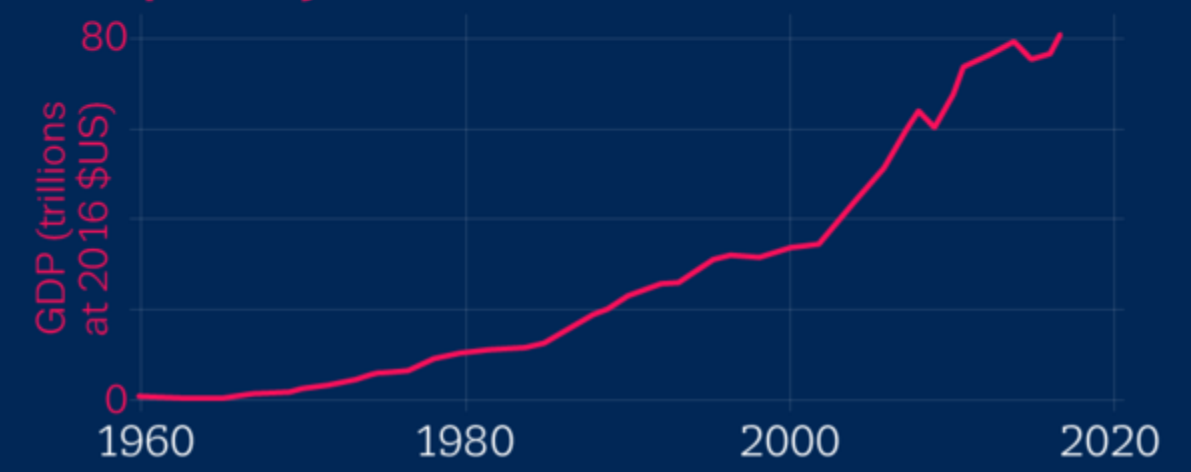


Environmental impact



*a measure of ecological footprint, describing Earth's capacity to support our demands

Complexity



BBC FUTURE

Energy and Society – historical challenges

In the current historical moment, global society finds itself in a climatically extraordinary state and is faced with the demand for rapid decarbonization.

Societies must swiftly move away from reliance on fossil fuels and transition towards sustainable energy systems.

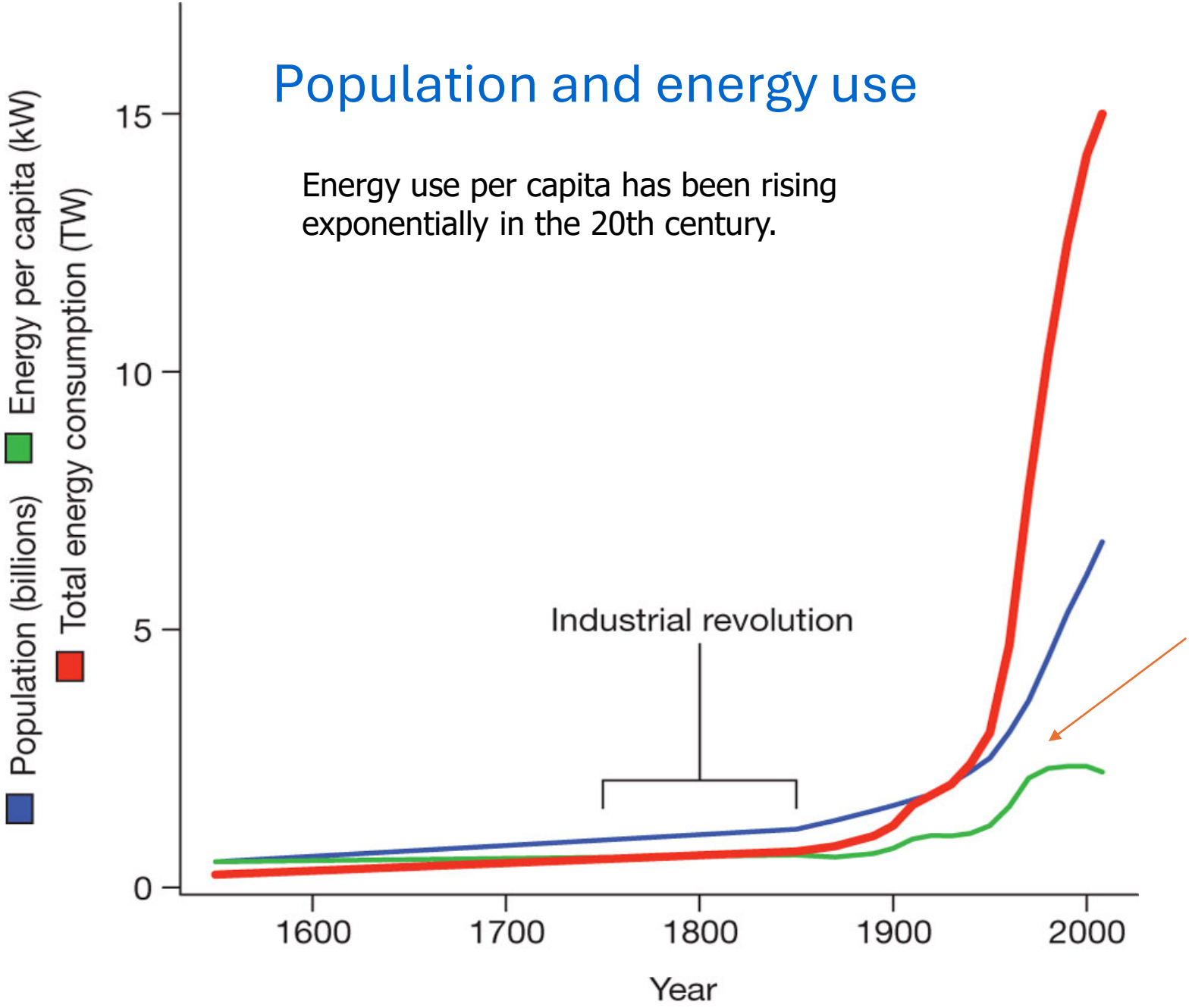
The currently unsustainable production and use of energy are deeply embedded in the economic, cultural, political, and material infrastructure of societies.

The entire system, from economic production to transportation and mobility to housing, is entirely dependent on fossil fuels.

Serious reduction of greenhouse gas emissions and maintaining global temperatures within 2 degrees Celsius warming require significant societal transformation that cannot be achieved solely through optimizing the existing energy system or through eco-modernist approaches and technological changes. It requires a radical change in the economic system, social infrastructure, and way of life.

Population and energy use

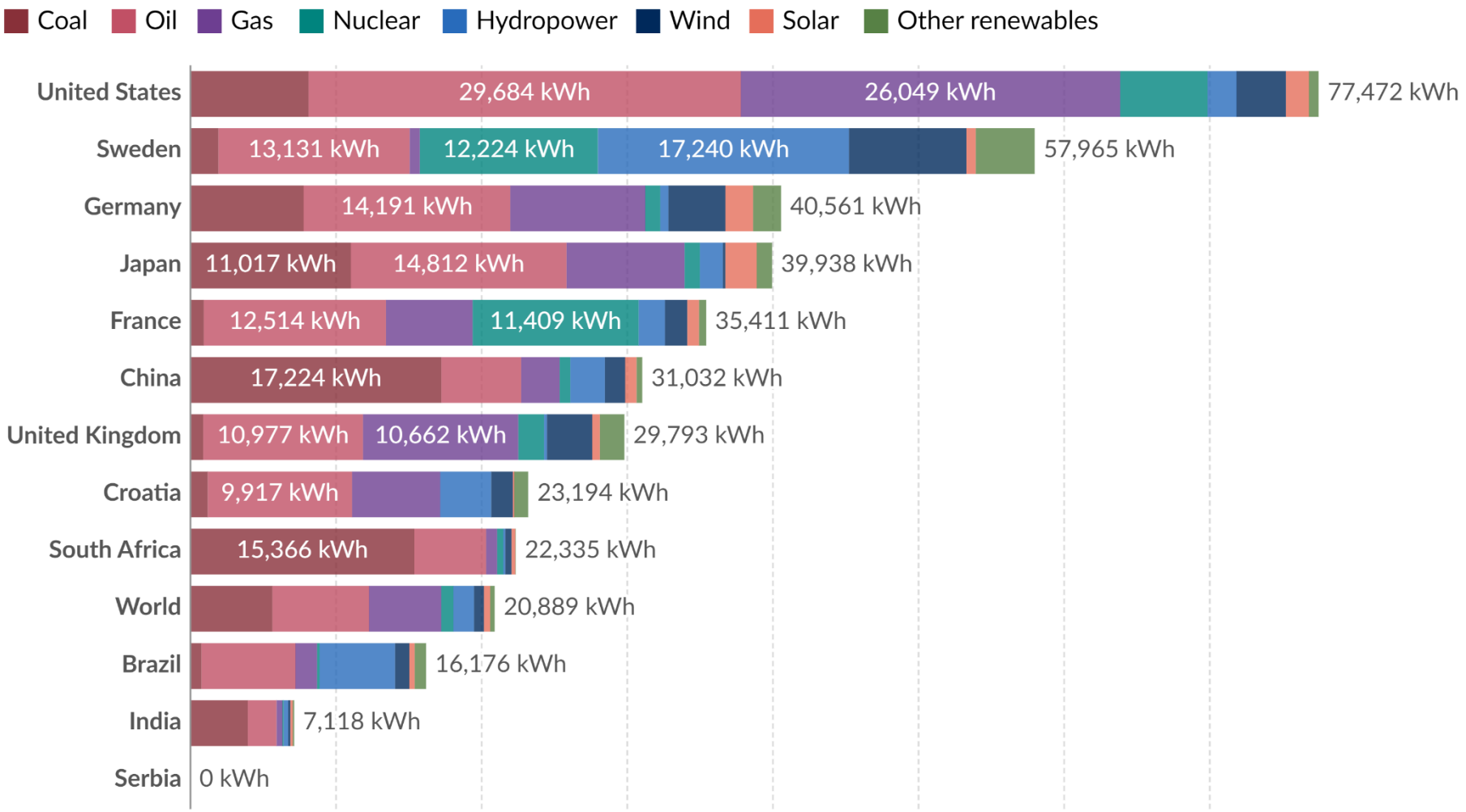
Energy use per capita has been rising exponentially in the 20th century.



Paul R. Ehrlich, Peter M. Kareiva and Gretchen C. Daily 2012. Securing natural capital and expanding equity to rescale civilization. Nature 486:68-73.

Per capita primary energy consumption by source, 2022

Primary energy[1] is measured in kilowatt-hours[2] per person, using the substitution method[3].



Data source: Energy Institute - Statistical Review of World Energy (2023); Population based on various sources (2023)
OurWorldInData.org/energy-mix | CC BY

Energy and Society – historical challenges

Problems in energy have long been perceived as technological issues, thereby completely separating energy problems from society as such. Energy should be viewed as an inherent dimension of social transformation that reflects questions of social order and power within society.

Access to energy is a contentious issue and, as such, is intertwined between technological solutions and innovations, political processes, economic systems, and socio-cultural developmental pathways.

Geopolitical relations are shaped around access to large reserves of fossil fuels, especially those reserves with the greatest potential for financial exploitation.

In order to have a fruitful transitional approach to designing a new energy system completely detached from fossil energy and focused on sustainable energy sources, with low environmental and societal impact, in addition to technical innovations and solutions, we also need socio-political and socio-cultural innovations and solutions.

This lies at the heart of "sustainable transition," which requires an interdisciplinary approach aimed at understanding the barriers standing in the way of necessary systemic and radical changes.

Energy poverty – citizens as solution

Energy poverty in the WB is thus widespread. Affected families are forced to choose between food and basic energy services. Those living in individual homes often resort to living in inadequate conditions, attempting to reduce their heating consumption by living only in a few rooms during winter (in our study described below, more than 50% of visited families did this). Meanwhile, in urban, residential multifamily buildings many families, who lack the ability to control their heating, actually experiencing excessive heat and commonly open windows to cool down.

Social policies in the Western Balkans are considered as typical for post-socialist transformation. The legacy is worsened by after-socialist confl icts and devastated institutional capacities. Social policies in general are functioning merely as politically-motivated care of state for the people (voters) and without covering targeted vulnerable groups (Babović and Vuković 2015). As with social legislation, energy legislation suffers from lack of strategic planning and consistent policies.

Citizens energy

The development of renewable energy sources (RES) in recent years has significantly changed the energy landscape, with the rise of local and small-scale low-carbon technologies (Alanne & Saari, 2006; Berka & Dreyfus, 2021). This evolution has opened up the possibility for new actors, such as energy communities, to participate in energy production (Bauwens et al., 2016; Hewitt et al., 2019; Wyse & Hoicka, 2019).

Energy communities are initiatives where citizens come together to address various aspects of low-carbon energy transitions, including the development of projects for heat and energy production from renewable energy sources (Bauwens, 2019). Such communities have played a central role in mobilizing financial capital for the transformation of energy systems in several European countries (Kooij et al., 2018; Mey & Diesendorf, 2018; Yildiz, 2014).

In the European Union, there are more than 10,500 such initiatives (Schwanitz et al., 2023).

Laws passed by the Croatian Parliament at the end of 2021 raise questions about the quality of transposing EU directives and the role of citizens in the energy transition. The new laws limit the opportunities for citizens to participate in the energy transition, both independently and through the formation of citizens' energy communities.

Stanari tri zgrade u Nišu udružili su se i izgradili solarnu elektranu

Foto: CORE

Objavljeno
12.04.2023.

Zemlja
Srbija

Autor
Vladimir Spasić

Komentari
8 komentara

Stambena zajednica, koja se sastoji od tri zgrade u Nišu, postavila je solarne panele na svojim krovovima koji će omogućiti proizvodnju električne energije dovoljne za pokrivanje zajedničke potrošnje električne energije. Na taj način prosumer model i proizvodnja zelene energije za vlastitu potrošnju nakon kućanstava počinje osvajati i zgrade.

Stambena zajednica iz Niša je druga koja je dobila status prosumera ili kupca-proizvođača, nakon zgrade iz Pančeva , ali je suštinski prva prava stambena zajednica koja proizvodi električnu energiju za vlastitu potrošnju. Naime, u Pančevu je stambena zajednica bila način da jedan od stanara proizvodi energiju za svoje potrebe, dok će u Nišu tri zgrade sa 134 stana i oko 400 stanara proizvoditi struju koju će koristiti svi.

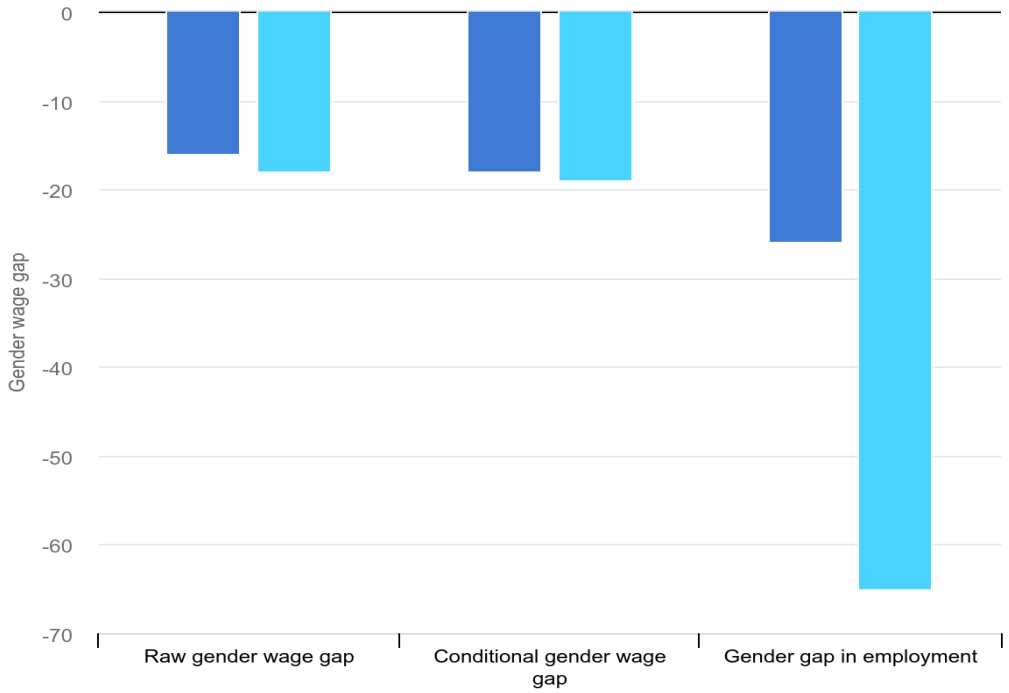
Gender and energy

Decreasing energy poverty seems to enhance job prospects for women, particularly in industry and service fields, leading to an increase in the proportion of female employees compared to males.
Additionally, alleviating energy poverty is seen to address gender disparities in health outcomes.
Importantly, mitigating energy poverty plays a significant role in promoting gender equality in education and socioeconomic opportunities (Canh Phuc Nguyen ∗, Thanh Dinh Su, 2021.).

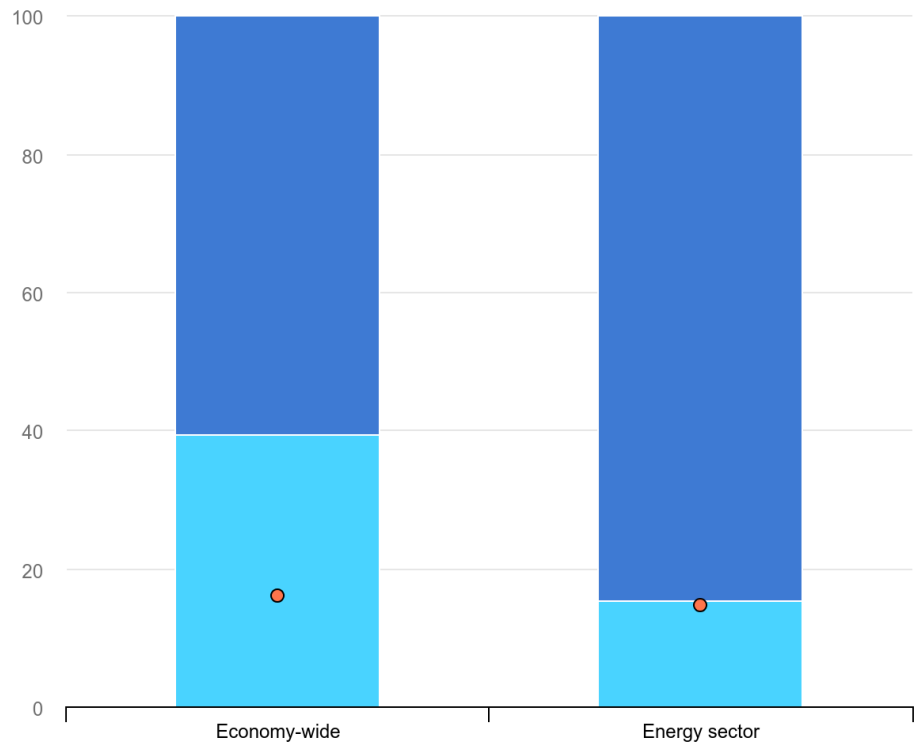
Despite making up 48% of the global labour force, women only account for 22% of the labour force in the oil and gas sector and 32% in renewables.

Gender and energy

Average gender wage and employment gaps by sector

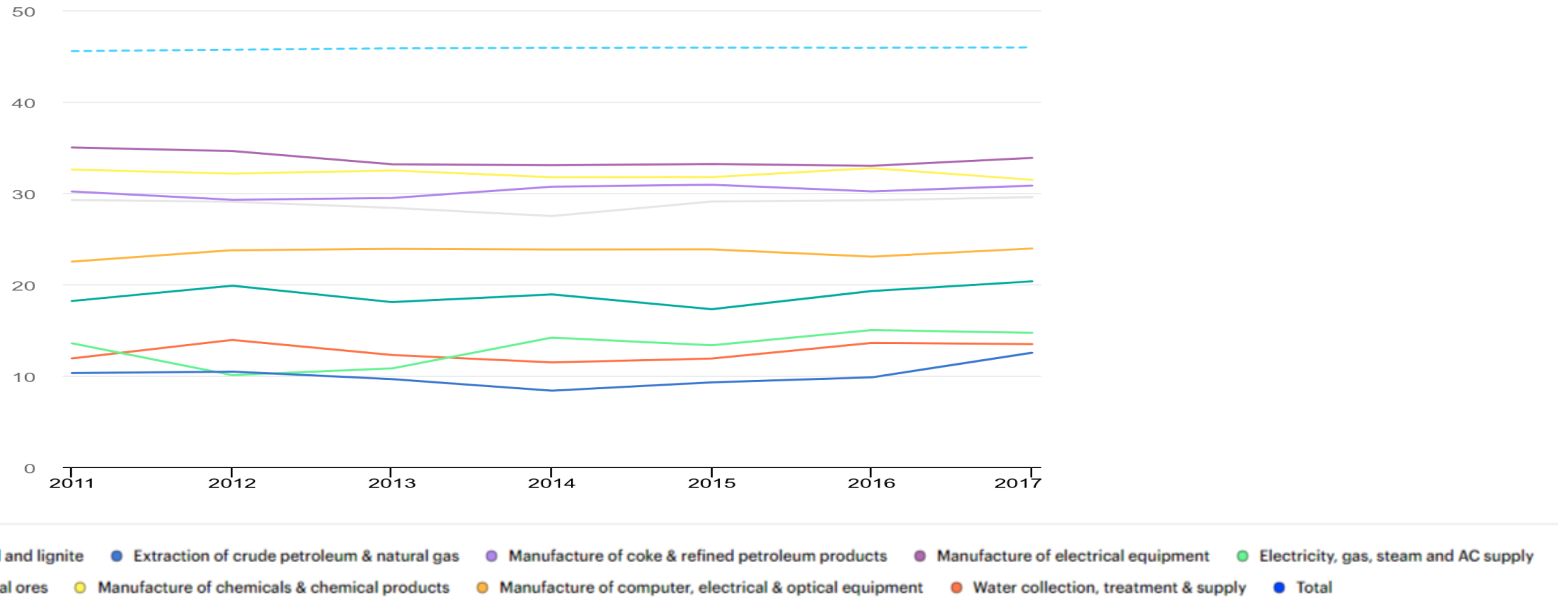


Employment by gender, 2019



Gender and energy

Percentage of female employees in the energy sector in the European Union, 2011-2017



Energy in (green) growth paradigm

Green growth theory promoted by multilateral organisations – national and international policies

- assumption that absolute decoupling of GDP growth from resource use and carbon emissions is feasible
- and at a rate sufficient to prevent dangerous climate change and other dimensions of ecological breakdown

But it is not possible?!

- to be truly green, green growth requires not just any degree of absolute decoupling, but absolute decoupling that is rapid enough to meet ecological targets.
- high-income nations have done better, at least in terms of territorial emissions – but production moved to global South
- while it is technically possible to decouple in line with the carbon budget for 1.5°C or 2°C, empirical projections show that this is unlikely to be achieved, even under highly optimistic conditions

With a society designed around pursuing growth, no country currently uses sustainable levels of energy and resource to meet human needs and well-being sufficiently

Even a low-carbon economy with renewable energy, electrification and negative emissions technologies will all require resources such as concrete, metals, and land.

Energy in degrowth paradigm

Degrowth advocates argue that it is not enough to just “green” the economy.

Wealthy countries must also address affluence and reduce its consumption and overall resource use.

Overconsumption also highlights the issue of global inequality, as income is linked to consumption and consumption is the key driver of environmental impacts, suggesting that overconsumption also causes environmental inequality.

One of the critical areas that need attention is the reduction of unnecessary production and consumption in rich countries. This would lead to a decrease in energy use, resource depletion, and ecological impacts, and would leave more resources to low and middle-income countries.

To reduce production, some destructive sectors such as fossil fuels, cars, aviation, and private jets should be scaled down.

Thank you!

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