Being children of God in a time of climate change

在氣候變化的世代中作神的兒女

Creation

創造

Death

死亡

Restoration

復和

Vice-regents

攝政者

Romans 8:19-21 (NIV)

羅馬書8:19-21 (和合本修訂版)

For the creation waits in eager
expectation for the children of
God to be revealed. For the creation
was subjected to frustration, not by
its own choice, but by the will of the
one who subjected it, in
hope that the creation itself will be
liberated from its bondage to
decay and brought into the freedom
and glory of the children of God.

受造之物切望等候神的眾子顯出來。因為受造之物屈服在虛空之下，不是自己願意，而是因那使它屈服的叫他如此。但受造之物仍然指望從敗壞的轄制下得釋放，得享神兒女榮耀的自由。

Creation is waiting for us to be who God made us to be

受造之物皆一同等候回復神起初創造之原貌

Slide presentation draws with gratitude

on:

A previous presentation by Dr Ben Richards, PhD, Creation care hub, YWAM Paisley, itself drawing from a presentation by Rev. Dr. Jessica Moerman, PhD

受造之物告訴我們甚麼？

WHAT GOD'S CREATION IS TELLING US

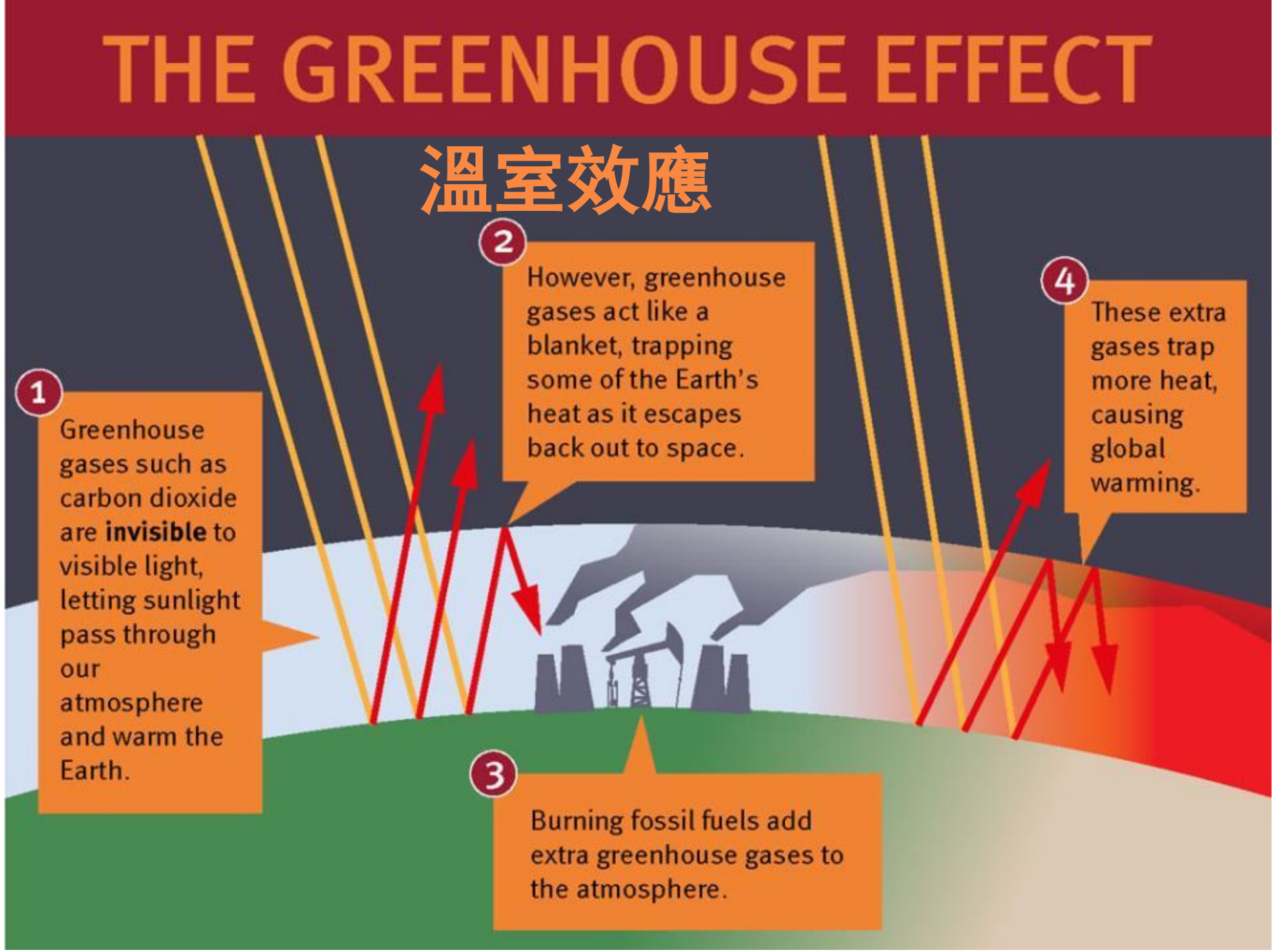
THE SCIENCE AND IMPACTS OF CLIMATE CHANGE

氣候變化之科學及影響

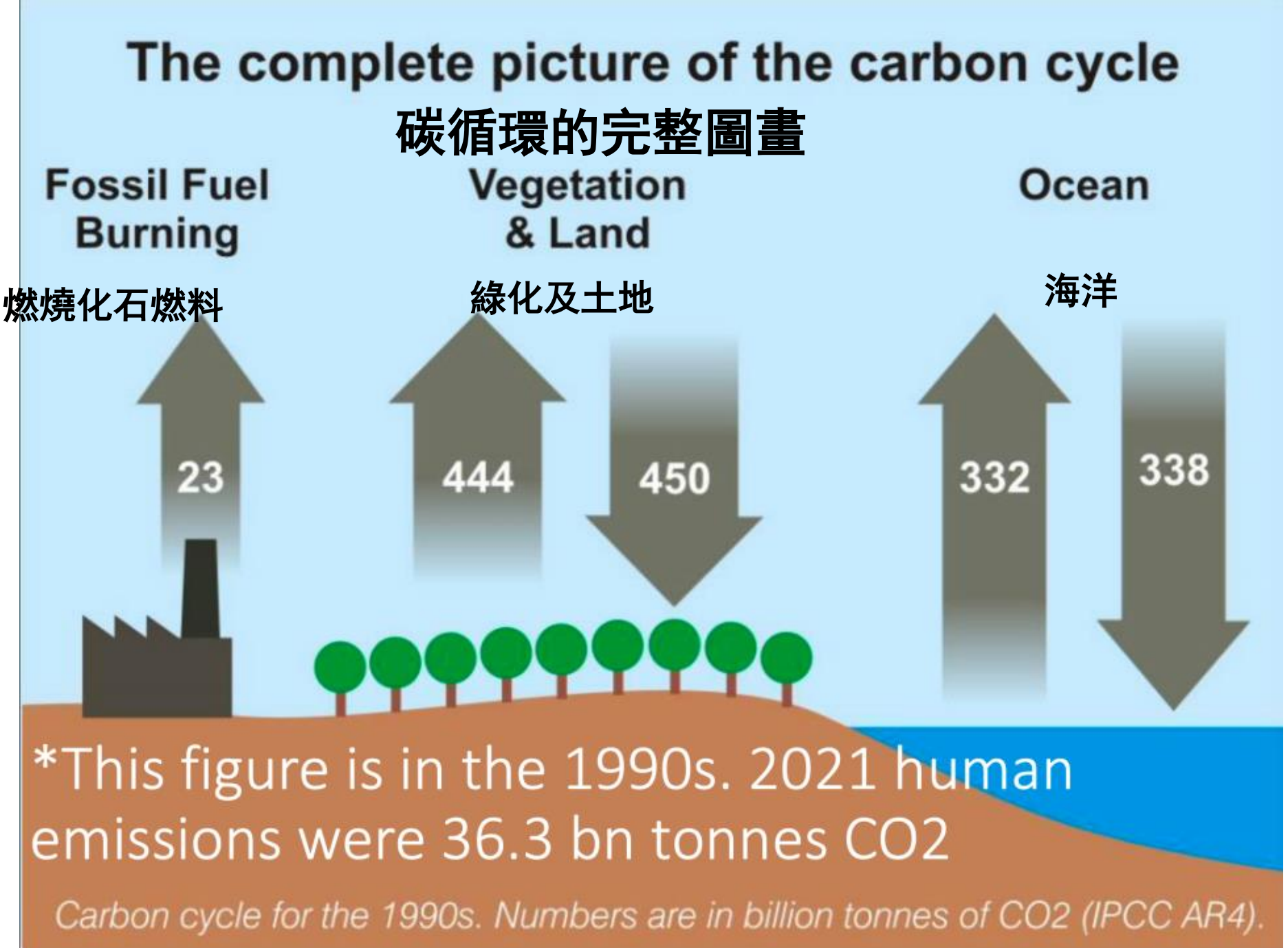
Rev. Dr. JESSICA MOERMAN, PhD

Vice President, Science and Policy
Evangelical Environmental Network

Co-Founding Pastor, Grace Capital City



Source: [Skeptical Science]

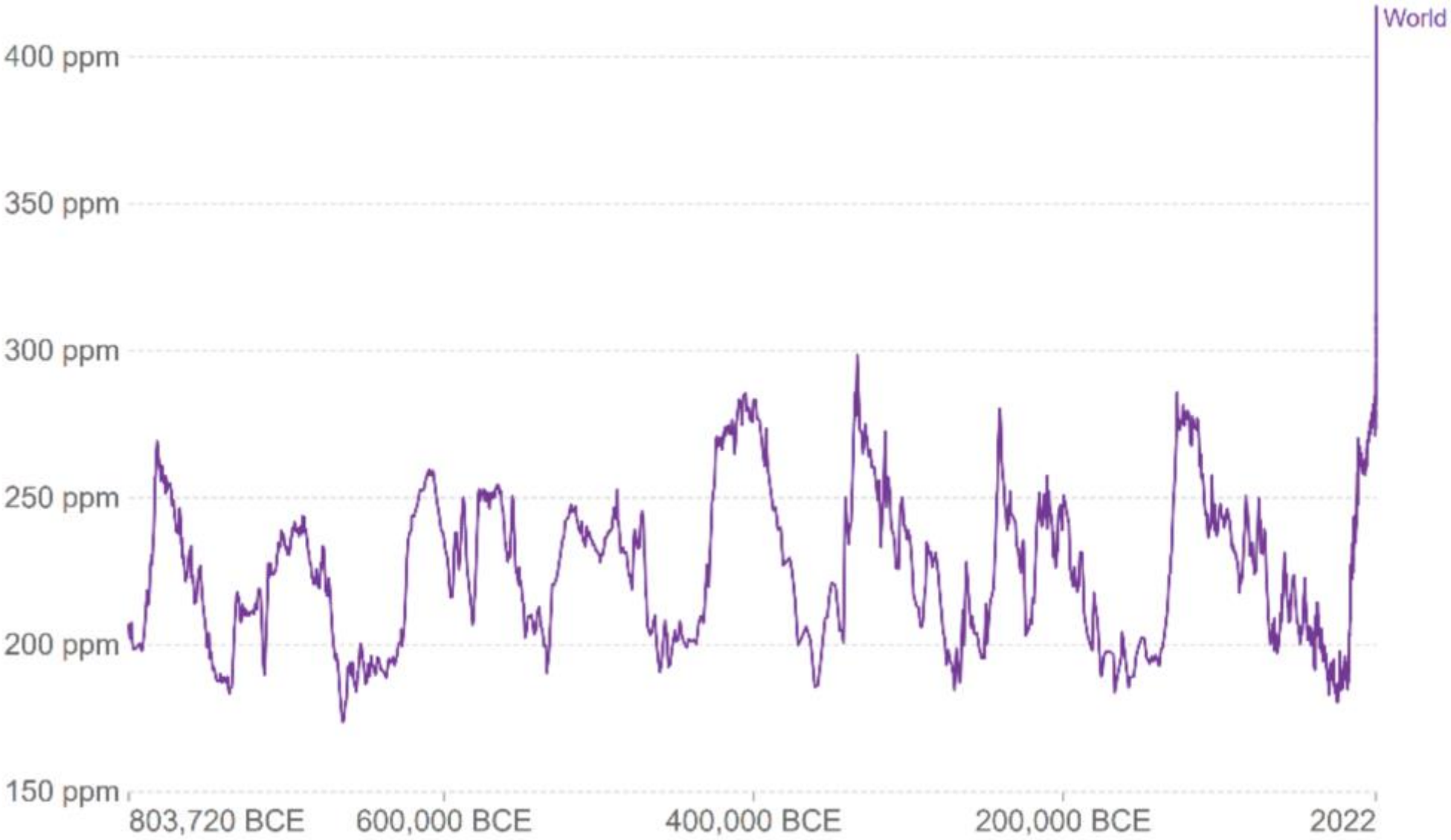


Source: Skeptical Science

Global atmospheric CO_2 concentration 全球二氧化碳濃度

Our World in Data

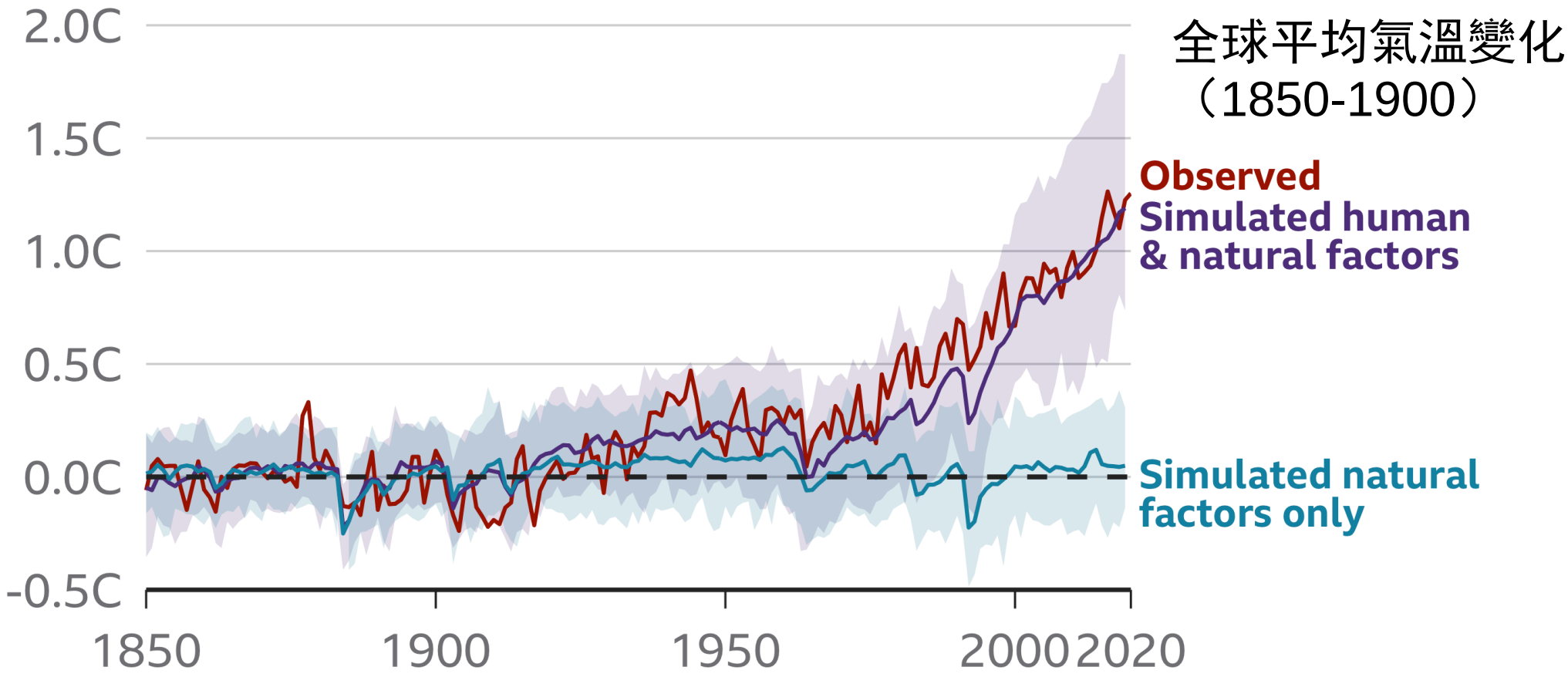
Atmospheric carbon dioxide (CO_2) concentration is measured in parts per million (ppm). Long-term trends in CO_2 concentrations can be measured at high-resolution using preserved air samples from ice cores.



Source: National Oceanic and Atmospheric Administration (NOAA)

Human influence has warmed the climate 人類帶來氣侯暖化

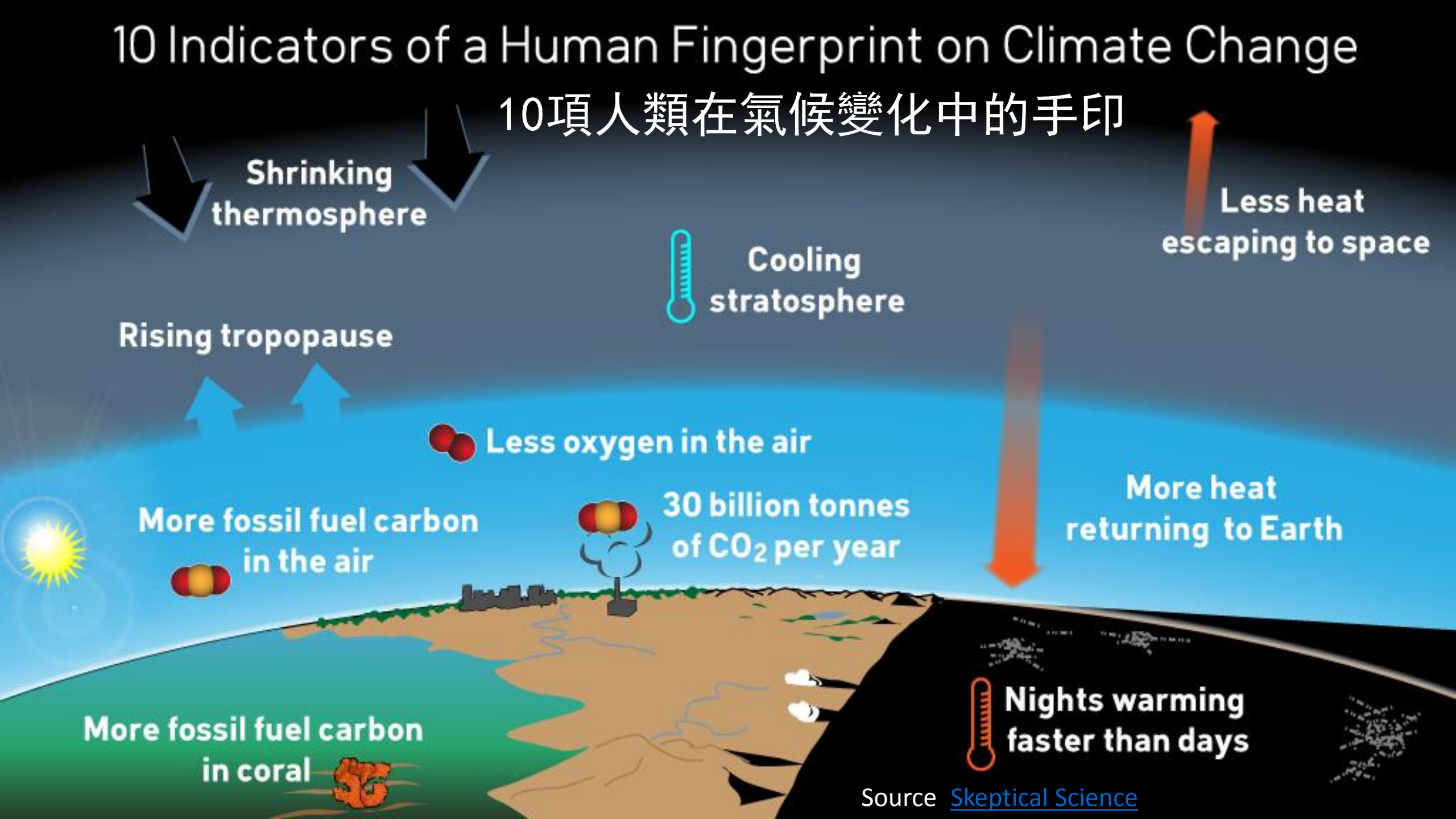
Change in average global temperature relative to 1850-1900, showing observed temperatures and computer simulations



Note: Shaded areas show possible range for simulated scenarios

Source: IPCC, 2021: Summary for Policymakers

BBC


10 Indicators of a Human Fingerprint on Climate Change
10項人類在氣候變化中的手印
Shrinking thermosphere
Less heat escaping to space
Cooling stratosphere
Rising tropopause
Less oxygen in the air
More fossil fuel carbon in the air
30 billion tonnes of CO_2 per year
More heat returning to Earth
More fossil fuel carbon in coral
Nights warming faster than days
Source Skeptical Science

Direct causes 主要因素

- Fossil Fuel Burning 燃燒化石燃料
- Agricultural system, especially meat production (and cultural demand for it) 農業發展，尤其是肉食生產及社群文化之需求
- Consumerism: over-consumption
  消費主義：過度消費
- Development: Life-improving deployment of technology
  提升生活質素不斷進步的科技發展

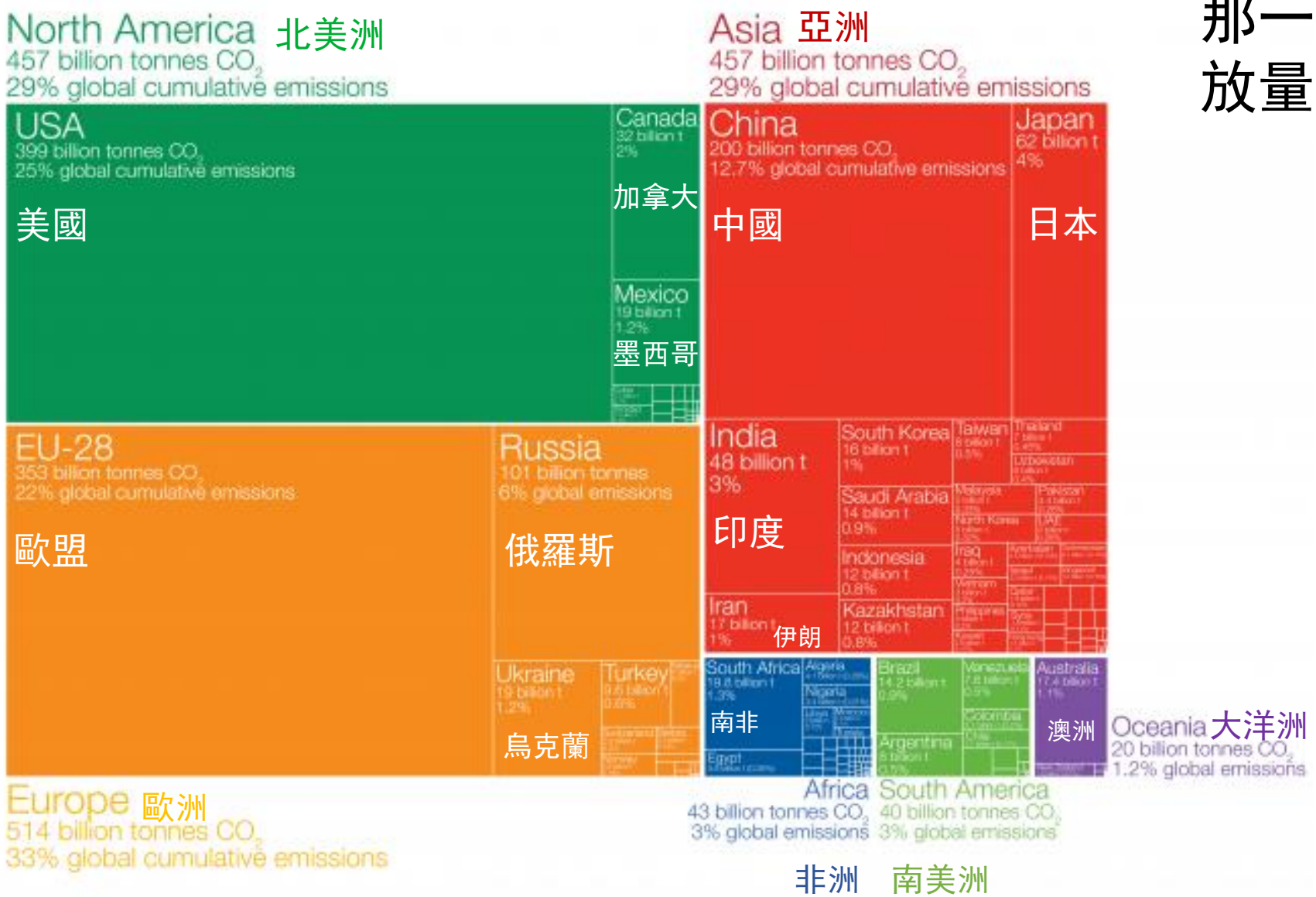
In 1941 (left), Muir Glacier filled this valley in Glacier National Park and Preserve in Alaska. It was a tidewater glacier, meaning that it flowed out onto the ocean. By 2004 (right), Muir Glacier had retreated 12 kilometers (7 miles) and thinned by more than 800 meters (2,600 feet). — Credit:William Osgood Field (1941) and Bruce F. Molnia (2004); courtesy of the Glacier Photograph Collection at the University of Colorado Boulder & NSIDC

Who has contributed most to global CO_2 emissions?

Our World in Data

Cumulative carbon dioxide (CO_2) emissions over the period from 1751 to 2017. Figures are based on production-based emissions which measure CO_2 produced domestically from fossil fuel combustion and cement, and do not correct for emissions embedded in trade (i.e. consumption-based). Emissions from international travel are not included.

那一個國家二氧化碳排放量最高？



Figures for the 28 countries in the European Union have been grouped as the 'EU-28' since international targets and negotiations are typically set as a collaborative target between EU countries.
Values may not sum to 100% due to rounding.

Data source: Calculated by Our World in Data based on data from the Global Carbon Project (GCP) and Carbon Dioxide Analysis Center (CDIAC).
This is a visualization from OurWorldinData.org, where you find data and research on how the world is changing.

Number of events

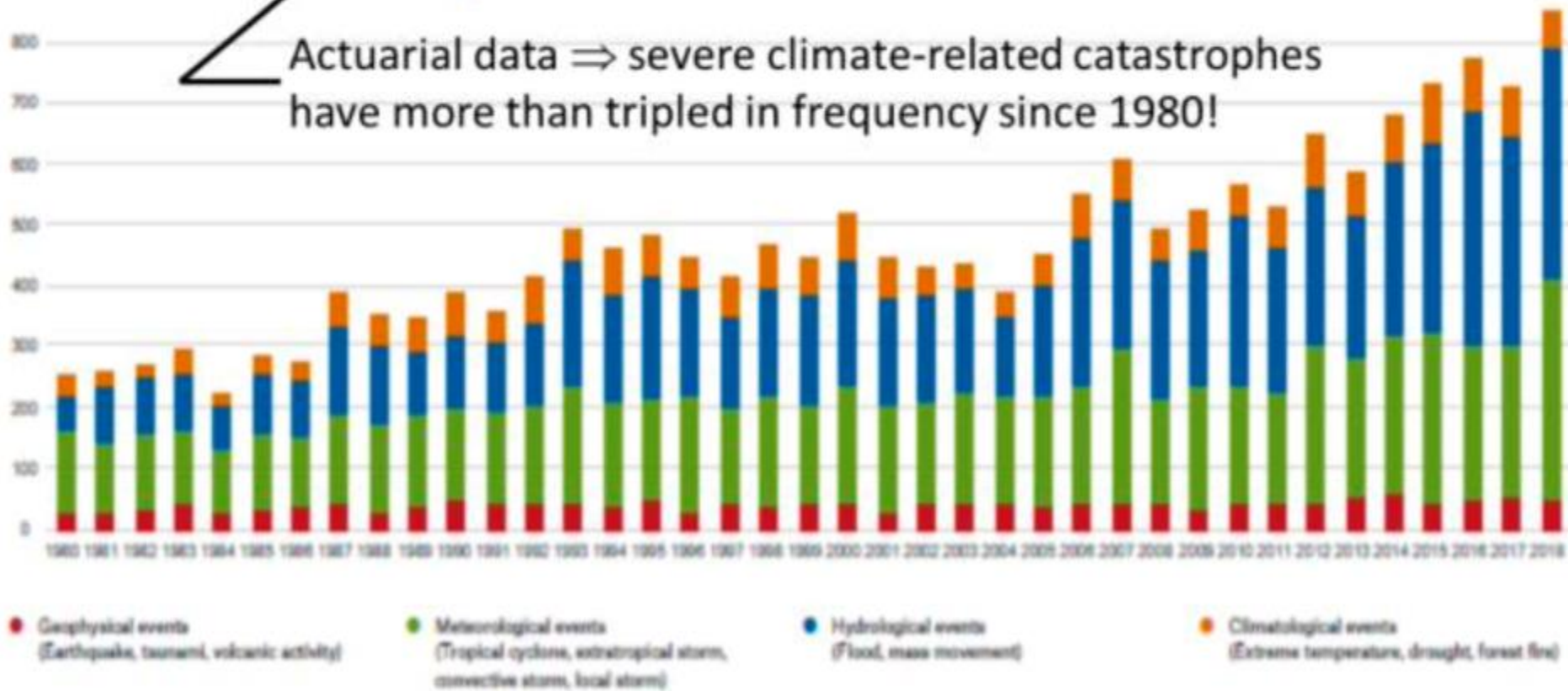
Relevant natural loss events worldwide 1980 – 2018

Geophysical events (Earthquake, tsunami, volcanic activity)

Meteorological events (Severe storms)

Hydrological events (Flood, mass movement)

Climatological events (Extreme temperature, drought, forest fire)



Accounted events have caused at least one fatality and/or produced normalised losses a US$ 100k, 300k, 1m, or 3m (depending on the assigned World Bank income group of the affected country).

Current effects – malnutrition

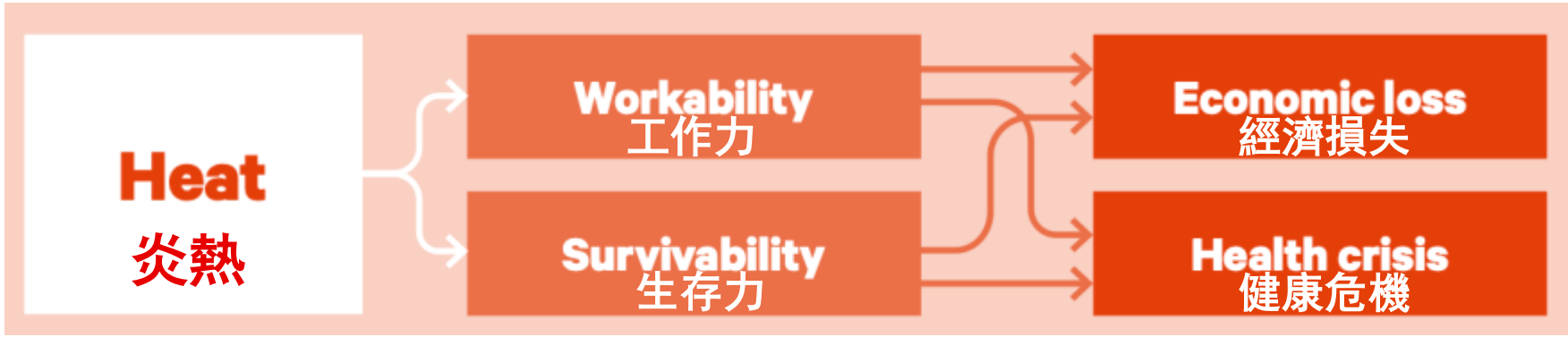
今天的影響 – 營養不良

What is the difference in climate impacts between 1.5°C and 2°C of warming?
假若溫度提升1. 5度或2度所帶來的影響之分別

▸ **Severe climate impacts** with 1.5 degrees of warming, and the effects get significantly worse with 2 degrees.

Source: WRI Blogpost
Last updated: March 2, 2022

CLIMATEWATCH



Source: *Climate Change Risk Assessment 2021*, Chatham House

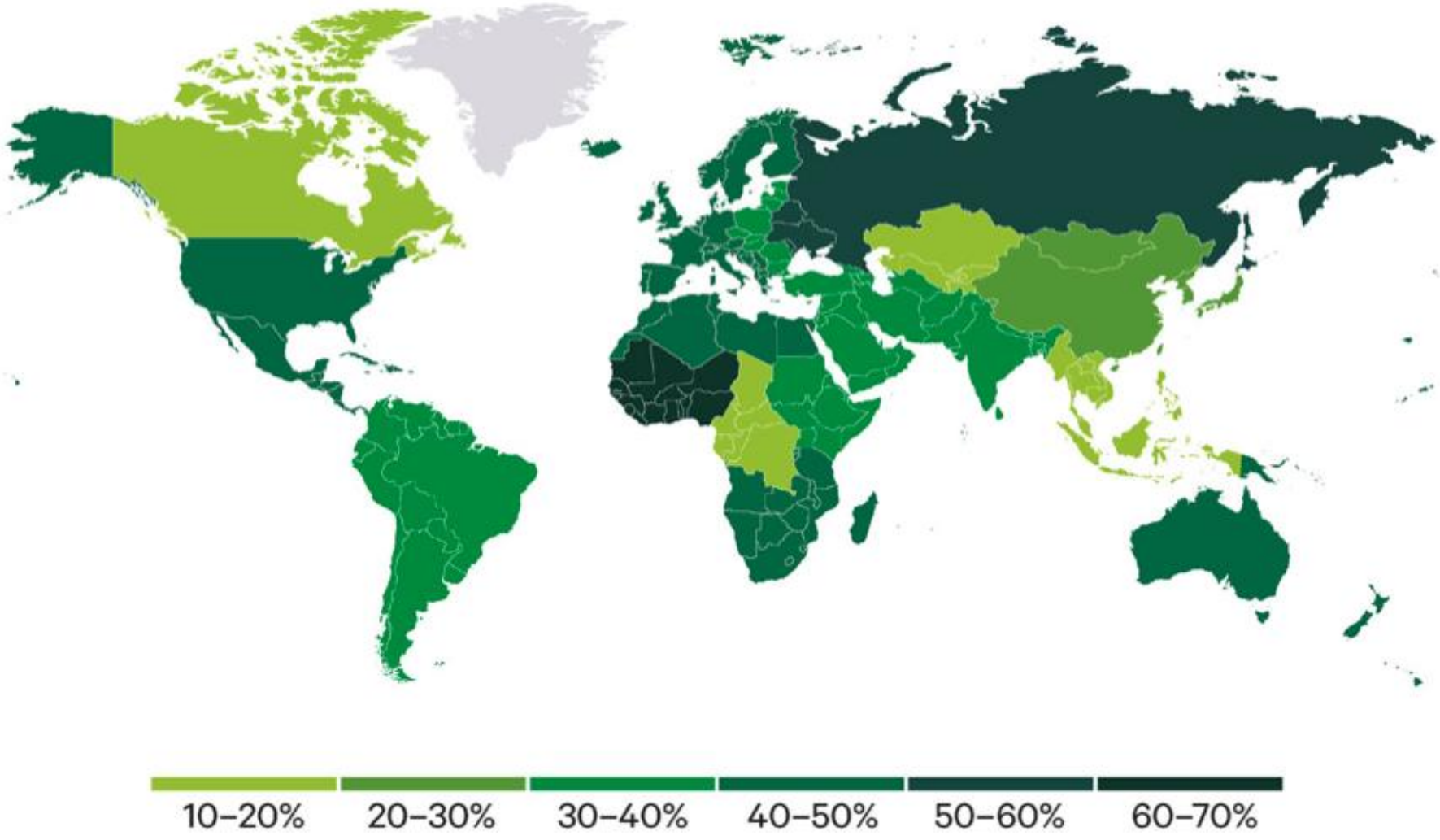
死亡年齡提前

衛生健康狀況下降

營養不良

Regional impacts, 2050: proportion of cropland exposed to severe drought each year

區域性影響 2050：每年農作地面臨嚴重旱災危機之比例



During the 2040s there is a 50% chance of synchronous crop failure
2040年將有一半現存的農作物失收

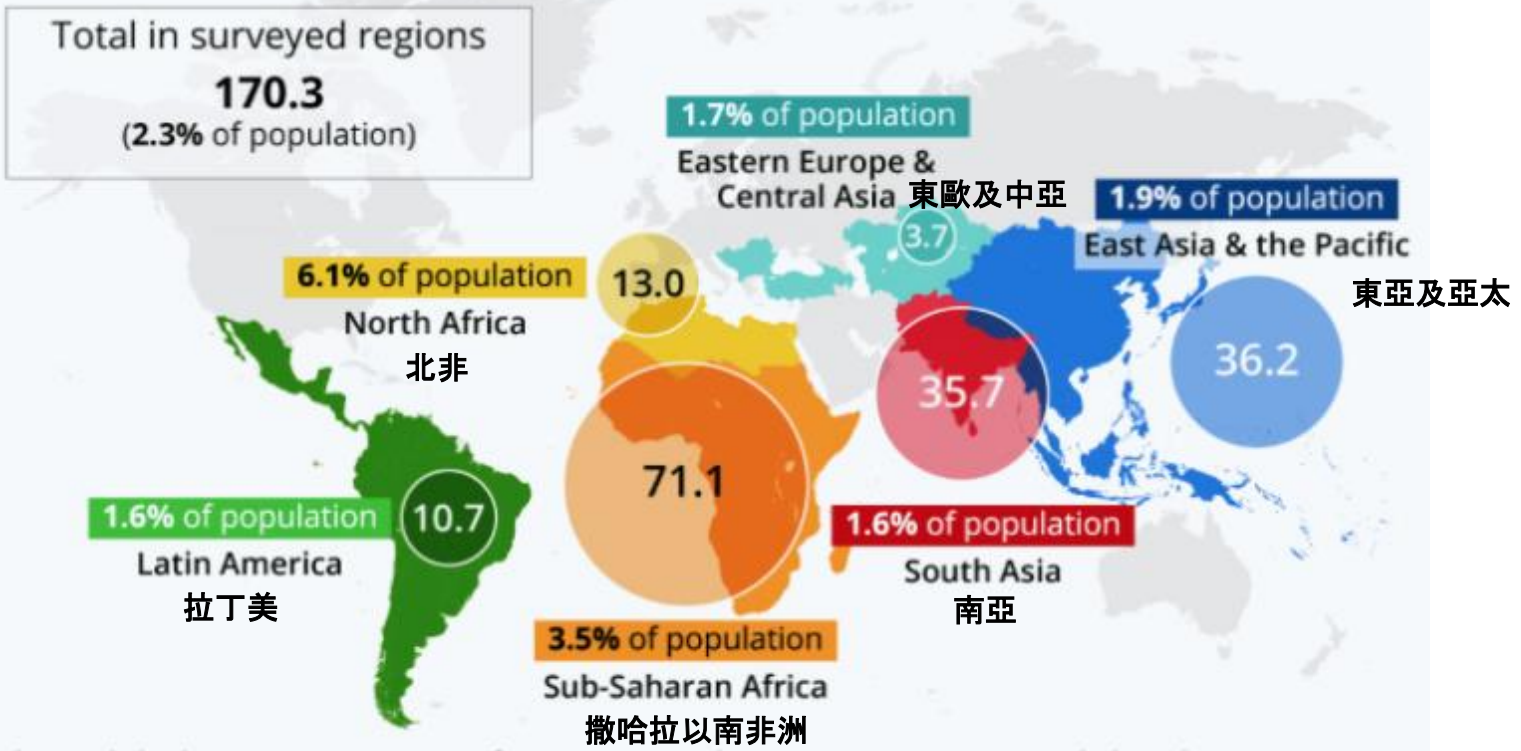
Source: *Climate Change Risk Assessment 2021*, Chatham House

Future effects – migration & biodiversity loss

明天的影響 – 遷移及失去生物品種多樣性

Climate Change, the Great Displacer 氣候變化人口大遷徙

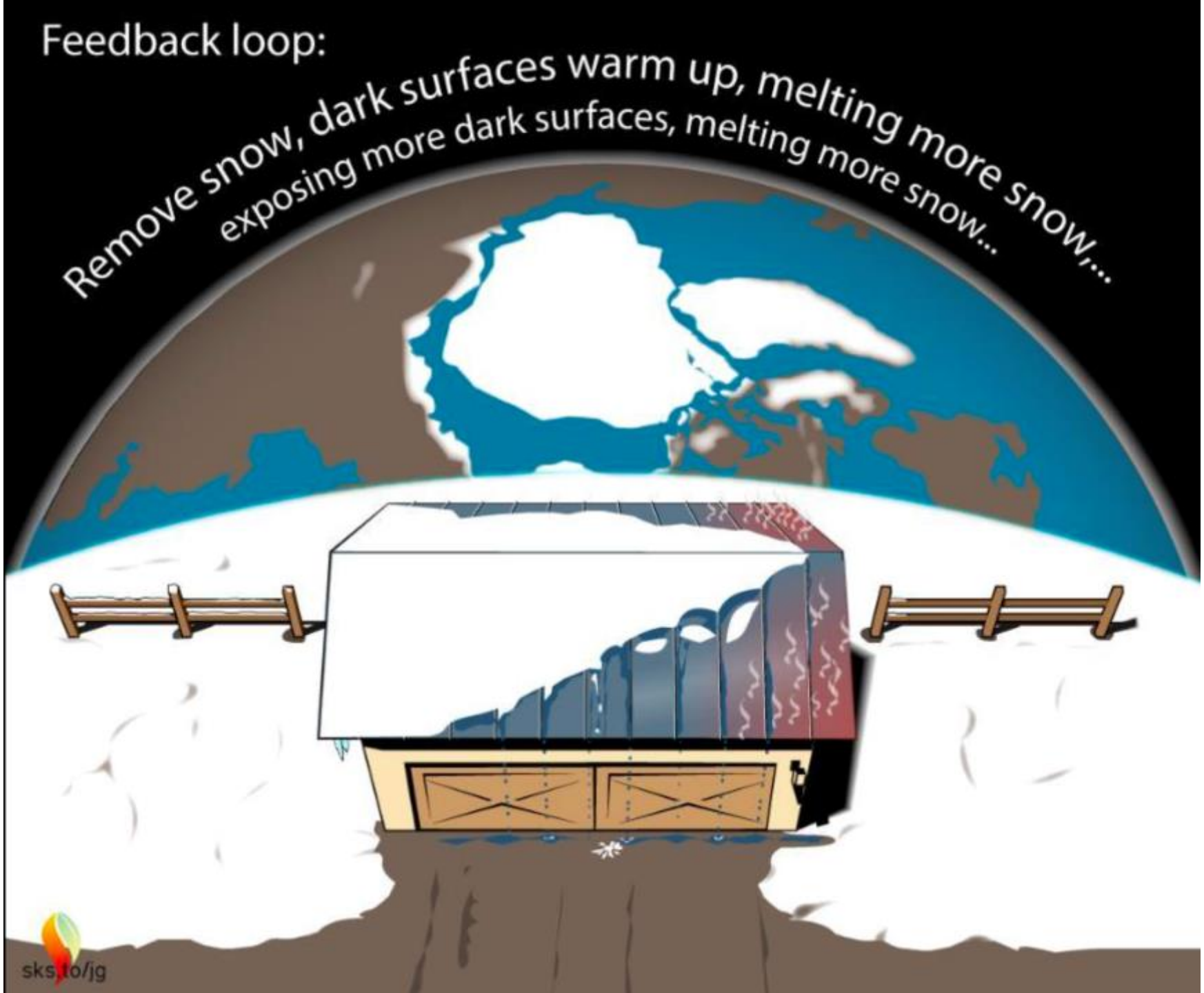
Average number of internal climate migrants by 2050 per region (in millions)*



* Modeled on pessimistic reference = High emission & unequal development scenarios concerning water availability, crop productivity and sea-level rise

Source: World Bank

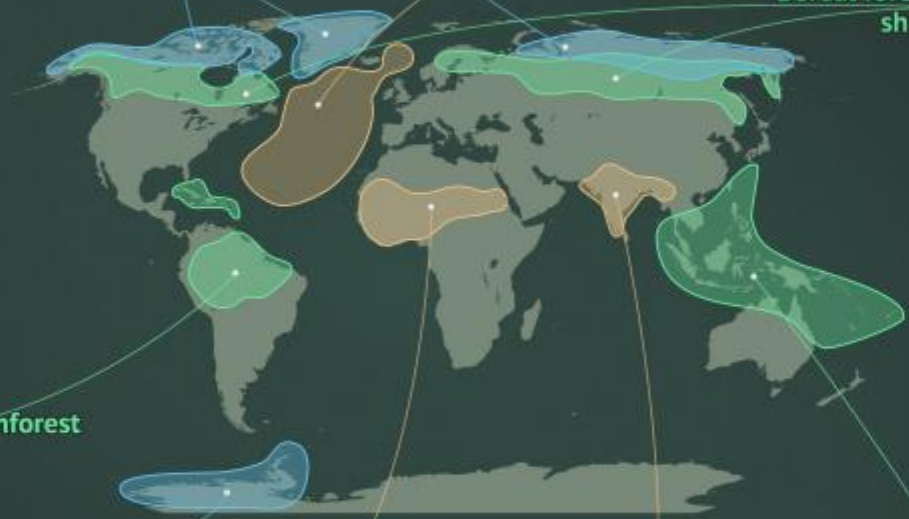
statista



Source: [Skeptical Science]

TIPPING POINTS

Nine climate "tipping points" where rising global temperatures could push parts of the Earth system into irreversible change



Greenland ice sheet disintegration
Irreversible retreat of the ice sheet caused by rising temperatures
Sea level rise (2-7m)

Permafrost loss
Abrupt increase in emissions of CO_2 and methane through the thawing of frozen carbon-rich soils
Greenhouse gas release
Amplified warming

Atlantic meridional overturning circulation breakdown
Shutdown of the AMOC caused by an increased influx of freshwater into the North Atlantic
Regional cooling
Sea level rise

Boreal forest shift
A shift in boreal forests, seeing expansion into tundra to the north and dieback to the south
Ecological shift
Regional warming

Tipping points
Impacts

Impacts
Tipping points

Biodiversity loss
Decreased rainfall
Deforestation and hotter, drier conditions causing dieback of the rainforest and a shift towards savannah
Amazon rainforest dieback

Sea level rise (5m)
Collapse of the ice sheet triggered by persistent grounding-line retreat in one sector, cascading to other sectors
West Antarctic ice sheet disintegration

Ecosystem change
An abrupt change in Sahel rainfall, caused by a shift northwards (wetter) or southwards (drier) in the West African monsoon
West African monsoon shift

Decreased carrying capacity
Drought
The monsoon system could be weakened by higher aerosol emissions or strengthened by rising CO_2 emissions
Indian monsoon shift

Ecological change
Rising temperatures pushing corals beyond tolerable levels of thermal stress into an alternative state dominated by macroalgae
Coral reef die-off

- Melting
- Biome shift
- Circulation change

CarbonBrief

“We basically have three choices: **mitigation**, **adaptation** and **suffering**. We’re going to do some of each.

我們只有三個選擇：**緩和，適應**和**受苦**。我們需要每個選擇皆有行動回應。

The question is what the mix is going to be.

問題是這三個選擇該如何配合。

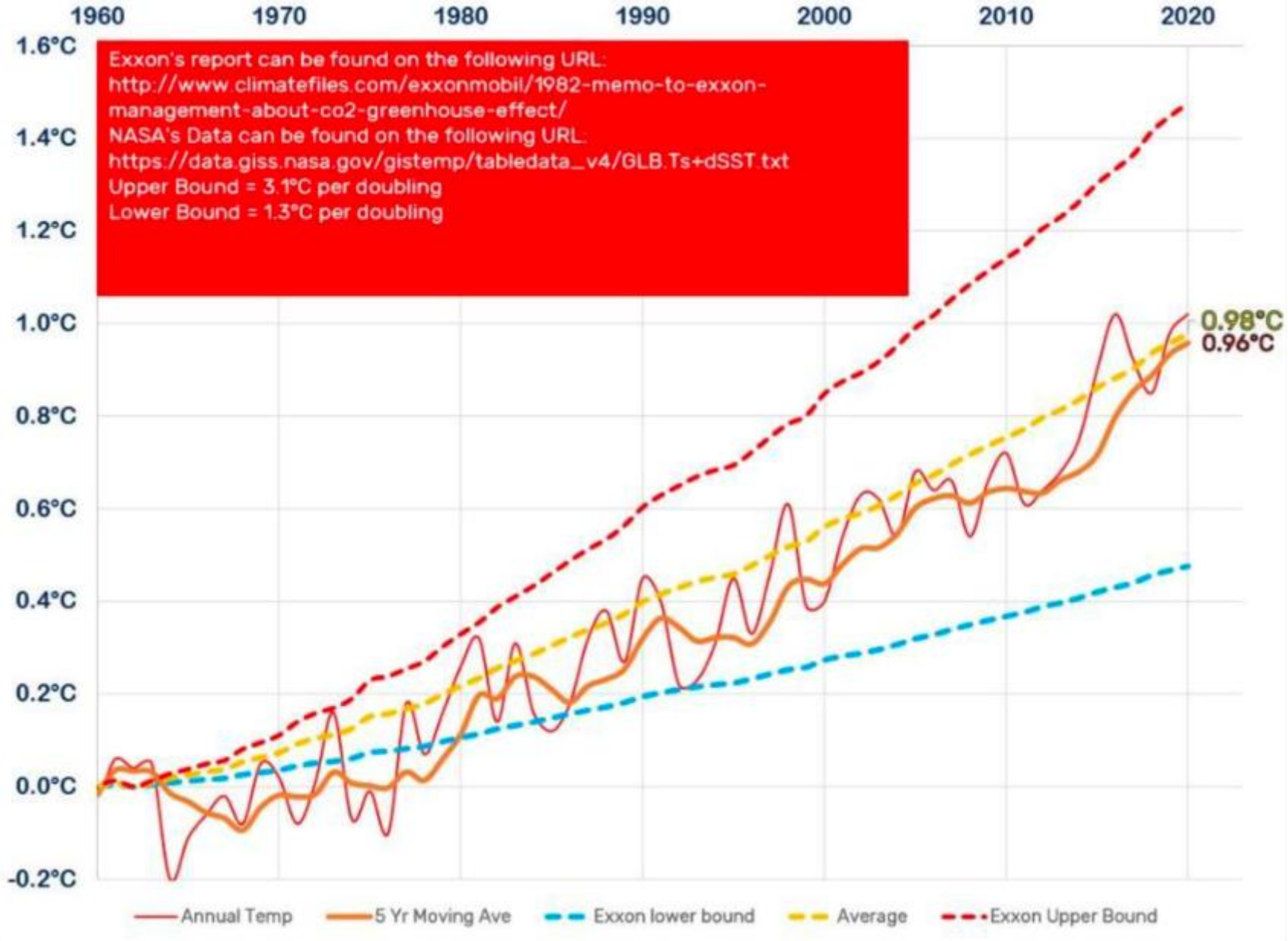
The more mitigation we do, the less adaptation will be required and the less suffering there will be.”

當有越多的緩和行動時，適應和受苦便會相對減少。

John Holdren, Harvard energy expert and climate adviser to Barack Obama, 2007

EXXON and Shell accurately predicted climate change

埃克森美孚及蜆殼油公司準確地預測氣候變化



- If I just buy this thing I'll be happier… 我買了這東西，一定會更快樂…
- The world ends in fire anyway so I don't need to look after it 世界終會終結，我不需要愛護她
- The market will find a way (… so no prodding needed) 他們總會找到辦法
- How serious is the problem? 這個問題有多嚴重?
- It's so scary – there's nothing we can usefully do 這太可怕了，我們沒有甚麼可以做
- It's not my problem 這不是我的問題
- There are so many important issues to address 我們有太多其他更重要的問題要處理

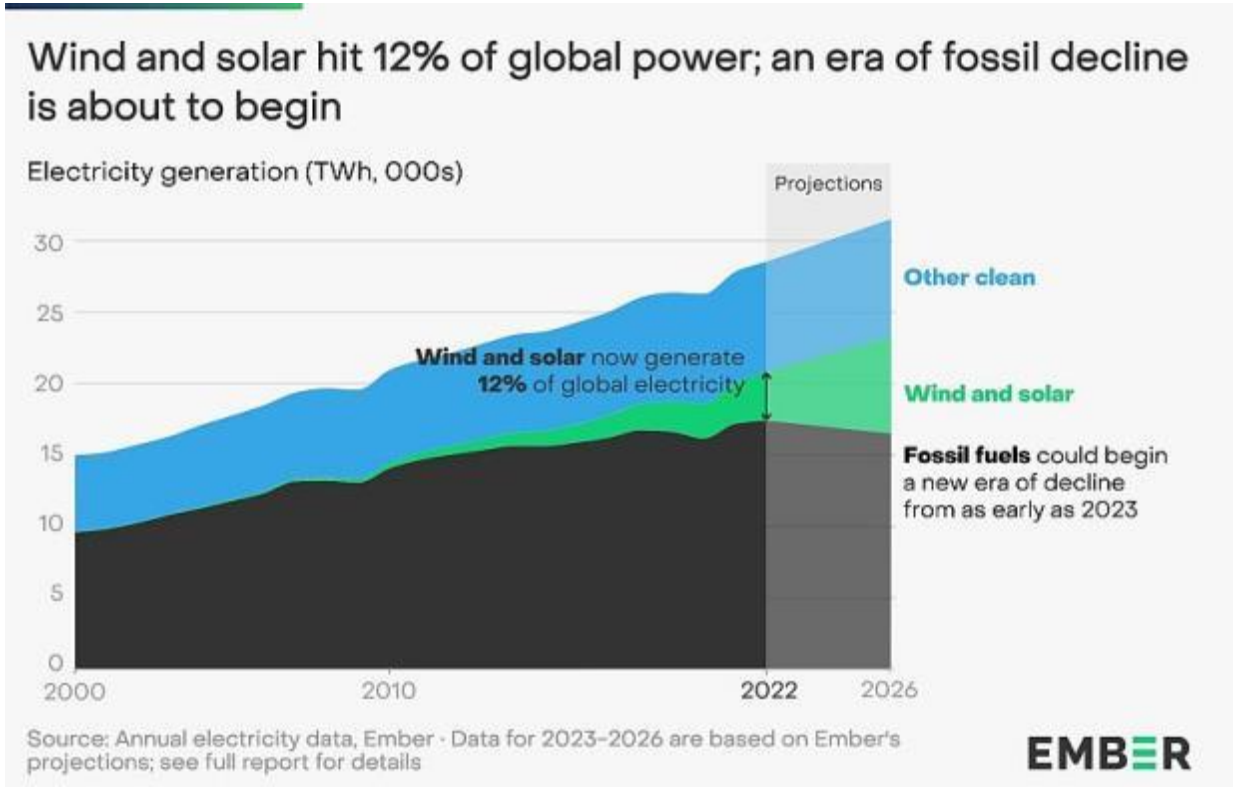
@masplashti, Unsplash

Some reasons for hope...

還有一點點盼望...

“End of fossil age” 化石燃料時代的終結

- “Peak fossil fuel” usage hit in 2022 (this is good news!)
  化石燃料使用已於2022年達至高峰
- 80% of new global electricity in 2022 met by wind and solar
  2022年全球80%新電能是風能和太陽能
- Solar and wind set to provide 75% by 2040
  預計2040年太陽能和風能將達至75%



No miracles required – wind, solar and water
不需神蹟 – 風能、太陽能和水能

- Wind and solar are beautifully complimentary

  風能和太陽能被受歡迎和讚賞

- Coupled with hydro-electricity & battery balancing the grid can become 100% “green”

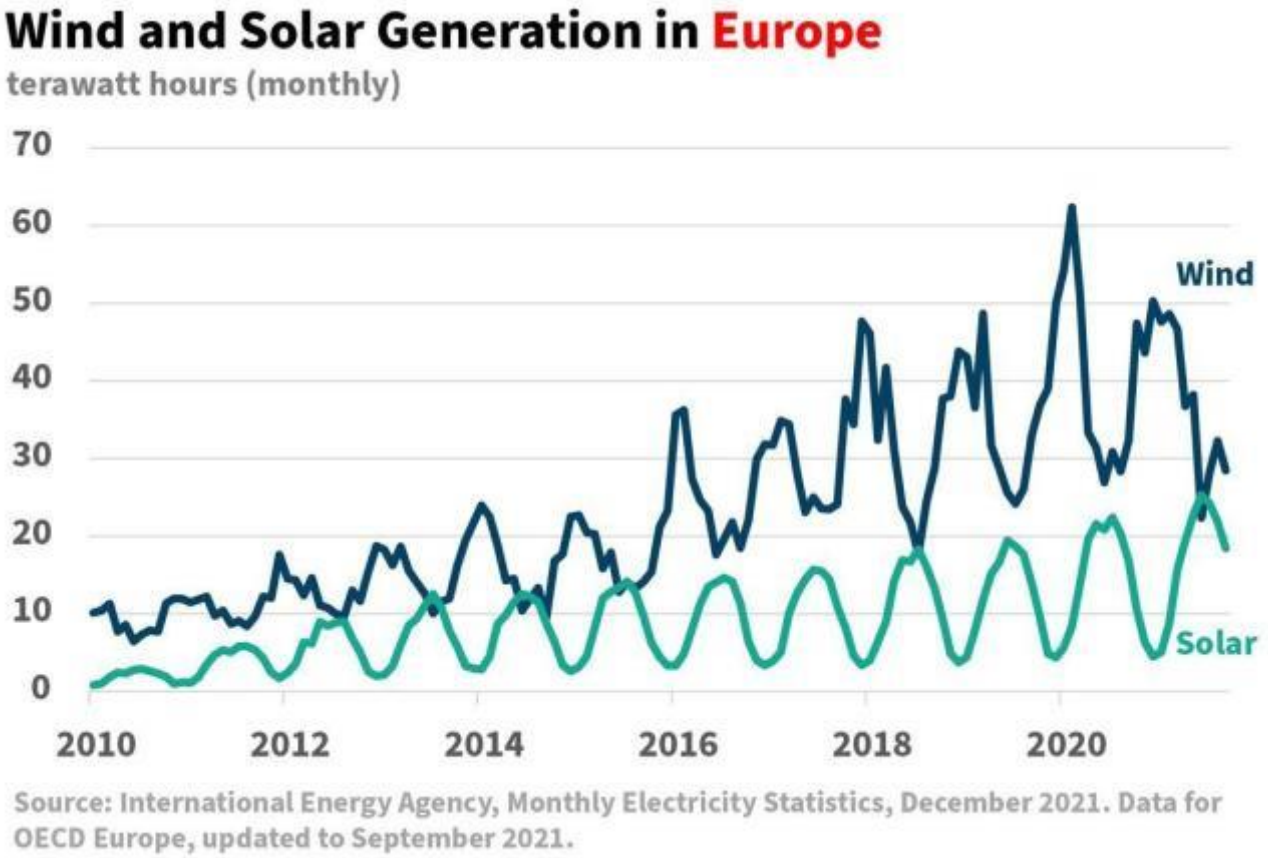
  加上水力發電，未來期望可達至100%綠色能源

- Global investment of $61T go fully green, but solar & wind are now so low cost / kWh that the payback is only 3.5 years

  全球61兆美元投資於綠色能源，風力和太陽能比的成本以前更便宜，回報可於3.5年內達到

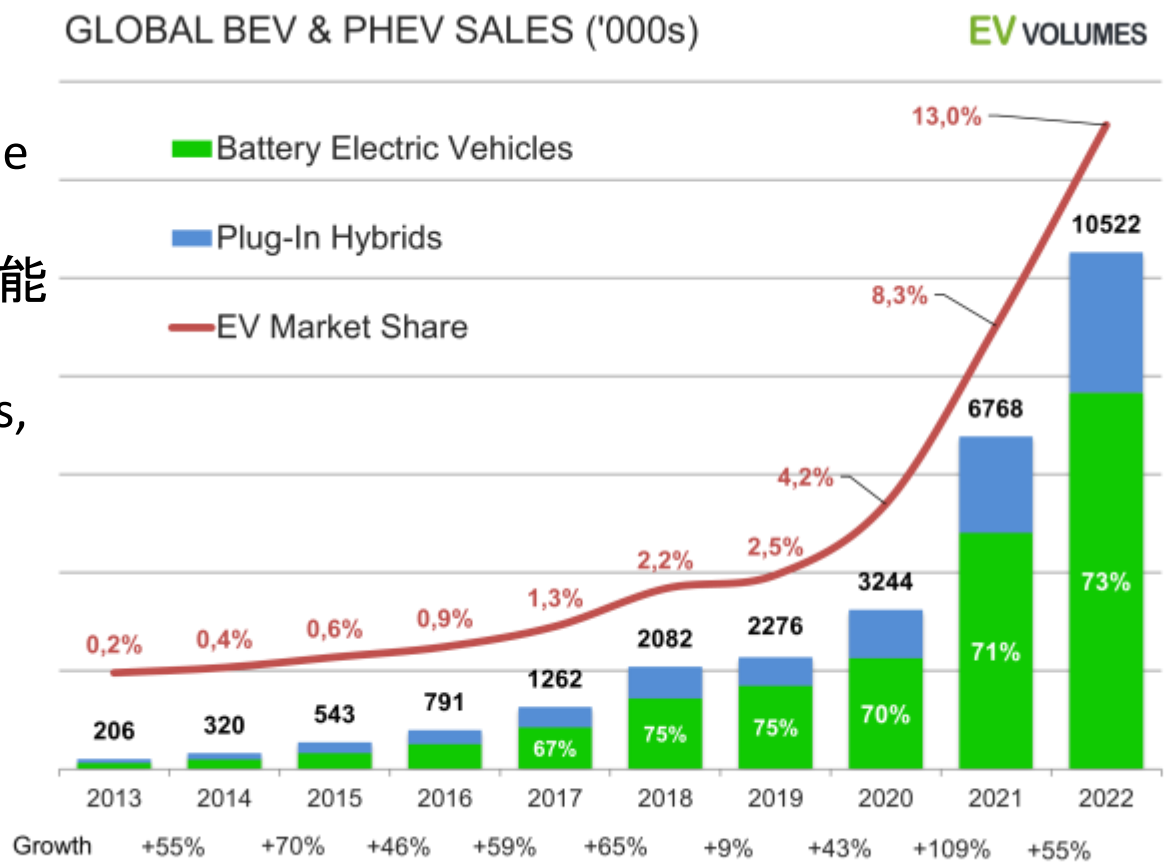
- This is good news – the investor community, governments and energy companies are all increasing investments in wind/solar

  好消息 – 投資者，政府和能源公司更願意增加風力和太陽能發電的投資



“Start of the electric age” 電動時代之開端

- Electric vehicles (EVs) made up 10% of global sales in 2022 電能車佔2022年全球汽車銷售的10%
- Average growth rate is 56% per year (last 10 years) 過去10年每年平均增長56%
- At the Shanghai motor show 70 of the 100 new vehicle launched were Evs 上海的汽車展覽中展100台新款汽車中有70台是電能車
- Most car companies are now “fully committed” to EVs, stopping investment in internal combustion engines 更多的汽車製造商全力投入電能車的生產
- EVs to become ubiquitous by 2030 電能車將於2030年普及化
- This is good news: halt of global warming, cleaner air (7m death per year due to air pollution) and reduced costs 好消息：減慢全球暖化，更清潔的空氣及減低成本

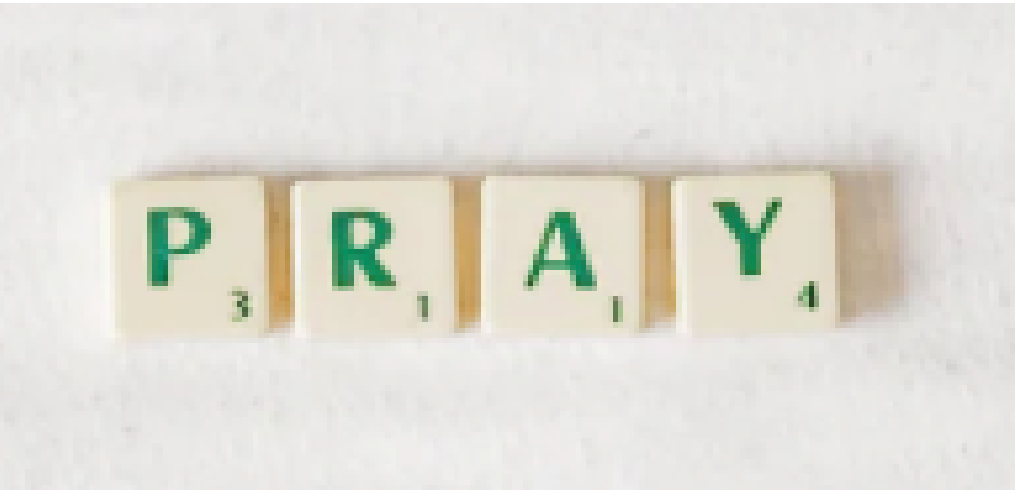


Transformed hearts and minds

轉化的心和思想

Pray about it

禱告



Individual

actions

個人回應

Talk about it 多討論

Make some changes

我們一起參與

Photos: Priscilla Du Preez and Sincerely Media on Unsplash

Evening Standard

BREAKING 3h

Murray relishes first Djokovic tie in five years after Shapovalov win

NEWS › UK

Archbishop of Canterbury urges public not to despair about climate change

The cleric used his message at the start of the year to remind people 'important steps were taken at the Cop26 summit'.

The Archbishop of Canterbury has urged the public not to despair over climate change as he said there are 'real reasons to hope' in 2022 (Stefan Rousseau/PA) / PA Wire

"We believe God raised Jesus Christ from the dead.

There is no situation that is beyond His power, if only we are willing to join Him in the work of reconciliation both with our neighbour and also our planet. "

我們相信上帝使耶穌從死人中復活。

當我們願意和身邊的鄰舍和世界一起參與上帝的復和工作，祂的能力必定超越我們眼前的景況。