The Green Transition of European Industry

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Factors Promoting a Green Transition

- Climate Change and Environment
- Resource Dependency
- Costs
- Supply Chain Vulnerability
- Growth and Jobs
- (International) Geo-political Competition
- Intra-Generational Equity
- Inter-Generational Equity

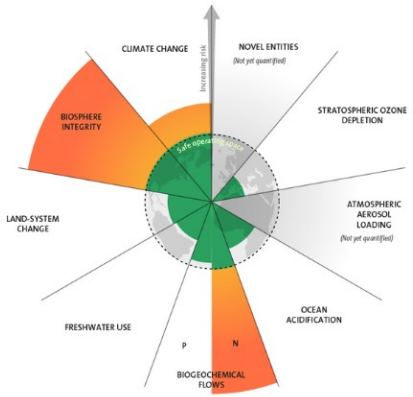
2012 United Nations Conference on Sustainable Development: Rio de Janeiro

Green Economy.

Planetary Boundaries

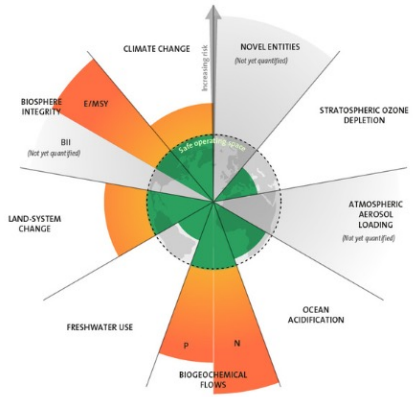
RIO+20
United Nations Conference on Sustainable Development

2009



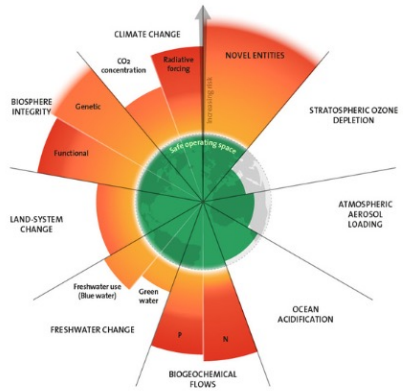
7 boundaries assessed,
3 crossed

2015



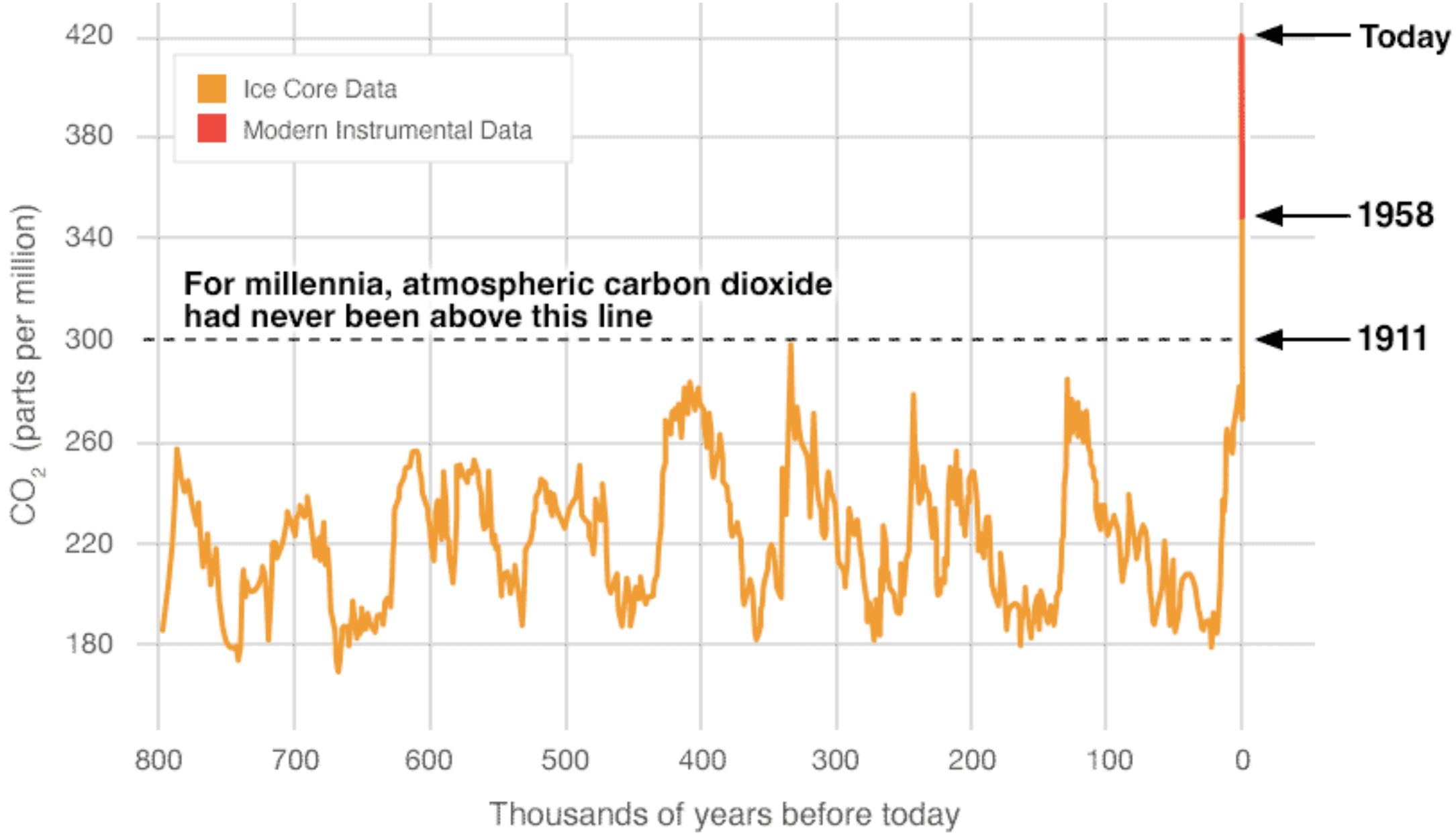
7 boundaries assessed,
4 crossed

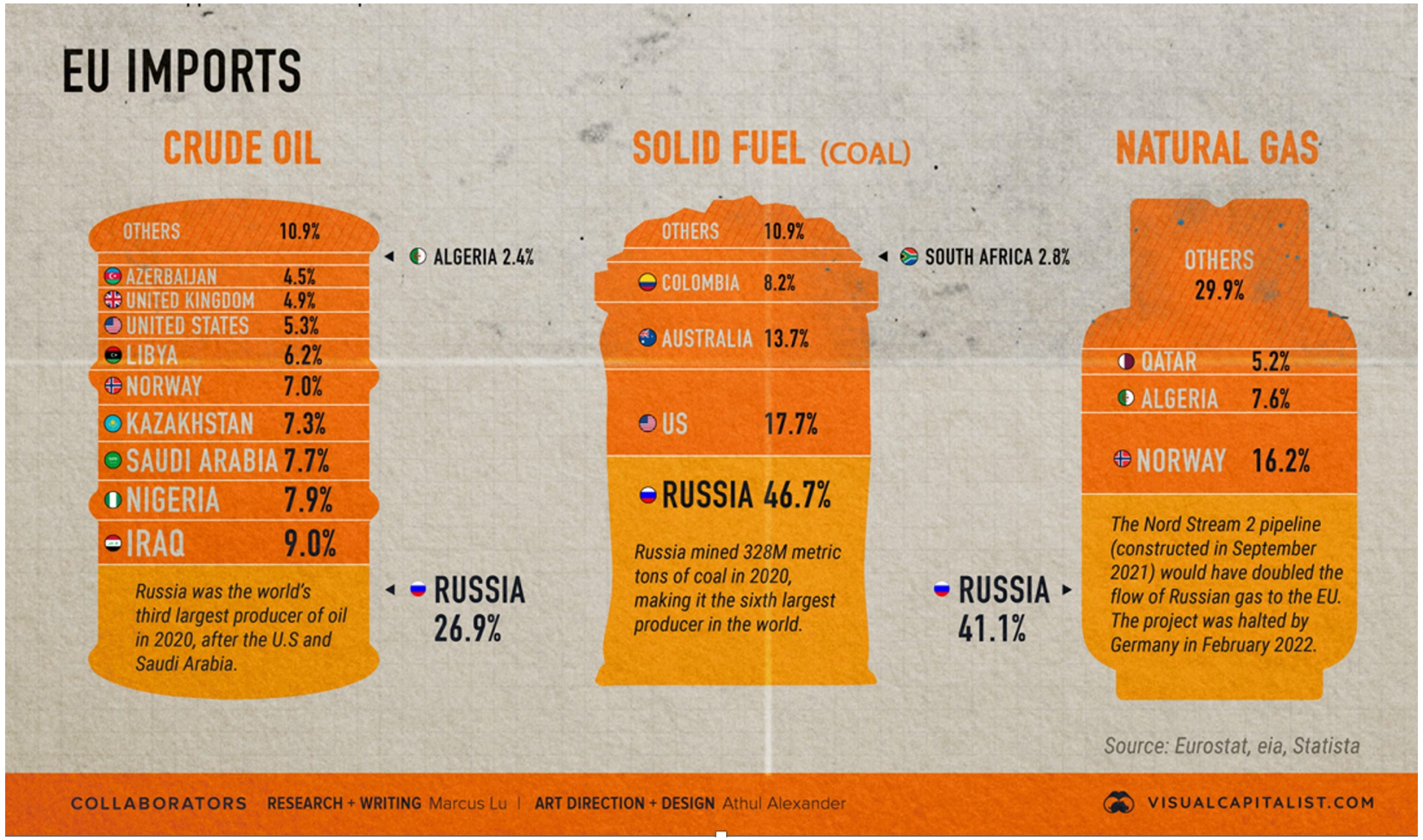
2023



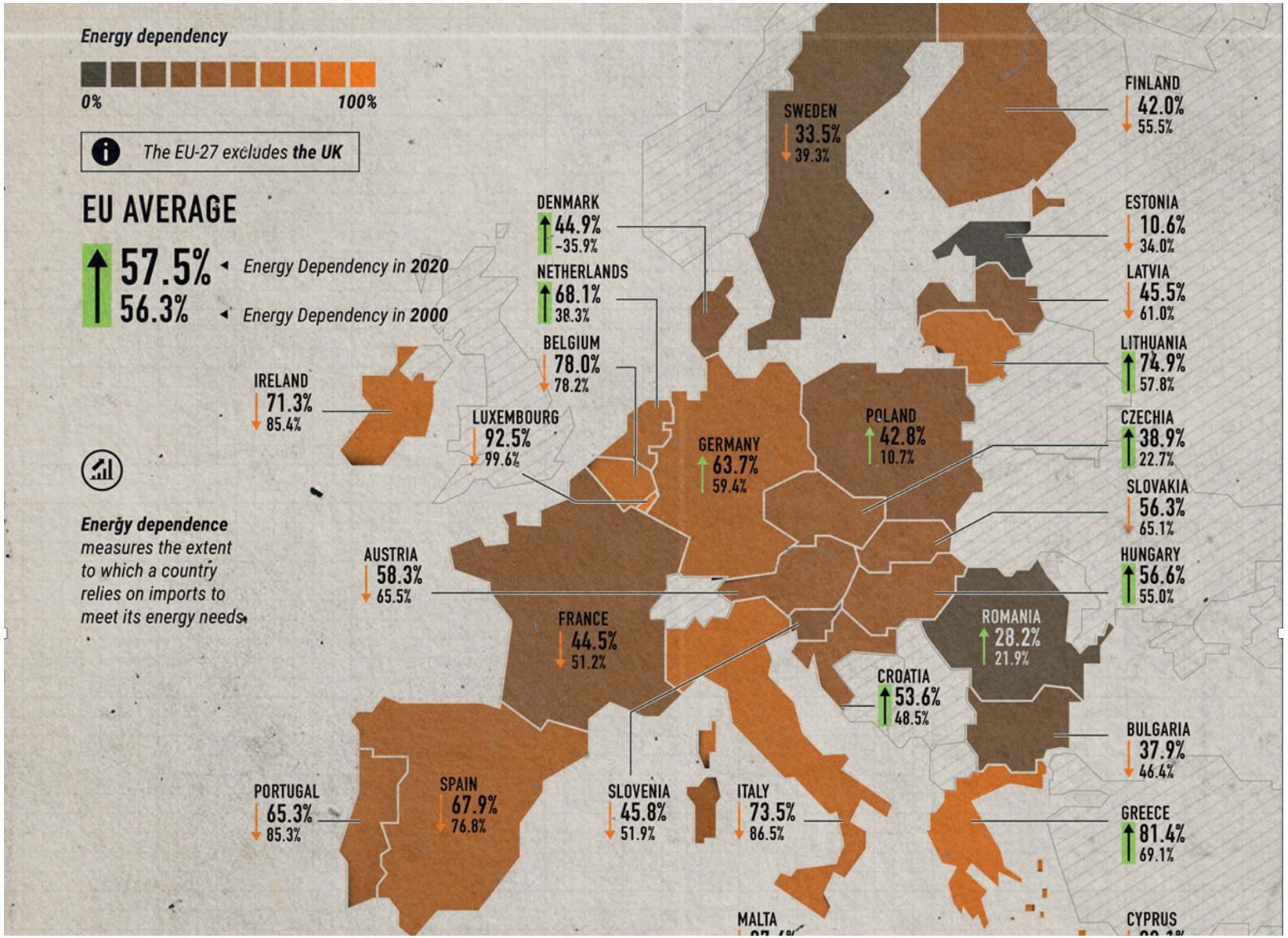
9 boundaries assessed,
6 crossed

https://www.stockholmresilience.org


Ice Core Data
Modern Instrumental Data
For millennia, atmospheric carbon dioxide had never been above this line
Today
1958
1911
CO_2 (parts per million)
420
380
340
300
260
220
180
800
700
600
500
400
300
200
100
0
Thousands of years before today



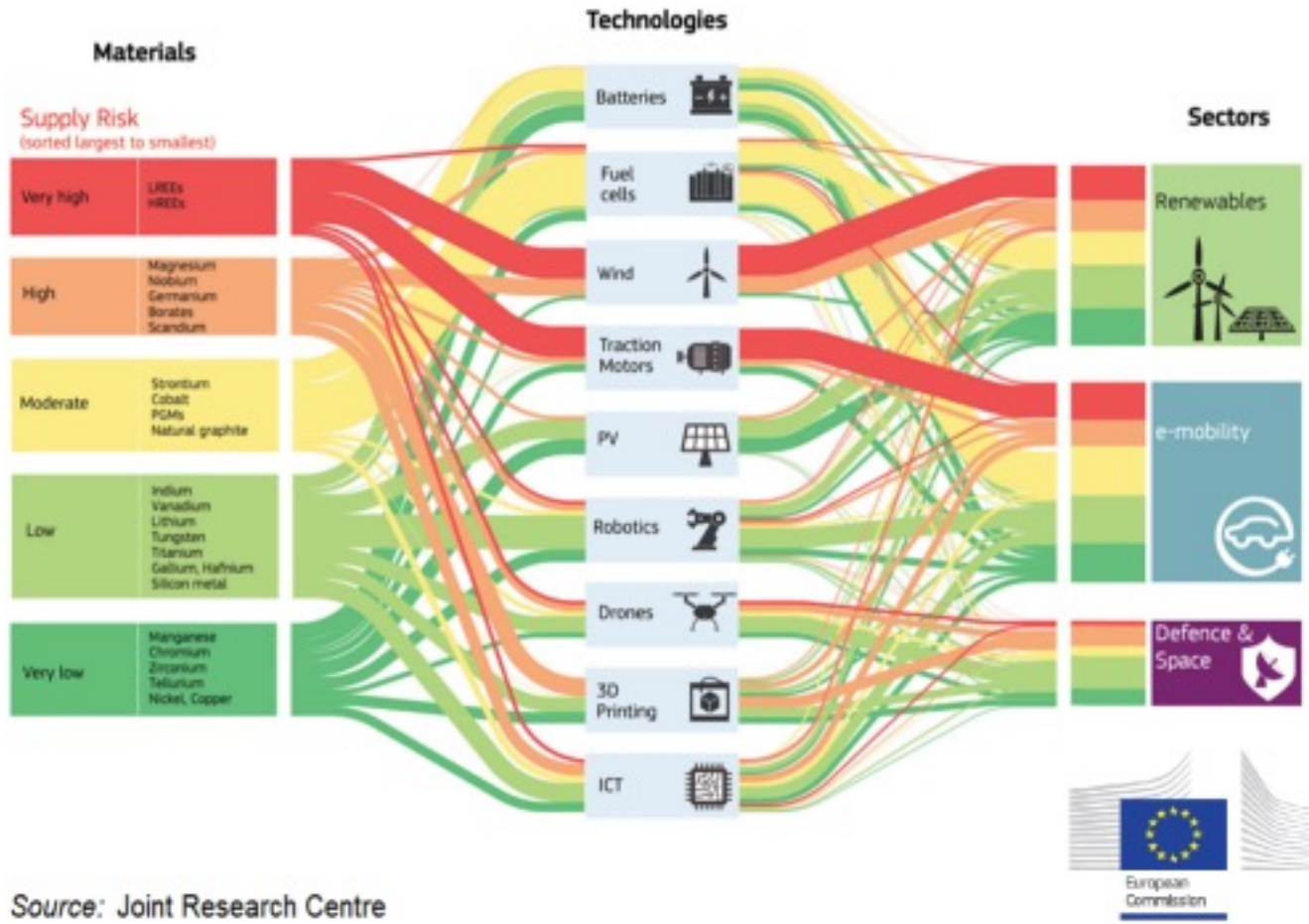
Visual Capitalist, March 22, 2022



ENERGIE IMPORT ABHÄNGIGKEIT

Visual Capitalist, March 22, 2022

Critical raw materials and their supply risk

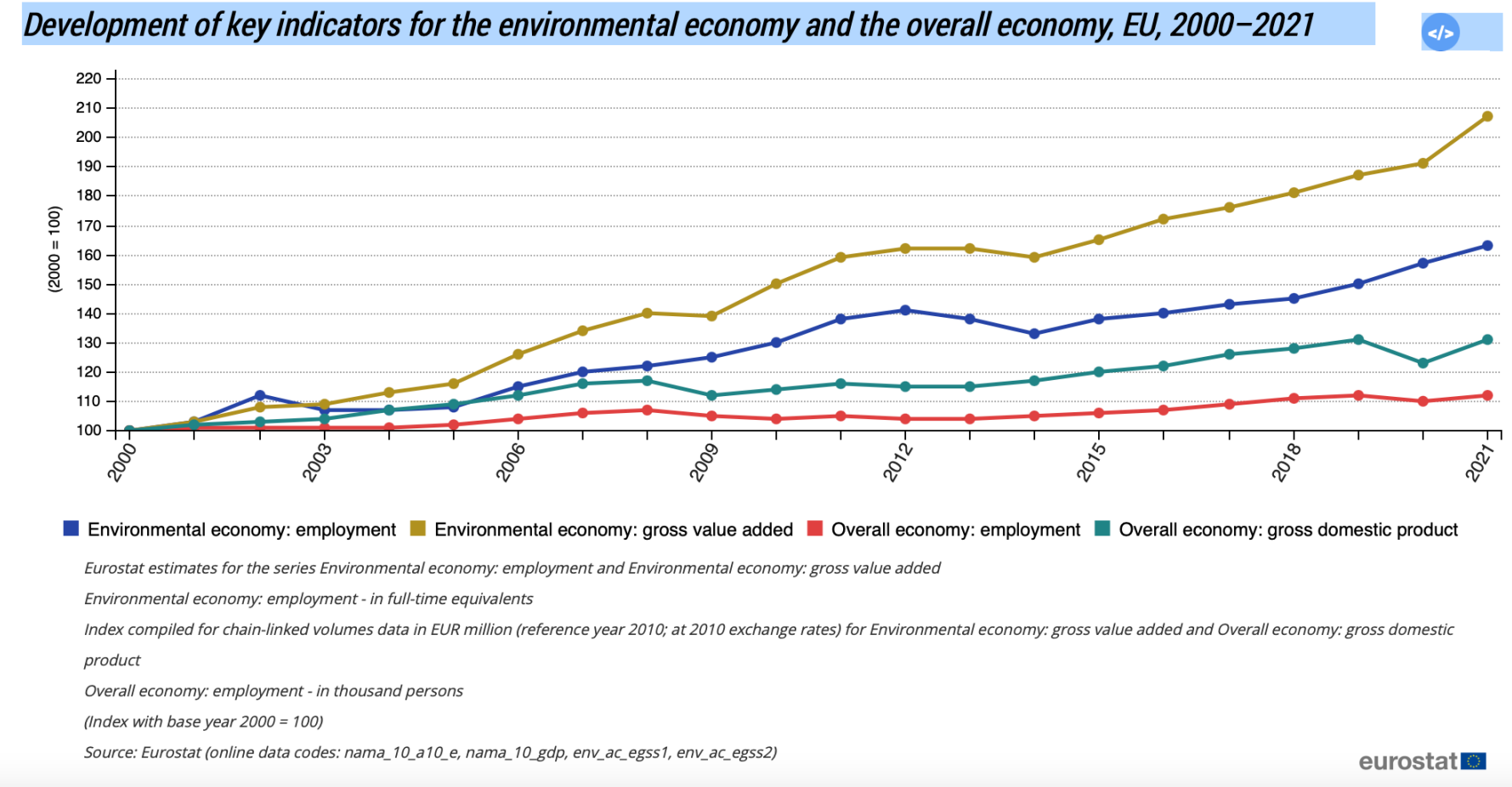


Source: Joint Research Centre

Industrial Innovators

Green Jobs. 5.2 million full time equivalents (2021)

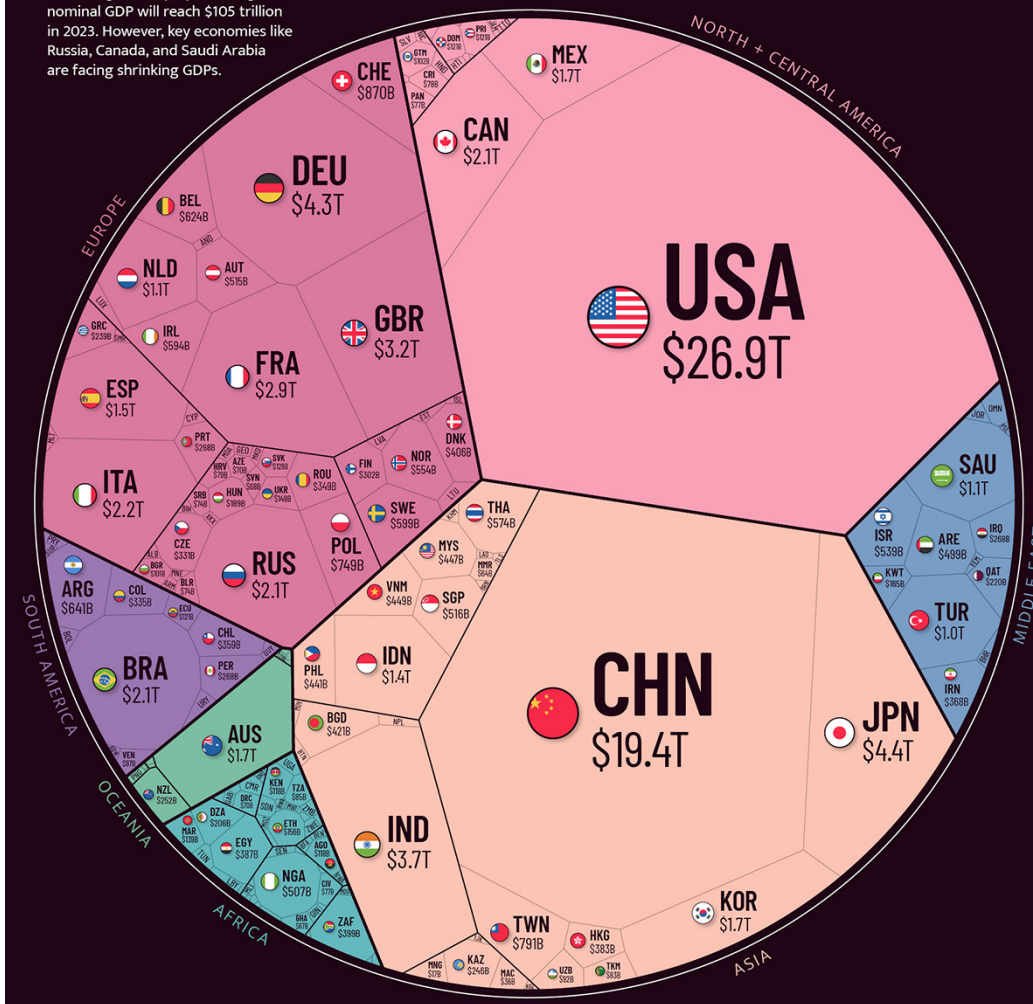
Green Economy. Euro 937 billion output; 369 billion gross value added



THE $105 TRILLION WORLD ECONOMY

2023 GLOBAL GDP

According to IMF projections, global nominal GDP will reach $105 trillion in 2023. However, key economies like Russia, Canada, and Saudi Arabia are facing shrinking GDPs.



The IMF sees the world economy growing 5.3%, or when adjusted for inflation, 2.8%.

Russia's projected $150B GDP drop is more than Ukraine's total $149B GDP.

India dethrones the UK as the 5th largest economy in the world.

China's GDP is expected to grow 7.1% in 2023, ahead of U.S. growth of 5.5%.

VISUAL CAPITALIST

Note: No 2023 IMF Data for Afghanistan, Lebanon, Pakistan, Sri Lanka and Syria.
Source: IMF Datamapper, World Economic Outlook, 2023

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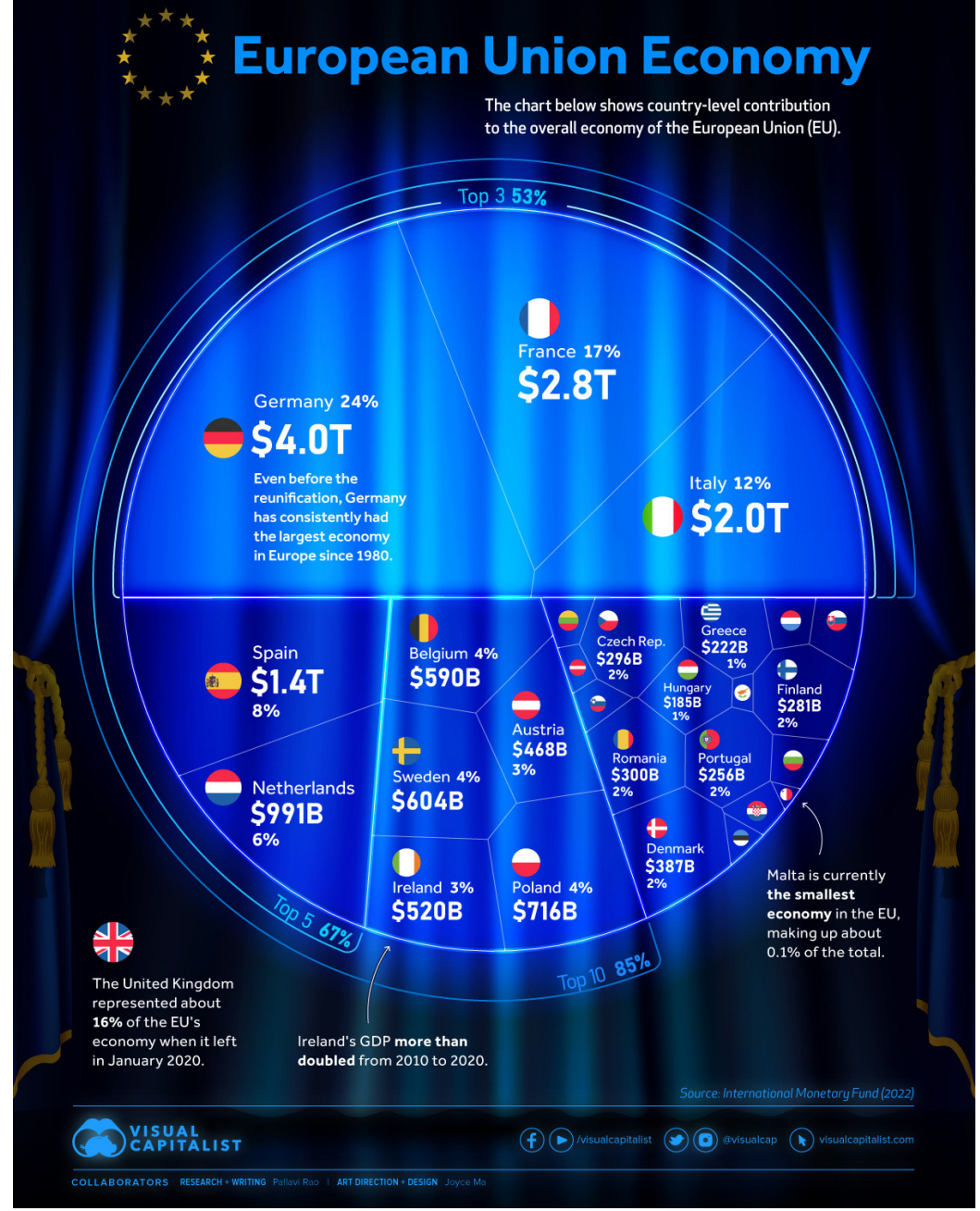
European Union Economy

The chart below shows country-level contribution to the overall economy of the European Union (EU).



Source: International Monetary Fund (2022)

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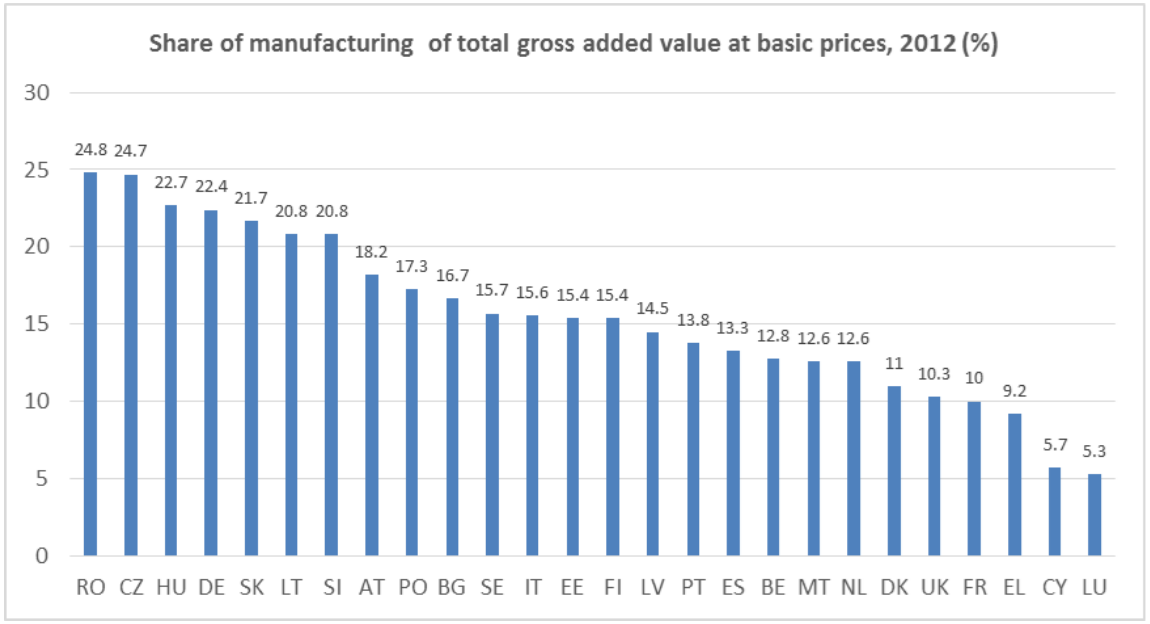
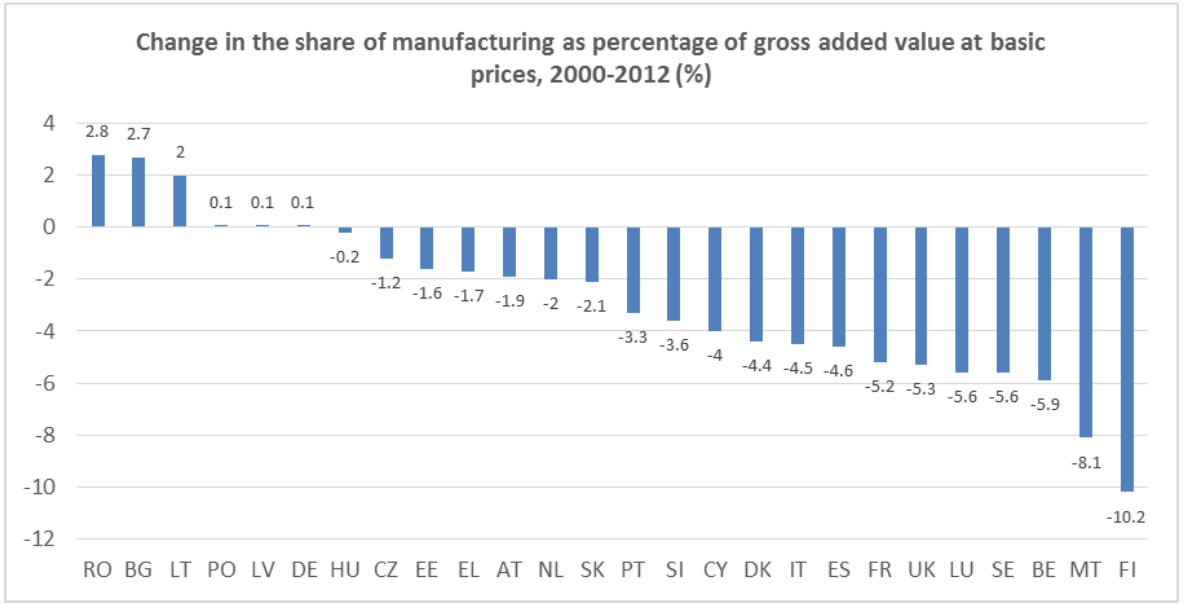
COLLABORATORS RESEARCH + WRITING Pallavi Rao | ART DIRECTION + DESIGN Joyce Ma

https://www.europarl.europa.eu/RegData/etudes/STUD/2016/570007/IPOL_STU(2016)570007_EN.pdf

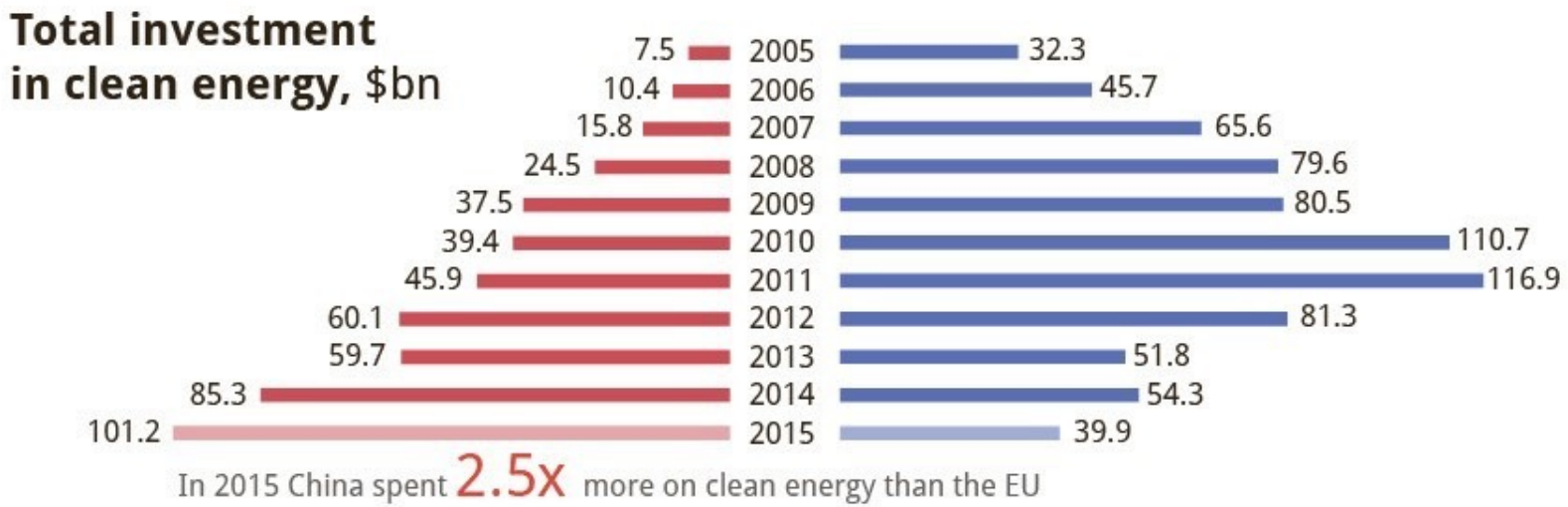


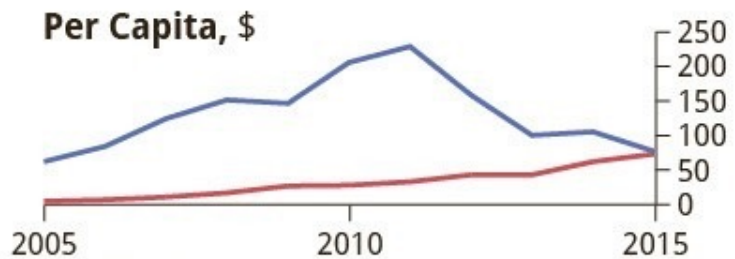


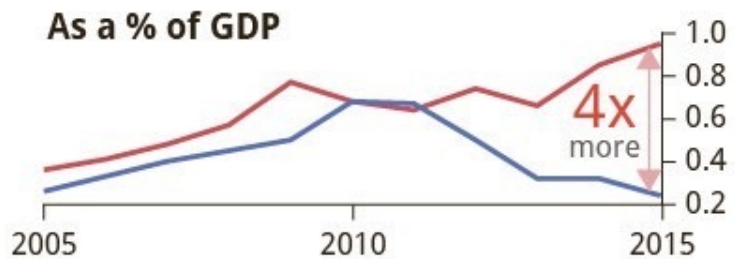
China

China has already overtaken the EU in clean energy investment

EU



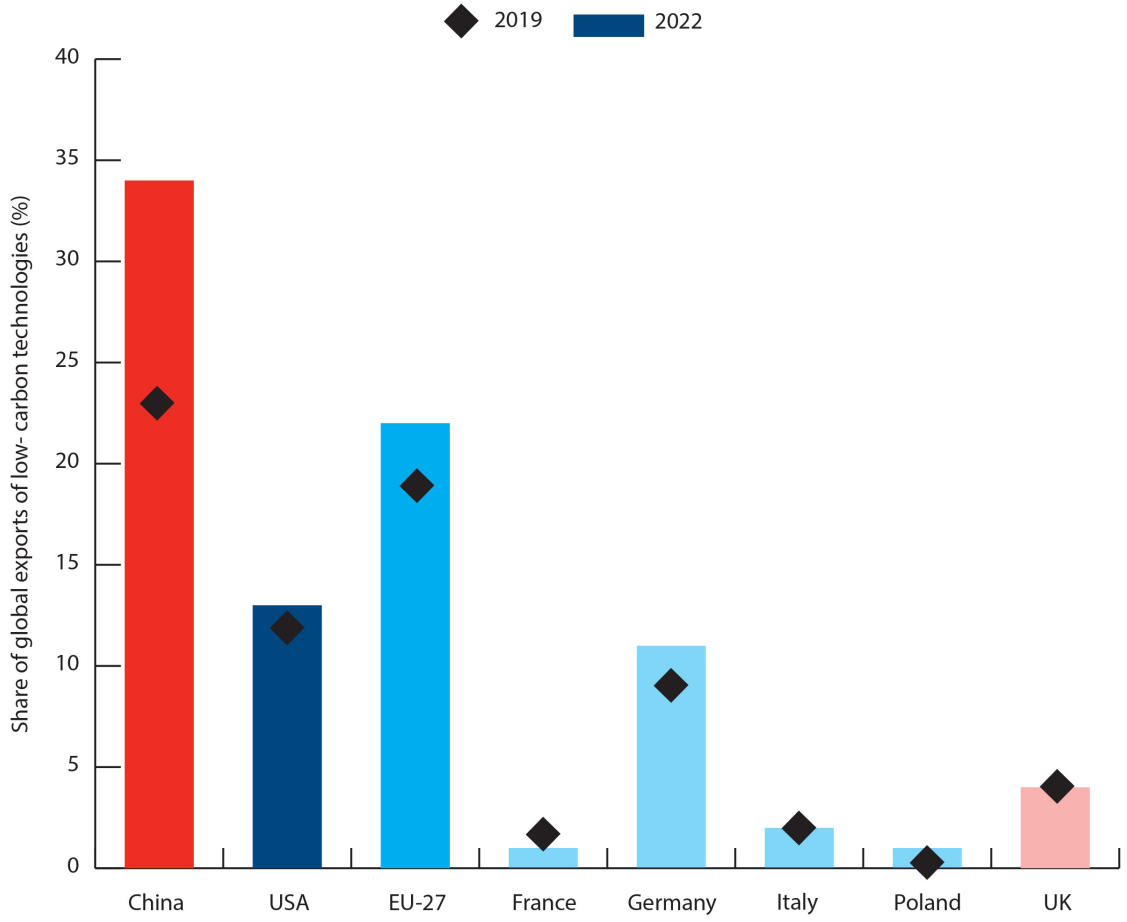




E3G

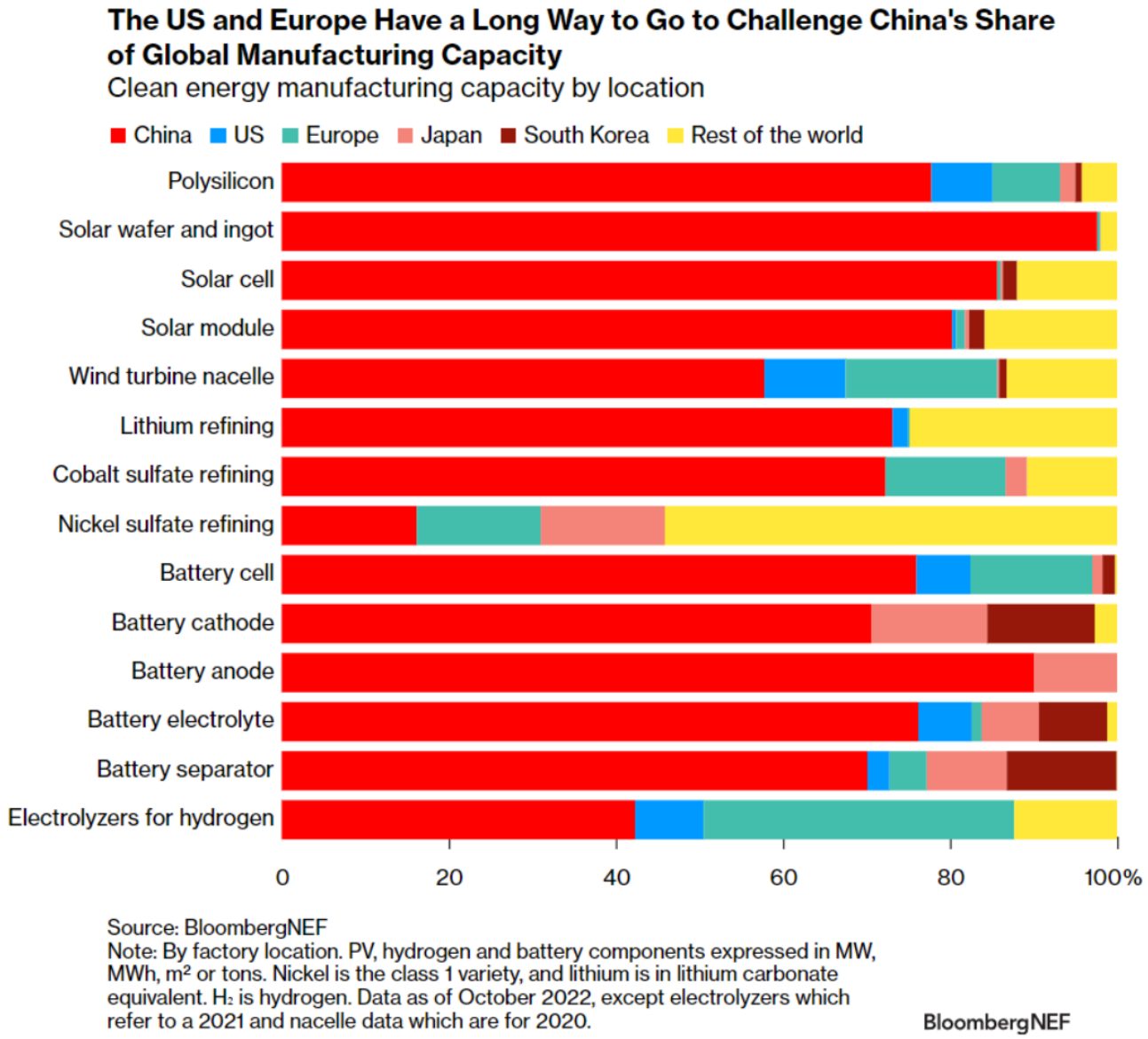
Sources: BNEF; Xinhuanet

Chart 1: The EU's share of global green tech exports is growing more slowly than China's, but it remains well ahead of the US

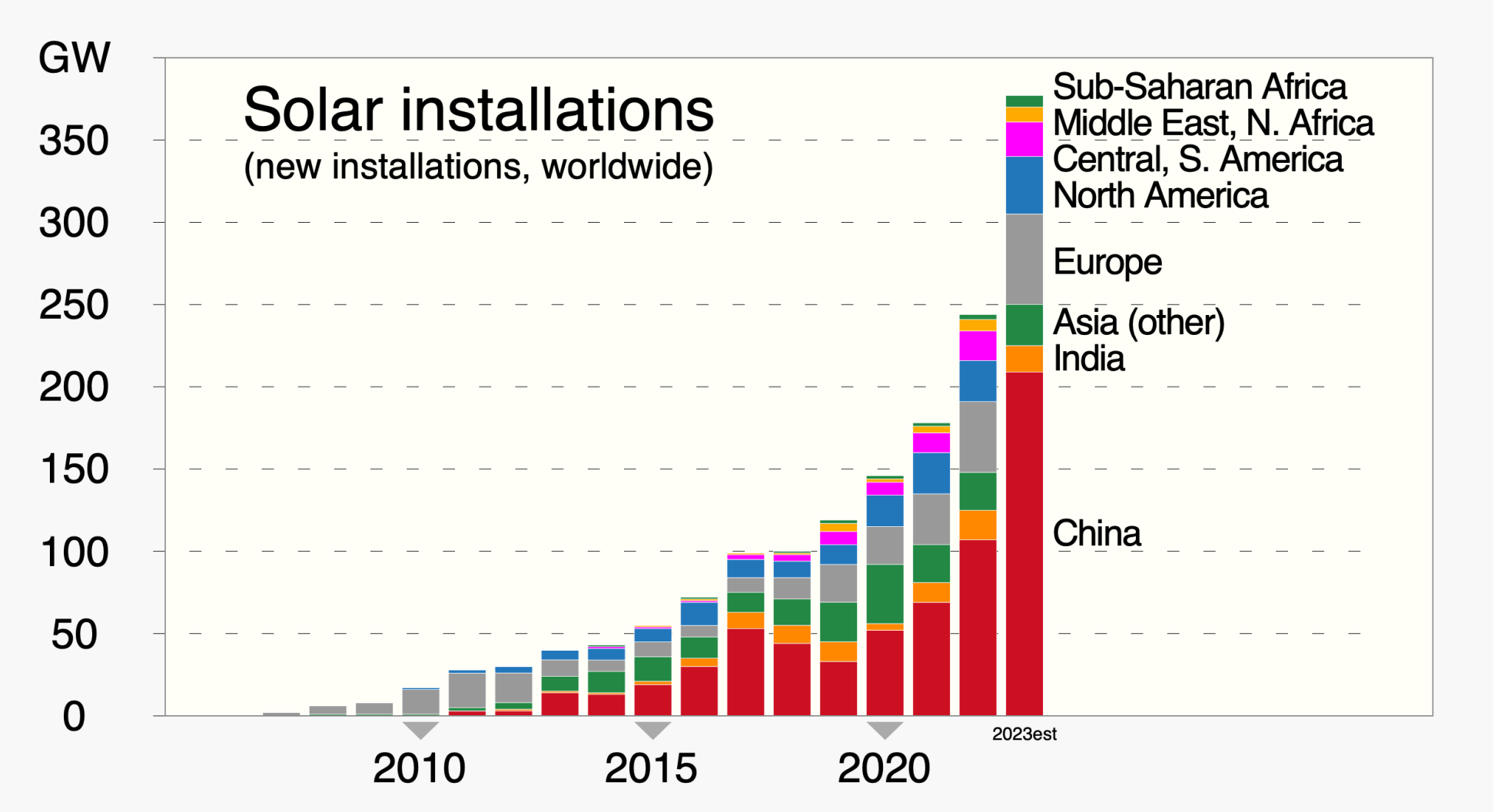


Source: CER analysis of UN COMTRADE data. Exports data are in value terms.

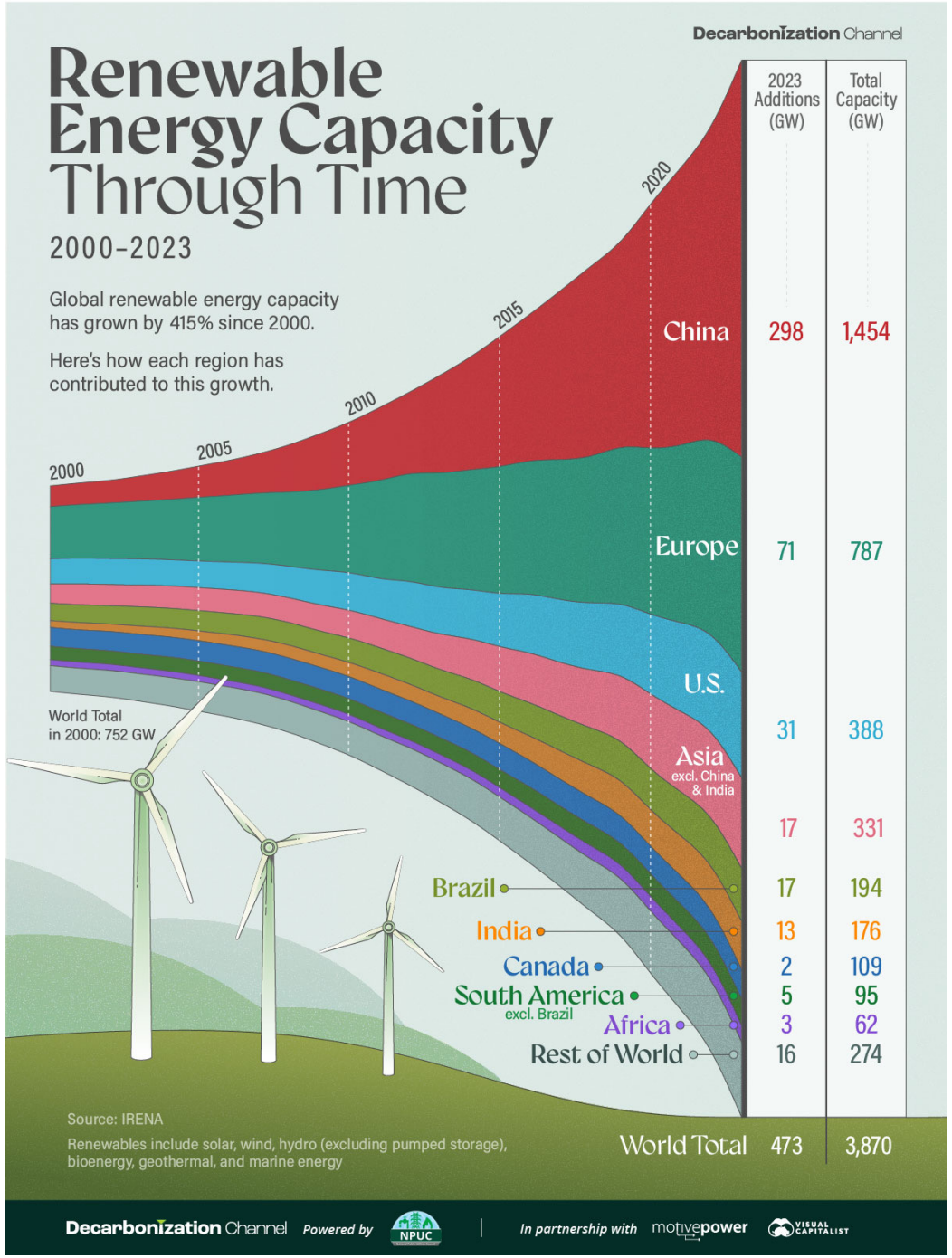
https://www.cer.eu/publications/archive/policy-brief/2023/europe-american-chinese-green-tech



https://about.bnef.com/blog/the-race-to-localize-clean-technology-supply-chains/



•Rcraig09 CC BY-SA 4.0
•File:2007- New solar installations - annually by country or region.svg
•Created: 15 September 2023 https://en.wikipedia.org/wiki/Growth_of_photovoltaics#/media/File:2007-_New_solar_installations_-_annually_by_country_or_region.svg

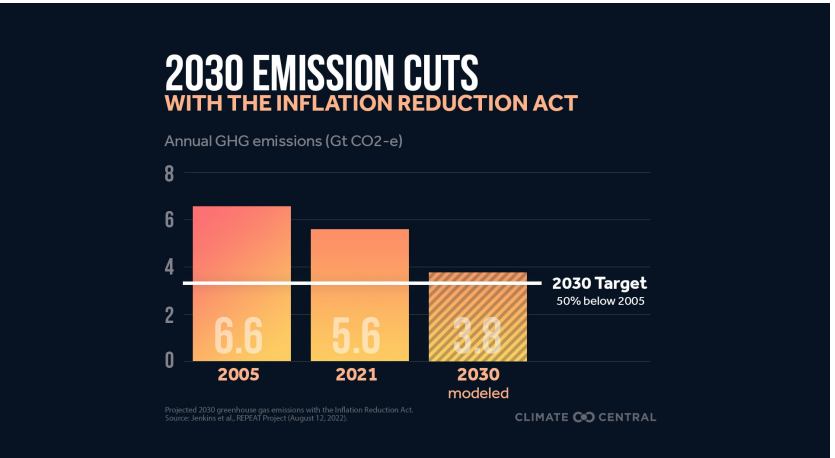


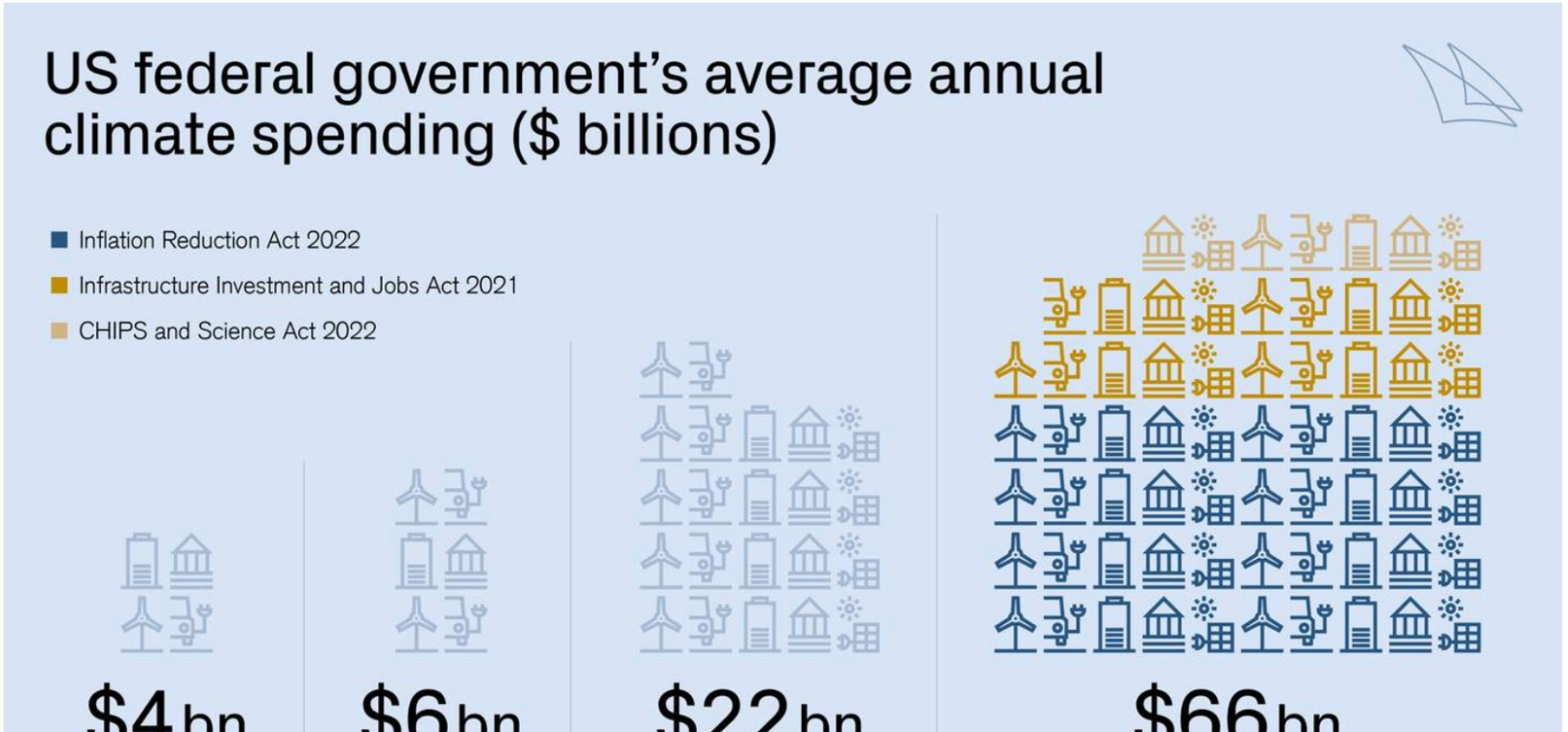
https://www.visualcapitalist.com/sp/visualized-renewable-energy-capacity-through-time-2000-2023/


One belt, one road – China's new Silk Road
Kazan
Moscow
Irkutsk
Venice
Urumqi
Ankara
Beijing
Kashgar
Piraeus
Tehran
Xi'an
Suez
Kunmin
Fuzhou
Gwadar
Kolkata
Chittagong
Haiphong
Sittwe
Djibouti
Colombo
Singapore
Mombasa
Jakarta
Planned Silk Road economic belt
Planned maritime Silk Road
Member states of AIIB (Asian Infrastructure Investment Bank)
Harbor with Chinese involvement
Source: MERICS, DW | 12/2015
© DW

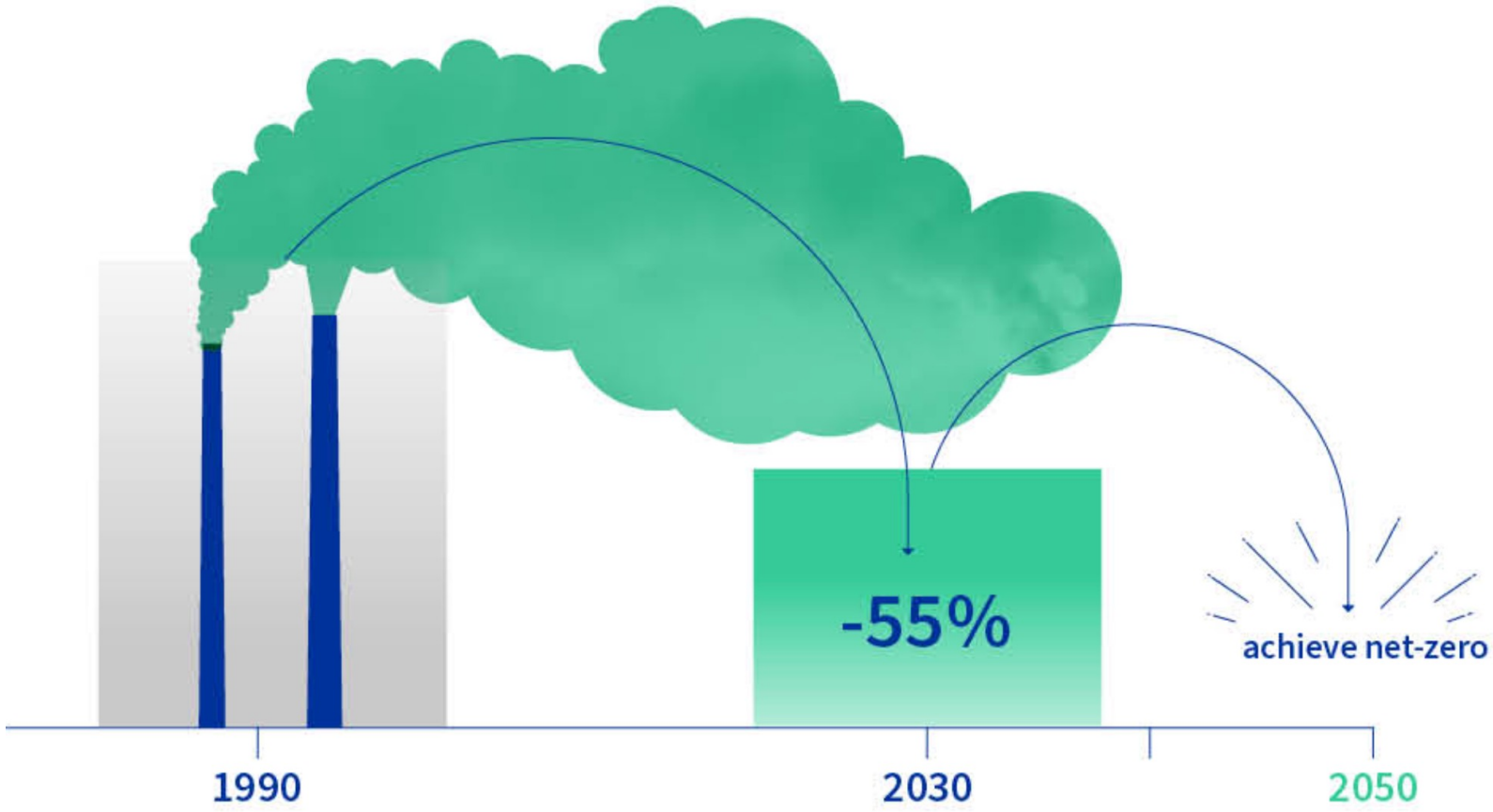
Also, developments in the United States

- US Inflation Reduction Act $369 Billion for clean energy & to cut emissions. Cut ghg emissions 42% below 2005 levels by 2030
- Bi-partisan Infrastructure Act



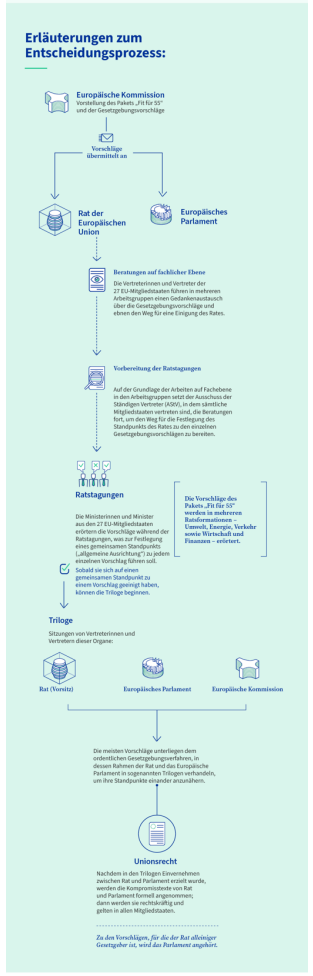


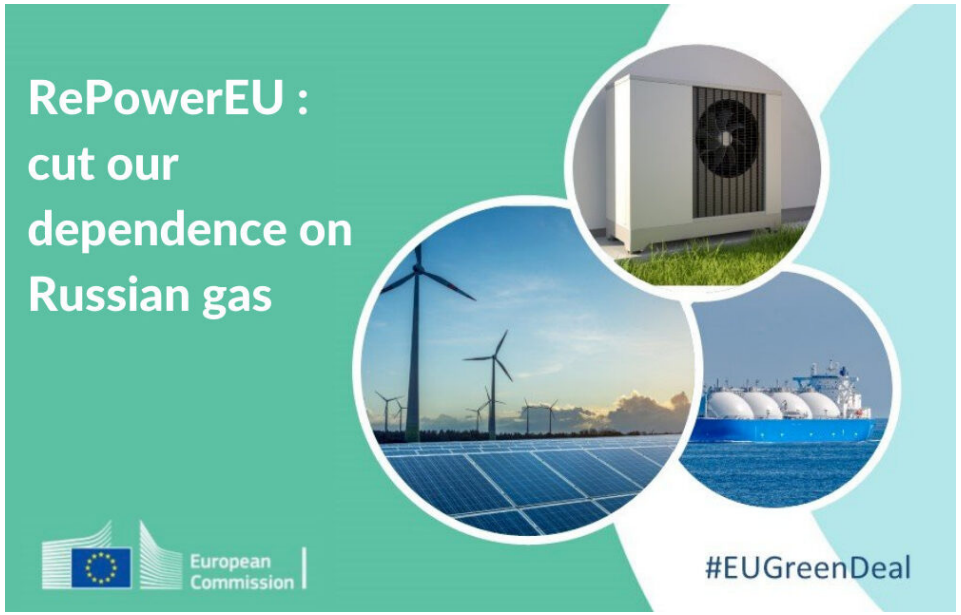
EU Climate Targets: 2050 Climate Neutrality Target



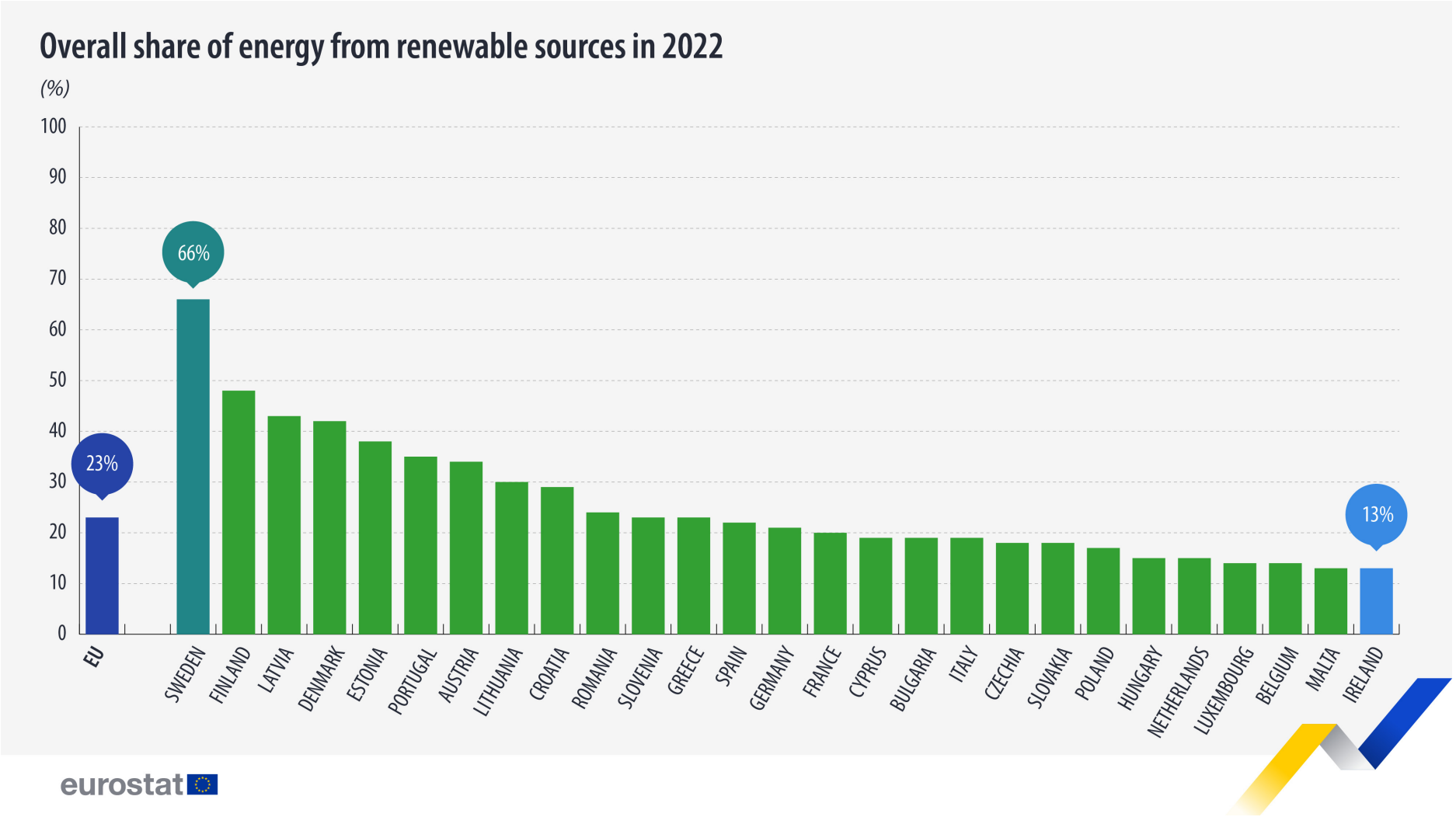
Europe

- EU Climate Law
- Fit for 55
- Hydrogen and Gas Package
- REPowerEU





Renewable Energy in Europa: 23% of electricity in 2022



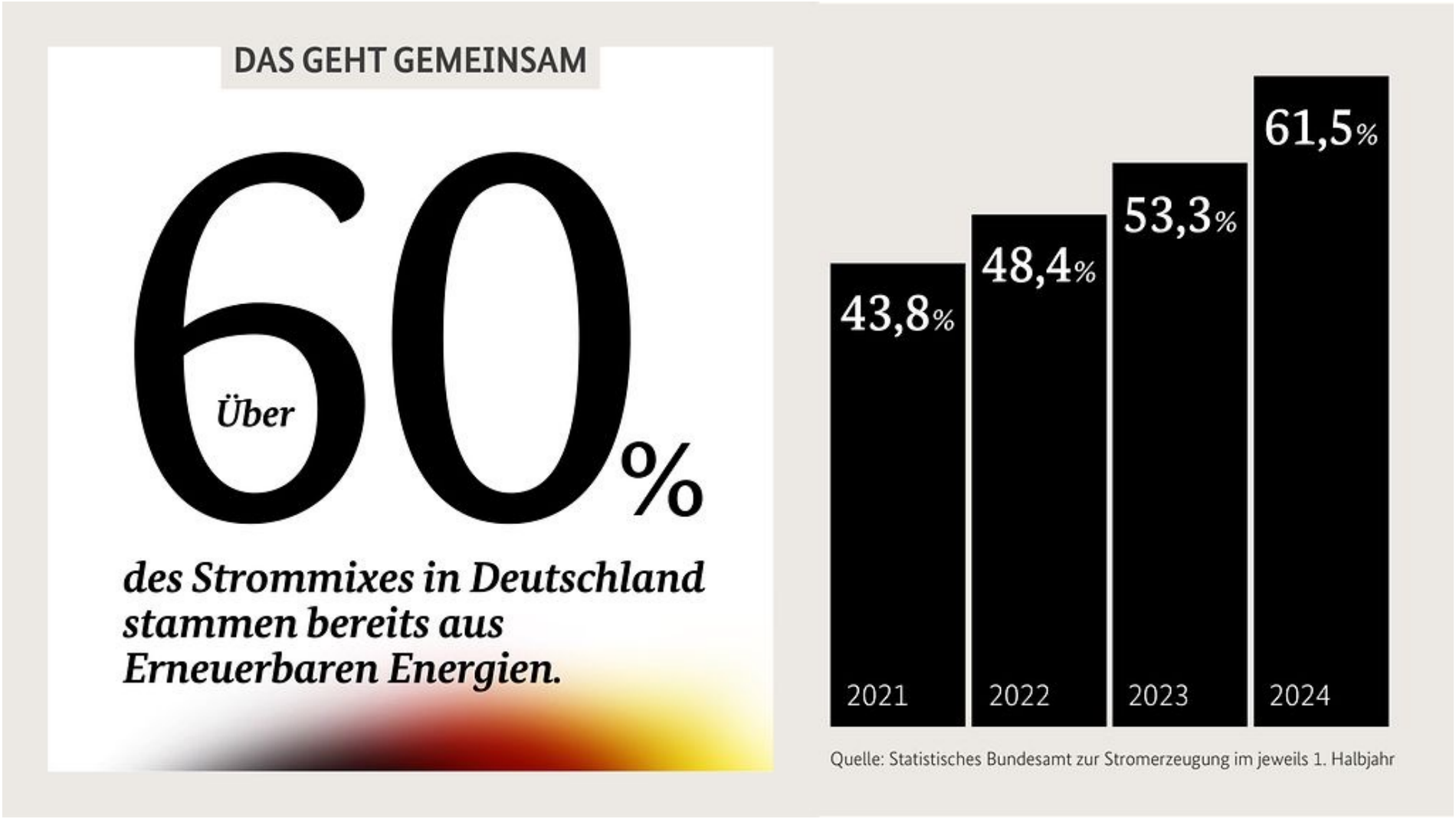
https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20231222-2

Ausbau der Erneuerbaren gewinnt an Tempo

Anteil der Erneuerbaren Energien am Bruttostromverbrauch im Zeitraum 2000 bis Juni 2024.

Quelle: Arbeitsgruppe Erneuerbare Energien-Statistik (AGEE-Stat); Stand: Juli 2024.

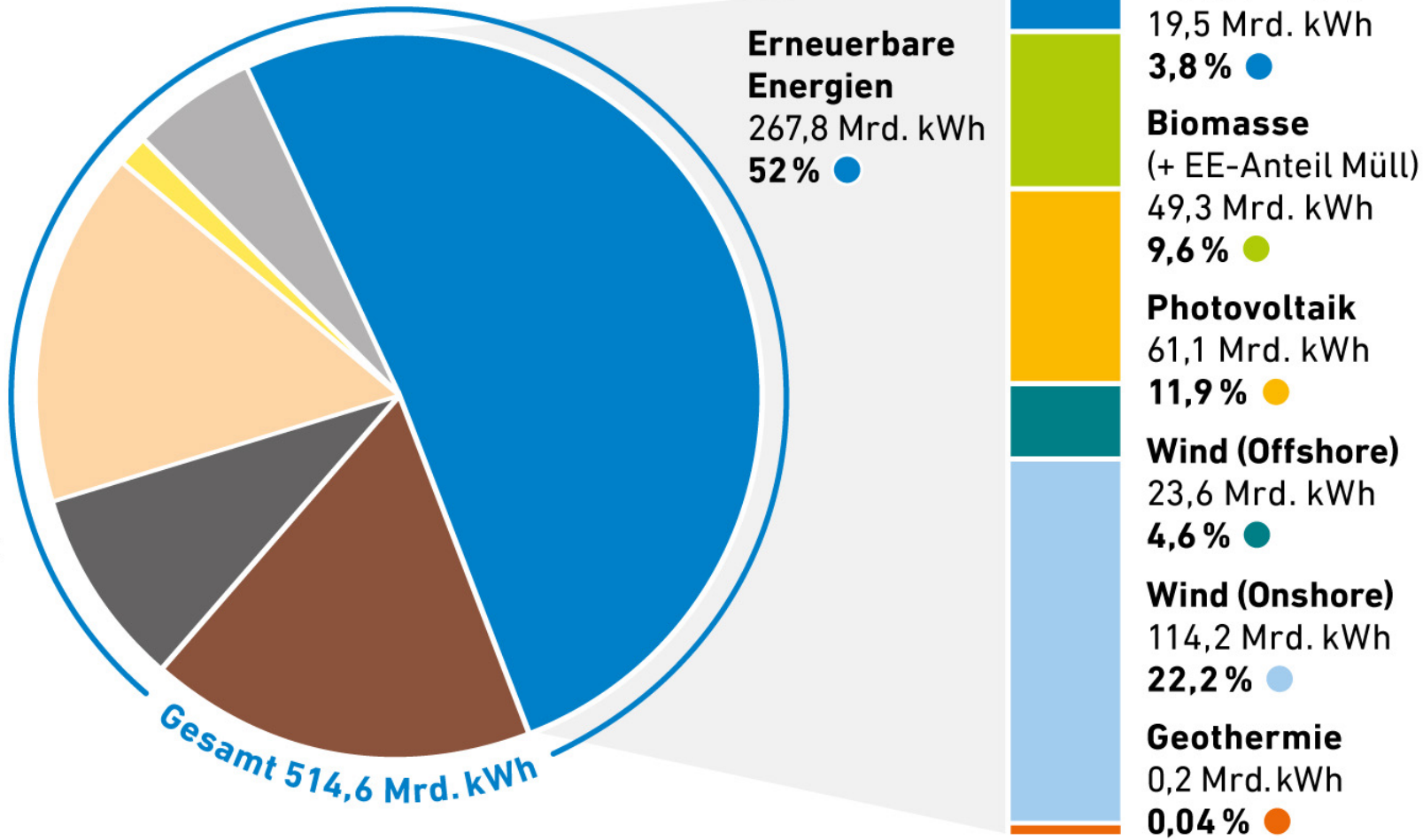
Erneuerbare Energie Anteil im Stromerzeugung im jeweils 1 Halbjahr.



Bundesregierung.de

Der Strommix in Deutschland im Jahr 2023

Insgesamt wurden rund 515 Milliarden Kilowattstunden Strom erzeugt, woran die Erneuerbaren Energien einen Anteil von 52 Prozent hatten.



Quelle: AG Energiebilanzen; Stand: 12/2023

AGENTUR FÜR ERNEUERBARE ENERGIEN

27 May

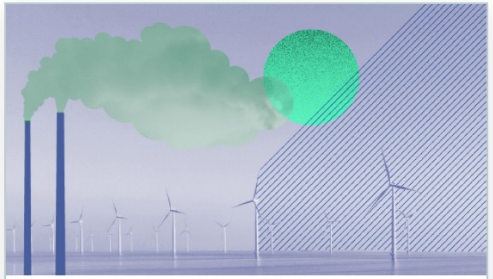
Council gives final approval to the net-zero industry act

The Council adopted a regulation on establishing a framework of measures for **strengthening Europe's net-zero technology manufacturing ecosystem**, better known as the 'net-zero industry act'.

These new rules will facilitate the **conditions for investments in green technologies** by:

- simplifying permit granting procedures
- supporting strategic projects, based on specific criteria contributing to decarbonisation
- facilitating access to markets for net-zero technological products
- defining rules for public incentives
- enhancing the skills of the European workforce

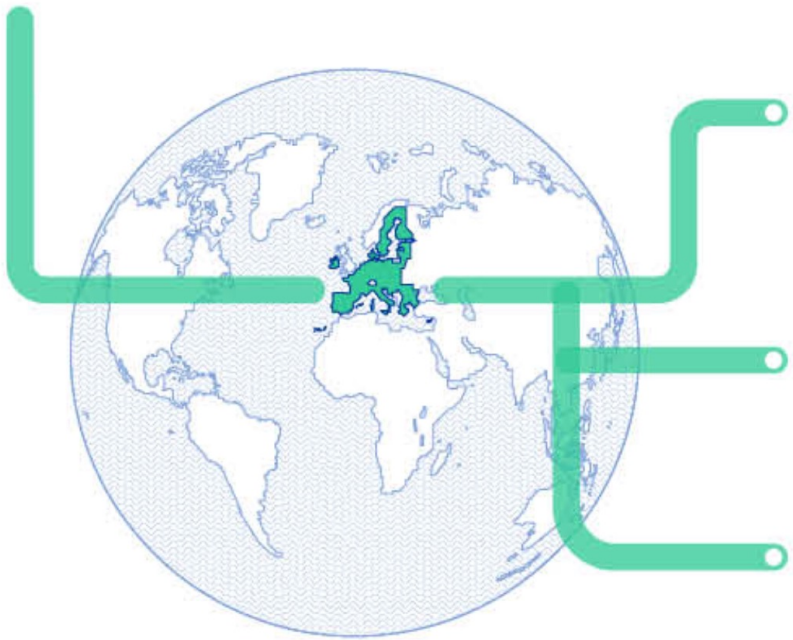
The objective is **to cover 40% of the EU's needs** in strategic technology products, such as solar photovoltaic panels, wind turbines, batteries and heat pumps.



Net-zero industry act: a benchmark for the manufacturing capacity of strategic net-zero technology products (infographic)

→

Objectives of the net-zero industry act:



- to **promote investments** in the production capacity of key products that ensure the EU's climate neutrality goals
- to **create a simple legal framework** for EU-based net-zero industries
- to cover **40%** of domestic needs in the EU with domestically-produced clean technologies by 2030

Solar photovoltaic and solar thermal

by **2025**

Objectives of over 320 GW of newly installed solar photovoltaic capacity

by **2030**

600 GW

Could deliver:

€60 billion of GDP per year in Europe and 400 000 new jobs

Onshore wind and offshore renewables

Capacity will have to grow from 204 GW in 2022 to more than 500 GW in 2030

by **2030**

At least 42.5% of renewables

Batteries

Collection targets:

- portable batteries targets are 63% in 2027
- batteries from light means of transport, the target are 51% in 2028
- material recovery targets for lithium will be 50% by 2027

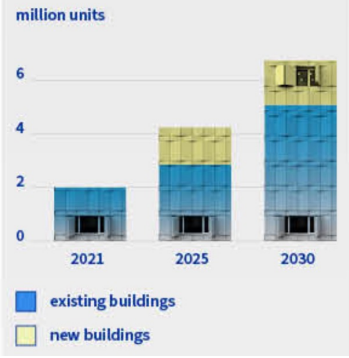
by **2030**

73%

61%

80%

Heat pumps



by **2030**

predictions are that heat pumps will lower Europe's gas demand for heating in buildings by at least 21 billion cubic meters

Biomethane and biogas

In 2021 biogas and biomethane production represented the same amount of natural gas consumption of Belgium, 196TWh

by **2030**

EU biomethane production must reach 35 billion (bcm) per year

CO2 capture and storage (CCS)

CCS is expected to grow to 80 million tonnes of CO2 and reach at least 300 million tonnes in 2040

by **2030**

annual injection capacity of at least 50 million tonnes of CO2 in storage sites located in the EU, its exclusive economic zones or on its continental shelf

Grid technologies

by **2024**

77% of EU consumers will have smart meters for electricity and 44% will have one for gas

GLOBAL MARKET:

The net-zero technology global market is worth about

by **2030**

€600 billion

Source: European Commission, Edelman Global Advisory, Carbon Gap

HOW:

→ faster permit-granting processes to construct, extend change and operate net-zero manufacturing projects

- 12 months for projects of less than 1 GW annually
- 18 months for larger projects
- support from a "one-stop shop"

→ a simple legal framework for EU-based net-zero industries

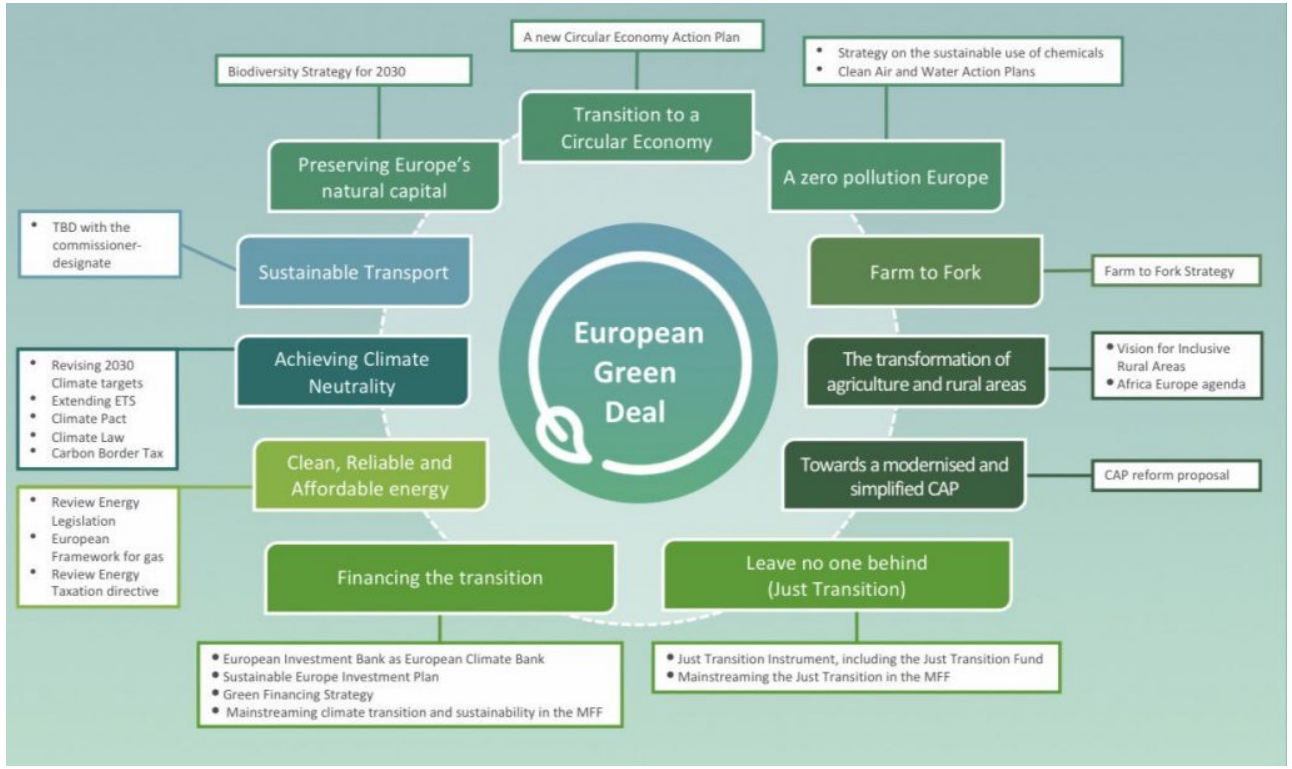
→ **fostering innovation**: member states will be able to support **innovation by creating net-zero regulatory sandboxes**

→ **access to markets** by stimulating consumer demand and **public procurement**

→ **net-zero Europe platform** as a coordination mechanism for discussion, information exchange and sharing of best practices on issues related to this regulation

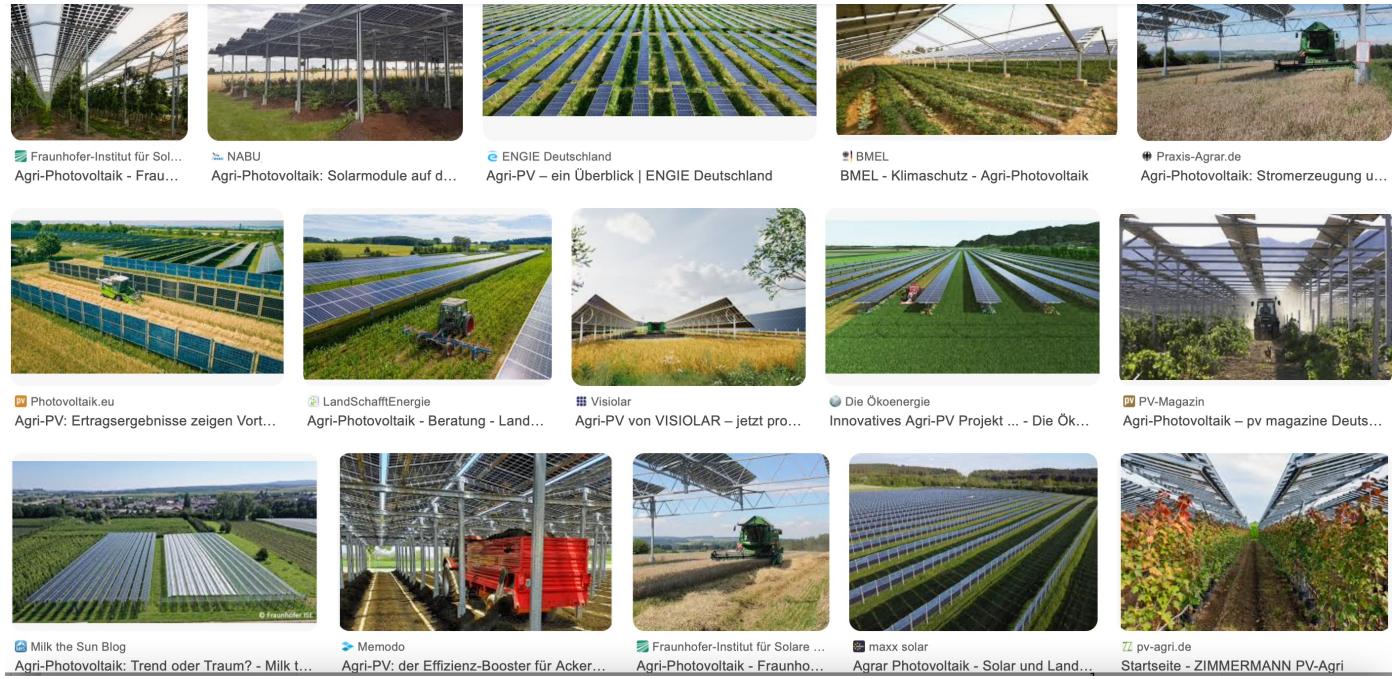
→ **enhancing skills (skills academies)**: developing the skilled workforce and quality jobs required for net-zero industry in Europe

European Green Deal



Risk Benchmarking of Ground-Mounted Photovoltaic and Agrivoltaic Systems:

A Comparative Risk Assessment of Ground-Mounted Photovoltaic and Hay-PV Resulting in Mitigation Approaches



Master Thesis in Politics & Technology (M.Sc.)
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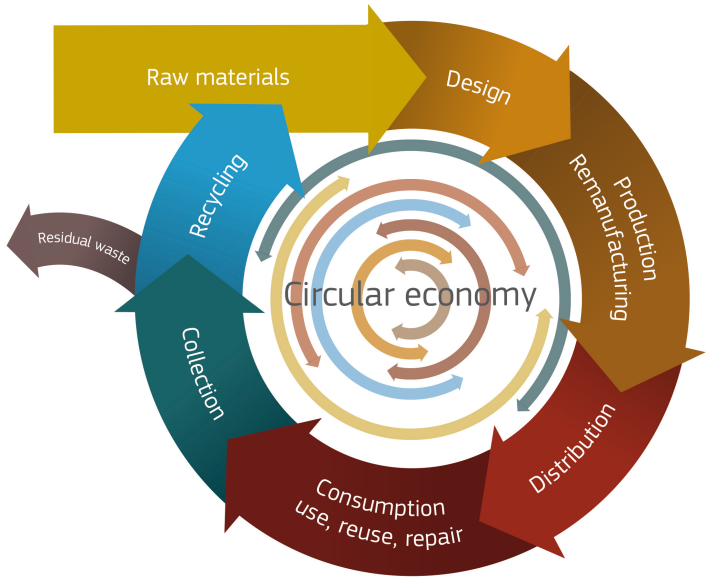
Submitted on:	03.10.2024 Munich

BayWa r.e.

Linear Economy

Circular Economy

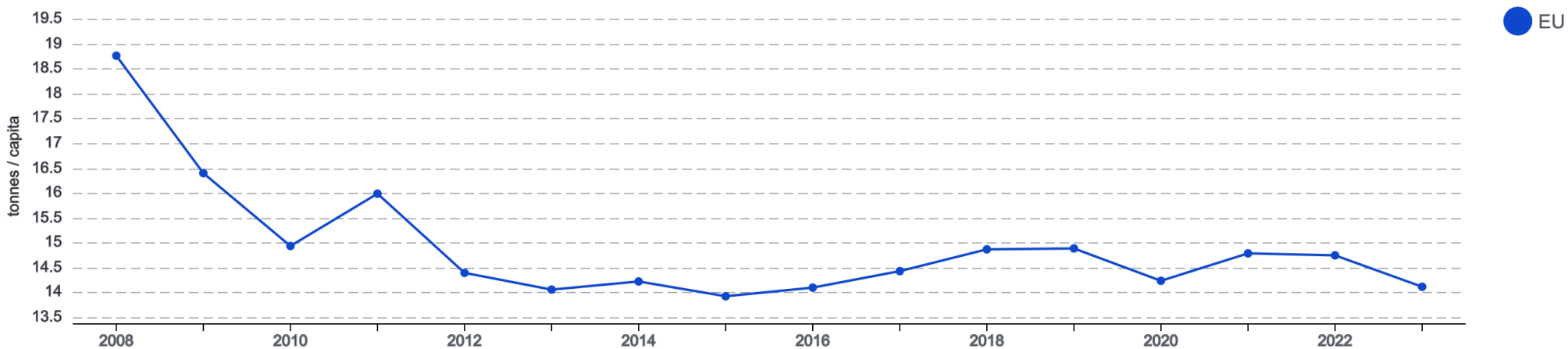


Circular Economy Package 2022

- make sustainable products the norm in the EU (Sustainable Products Initiative)
- empower consumers and public buyers
- Ecodesign laws 2022-2024
- Textile strategy
- Construction Products regulation

Raw material consumption (RMC) by main material category

Total | tonnes per capita



Source: Eurostat

Data is available for a limited number of EU countries.

Corporate Sustainability Reporting

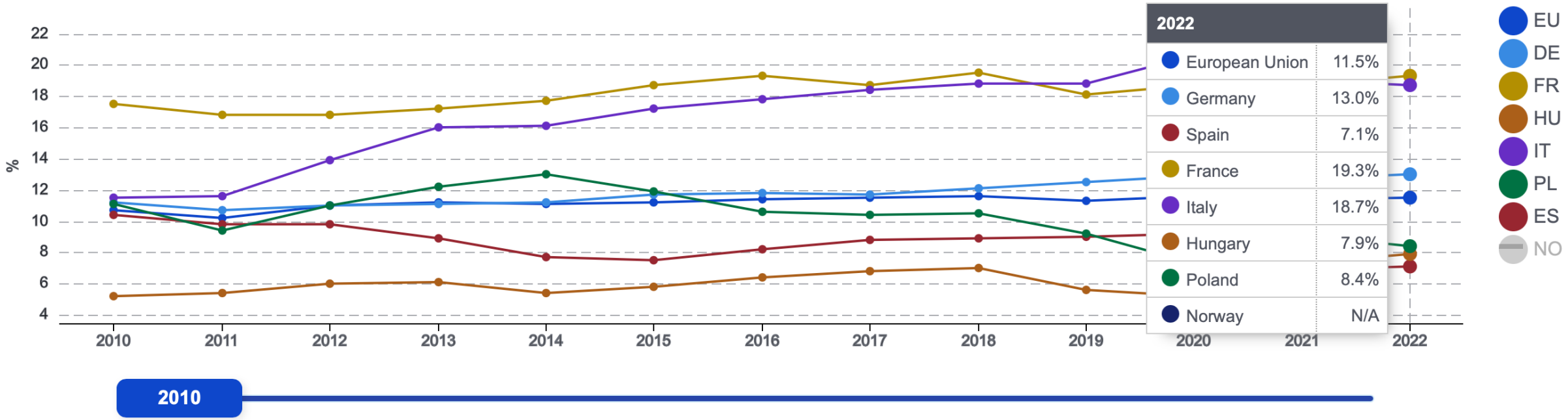
- **DIRECTIVE (EU) 2022/2464 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**
- **of 14 December 2022**
- **amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting**
- **(Text with EEA relevance)**

Plastics directive (2019/904)

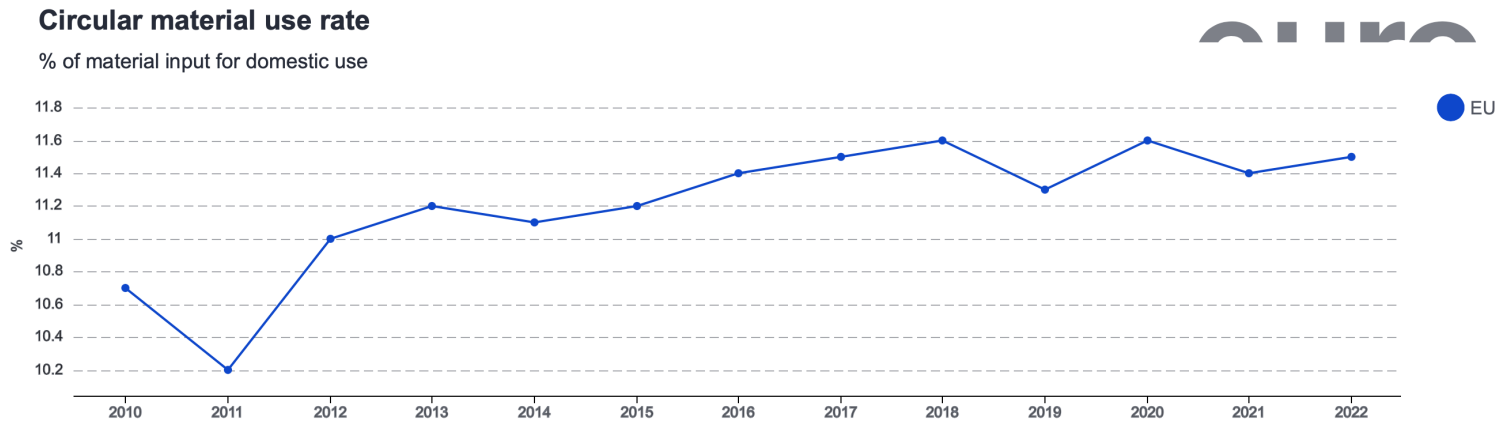
- introduced a ban starting in 2021 on the most common one-way plastics found on European beaches, including single-use plastic plates and cutlery, cotton buds, straws and stirrers, and expanded polystyrene foam food and drink containers.
- 90 percent of plastic beverage bottles must be collected separately by 2029 and plastic bottles must contain 25% recycled content by 2025 and 30% by 2030.

Circular material use rate

% of material input for domestic use

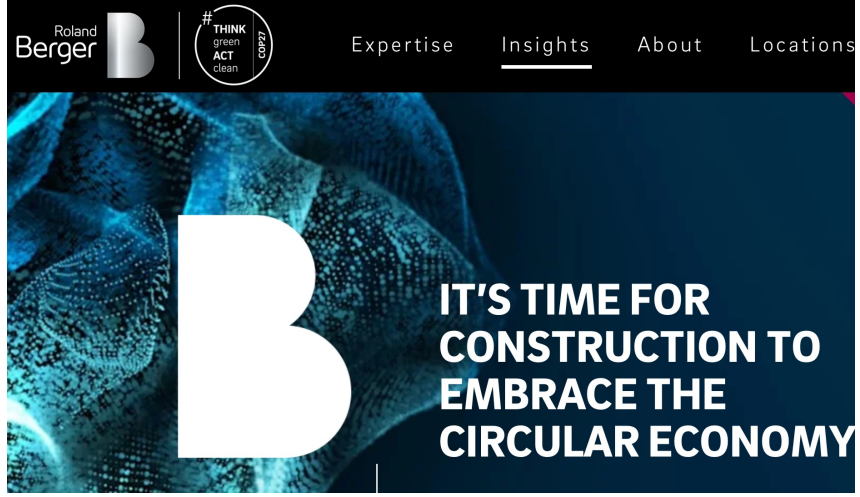


Source: Eurostat - access to dataset

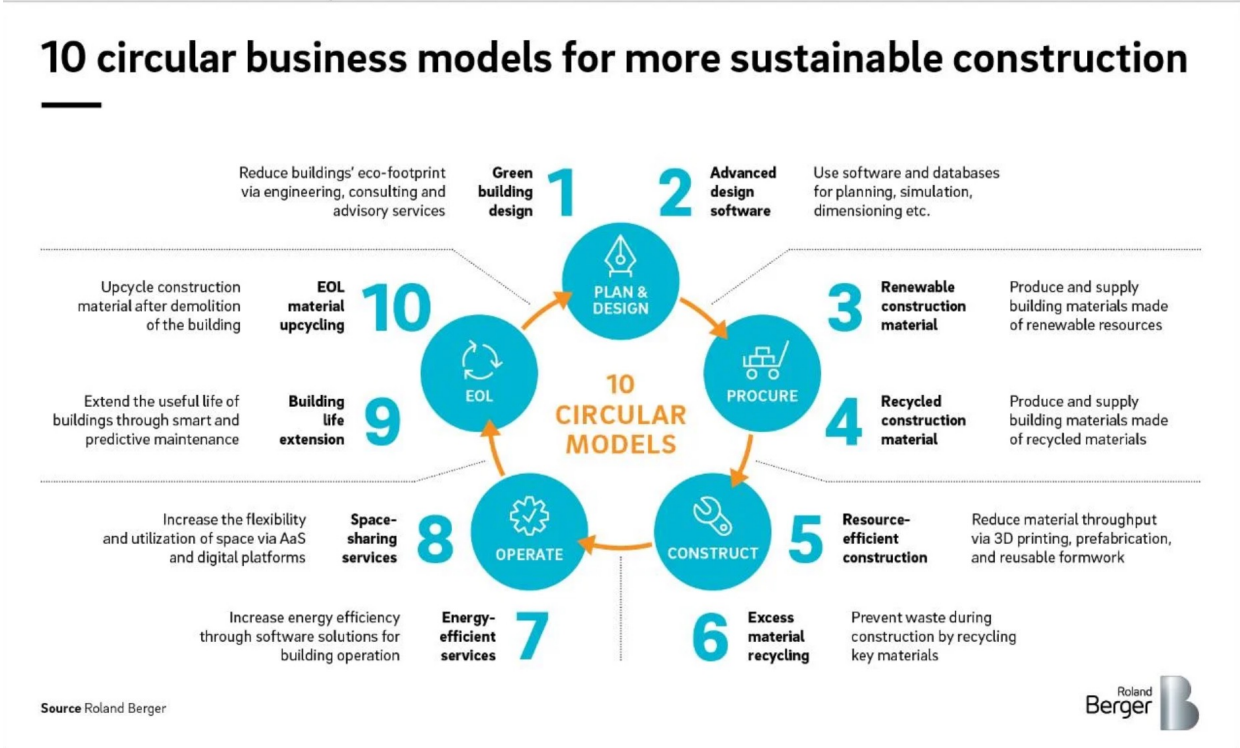


Source: Eurostat

Globally CONSTRUCTION responsible for:



40% global CO_2 Emissions
30% extraction natural resources
25% of solid waste



Revised Construction Products Regulation

1.8. Sustainable use of natural resources of construction works

The construction works and any part of them shall be designed, constructed, used, maintained and demolished in such a way that, throughout their life cycle, the use of natural resources is sustainable and ensures the following:

(a) use of raw and secondary materials of high environmental sustainability and thus with a low environmental footprint;

(b) minimizing the overall amount of raw materials used;

(c) minimizing the overall amount of embodied energy;

(d) minimizing the overall use of drinking and brown water;

(e) reuse or recyclability of the construction works, parts of them and their materials after demolition.

Press release

10-04-2024 - 17:48
20240408IPR20303

European Parliament

Parliament gives its final approval to the revised construction products regulation

- Publication of standards to become faster and more efficient.
- All product information to be made available in a single place via Digital Product Passport.
- Inclusion of used construction products to boost reuse and remanufacturing.

https://ec.europa.eu/docsroom/documents/49315

REGULATION (EU) 2023/1542 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 12 July 2023

concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

- Addresses the whole life cycle of batteries (from small household batteries to large vehicle and industrial batteries) from the sourcing of materials and battery design to the treatment of used batteries
- Introduces mandatory requirements on sustainability (such as carbon footprint rules, minimum recycled content, performance and durability criteria), safety and labelling for the marketing and putting into service of batteries, and requirements for end-of-life management.

EU strategy for sustainable and circular textiles

- **Objectives**
- The strategy aims to create a greener, more competitive sector that is more resistant to global shocks.
- all textile products placed on the EU market are durable, repairable and recyclable, to a great extent made of recycled fibres, free of hazardous substances, produced in respect of social rights and the environment
- ”fast fashion is out of fashion” and consumers benefit longer from high quality affordable textiles
- profitable re-use and repair services widely available
- the textiles sector is competitive, resilient and innovative with producers taking responsibility for their products along the value chain with sufficient capacities for recycling and minimal incineration and landfilling

Green Deals going Local

- https://cor.europa.eu/en/engage/Pages/green-deal.aspx

- https://sustainablecities.eu/mannheim-message/local-green-deals/