Sixth Assessment Report
WORKING GROUP III – MITIGATION OF CLIMATE CHANGE

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Climate Change 2022

The built environment: the battlefield where the fight against climate change will be won or lost?

(after John Schellnhuber)

[Matt Bridgestock, Director and Architect at John Gilbert Architects]


Climate Change is when you realise you are shooting the evening news with your own mobile

Tornado, Czech Republic, July 2021

https://www.theguardian.com/world/gallery/2021/jul/19/climate-crisis-weather-around-world-in-pictures-wildfires-floods-winds?CMP=share_btn_tw

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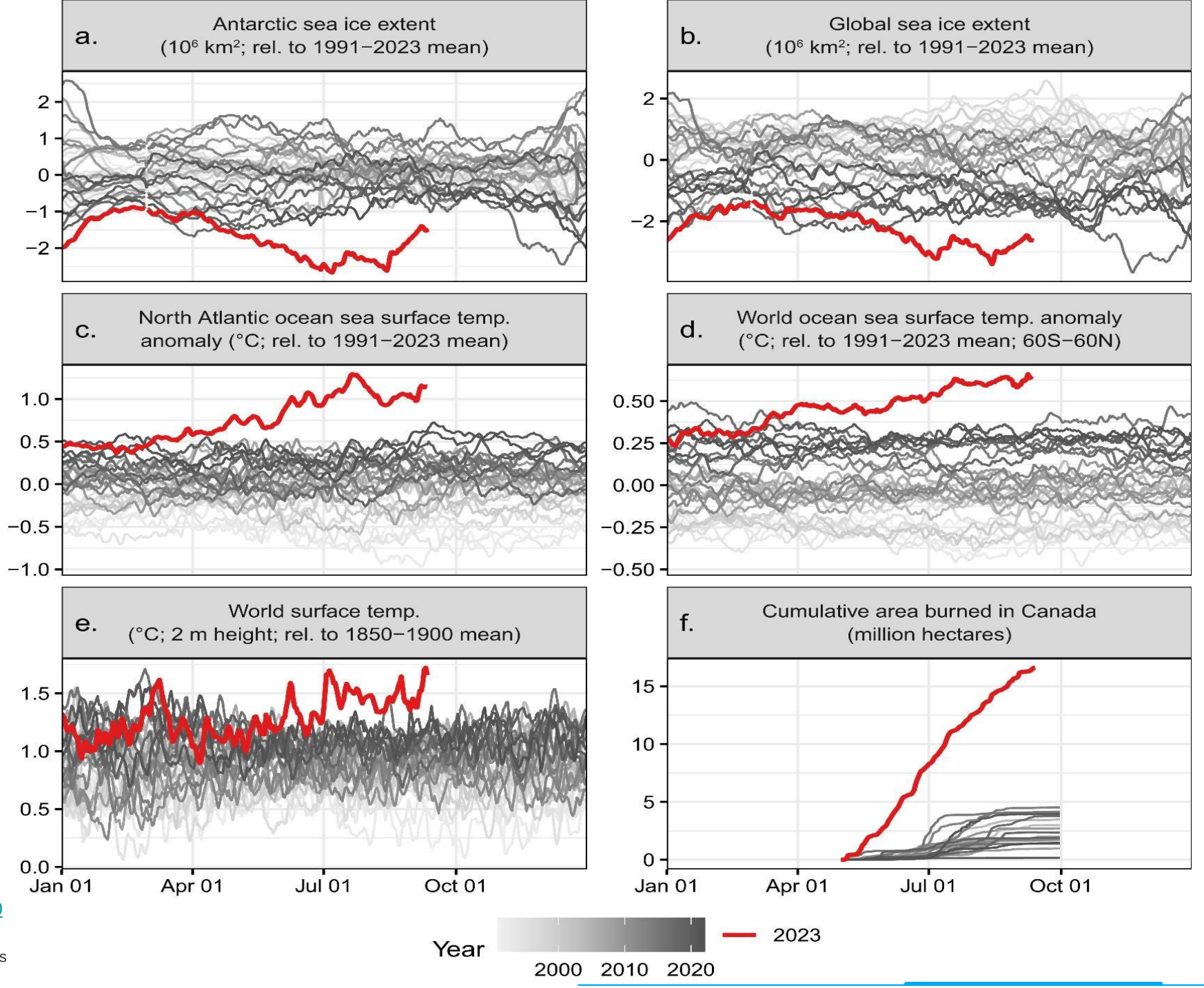
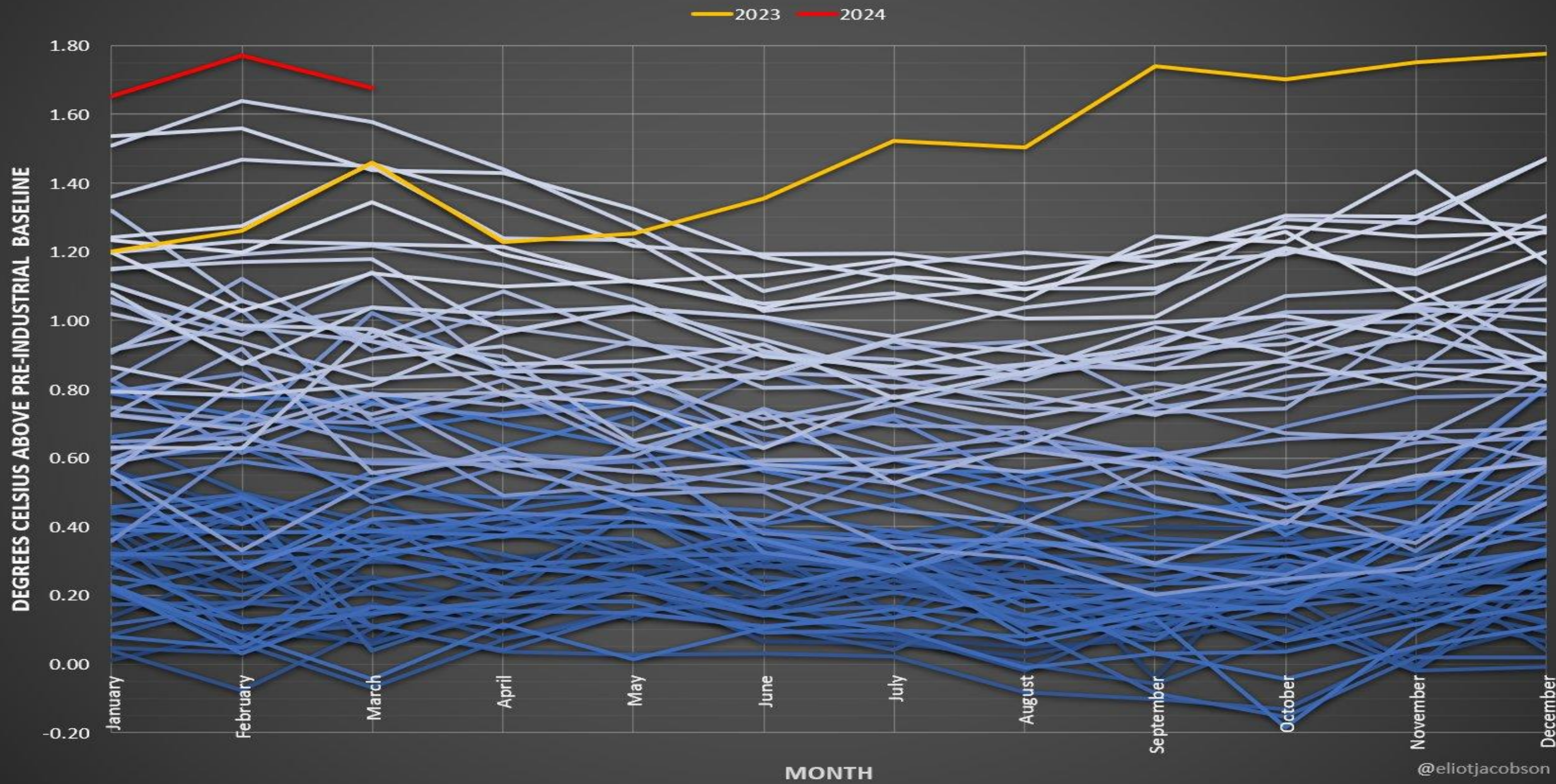
Figure 1. Unusual climate anomalies in 2023 (the red line, which appears bold in print). Sea ice extent (a, b), temperatures (c–e), and area burned in Canada (f) are presently far outside their historical ranges. These anomalies may be due to both climate change and other factors. Each line corresponds to a different year, with darker gray representing later years.



BioScience, biad080,
https://doi.org/10.1093/biosci/biad080

Monthly Global Surface Temperature Anomaly: 1940 - 2024 vs. Pre-Industrial Baseline

Data: ERA5 Copernicus C3S



On the Highway to Climate Hell

The world's infrastructure was built for a climate that no longer exists.

By Christina Lu and Brawley Benson

This aerial photo shows staff members repairing a flood-damaged section of Fengtai-Shacheng Railway in Beijing on Aug. 8. ZHANG CHENLIN/XINHUA VIA GETTY IMAGES

AUGUST 11, 2023, 2:06 PM

Cooling Center, Oregon, 48C outside, Jun 2021

https://www.theguardian.com/world/gallery/2021/jul/19/climate-crisis-weather-around-world-in-pictures-wildfires-floods-winds?CMP=share_btn_tw

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Science

Climate change: IPCC report is 'code red for humanity'

By Matt McGrath
Environment correspondent

9 August | Comments

VÖRÖS KÓD AZ EMBERISÉGNEK

VÁLTOZÁS (alkotó: Alisa Singer)
"Látjuk, halljuk, mérjük, ahogy a bolygónk átváltozik körülöttünk … és válaszolunk".

[Credit: NASA]

“Recent changes in the climate are widespread, rapid, and intensifying, and unprecedented in thousands of years.”

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[Credit: NASA]

- Global average temperature has not been so high for at least **125000 years**
- Global CO2 concentrations and ocean surface acidity have not been so high for **2 million years**
- concentrations of CH4 and N2O were higher than at any time in at least **800,000 years**

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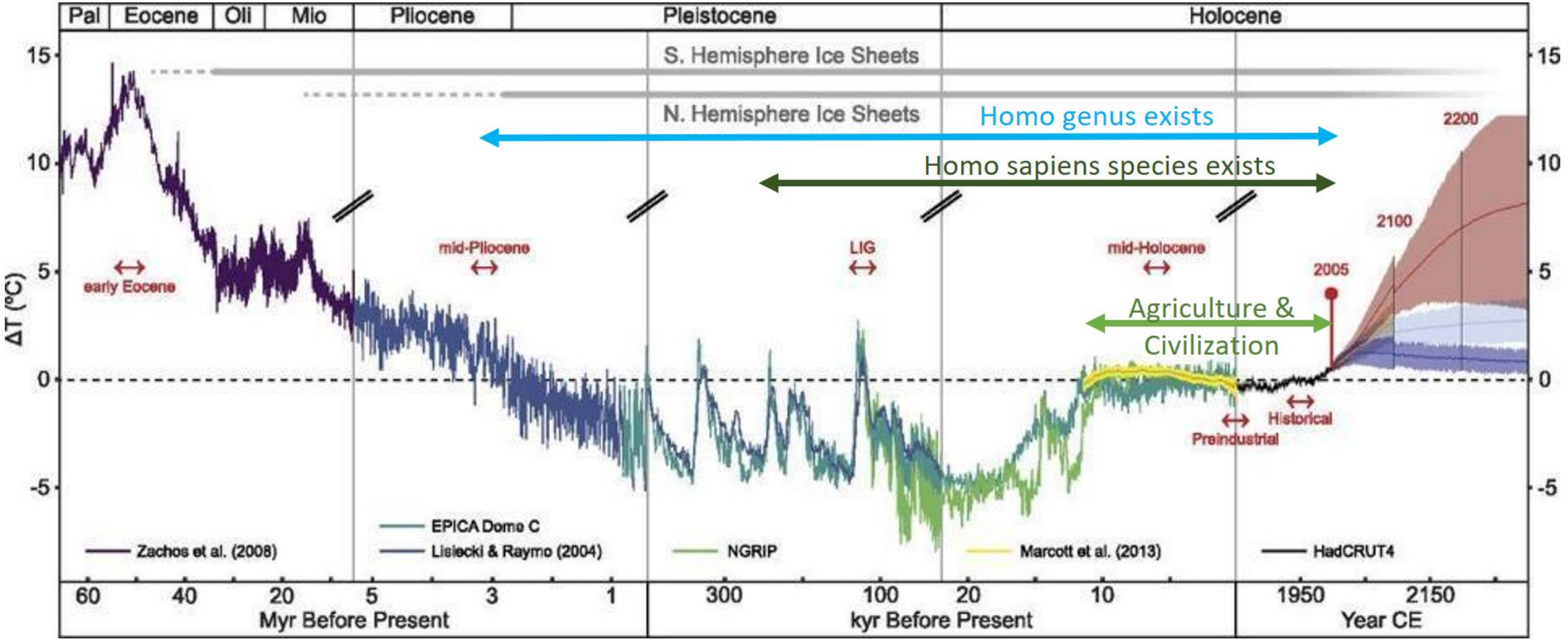
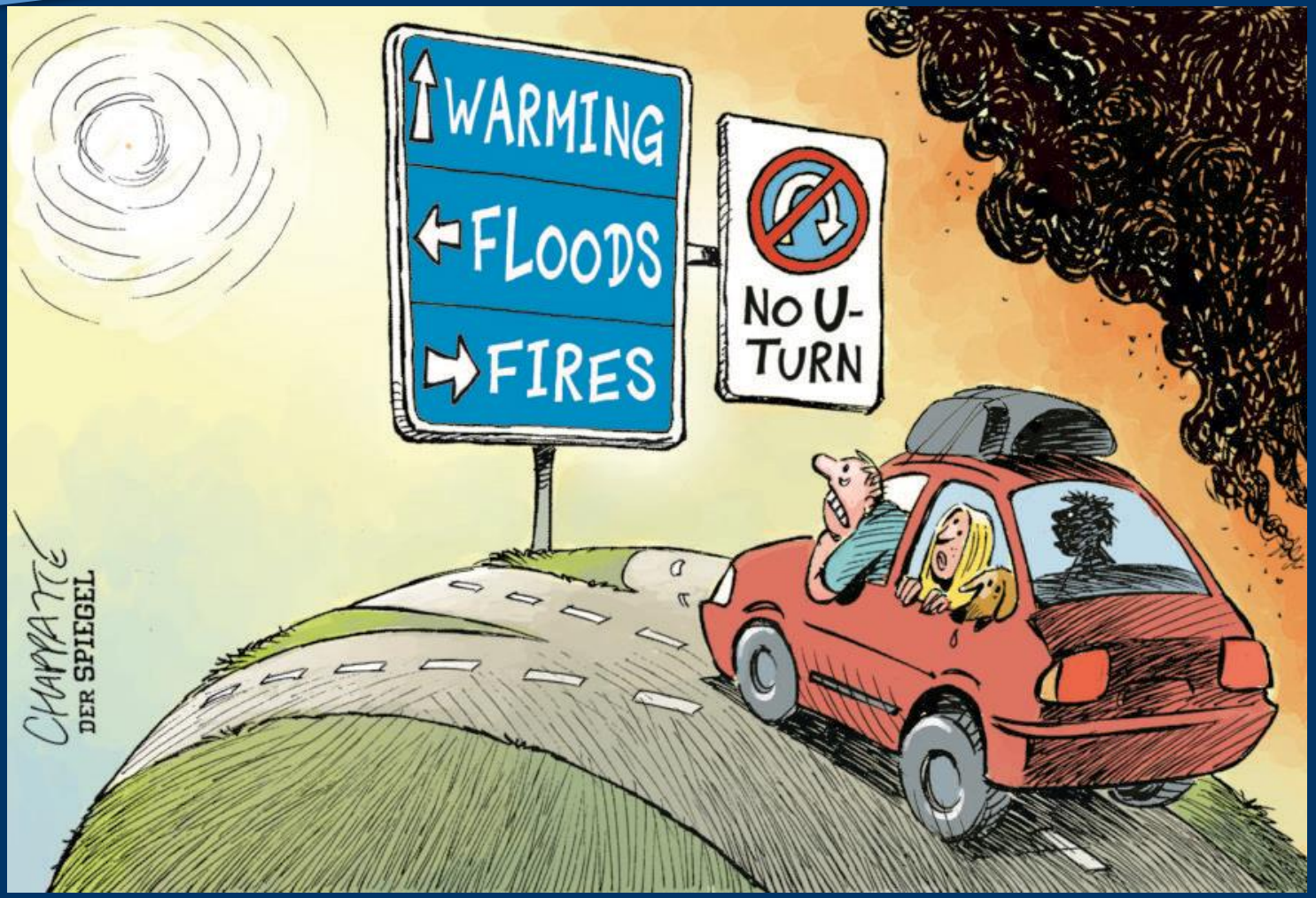
Temperature trends for the past 65 Ma and potential geohistorical analogs for future climates



Pliocene and Eocene provide best analogs for near-future climates
K. D. Burke, et al PNAS Dec 2018, 115 (52)

PNAS


IF BEES GO EXTINCT
IF HUMANS GO EXTINCT
EWAD

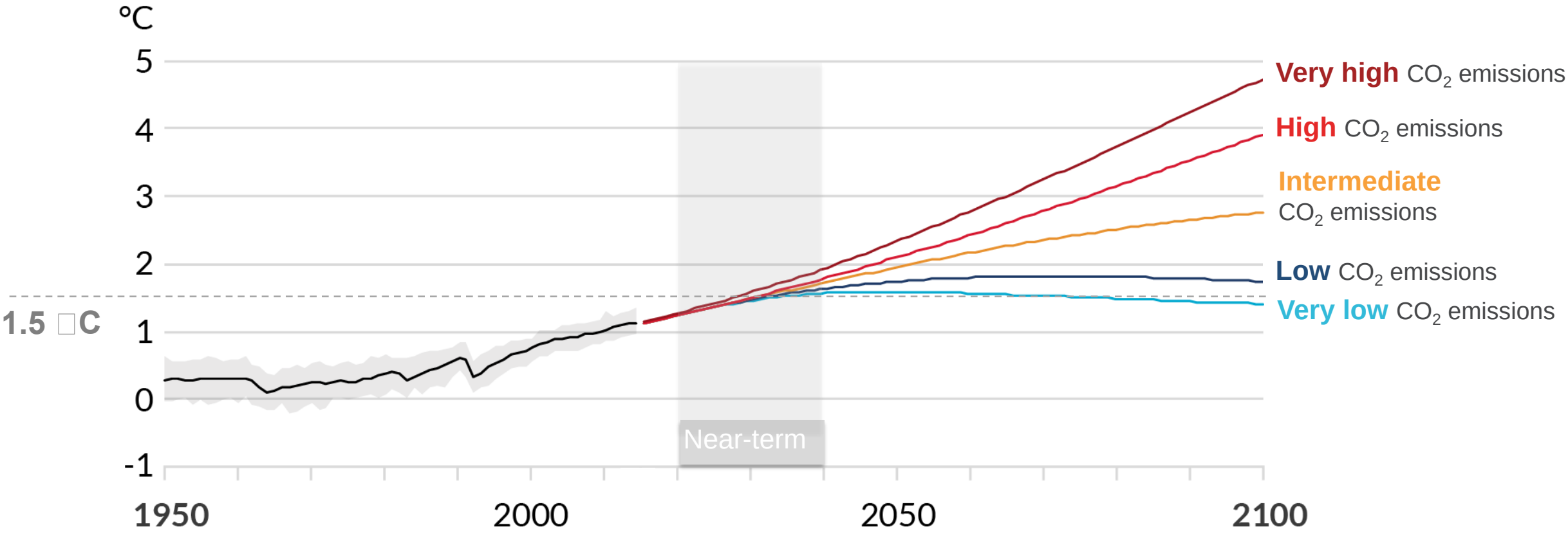


There are already irreversible changes in our climate system…

“

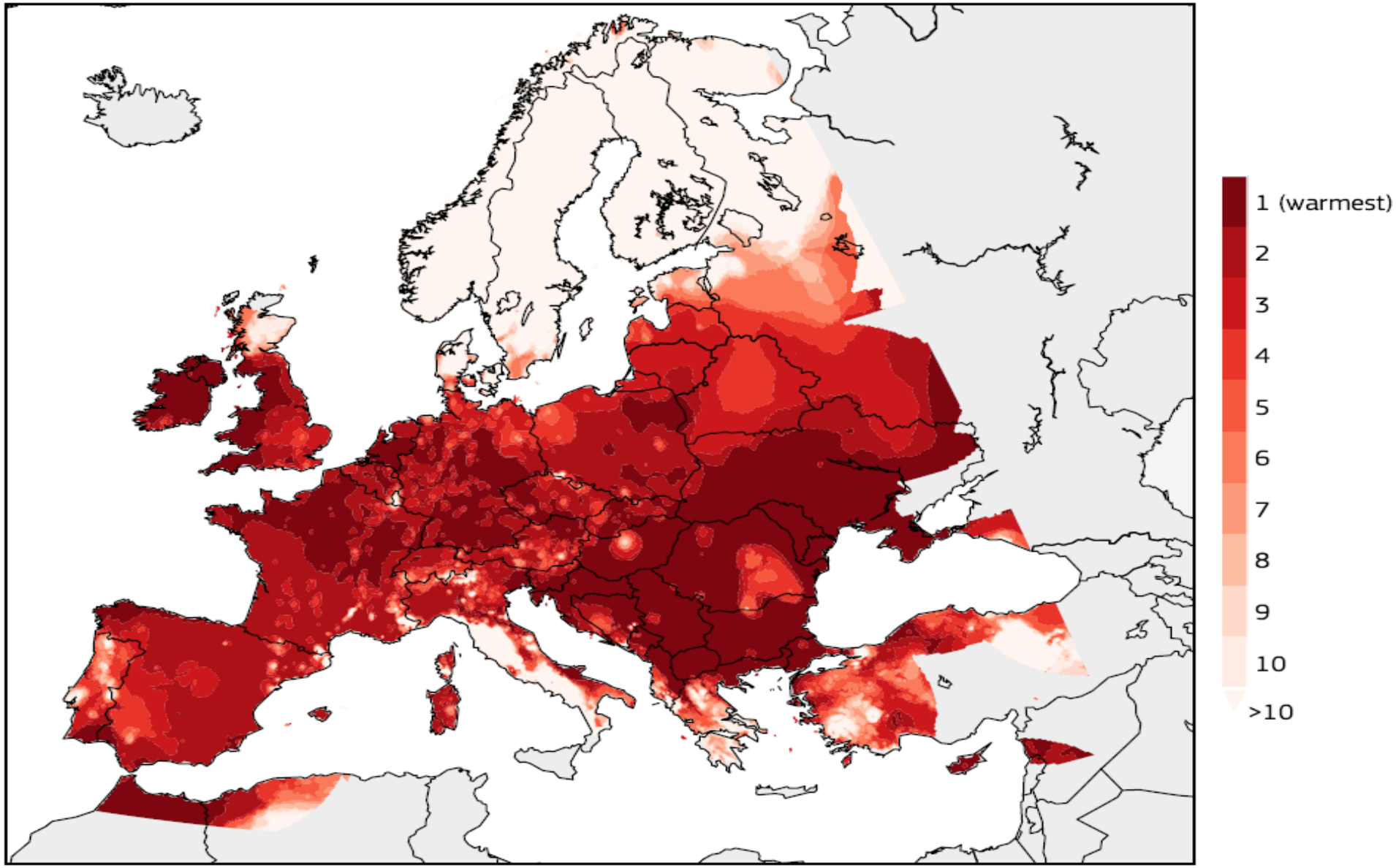
However, some changes can be slowed and others can be stopped by limiting warming.

Future emissions cause future additional warming



Ranking of annual average surface air temperatures in 2023

Data: E-OBS • Credit: KNMI/C3S/ECMWF



Copernicus Climate Change Service
European State of the Climate | 2023

PROGRAMME OF
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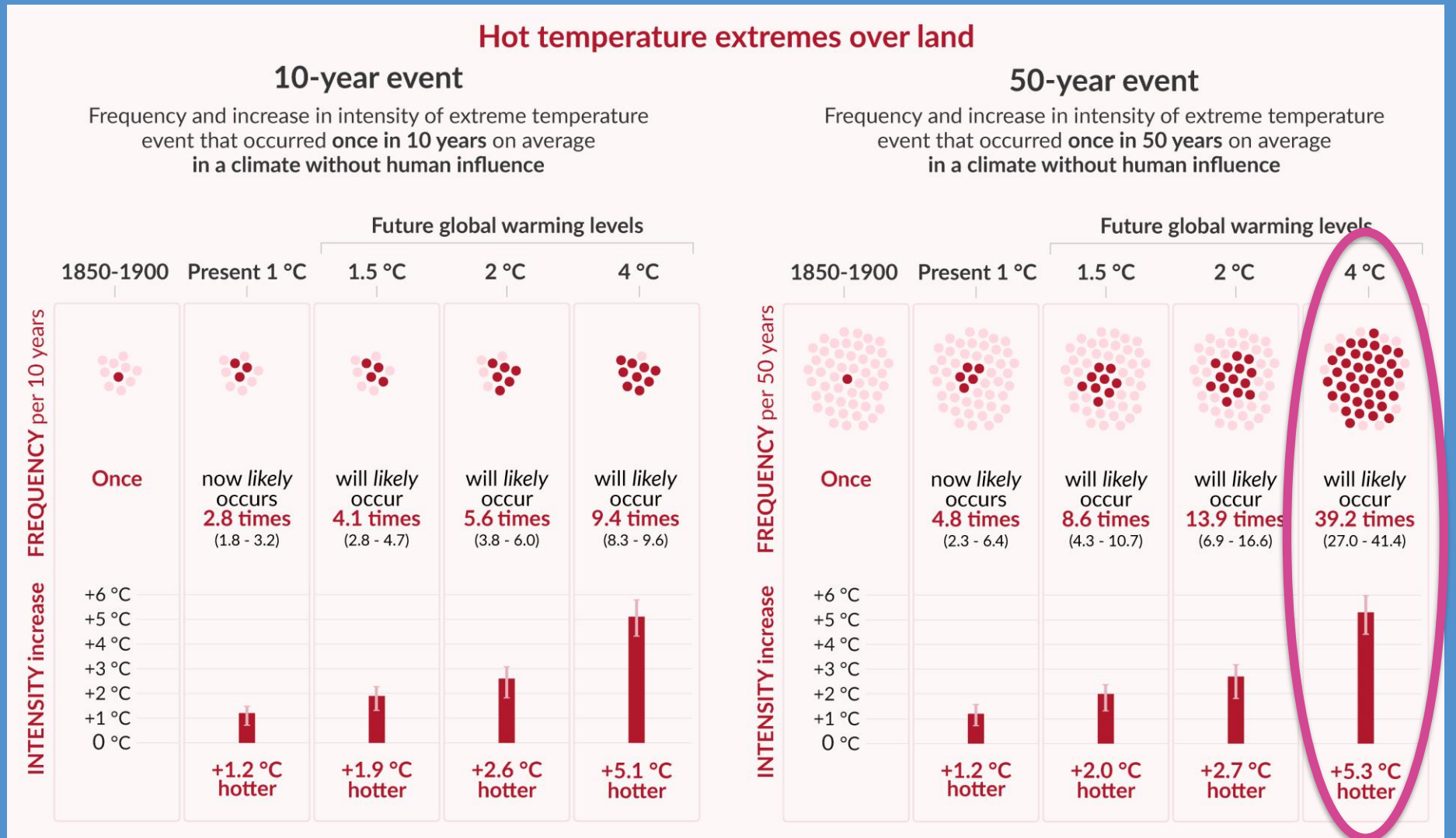
Copernicus
Europe's eyes on Earth

IMPLEMENTED BY
ECMWF


@QueerSatanic
THIS IS THE HOTTEST SUMMER OF MY LIFE
THIS IS THE COLDEST SUMMER
OF THE REST OF YOUR LIFE

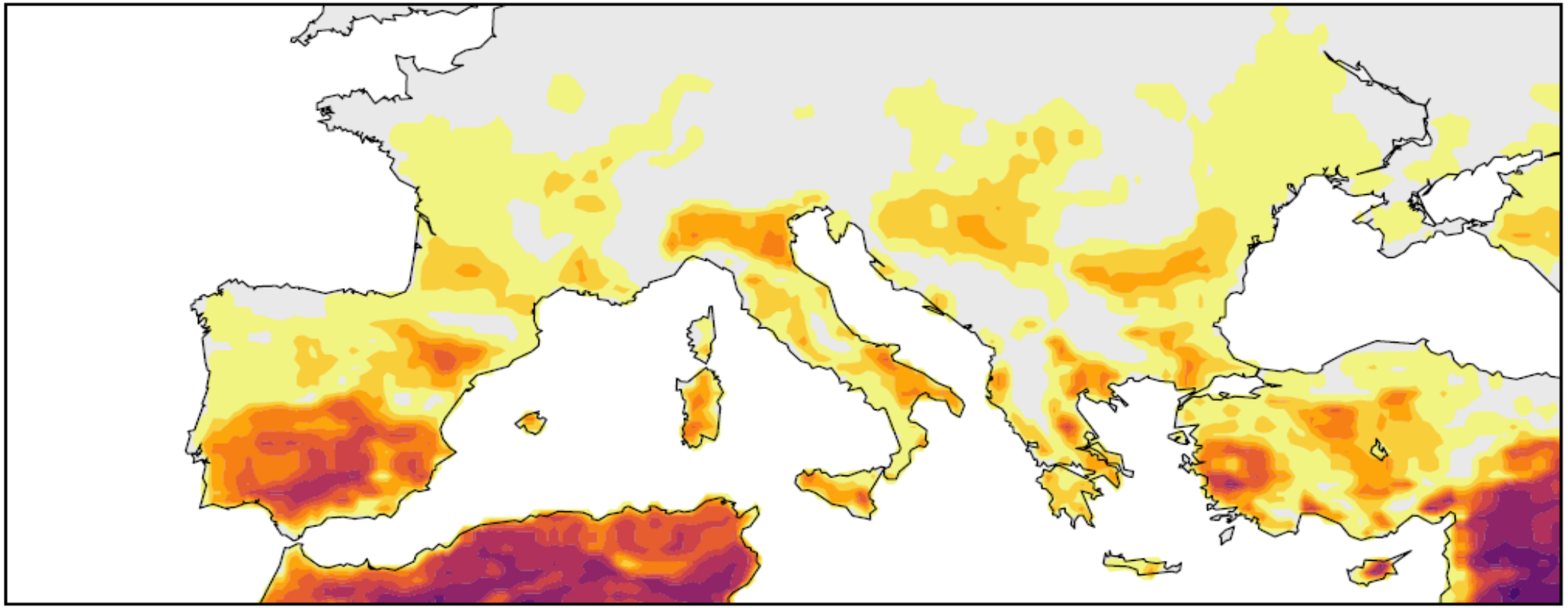
Projected changes in extremes are larger in frequency and intensity with every additional increment of global warming

Figure SPM.6



Number of days during extended summer (JJAS) 2023 with 'very strong heat stress'

Data: ERA5-HEAT daily maximum Universal Thermal Climate Index (UTCI) • Credit: ECMWF/C3S



Number of days

1 10 20 30 40 50 60 70 80 90 100 110 122

Copernicus Climate Change Service
European State of the Climate | 2023

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Europe's eyes on Earth

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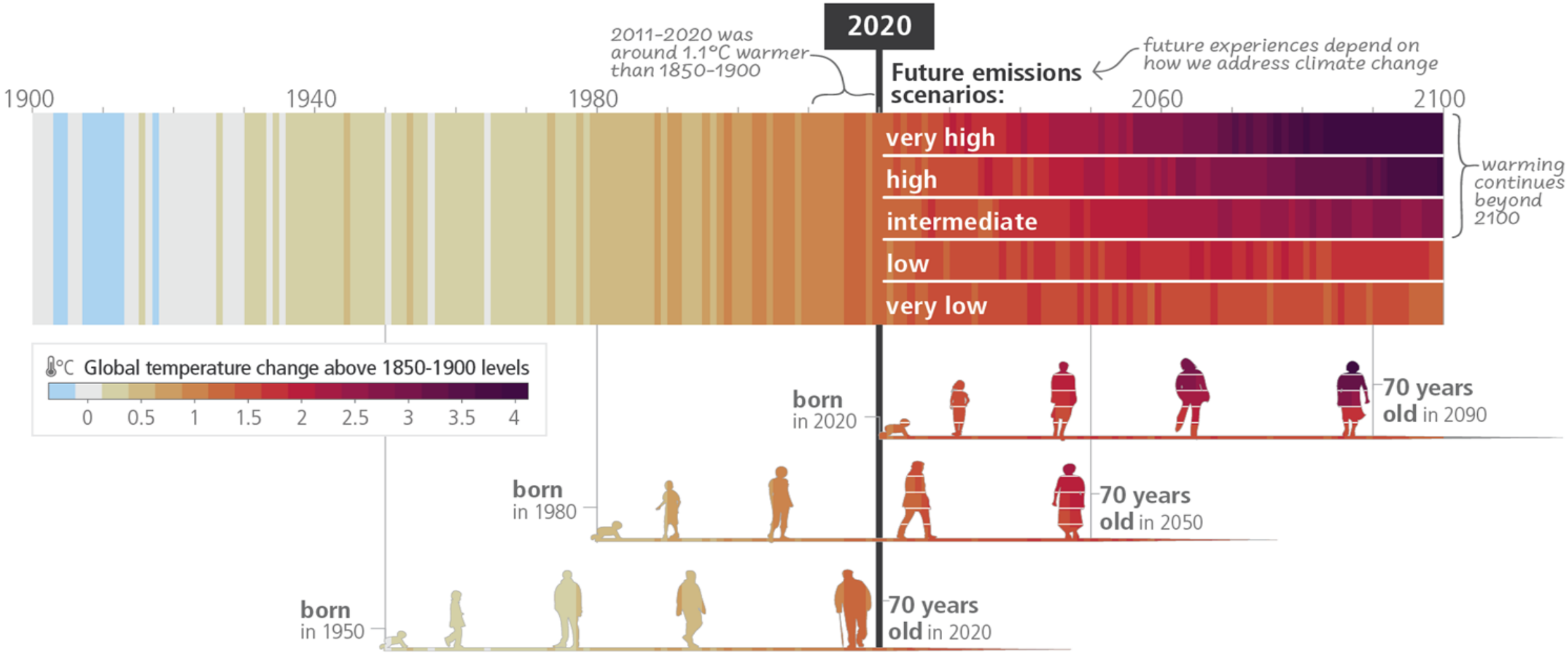
ECMWF

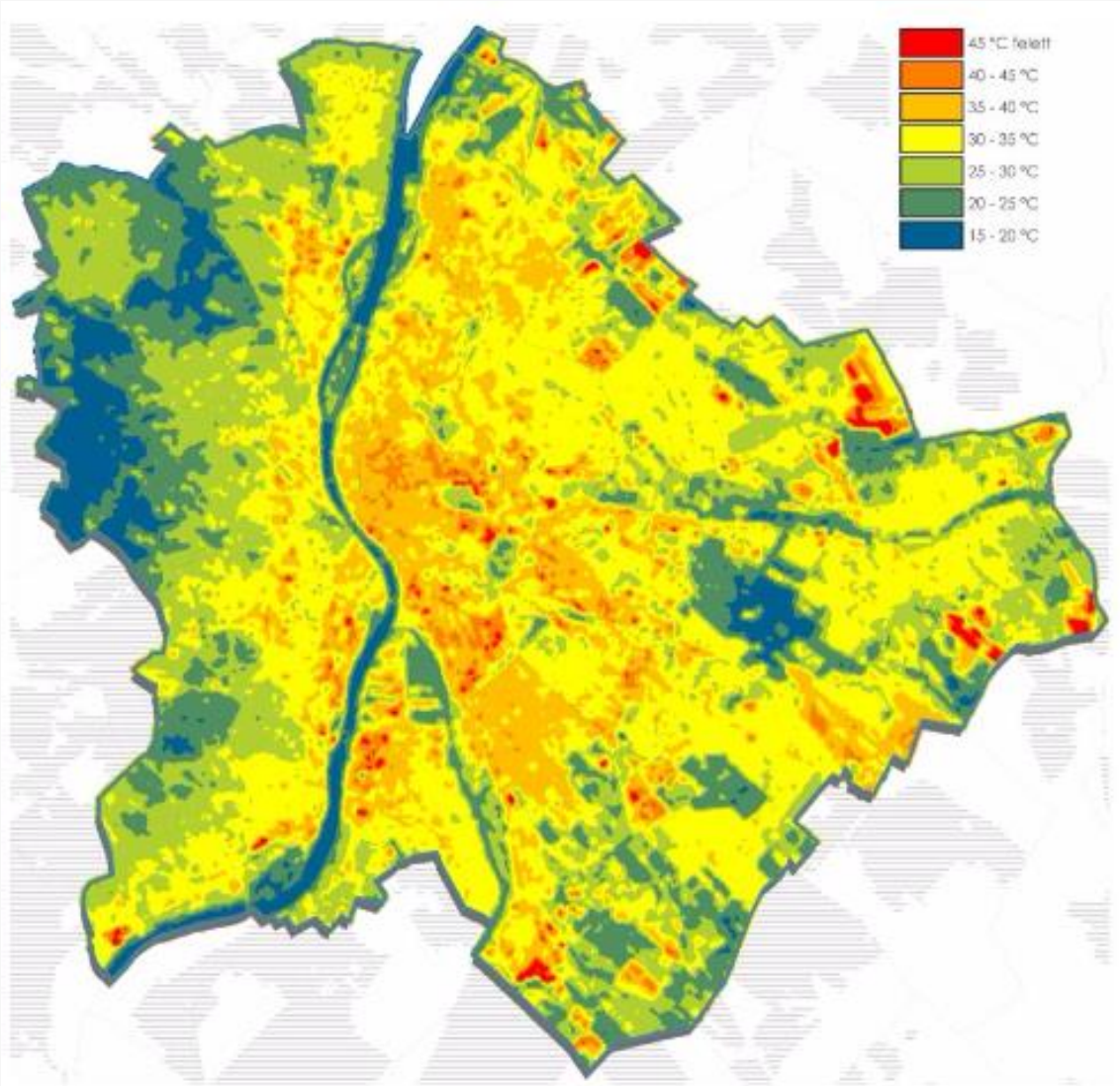
Adverse impacts from human-caused climate change will continue to intensify

The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near-term



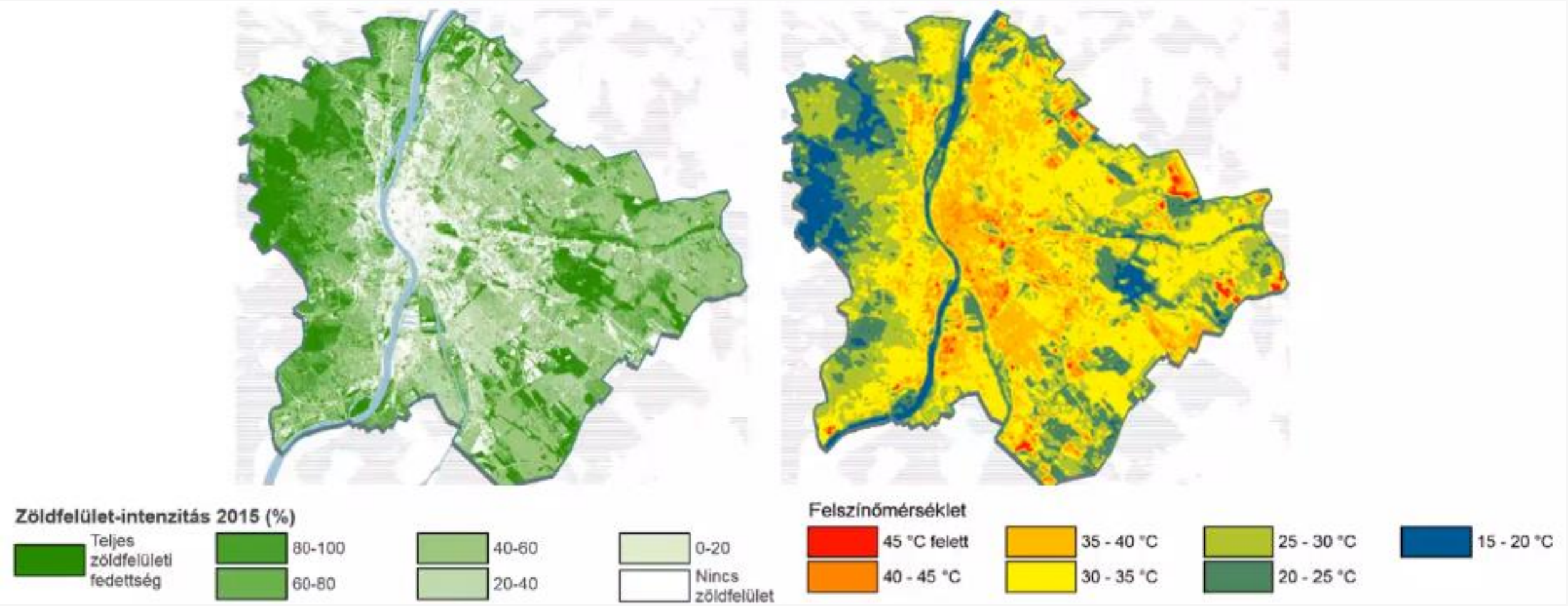
HEAT ISLAND

Budapest



Budapest felszínhőmérséklet térképe 2016 aug. 31-én 11:00 és 12:00 között zavartalan napfényes időszakban (forrás: Budapest Zöldinfrastruktúra Koncepciójának helyzetelemzése)

The only real air conditioners of cities and properties: large, leafy deciduous trees with much foliage



Forrás: Greenscope Kft térképei Landsat felvételek alapján (2015), in: Bp. Zöldinfrastruktúra Stratégiája (2018)

The value of one single tree.


smugasta

Nature's crucial services
we should work WITH nature on solutions rather than replacing it

Pollination

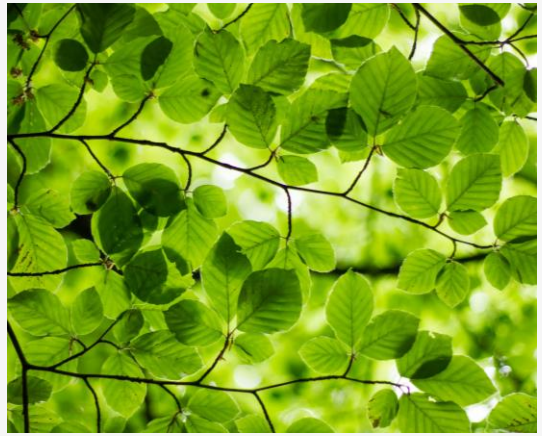
Coastal protection

Tourism / recreation

Food source

Health

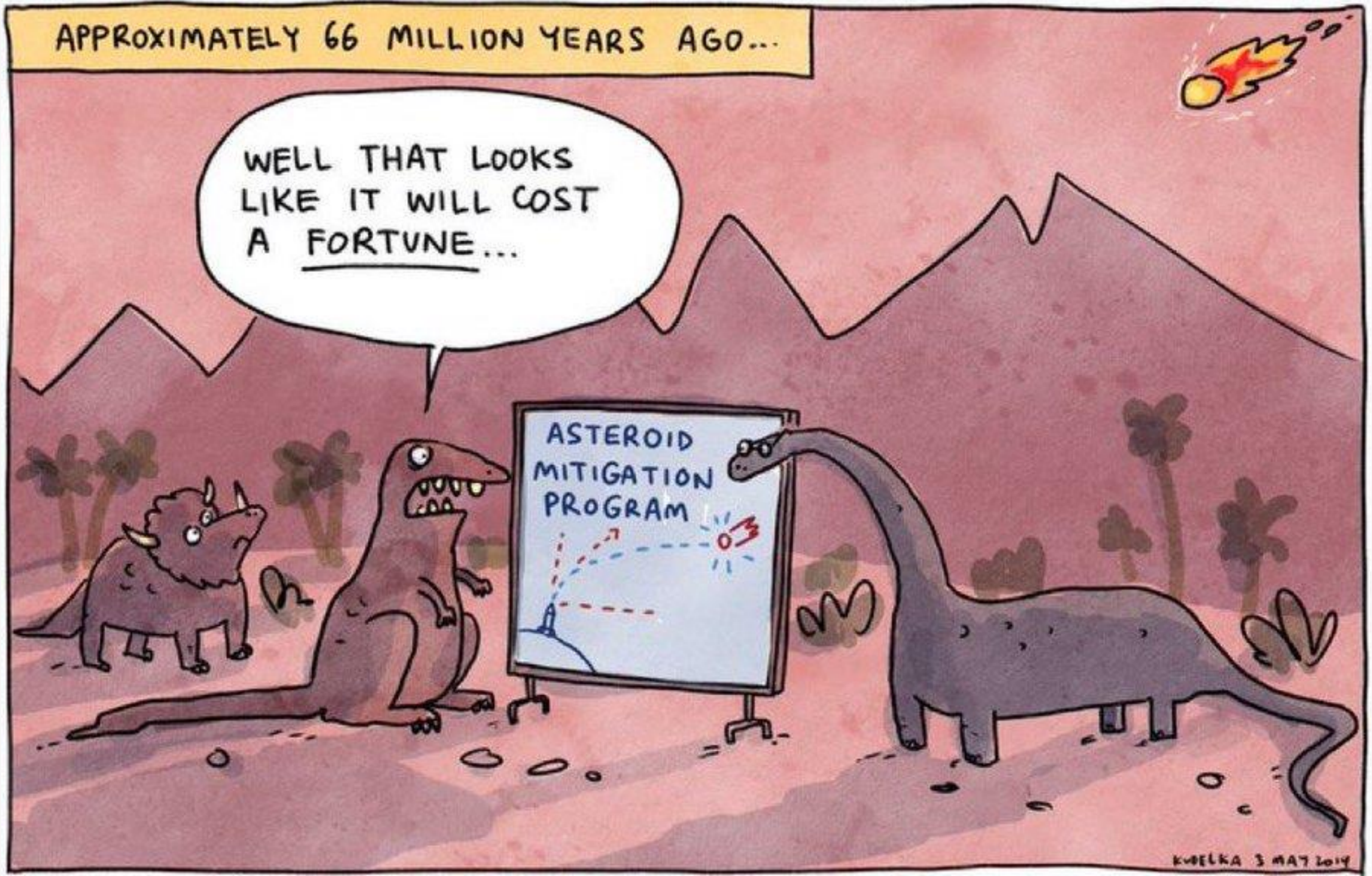
Water filtration



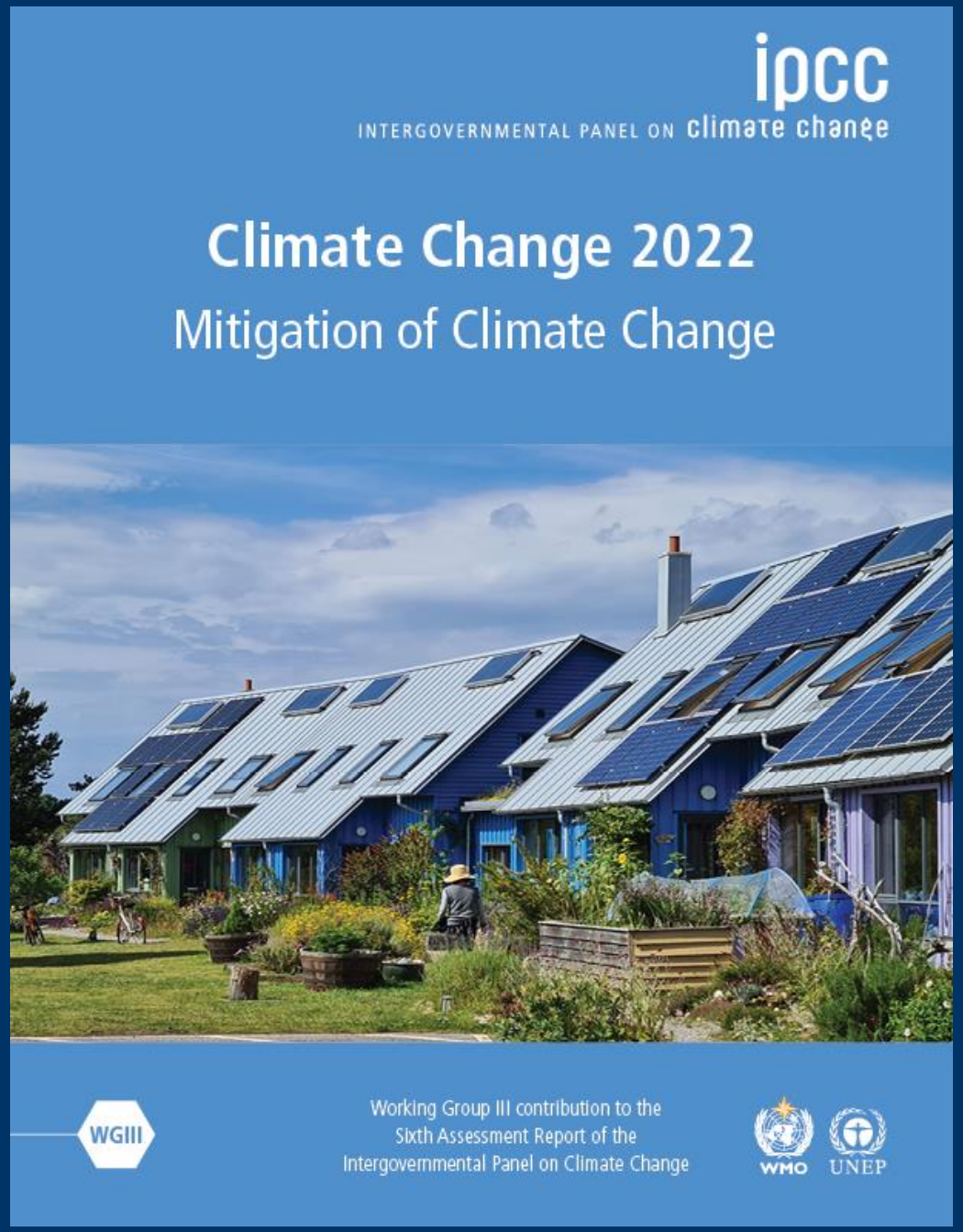
Clean air

Climate regulation

[Ocean Image Bank/ Shaun Wolfe, Dimitris Poursanidis; FAO/Kurt Arrigo, Unsplash, Axel Fassio/CIFOR CC BY-NC-ND


APPROXIMATELY 66 MILLION YEARS AGO...
WELL THAT LOOKS LIKE IT WILL COST A FORTUNE...
ASTEROID MITIGATION PROGRAM
KUBELKA 3 MAY 2014

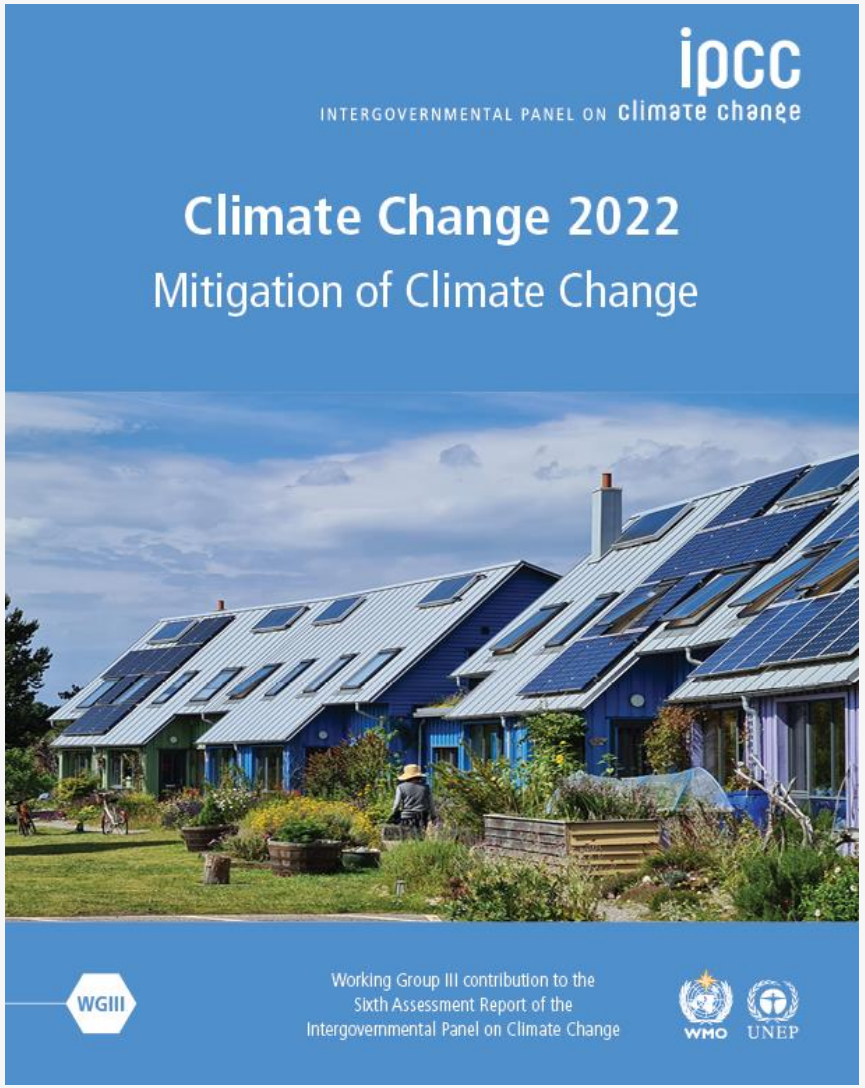
Limiting human-induced global warming to a specific level requires reaching at least net zero CO2 emissions.



[Matt Bridgestock, Director and Architect at John Gilbert Architects]

Buildings are crucial for a net zero future

Buildings are crucial for a net zero future



1. **Net zero energy** buildings are feasible in all climates and economic for almost all building types, both for new and retrofit
2. Key to this is maximised energy efficiency and **minimised energy and material demand**
3. This requires net zero energy **retrofit** of existing building stocks and **repair** of components rather than new and replacement
4. Requires **durable, long-life** buildings & components, with warranties and accessible repair services
5. Replacing high-emission materials, esp. cement and steel, by bio-based materials
6. Maximised use of bio-based materials and nature for **Carbon capture and storage**
7. Integrating **mini&micro ecosystems** into properties

1. **Net zero energy buildings are feasible in all climates and and economic for almost all building types, both for new and retrofit**

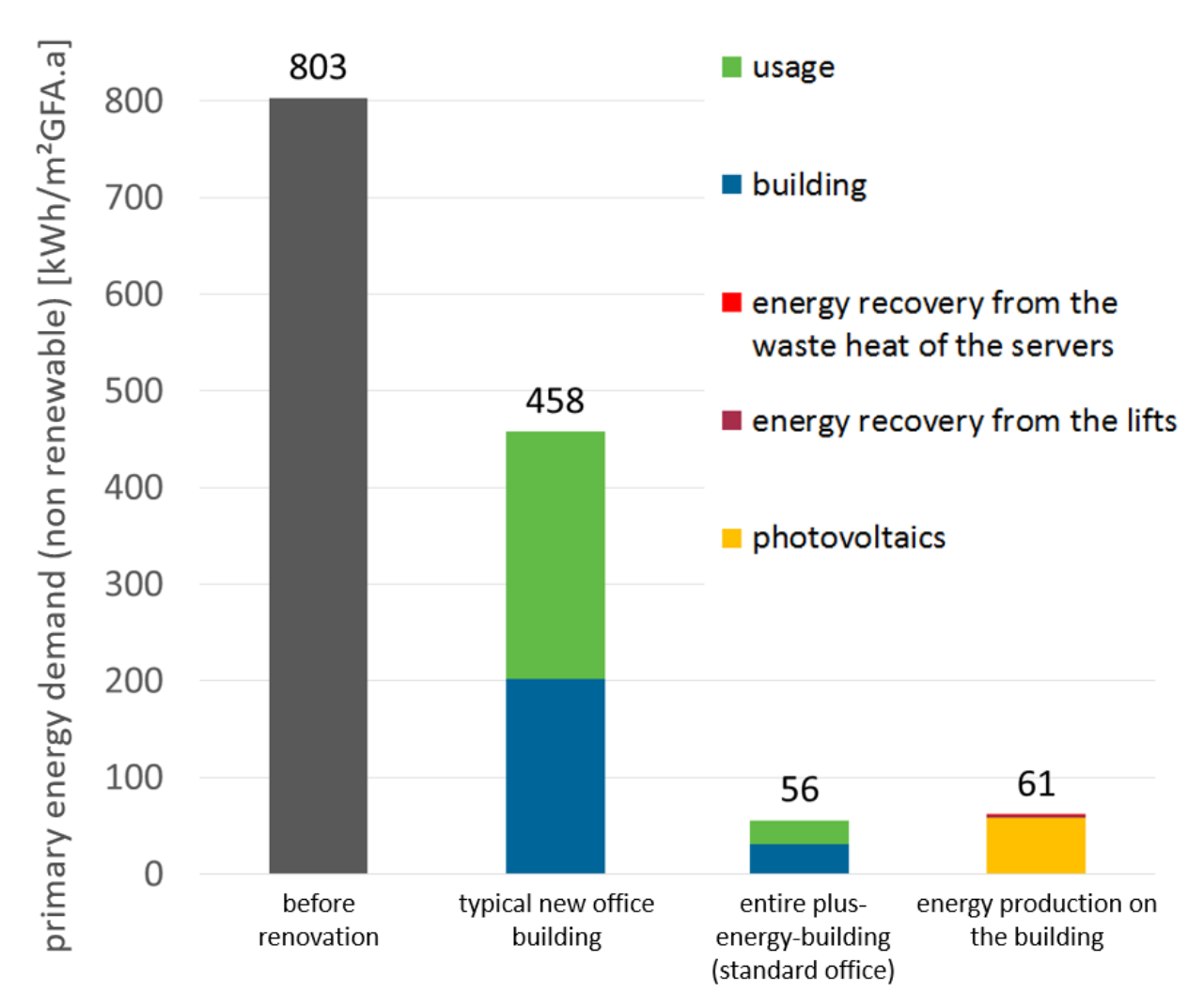
Banánültetvény #70-74, Amory Lovins háza, Colorado, odakint -44 C, fűtés nincs*;*
„így olcsóbb megépíten”

Passzívházak

2. Key to this is maximised energy efficiency and minimised energy and material demand
3. This requires net zero energy retrofit of existing building stocks and repair of components rather than new and replacement

forrás: Klemens Schlögl, Schöber & Pöll, Austrian World Summit 2018, Vienna, May 2018

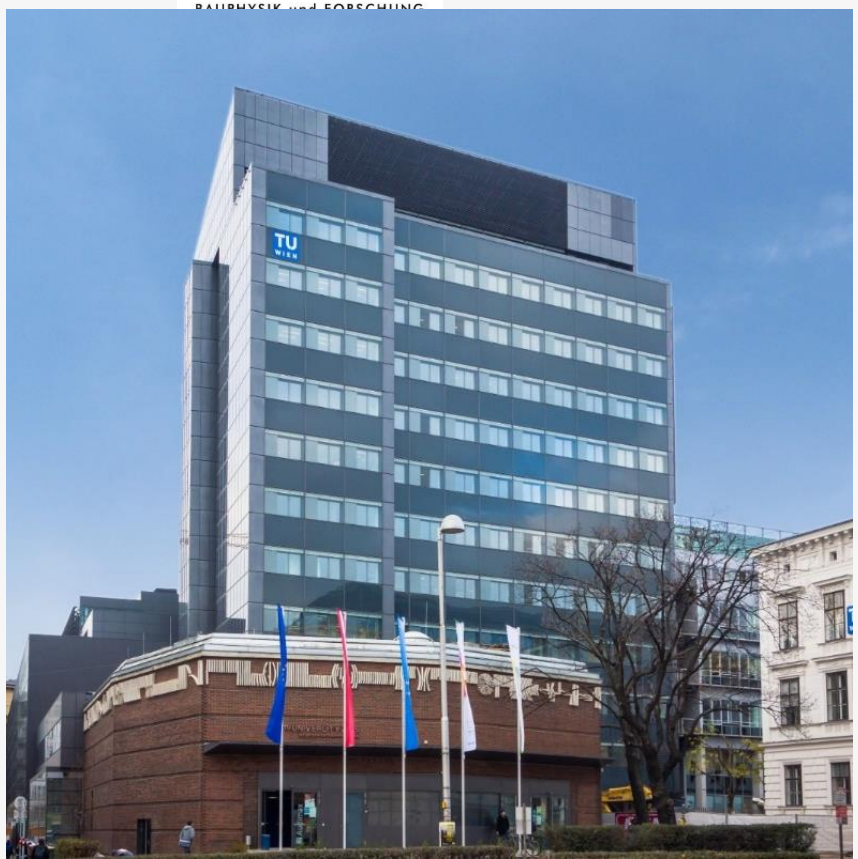
Retrofit of the Vienna TU to Energy Plus Passivhaus level: The key was improved efficiency and reduced demand



Source: Klemens Schlögl, Schöber & Pöll, Austrian World Summit 2018, Vienna, May 2018

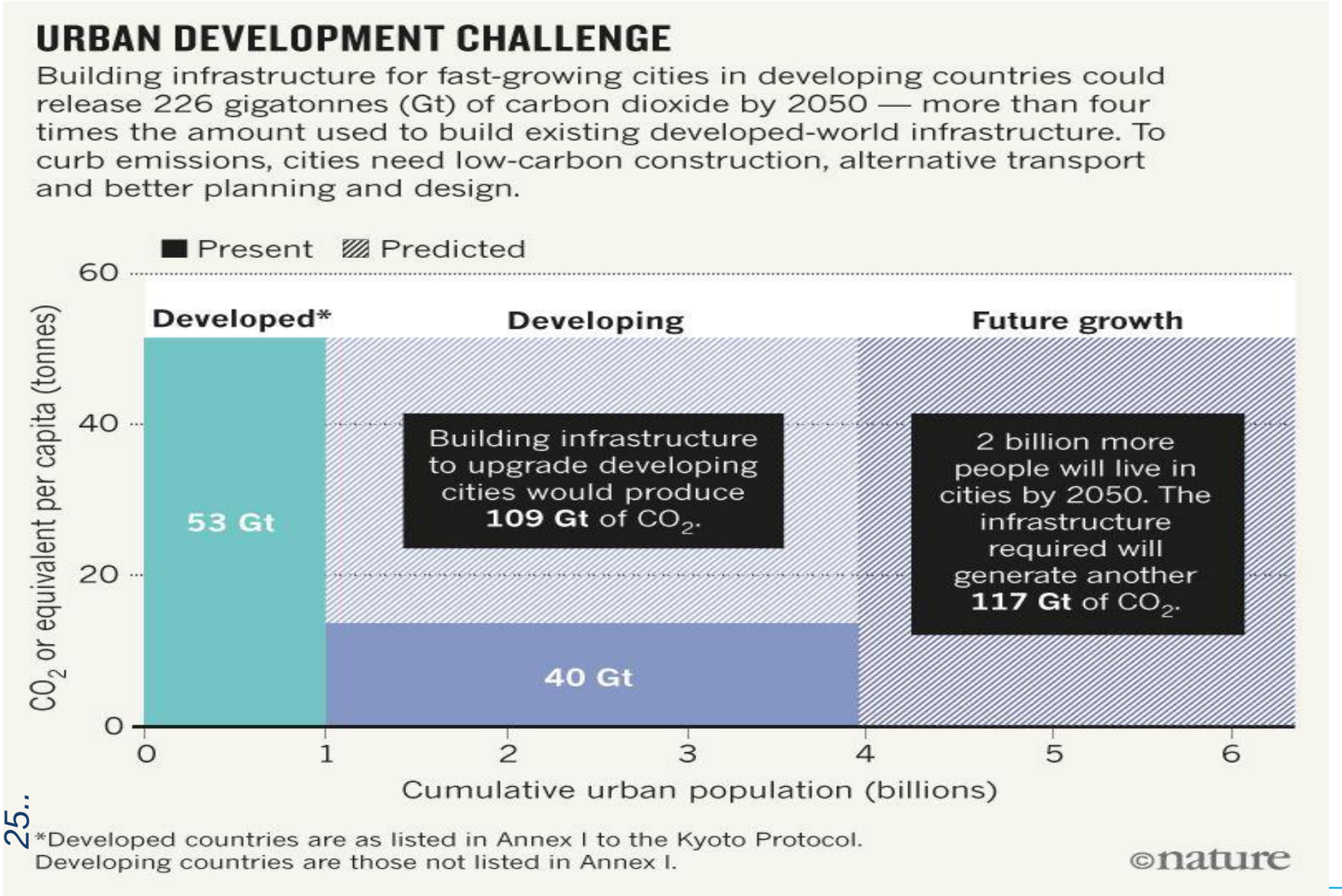
AUSTRIAN WORLD SUMMIT

Schöberl & Pöll GmbH




CHAPPATTE
P.R.

Building the necessary urban infrastructure by 2050 alone could take more than half of our remaining carbon budget



Forrás: Bai, X., Dawson, R. J., Ürge-Vorsatz, D., Delgado, G. C., Barau, A. S., Dhakal, S., ... & Roberts, D. (2018). Six research priorities for cities and climate change. Nature, 555(7694), 23-25..

- Replacing high-emission materials, esp. cement and steel, by bio-based materials
- Maximised use of bio-based materials and nature for Carbon capture and storage

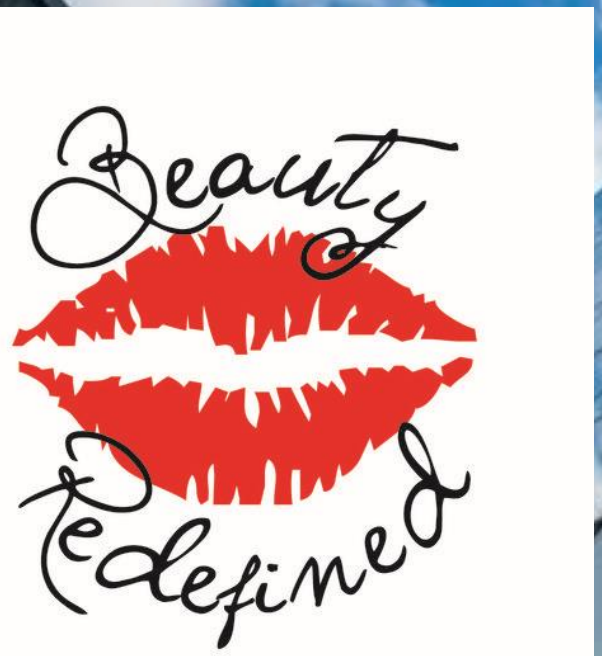
Elrond Burrell (he/him)
@ElrondBurrell

Dear construction industry: Forget about Life-Cycle Analyses, we don't have time. Just stop building with so much f**king steel, aluminium and concrete already. buff.ly/2CDLLuc

2:00 PM · Jan 23, 2019 · Buffer

Highly glazed buildings:

1. **Overheating**
2. **Excess air conditioning demand**
3. **High embodied CO2 in material (glass)**
4. **Giant spaces without a function (except aesthetics) to be conditioned**



Dąbrowa Chotomowska
(Mazowieckie)
Passivhaus
Net Zero Energy
timber construction

Brock Commons Carbon Impact

Volume of wood:
2,233 cubic meters of CLT and Glulam

U.S. and Canadian forests grow this much wood in:
6 minutes

Carbon stored in the wood:
1,753 metric tons of CO_2

Avoided greenhouse gas emissions:
679 metric tons of CO_2

TOTAL POTENTIAL CARBON BENEFIT:
2,432 metric tons of CO_2

EQUIVALENT TO:

511 cars off the road for a year

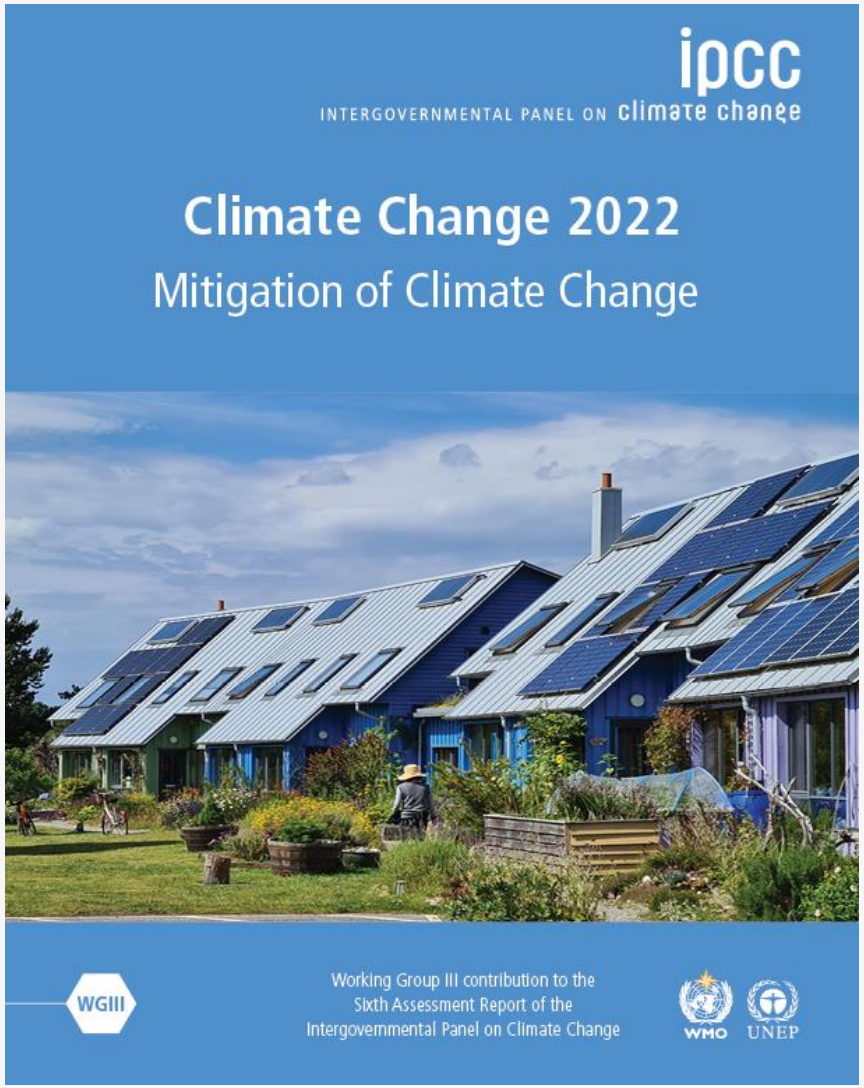
Energy to operate a home for 222 years

Source: US EPA

Source: Naturallywood


JUST LEITERN
JUST LEITERN
JUST LEITERN

Buildings are crucial for a net zero future



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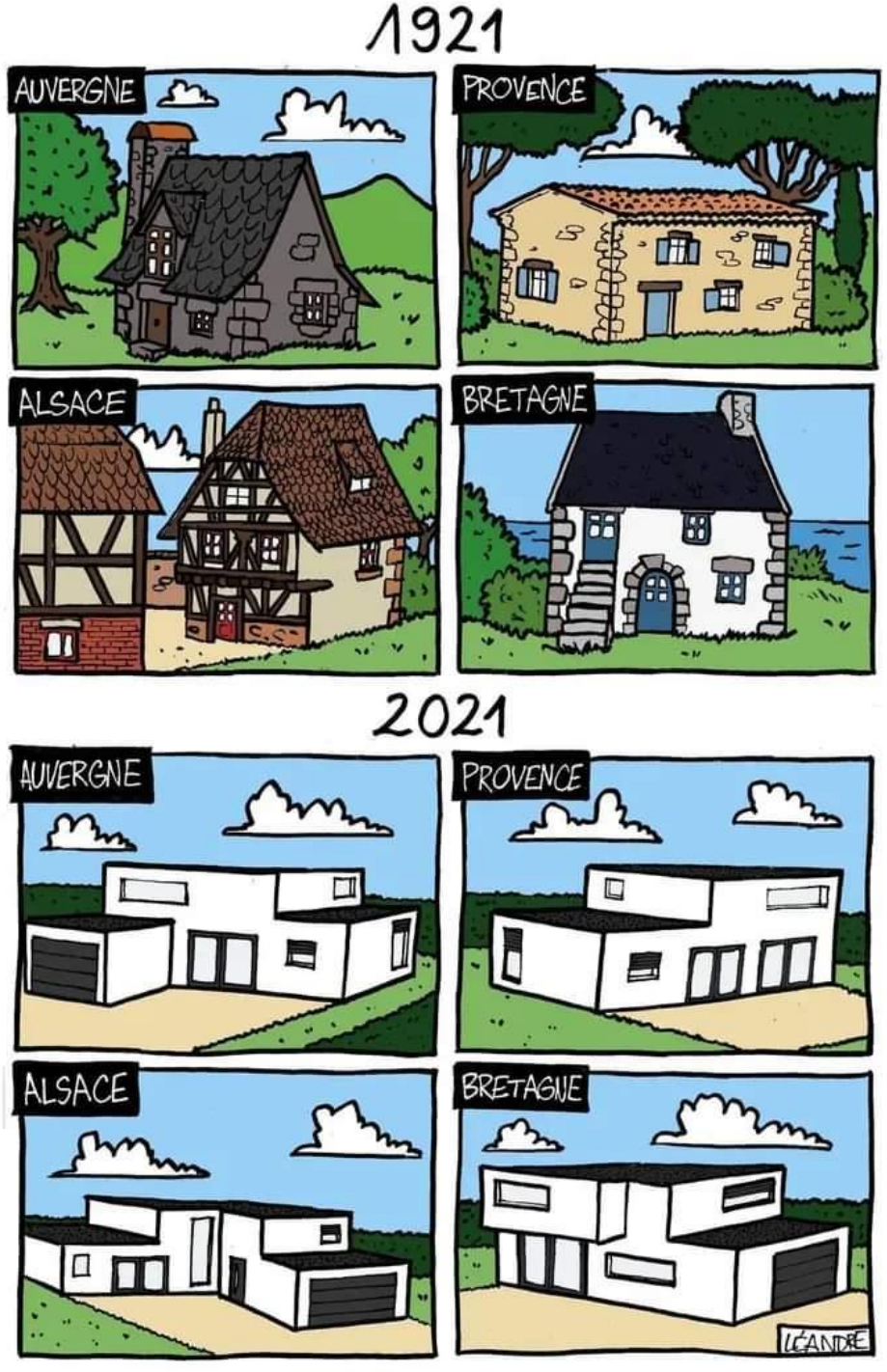
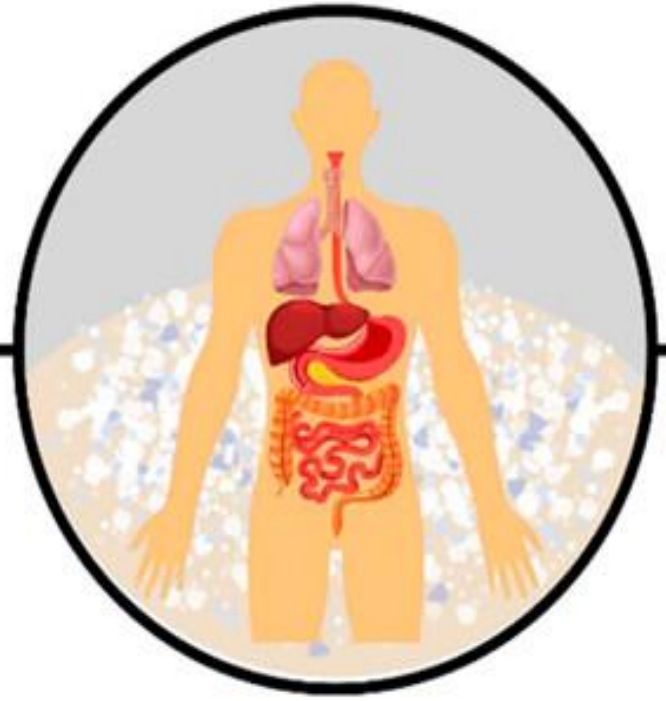

1921
AUVERGNE
PROVENCE
ALSACE
BRETAGNE
2021
AUVERGNE
PROVENCE
ALSACE
BRETAGNE
LÉANDRE

MICROPLASTIC

Exposure



Toxicity

oxidative stress

DNA damage

organ dysfunction

metabolic disorder

immune response

neurotoxicity

reproductive and developmental toxicity

Potential Health Impact of Microplastics: A Review of Environmental Distribution, Human Exposure, and Toxic Effects

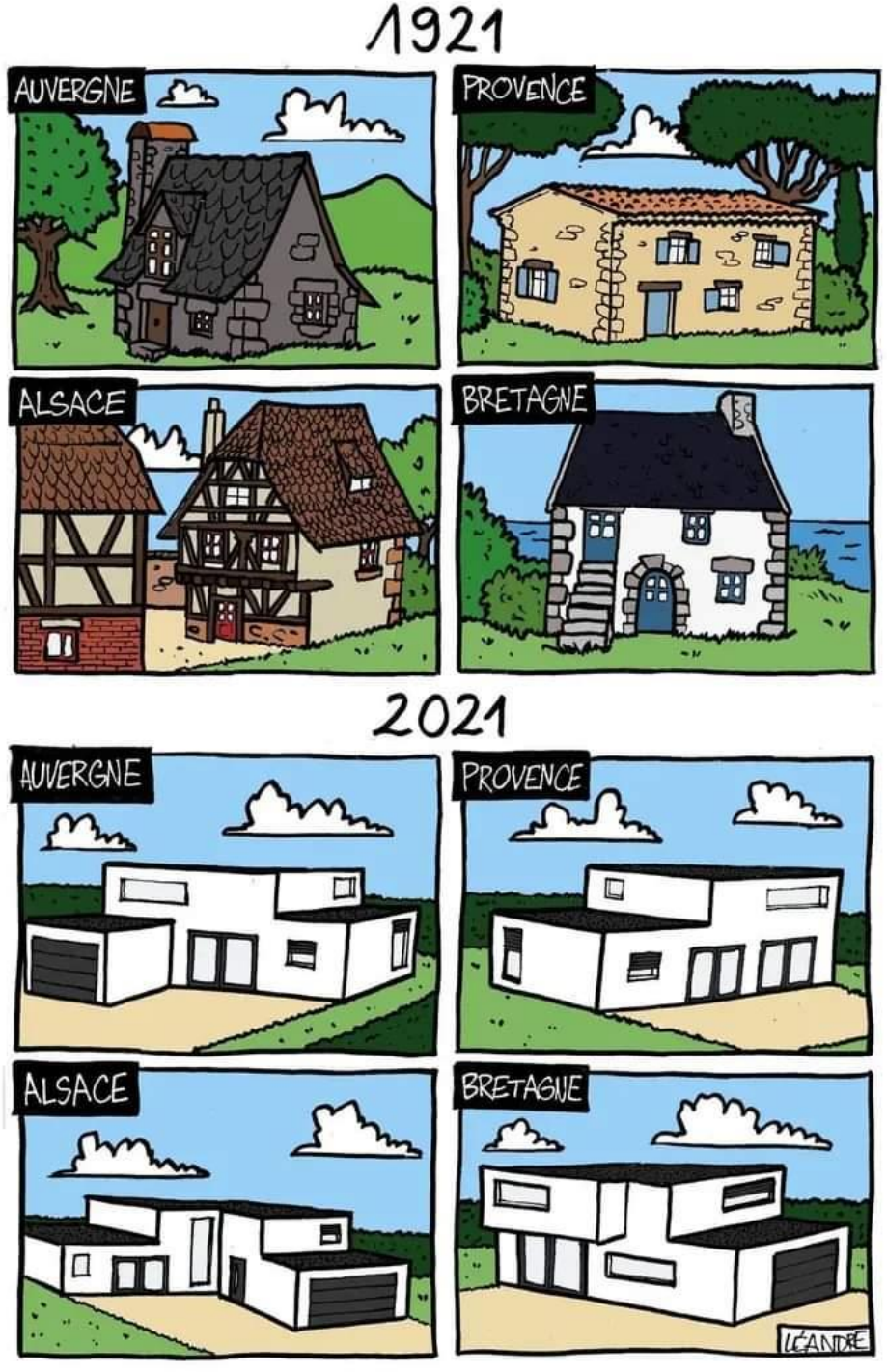
•Yue Li et al. *Environ. Health* 2023,

PLASTIC & CLIMATE CHANGE

Projected share of CO^2 emissions from global plastic production, maximum budget to meet 1.5 degree warming target by 2050.

* CO_2 equivalents: unit of measurement for standardizing the climate impact of different greenhouse gases.

SOURCE: PLASTIC ATLAS 2019 | © PLASTIC SOUP FOUNDATION


1921
AUVERGNE
PROVENCE
ALSACE
BRETAGNE
2021
AUVERGNE
PROVENCE
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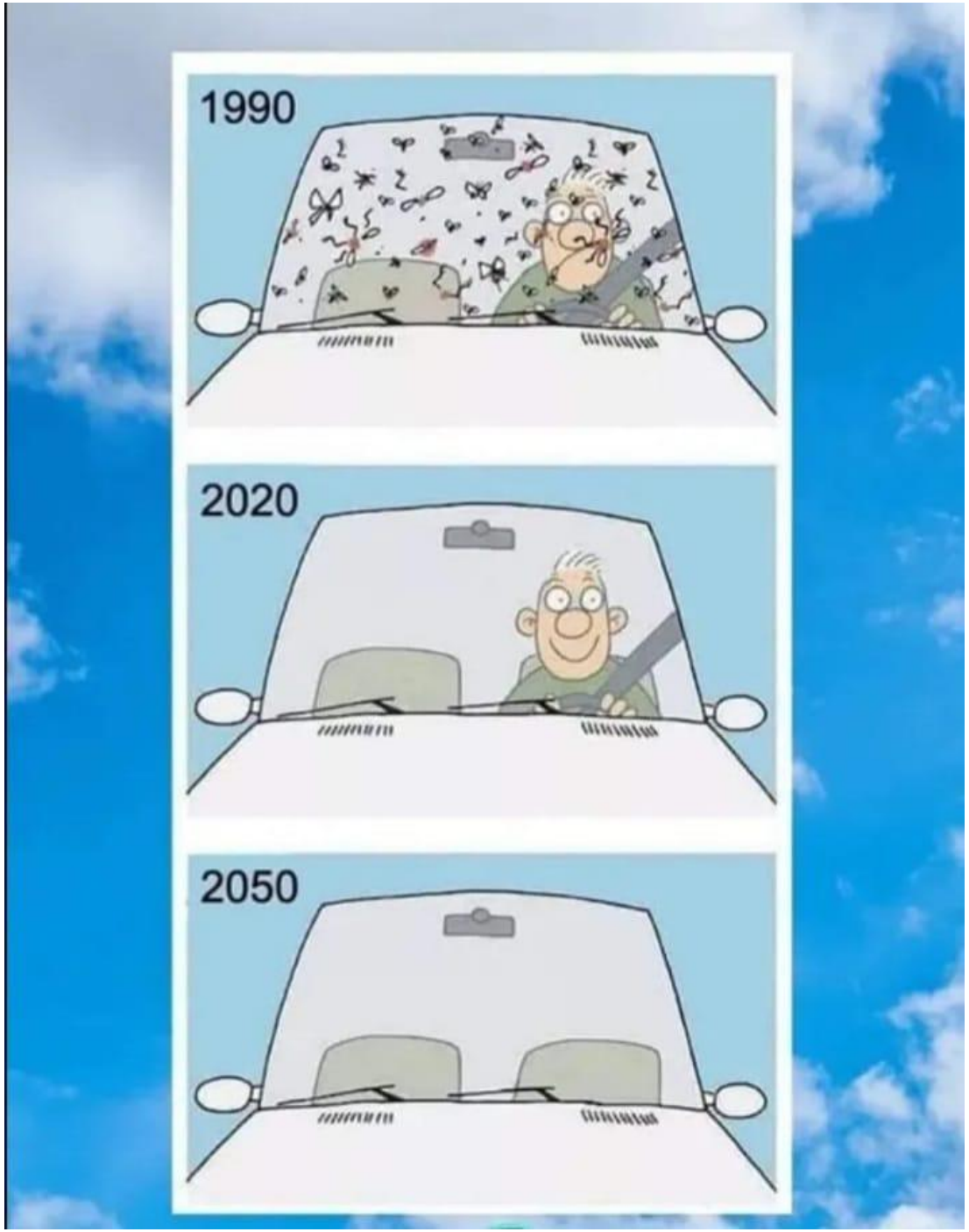
LÉANDRE


1990
2020
2050

- Humility in architecture towards nature
- Working with nature rather than ruling it
- Capturing carbon by living biomass
- Providing shading and cooling by lush foliage
- Improving well-being and mental health


Much more durable than asphalt
Permeable surface
Flood prevention
Keeps soil moisture
Captures carbon in soil
Micro ecosystem
Keeps soil alive


Who wants change?
Who wants *to* change?
Who wants *to* ***lead the*** change?

- From today, every property that we build or retrofit to a less than net zero energy level, using high quantities of man-made materials lock us into a hotter climate

Thank you for your attention

Ürge-Vorsatz Diana

CEU

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Twitter, Instagram:

@DianaUrge

Facebook:

diana.urgevorsatz

- This requires net zero energy retrofit of existing building stocks and repair of components rather than new and replacement

Energy producing historic district?

Klemens Schloegl

Günter Lang

Souran Chatterjee

Ürge-Vorsatz Diana

Dora Urge

18-as pavilon látványtervei

The energy plus retrofit costs less than a regular retrofit already at the investment level

A „Kernzone, Kernzone Ost” és „Kernzone West” pavilonok **fűtési és hűtési infrastruktúrájának beruházási költségei**

Infrastrukturális fűtési és hűtési beruházási költségek euróban

Beleértve a saját PV-paneleken keresztüli energiatermelés költségeit

Az adókat nem tartalmazza.