



THE CLIMATE CHANGE DEBATE

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ENERGY POLITICS

26.10.2021



VIDEO

- https://www.youtube.com/watch?v=jAa58N4Jlos&ab_channel=DJICaptures



OUTLINE

- Climate change & Impact on the environment and society
- Climate change & Energy sector
- International climate regime
- Impact of regulatory policies on energy mix and energy investments



CLIMATE CHANGE
&
IMPACT ON THE ENVIRONMENT AND SOCIETY



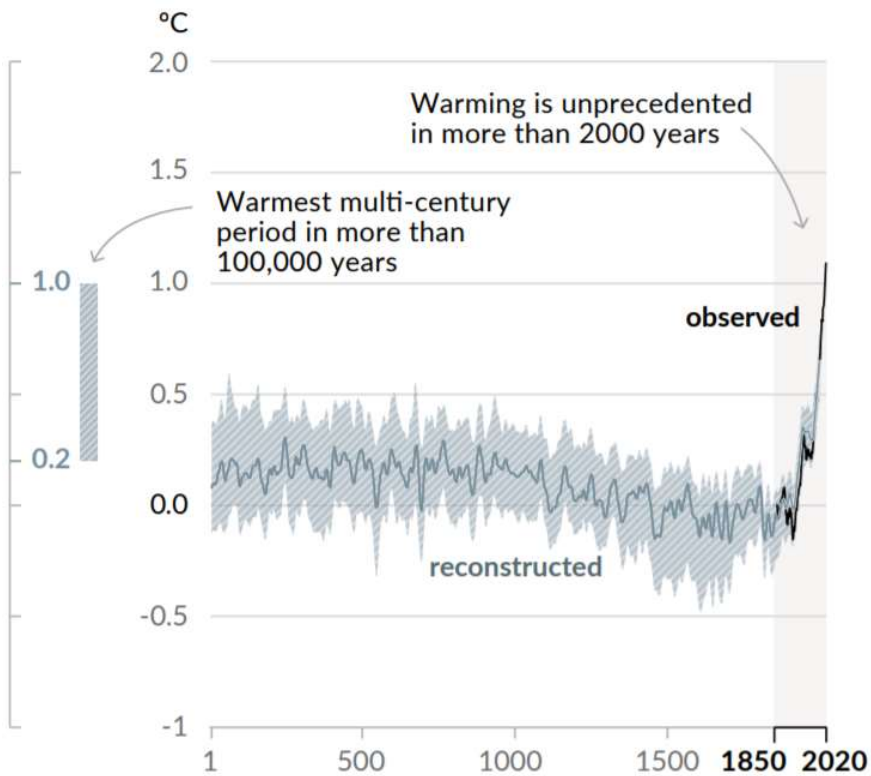


CLIMATE CHANGE

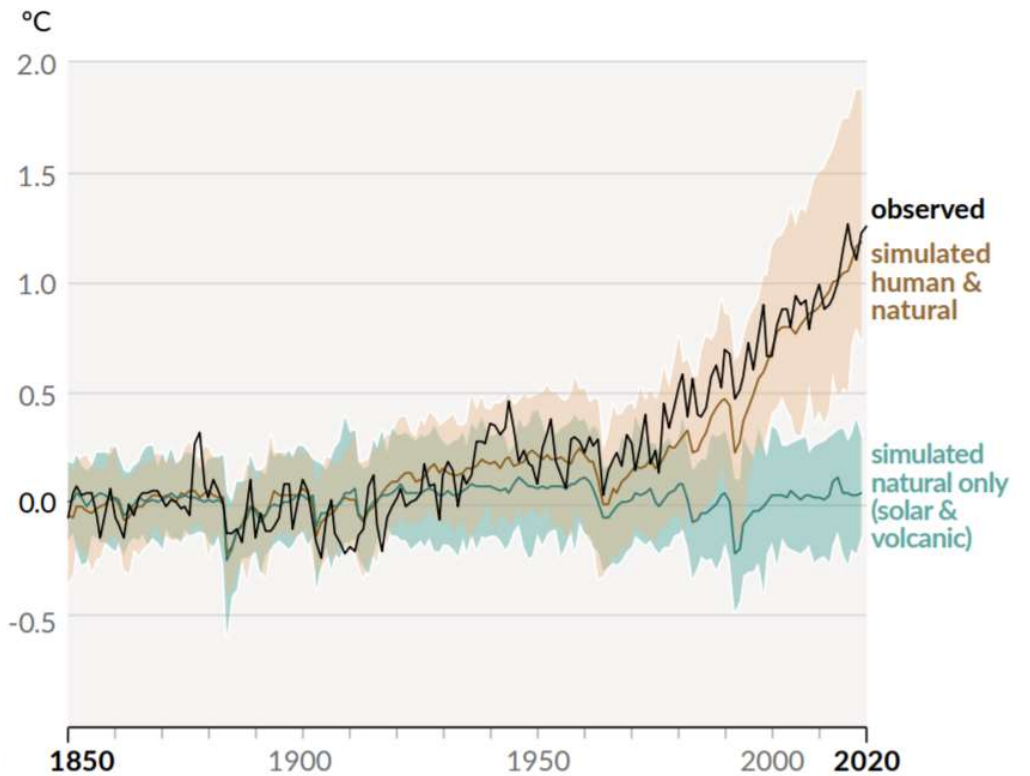
- 2021 IPCC Report
- The world has warmed 1.1°C compared to preindustrial levels
- Regional hot spots already feel the heat, some areas on Earth have already warmed beyond 2°C
- Temperatures in the Arctic are rising at least twice as fast as the rest of the world
- Islands are particularly at risk
- Global temperatures have a 20% chance of reaching 1.5°C above preindustrial levels during at least one of the next five years

Changes in global surface temperature relative to 1850-1900

a) Change in global surface temperature (decadal average) as **reconstructed** (1-2000) and **observed** (1850-2020)



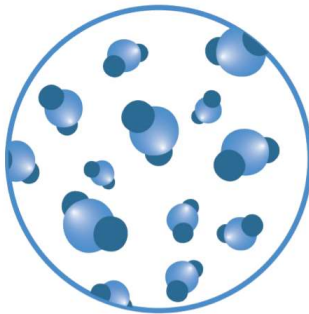
b) Change in global surface temperature (annual average) as **observed** and simulated using **human & natural** and **only natural** factors (both 1850-2020)



Source:
https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

THE CURRENT STATE OF THE CLIMATE

CO₂
concentration



Highest

in at least

2 million years

Sea level
rise

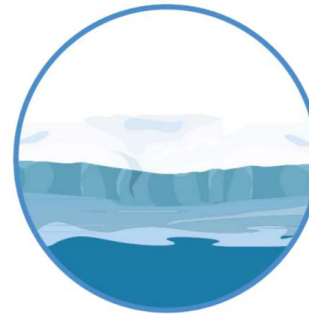


Fastest rates

in at least

3000 years

Arctic sea ice
area



Lowest level

in at least

1000 years

Glaciers
retreat



Unprecedented

in at least

2000 years

Source:
https://www.ipcc.ch/report/ar6/wg1/downloads/outreach/IPCC_AR6_WGI_Press_Conference_Slides.pdf

THE CURRENT STATE OF THE CLIMATE



Extreme heat
More frequent
More intense



Heavy rainfall
More frequent
More intense



Drought
Increase in some
regions



Fire weather
More frequent



Ocean
Warming
Acidifying
Losing oxygen

Source:
https://www.ipcc.ch/report/ar6/wg1/downloads/outreach/IPCC_AR6_WGI_Press_Conference_Slides.pdf

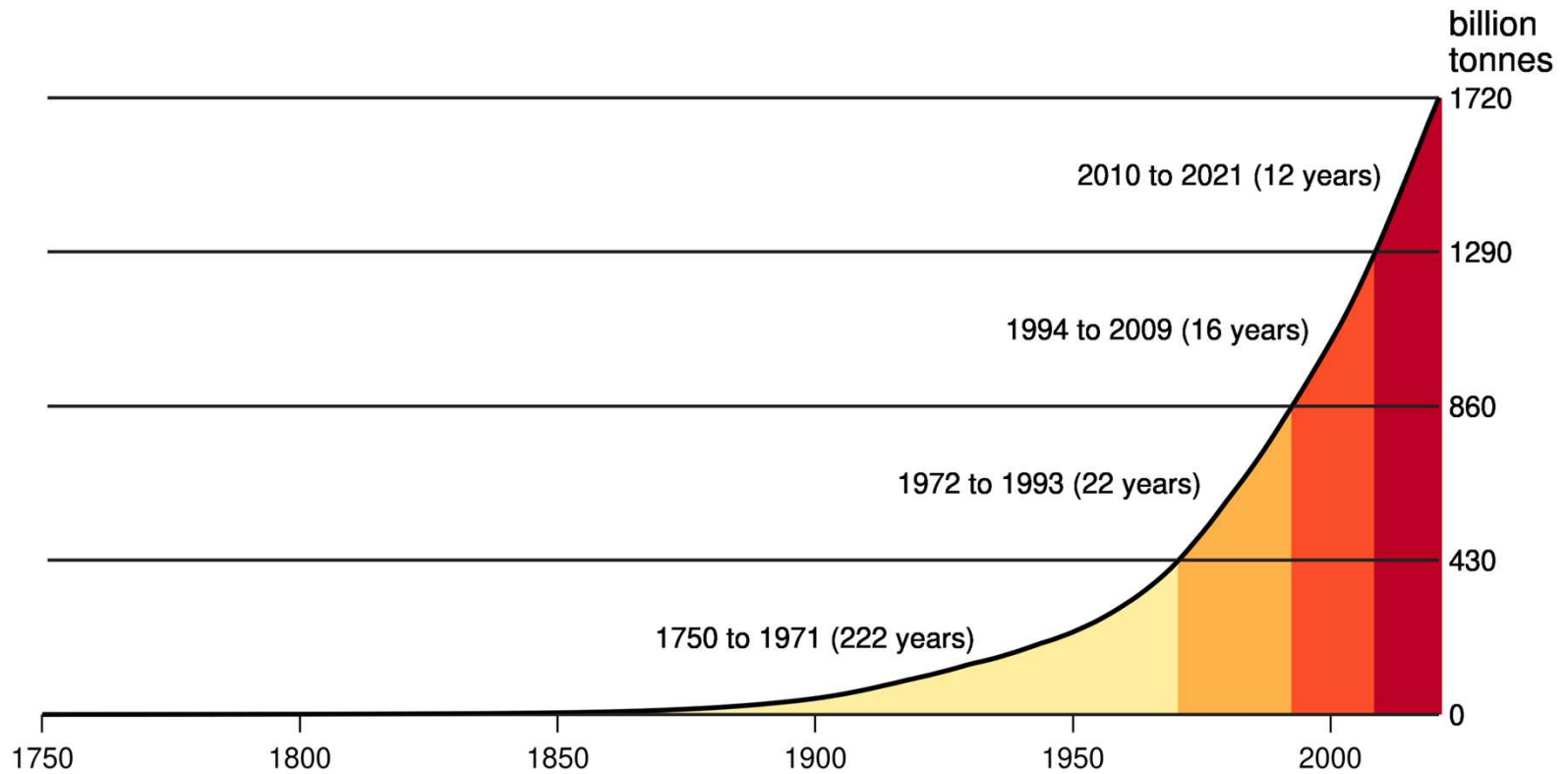


THE CURRENT STATE OF THE CLIMATE

- „It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.
- The scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years.
- Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since the Fifth Assessment Report (AR5).
- Improved knowledge of climate processes, paleoclimate evidence and the response of the climate system to increasing radiative forcing gives a best estimate of equilibrium climate sensitivity of 3°C, with a narrower range compared to AR5.“

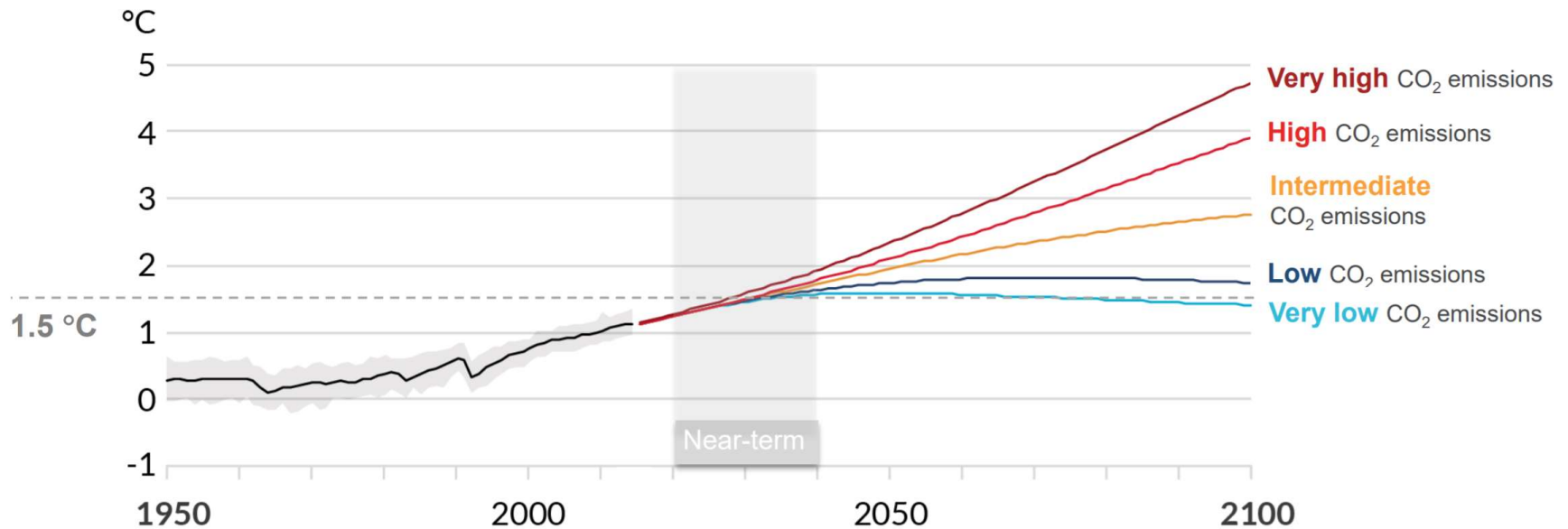
Source:
https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Headline_Statements.pdf

Four periods of equal global fossil fuel CO₂ emissions
(showing running total since 1750)



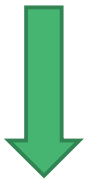
Data source: Friedlingstein et al (2020)
created by: @neilrkaye

FUTURE EMISSIONS CAUSE FUTURE ADDITIONAL WARMING



Source:
https://www.ipcc.ch/report/ar6/wg1/downloads/outreach/IPCC_AR6_WGI_Press_Conference_Slides.pdf

IPCC INTERACTIVE ATLAS

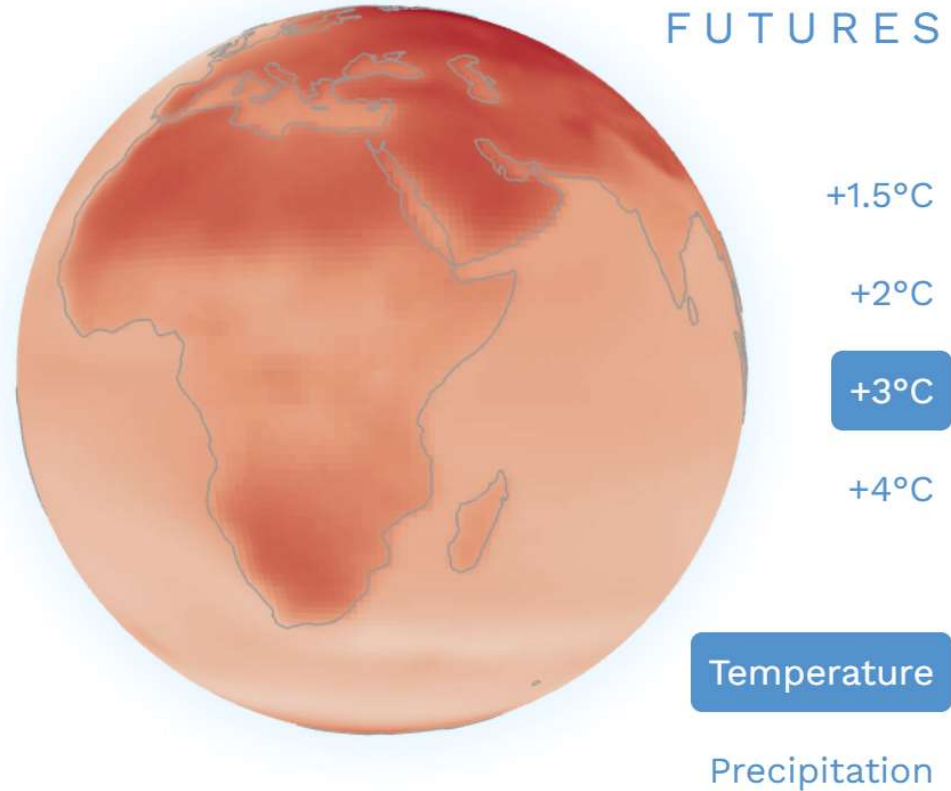


- <https://interactive-atlas.ipcc.ch/>

Other relevant websites:

- <https://climate.nasa.gov/>
- <https://insights.sustainability.google/>
- <https://www.bloomberg.com/graphs/climate-change-data-green/emissions.html>

OUR POSSIBLE
CLIMATE
FUTURES



Source: <https://interactive-atlas.ipcc.ch/>

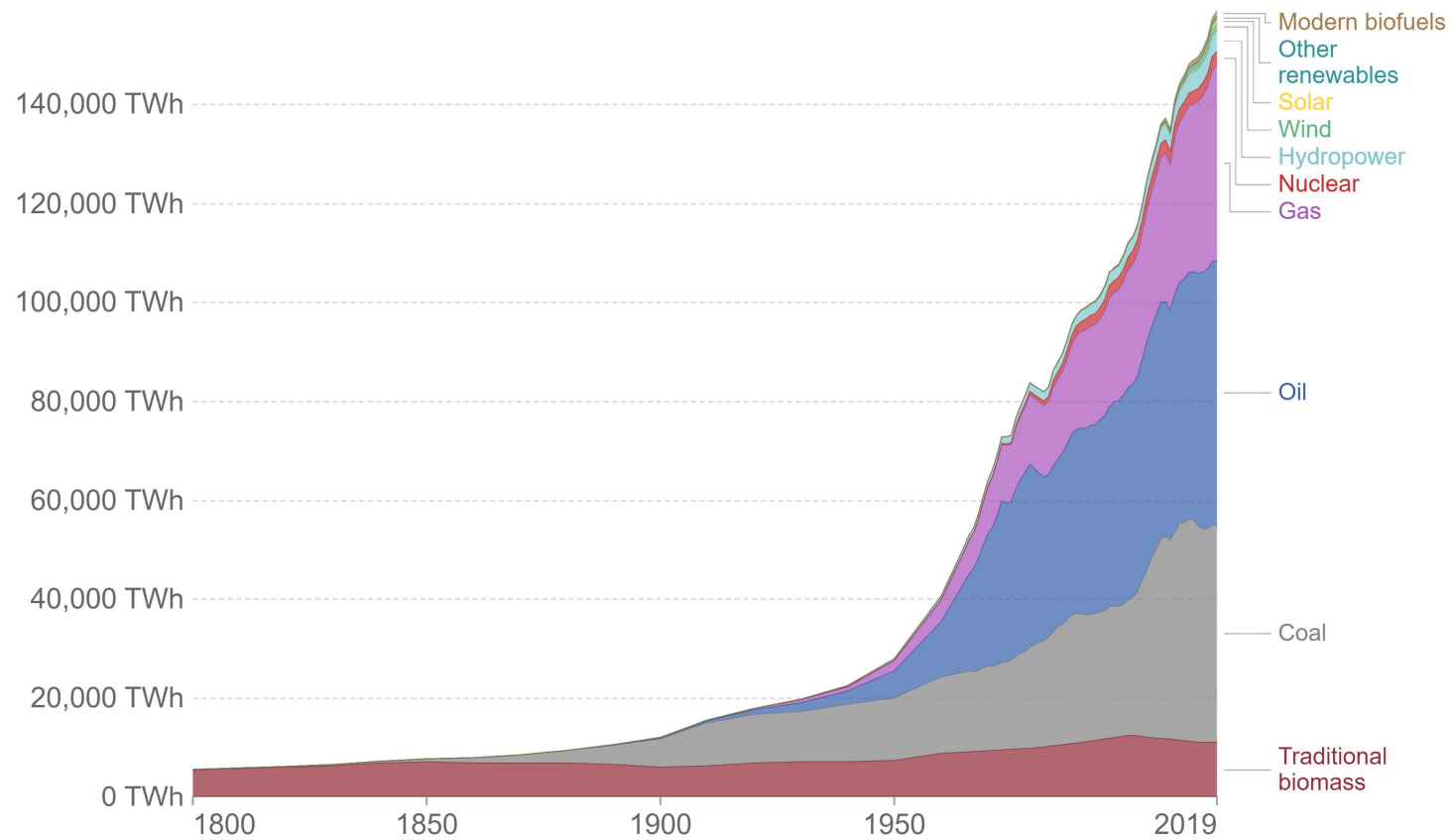


CLIMATE CHANGE AND ENERGY SECTOR



Global direct primary energy consumption

Direct primary energy consumption does not take account of inefficiencies in fossil fuel production.



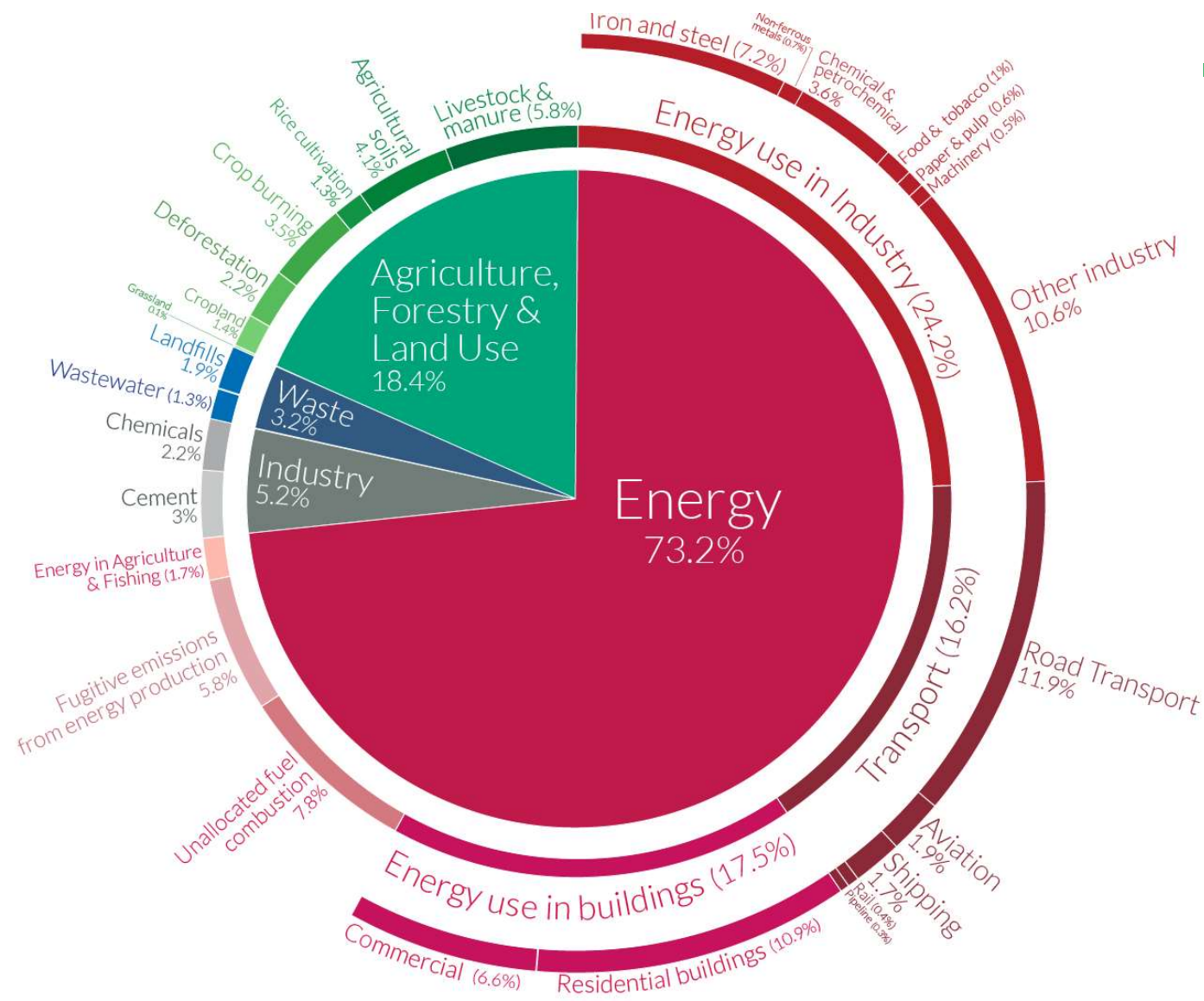
Source: Vaclav Smil (2017) and BP Statistical Review of World Energy

OurWorldInData.org/energy • CC BY

GLOBAL GREENHOUSE GAS EMISSIONS BY SECTOR

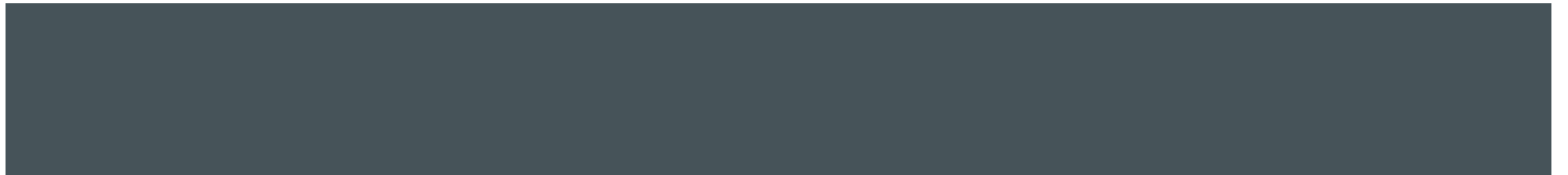
■ (2016, total emissions 49,4 billion tonnes CO₂ eq.)

Source: <https://ourworldindata.org/ghg-emissions-by-sector>





INTERNATIONAL CLIMATE REGIME



HISTORICAL MILESTONES

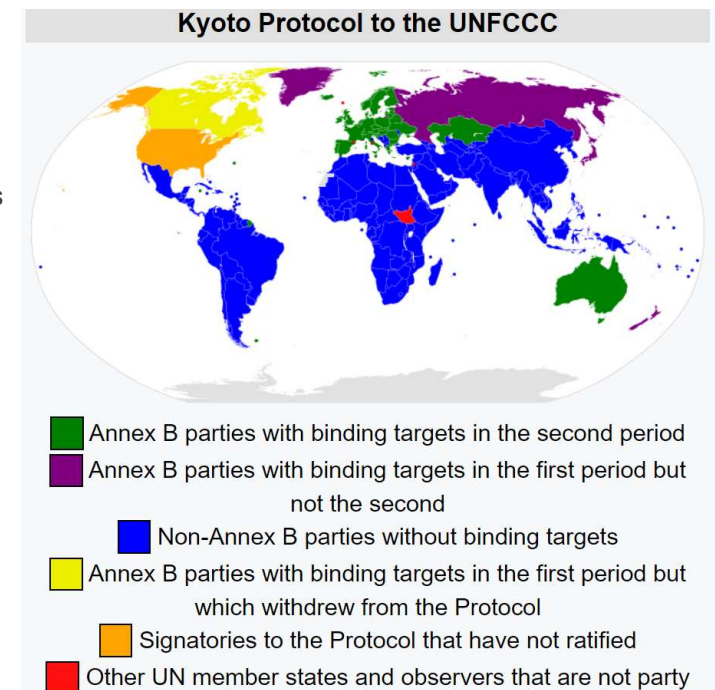
- Late 18th century – the greenhouse effect was described (Jean Fourier)
- Late 19th century – the first scientific findings that increase amount carbon dioxide in the air would raise the temperature of the Earth (Avante Arrhenius)
- Early 70´s – student movements, establishment of political Green parties, Exxon´s business decision
- 1988 – IPCC
- 1992 – Earth Summit in Rio de Janeiro (→ United Nations Conference on Environment and Development UNFCCC)
 - RECOGNITION THAT THERE IS A PROBLEM
- 1997 – Kyoto Protocol
 - FOR THE FIRST TIME THE INTERNATIONAL COMMUNITY AGREED ON BINDING TARGETS AND MEASURES FOR COMBATING CLIMATE CHANGE
- 2015 – Paris Agreement
 - LEGALLY BINDING INTERNATIONAL TREATY ON CLIMATE CHANGE THAT INCLUDES ALL COUNTRIES
- 2021 – COP26 Glasgow?

INTERNATIONAL (UN) REGIME TO FIGHT CLIMATE CHANGE

- Global atmosphere as one of the global commons, the spaces beyond sovereign jurisdiction.
- Climate as a „public good“, facing the „tragedy of commons“.
- UNFCCC regime as a tool to govern the climate without global governance.

KYOTO PROTOCOL

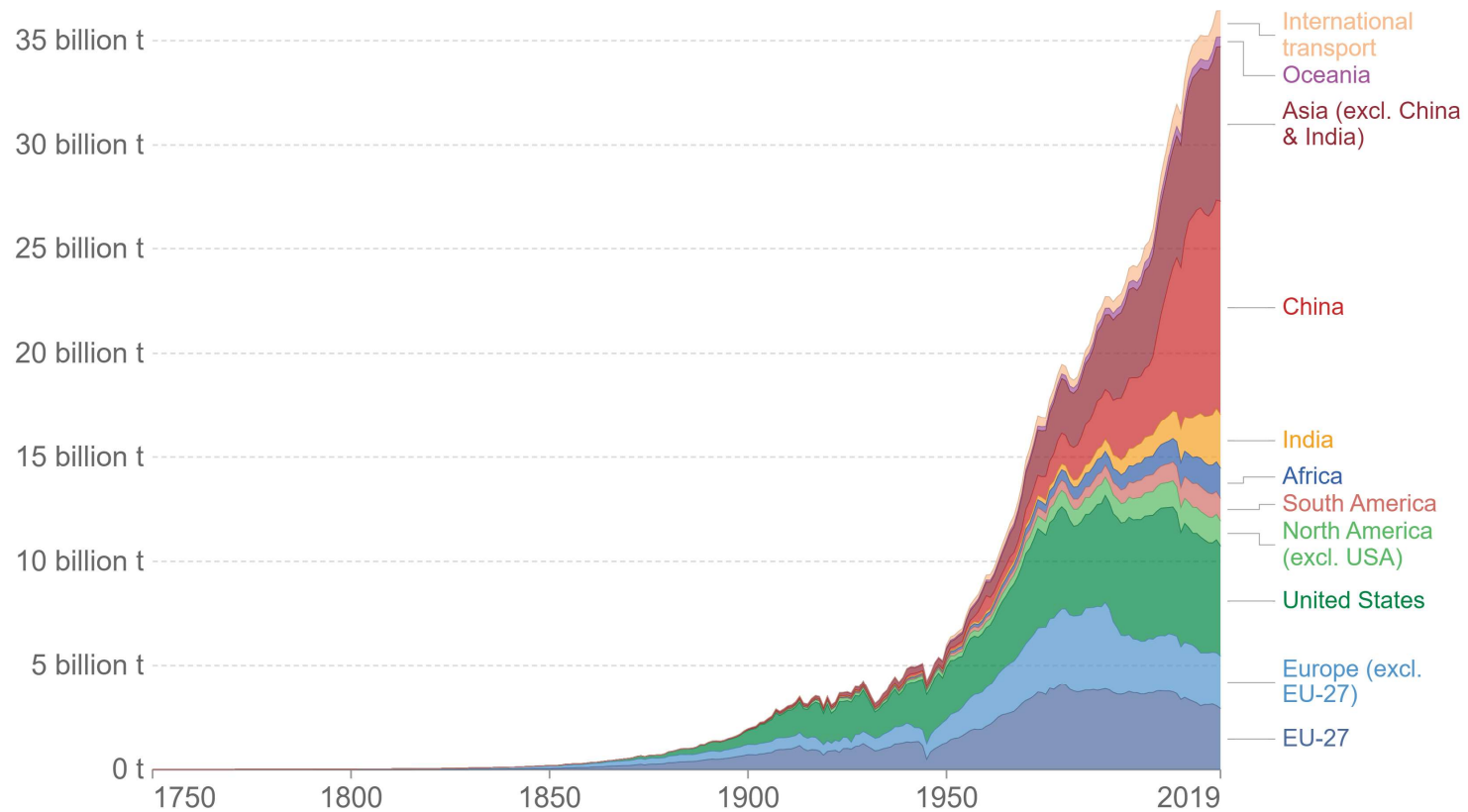
- Adopted 1997, into force 2005, 192 Parties to the Kyoto Protocol
- Operationalizes the UNFCCC by committing industrialized countries and economies in transition to limit and reduce greenhouse gases emissions in accordance with agreed individual targets.
- Called for reducing the emission of six greenhouse gases in 41 countries plus the European Union to **5,2% below 1990 levels between 2008–12**.
- Principle of “**common but differentiated responsibility and respective capabilities**”
- Limited potential of only ¼ of global CO2 emissions
- The **Kyoto market-based mechanism**:
 - International Emissions Trading
 - Clean Development Mechanism
 - Joint implementation
- Rigorous monitoring, review and verification system to ensure transparency
- Amendment to Kyoto – Doha 2012 → prolonged by 2020



Source:
https://en.wikipedia.org/wiki/Kyoto_Protocol#Views_on_the_Protocol

Annual total CO₂ emissions, by world region

Our World
in Data



Source: Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

Note: This measures CO₂ emissions from fossil fuels and cement production only – land use change is not included. 'Statistical differences' (included in the GCP dataset) are not included here.

PARIS AGREEMENT

- Adopted on 12 December 2015 at COP 21 in Paris, and in force from 4 November 2016, by 196 Parties
- Legally binding international treaty on climate change
- The first time when an international environmental agreement made a direct reference to the human rights paradigm
- Its goal is to **limit global warming to well below 2, preferably to 1.5 degrees Celsius**, compared to pre-industrial levels
- Framework for financial, technical and capacity building support to those countries who need it.
- Political triumph, but its net results fall short of its stated objectives as the collective ambition of NDCs has not been compatible with the two degrees target so far
- US withdrawal
 - Not as problematic as seemed at the beginning
 - Brought forward new actors (China, India, non-state actors, sub-national level of governance – „*We are still in*“)

Source: Thakur 2021

POST-PARIS PERIOD

- PA set a new course in the global climate effort by involving all the countries
- New landscape of transnational climate governance = **hybrid multilateralism**
 - Long history of participation of non-state actors, but post-Paris has witnessed a transnational coalition of such actors
 - Response to complex nature of the problem
 - Gained political and economical credence as a more effective form of governing the global commons
- **Climate justice movements**
 - Socio-political mobilization
 - Promote action for equitable and effective management of natural resources
 - Question business-as-usual approach
- Rising awareness about the link between conflict and climate change

Source: Thakur 2021

COP26 GLASGOW?

- The 2021 United Nations Climate Change Conference
- 31 OCT – 12 NOV 2021
- 26 year since the first Conference of the Parties
- 6 years after the PA to discuss and reevaluate the commitments laid out in the PA
- World leaders, negotiators, government representatives and citizens
- Main goal: to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change.
- Alok Sharma, COP President-designated: „As countries begin to recover from the Coronavirus pandemic, we must take the historic opportunity to tackle climate change at the same time – to build back better, and greener“



**UN CLIMATE
CHANGE
CONFERENCE
UK 2021**

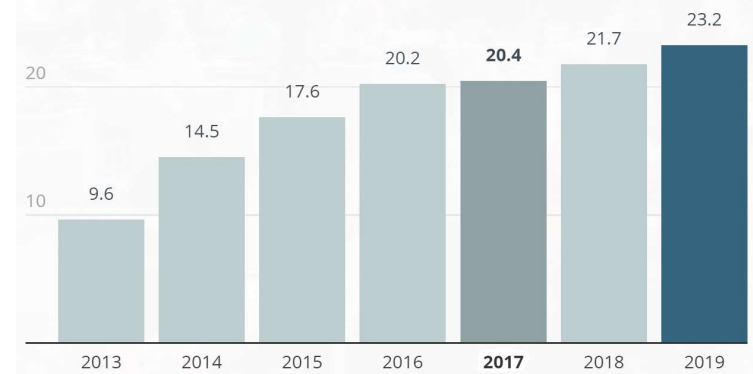
IN PARTNERSHIP WITH ITALY

→ EUROPEAN UNION

- Taking the lead on climate change
- The norm maker
- The targets:
 - 2009 – The EU’s first package of climate and energy measures set a key objective: **reducing emissions by 20% by 2020.**
 - 2014 – EU leaders recognized that the EU needed to go further and presented the 2030 Climate Target Plan: **reducing emissions by 40% by 2030.**
 - 2019 – Green Deal
 - 2020 – Increased goals in the 2030 Climate Target Plan: **reducing emissions by at least 55% by 2030 compared to 1990.**
 - Fit for 55
 - Taxonomy
 - 2050 long-term strategy – to achieve **climate neutrality**

Europe's contribution to climate finance (in €bn)

Since 2013, Europe has more than doubled the funds raised to help developing countries mitigate and adapt to the impact of climate change



Source:

<https://www.consilium.europa.eu/en/eu-climate-change/#group-The-EUs-action-so-far-3gB3lwH9j9>

→ CHANGING CLIMATE LEADERSHIP?

- The emerging economies and climate action → Global South countries
 - Non-Annex B parties
 - Norm takers
- 2009 change in approach of BASIC countries
- India and China have gradually taken up climate responsibilities, through nationally appropriate mitigation actions
- One of the factors: Climate change started limiting their economical development
- 2017 US withdrawal from PA → change maker, developing countries stepped forward and reaffirmed their commitment
- Technological development – competing with EU and the US
- Possibility to skip the fossil phase?



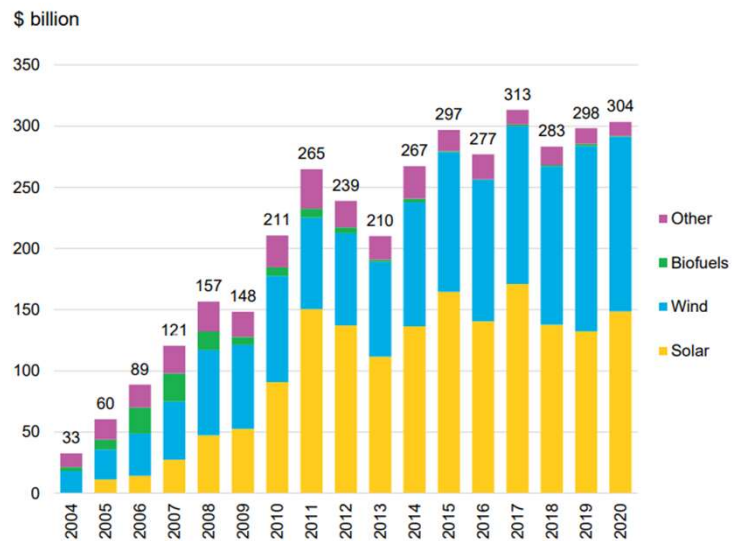
IMPACT OF REGULATORY POLICIES ON ENERGY MIX AND ENERGY INVESTMENTS



CLIMATE
CHANGE AS A
TECHNOLOGICAL
DRIVER

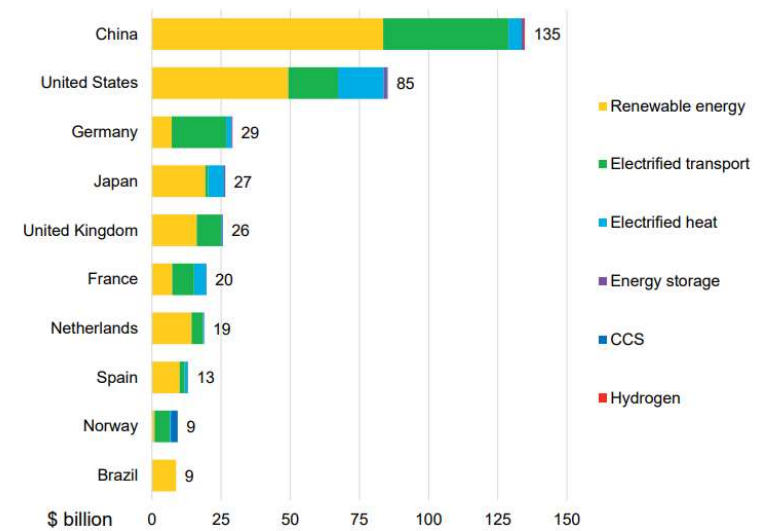


GLOBAL NEW INVESTMENT IN RES BY SECTOR



Source: BloombergNEF

GLOBAL INVESTMENT IN ENERGY TRANSITION



Source: BloombergNEF

Source: <https://www.pv-tech.org/bnef-solar-leads-renewables-growth-in-2020-despite-covid-19-slowdown/>

CONCLUSION

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LITERATURE

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