



INTRO

ENERGY FOR HUMANITY_

ENERGY FOR
HUMANITY_

WE ♥
ELECTRICITY...

Scroll
to begin



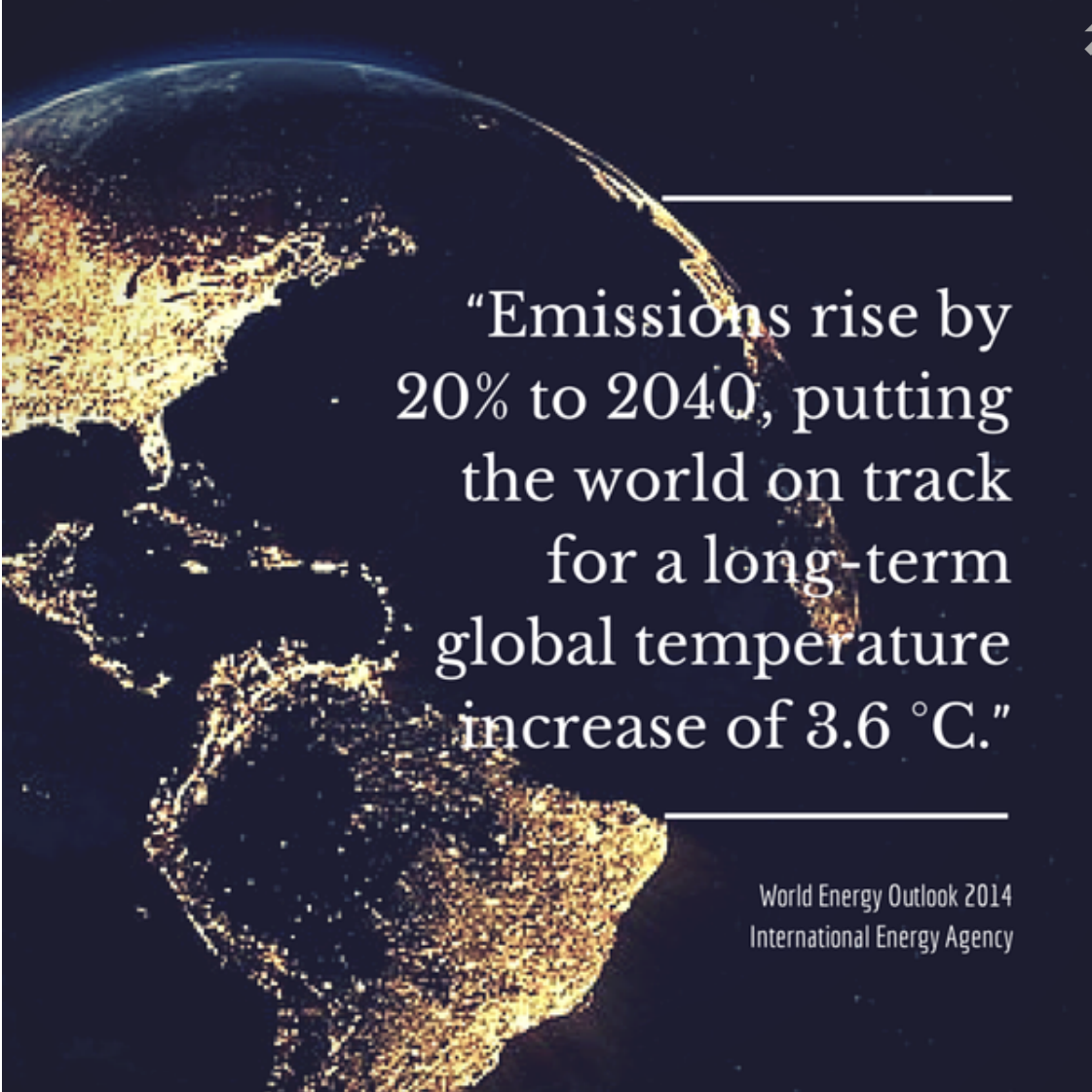
Our Values

"A GREEN NGO THAT
PROMOTES NUCLEAR
AS PART OF THE
SOLUTION, NOT THE
ONLY SOLUTION, IN A
LOW CARBON FUTURE
IS FANTASTIC AND
ABSOLUTELY VITAL."

UK CLIMATE AND ENERGY MINISTER MATT HANCOCK

WWW.ENERGYFORHUMANITY.ORG

- Global in scope.
- Optimistic, pragmatic, & pro-technology.
- Profoundly committed to improving quality of life for all people.
- Not affiliated with any political party, industrial or corporate enterprise.

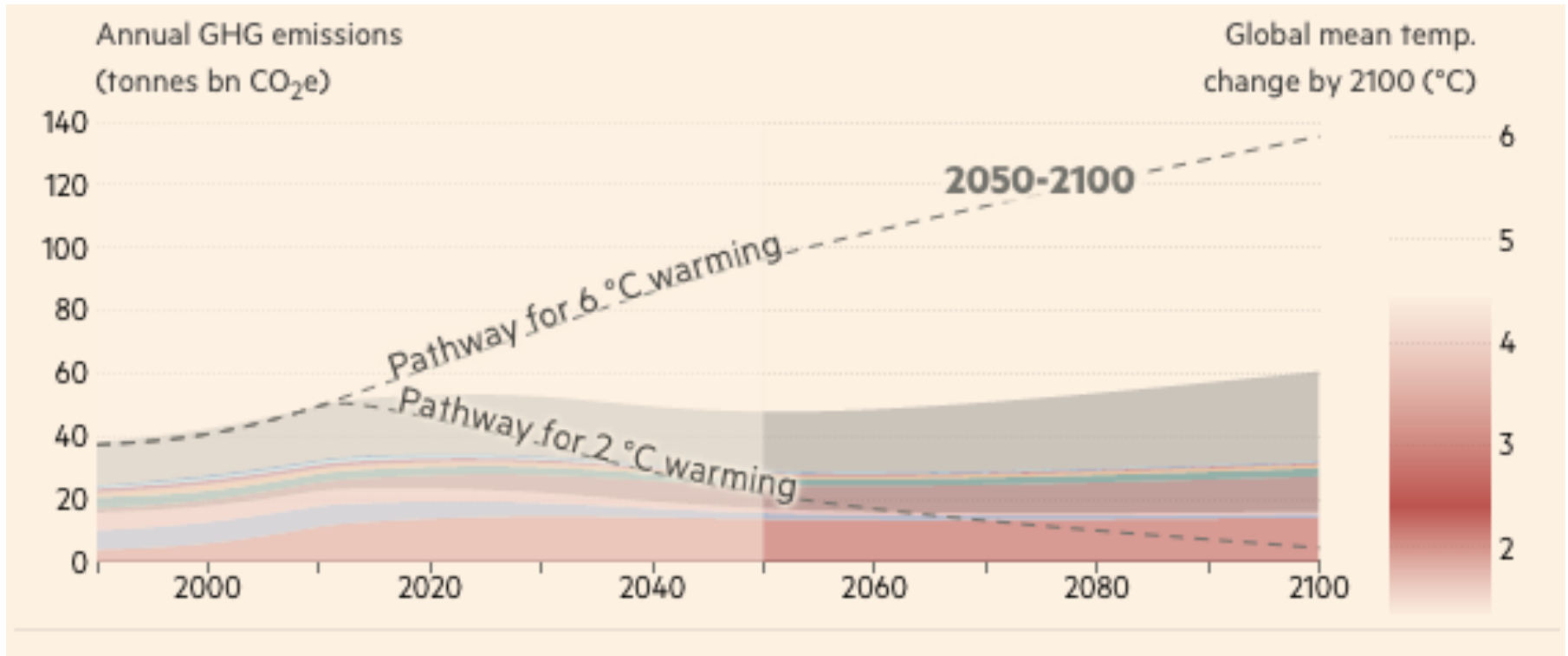


“Emissions rise by 20% to 2040, putting the world on track for a long-term global temperature increase of 3.6 °C.”

World Energy Outlook 2014
International Energy Agency

➤ To limit the world's temperature increase below 2°C in 2050 ...

➤ ...90% of the world's electricity must be low-carbon by 2050.



➤ Even if every country met the pledges it has made to date, we would still be looking at a rise in emissions. Average global temperatures would likely rise by between 3°C to 4°C by 2100 (depending on your level of optimism or pessimism) compared to 6°C increase with no action.

➤ Source: FT COP 21 Climate Change Calculator <http://ig.ft.com/sites/climate-change-calculator/>



“World electricity
demand increases
by almost 80%
over the period
2012-2040.”

World Energy Outlook 2014
International Energy Agency



- Today nearly three billion people cook over open fires fueled by wood, dung, coal, or charcoal.
- The health consequences are severe: every year, indoor air pollution causes two million premature deaths, one million cases of chronic lung disease, and half of all of pneumonia deaths among children under the age of five.

WIND AND SOLAR?

Wind power provides 2.6% of global electricity.

Solar power provides 0.5% of global electricity.

Coal provides more than 40% and is fastest growing source.



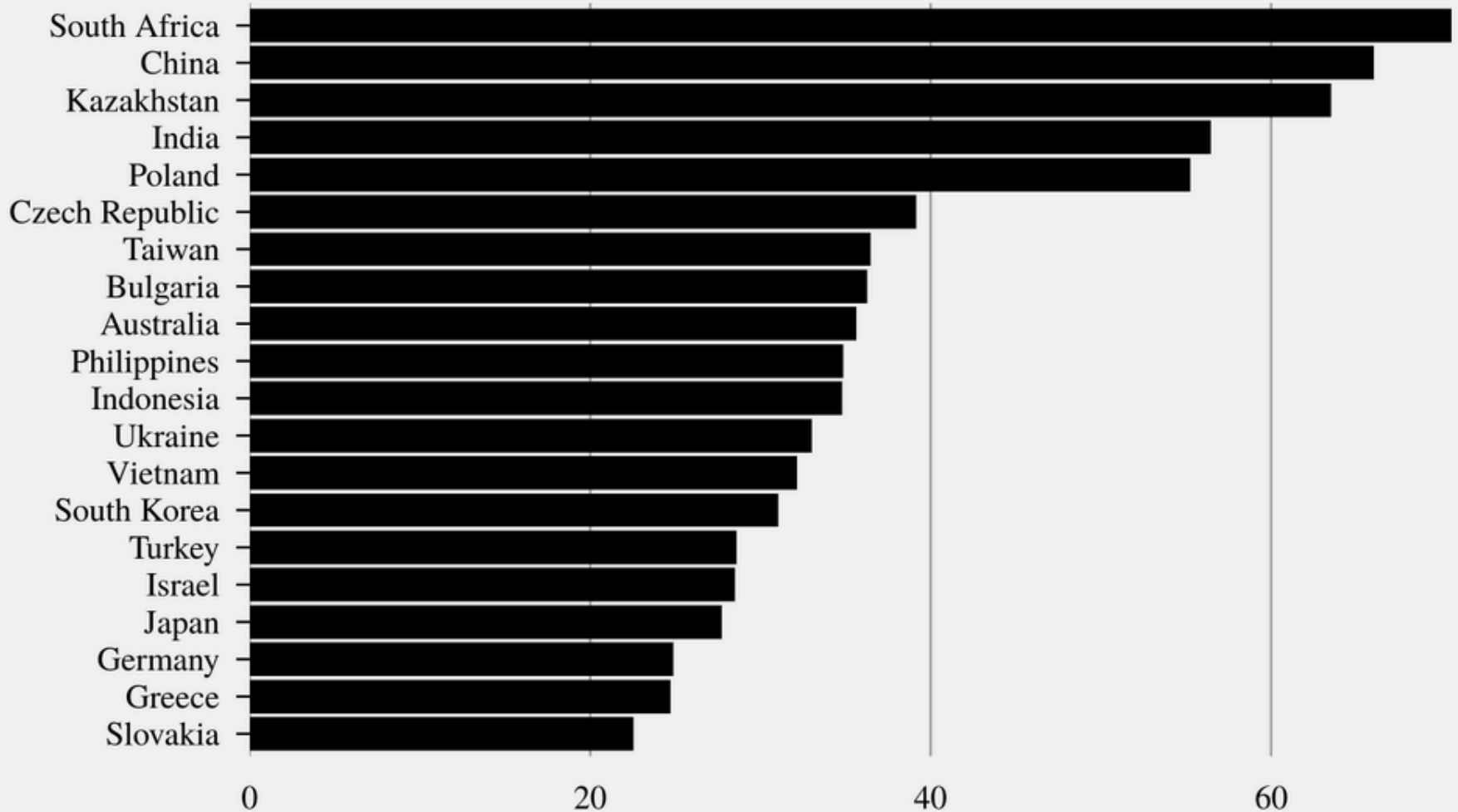
Urban growth in China: Shenzhen in 1980 versus 2013





Which countries are the most reliant on coal? Here are the worst offenders.

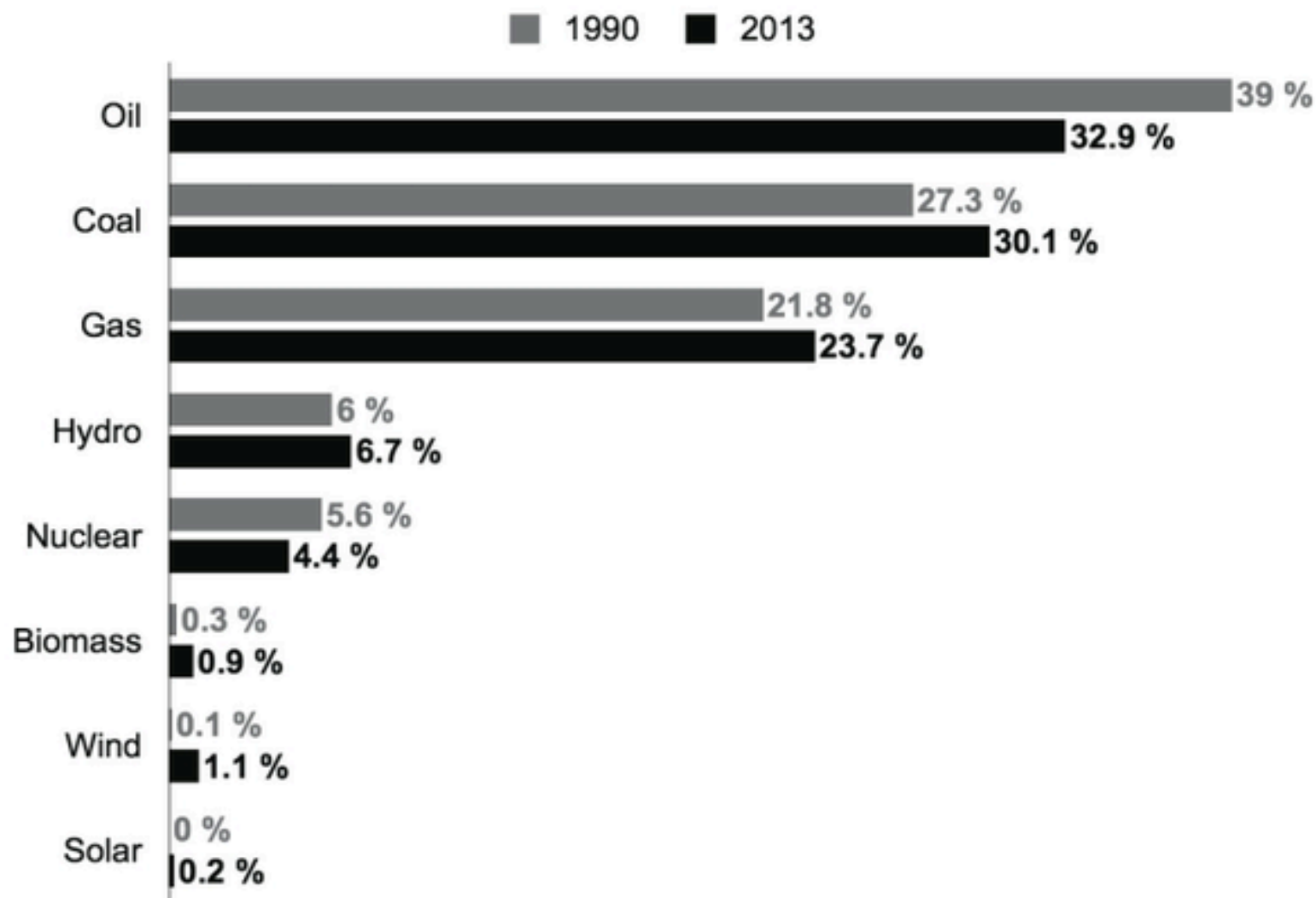
The countries that get the most of their energy from burning coal



% of primary energy consumption from coal

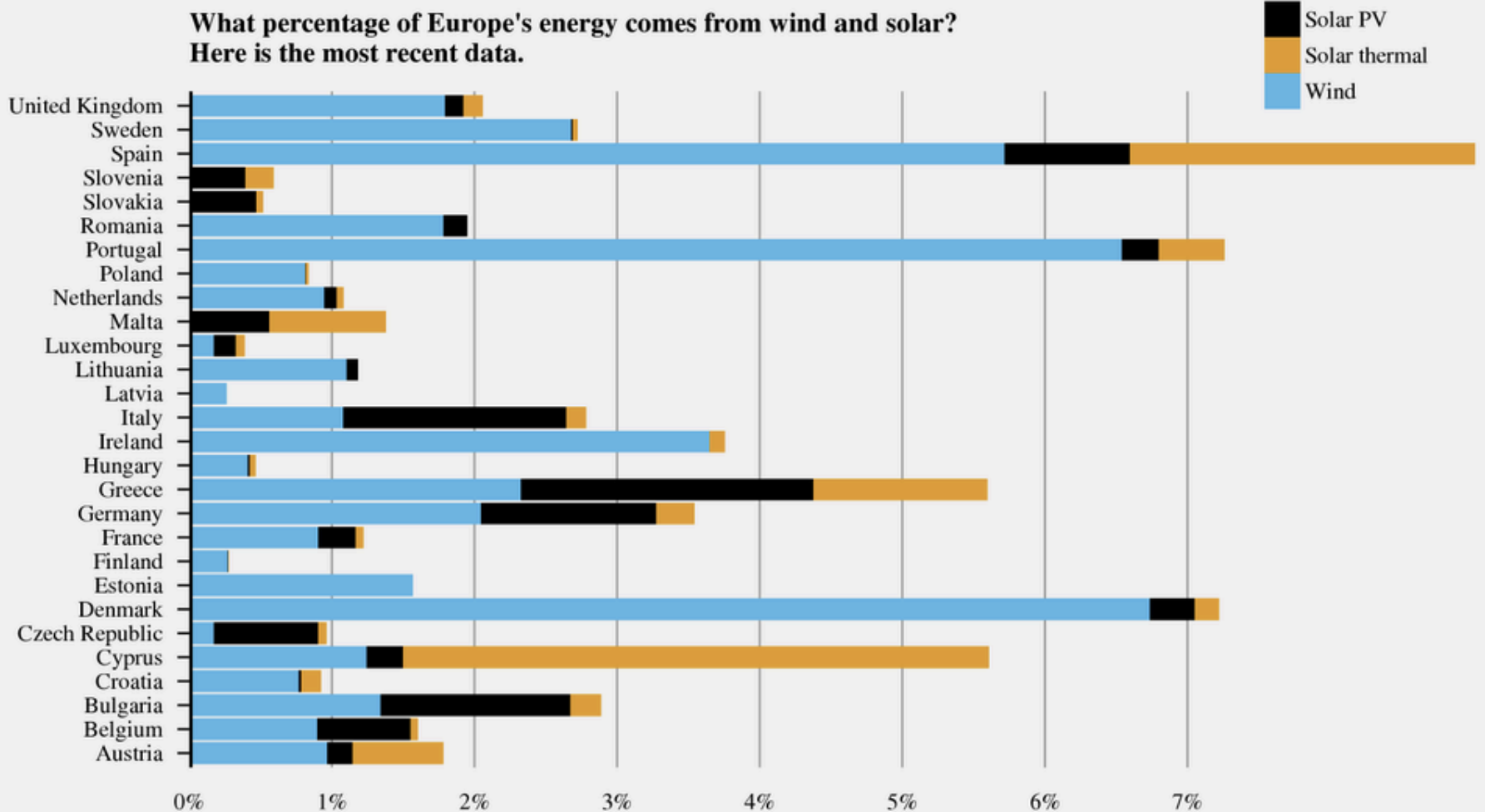
Data: BP Figure: @CountCarbon

Sources of world's energy in 1990 and 2013



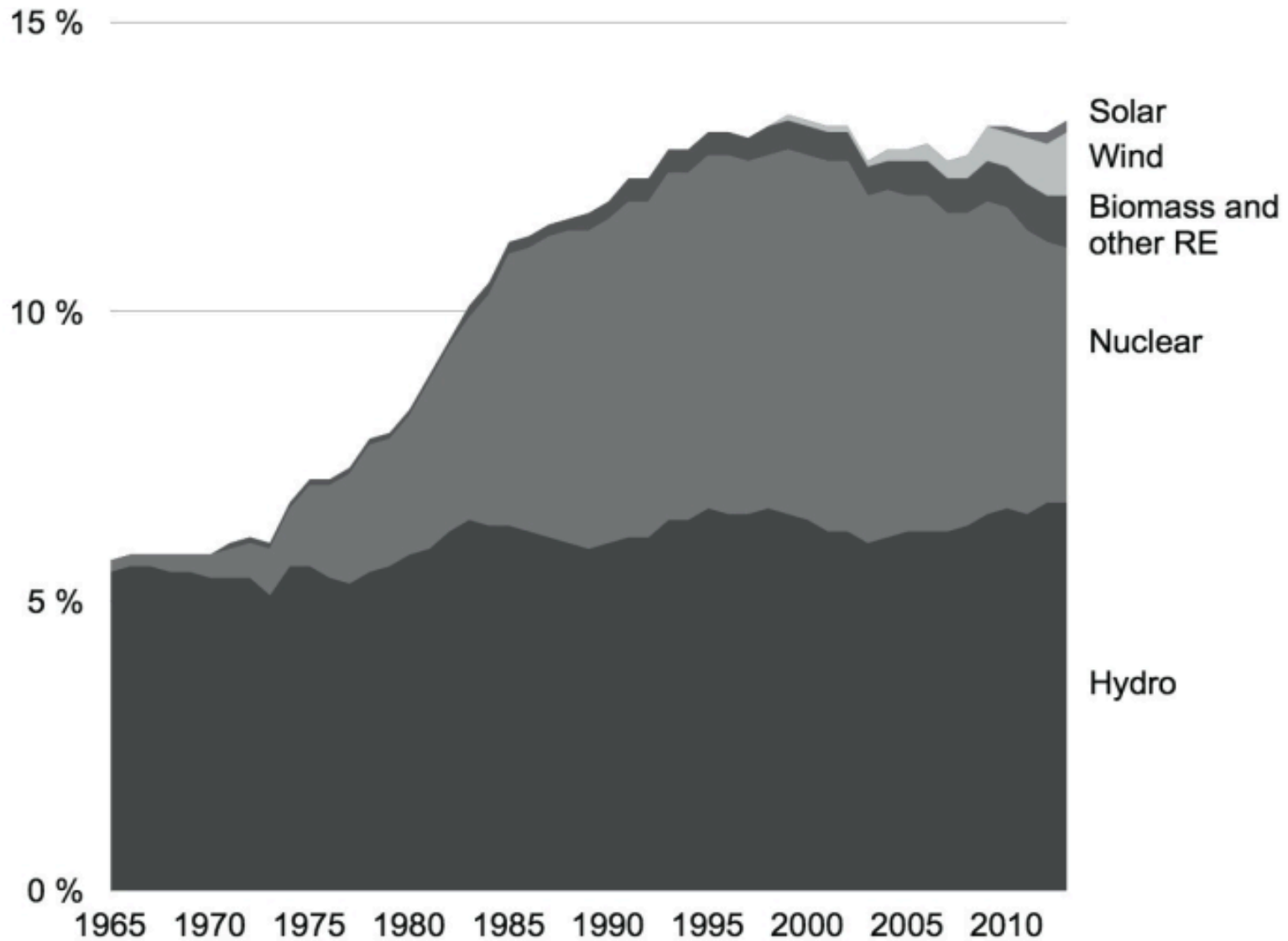
Source: BP World Energy Outlook Chart by Climate Gamble

“Ignore the breathless headlines. Here’s some actual data.”



Data: Eurostat renewables and final energy consumption statistics (2013) Figure: @CountCarbon

Share of fossil-free energy from world total, 1965-2013



Source: BP World Energy Outlook (Climate Gamble)



Can we afford to bet the planet by insisting on the goal of 100 per cent renewable energy?

Is it possible for the United States to run on 100% renewable energy (wind, water and solar) by 2050?

- Current US installed electric generating capacity (2015) **1.2 TW**
- Total US energy demand in 2050: **2.6 TW**
- To meet that energy demand with wind, water and solar: **6.5 TW**



Hinkley Point C land area and energy output compared to other types of energy production sites



Hinkley Point C =
430 acres

26TWh (terrawatt hours) per year

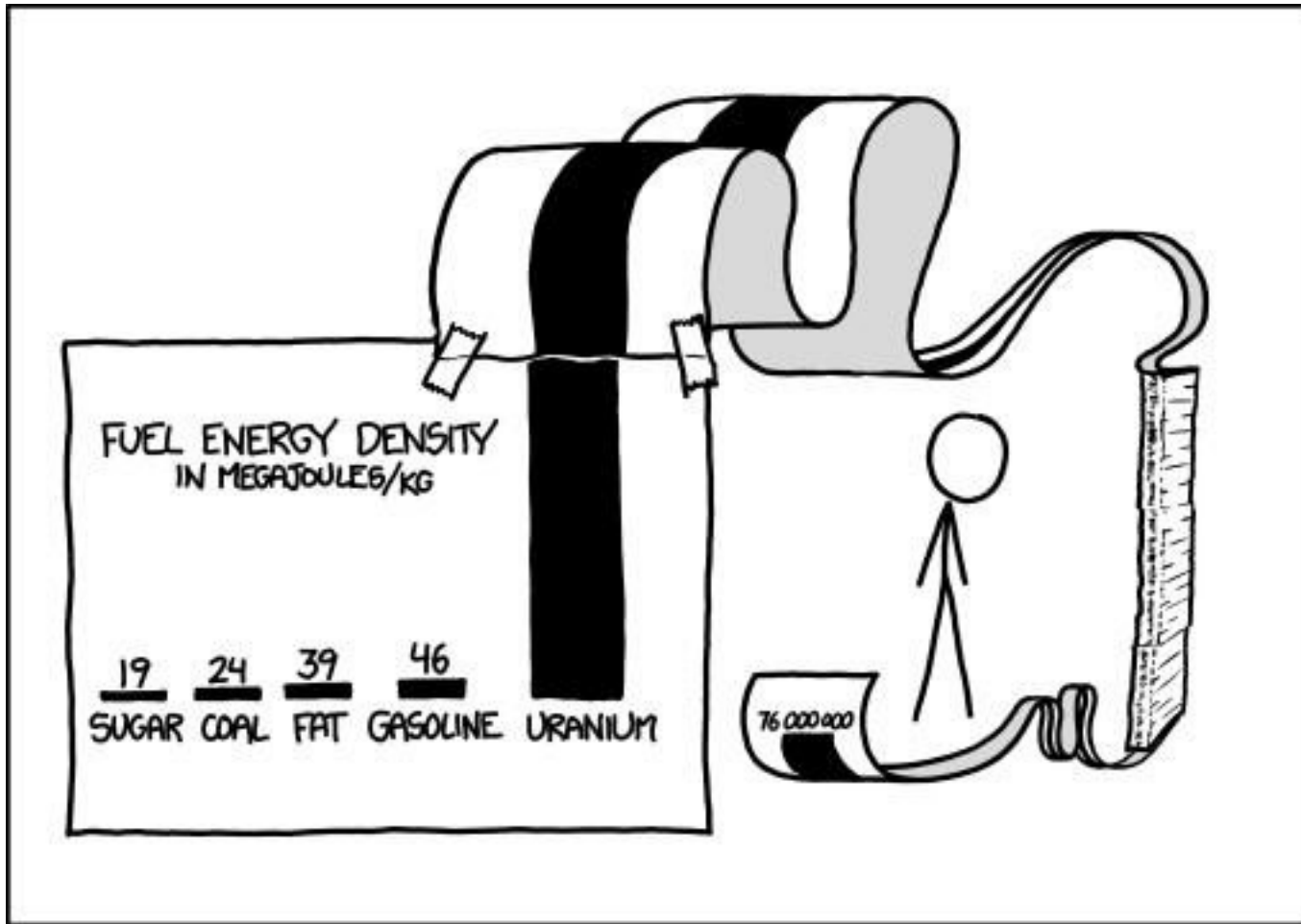
This is estimated to be equal to around 7% of UK electricity consumption in 2025 and enough to power nearly 6 million homes.

Solar farms =
130,000 acres

Onshore wind farms =
250,000 acres*

*The footprint will depend on the location and turbine technology deployed. DECC estimates the footprint could be between 160,000 and 490,000 acres.

A webcomic of romance, sarcasm, math and language.
<http://xkcd.com/1162/>



SCIENCE TIP: LOG SCALES ARE FOR QUITTERS WHO CAN'T FIND ENOUGH PAPER TO MAKE THEIR POINT PROPERLY.

Efficiency

Kilowatt hours of energy produced from 1kg of fuel

Coal
6

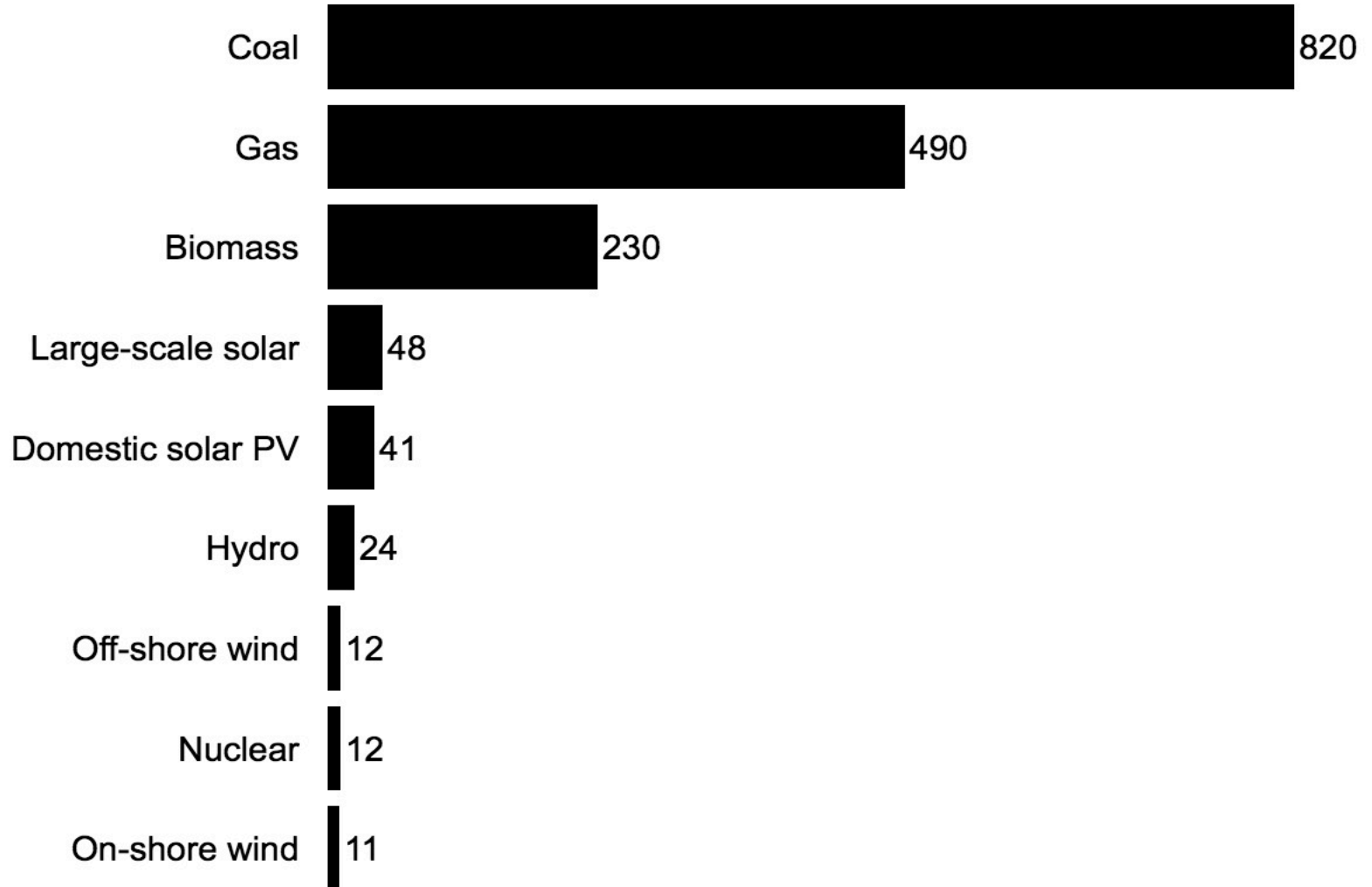
*Enough to power a
60 watt light bulb
for 4 days*

Nuclear

360,000
(uranium)

*Enough to power a 60 watt
light bulb for 685 years*

Life cycle emissions from electricity generation, gCO₂/KWh



Source: Median carbon balances of various energy sources, IPCC AR5 2014.

Accidents

Number of accidents at power stations in which five or more people died (1970 to 2008)

Coal

1,686

Oil

531

Gas

186

Nuclear



1

Hydroelectricity:
In 1975, severe flooding caused about 30 hydroelectric dams in China to fail – killing an estimated **230,000** people

Death and illness per TWh

Death and illness

Cases of illness or death per terawatt hour of energy produced (Europe)

Coal

225

25

- Serious illness
- Death from pollution
- Death from accidents

Fine particles of ash from coal-burning power plants kill an estimated **3million** people around the world every year

The estimated total death toll (over decades) for Chernobyl is expected to be **4,000** to **33,000**

Nuclear

0.12

0.22

0.05

0.02

Hinkley Point C: Number power

7%

Of UK's electricity,
enough for...

over **5m**
homes

£100m

contribution annually to the
local economy during peak
construction or £2bn during
project lifetime

9,000,000

tonnes (approximately) of CO2
avoided each year, equivalent
to roughly 2 million cars

1995

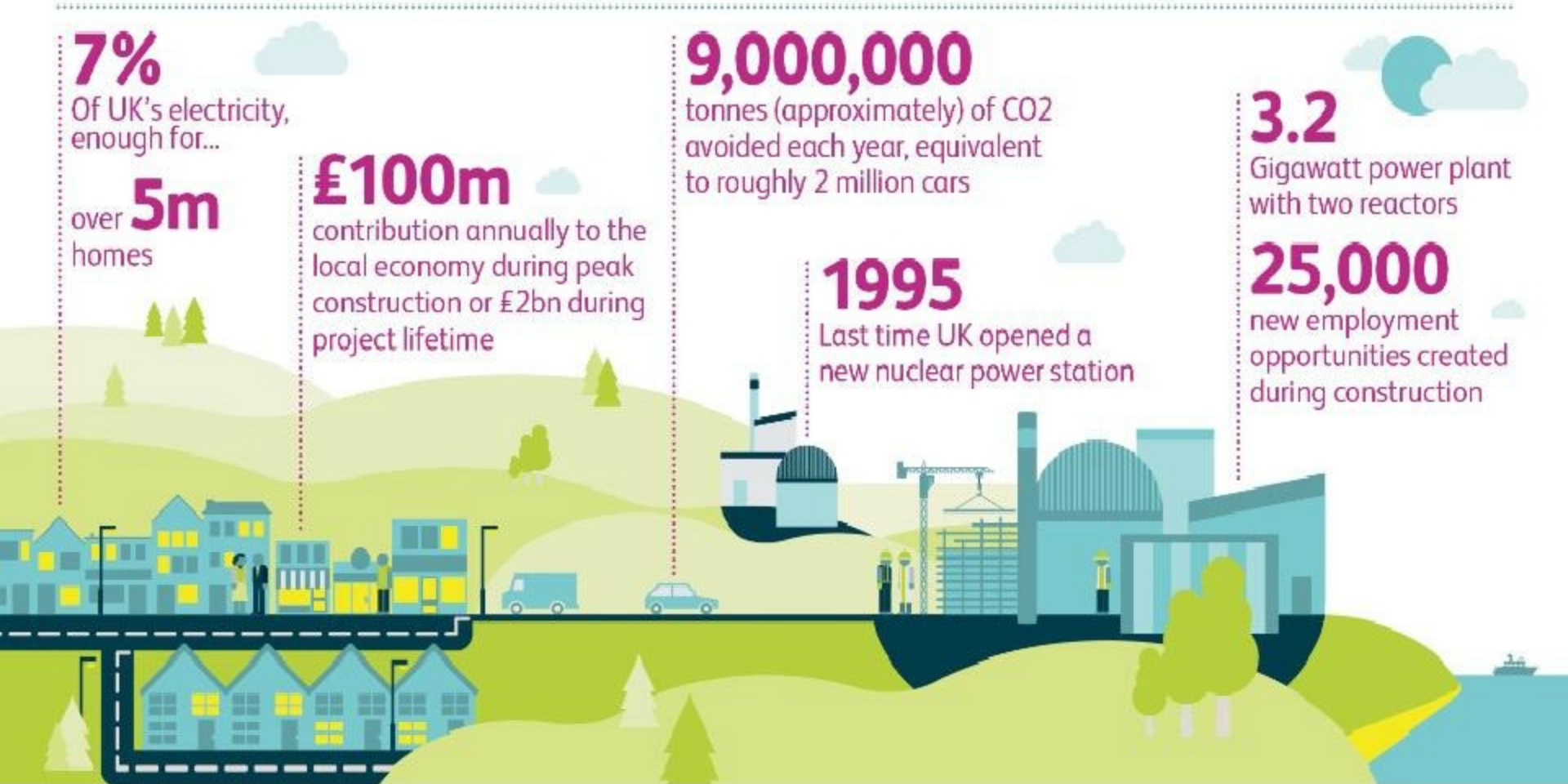
Last time UK opened a
new nuclear power station

3.2

Gigawatt power plant
with two reactors

25,000

new employment
opportunities created
during construction







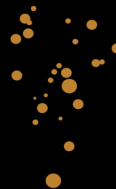
Leslie Dewan, CEO and Co-founder, TransAtomic Power

Leslie Dewan, Transatomic Power

USING EXISTING
WASTE



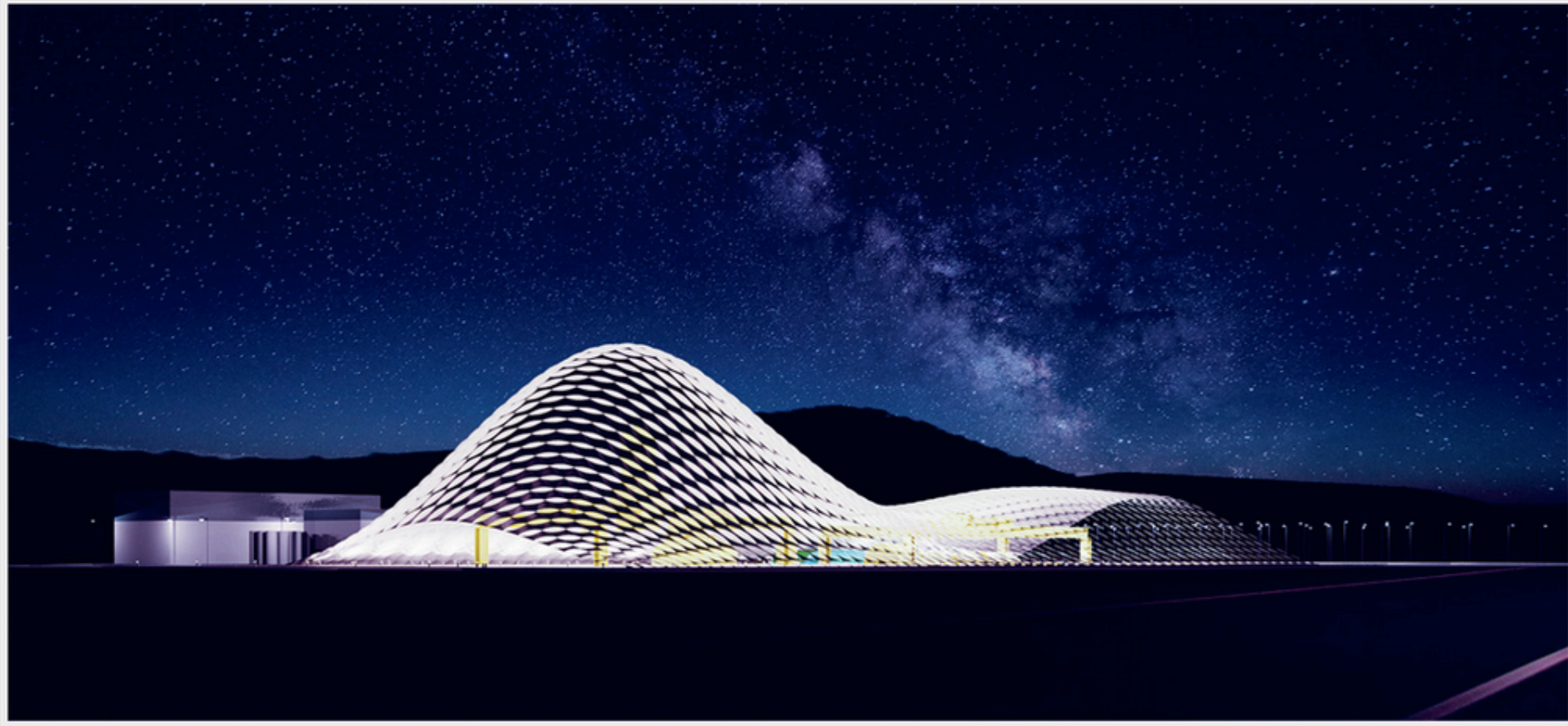
our reactor



CAN POWER
THE ENTIRE
WORLD FOR
72 YEARS

www.energyforhumanity.org

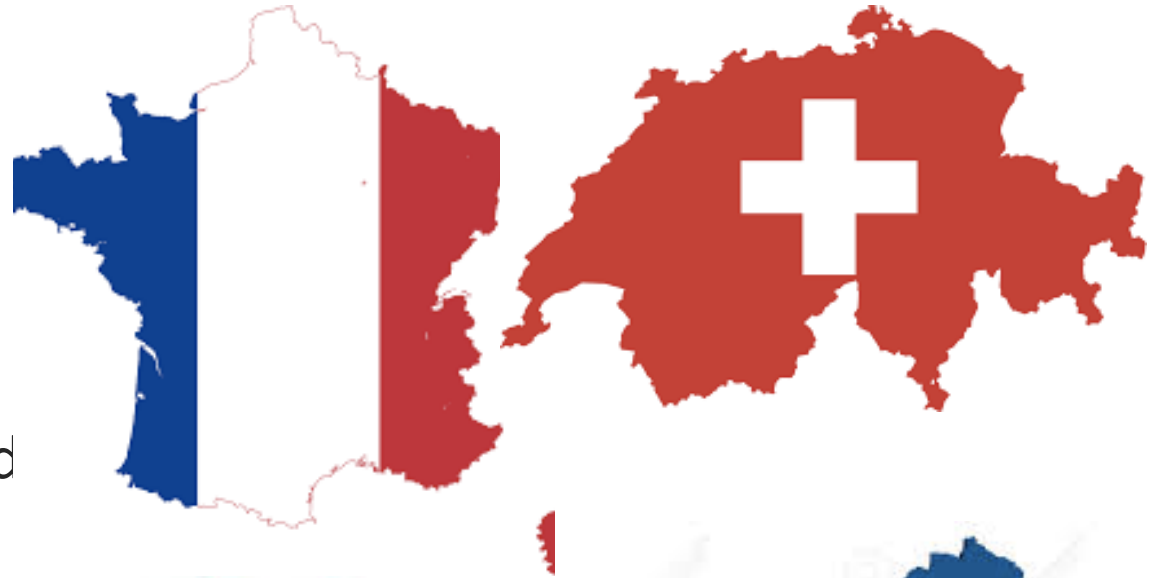
TransAtomic Power



Just six countries have so far achieved the goal of decarbonising electricity generation

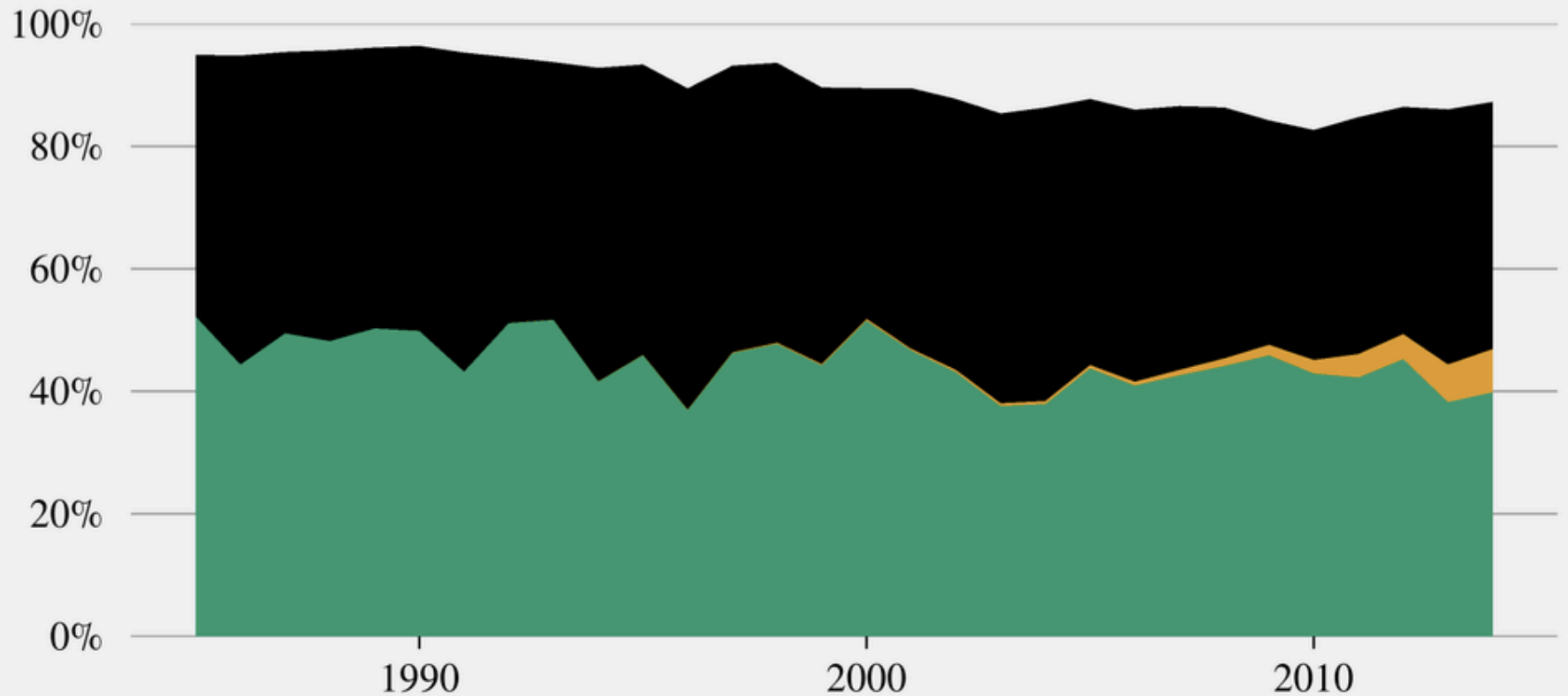


Iceland (geothermal) and Norway (hydropower)



➔ France, Switzerland
Brazil and Sweden
(combination of nuclear
& renewables)

How much of Sweden's electricity generation comes from nuclear, hydro, wind and solar?

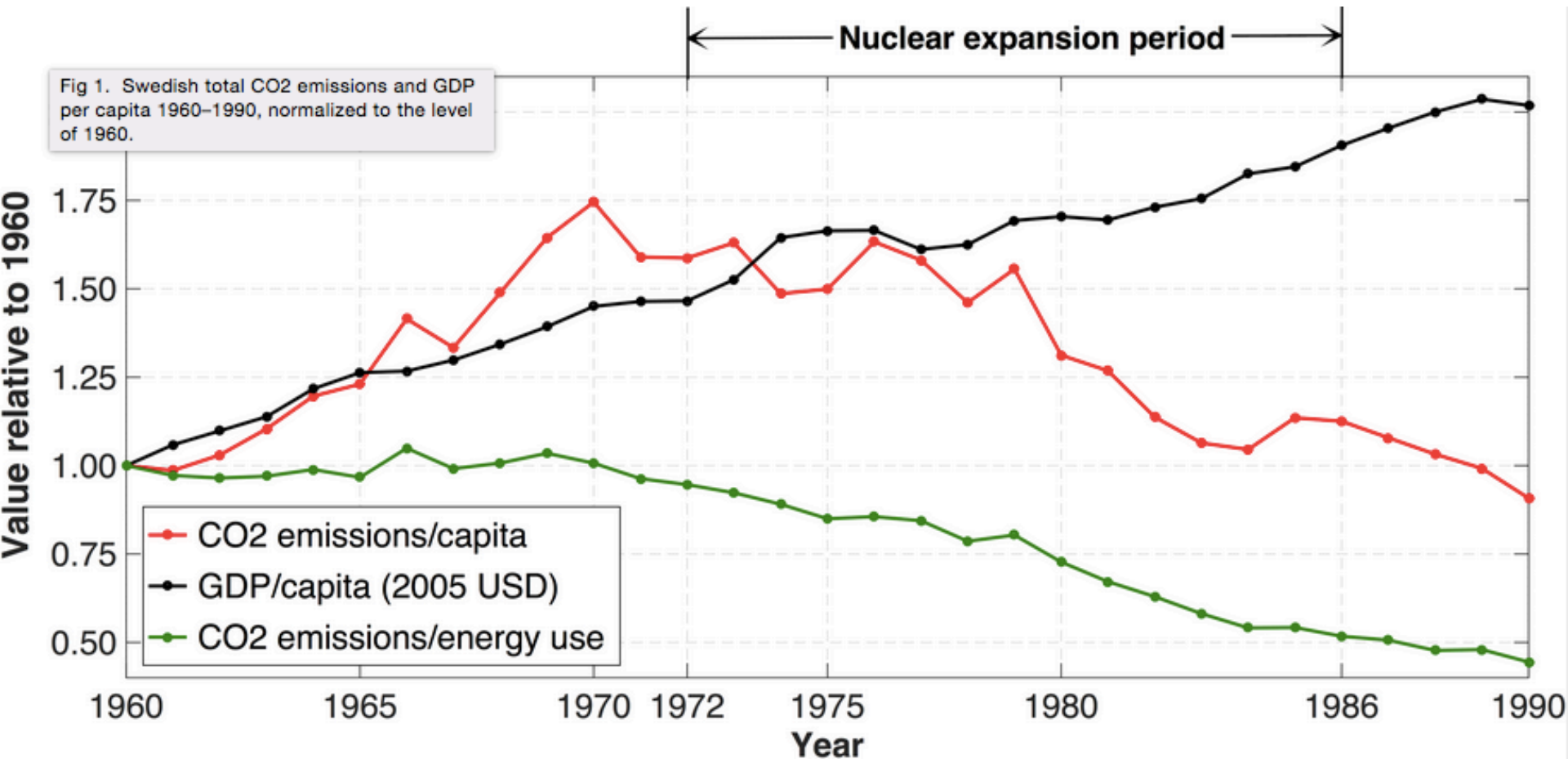


Data: BP

Figure: @CountCarbon

“No other carbon-neutral electricity source has been expanded anywhere near as fast as nuclear.”

Barry Brook and Staffan Qvist



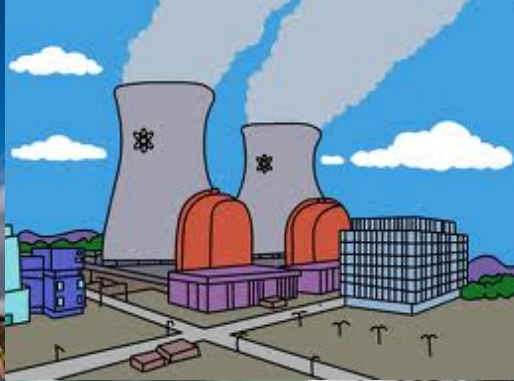
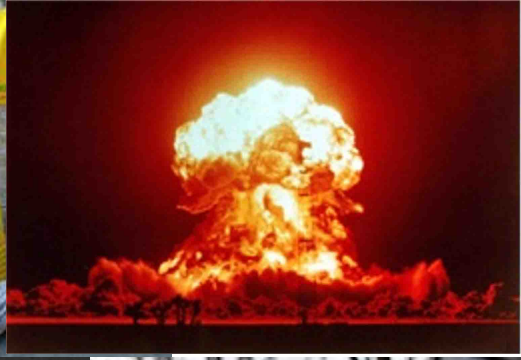


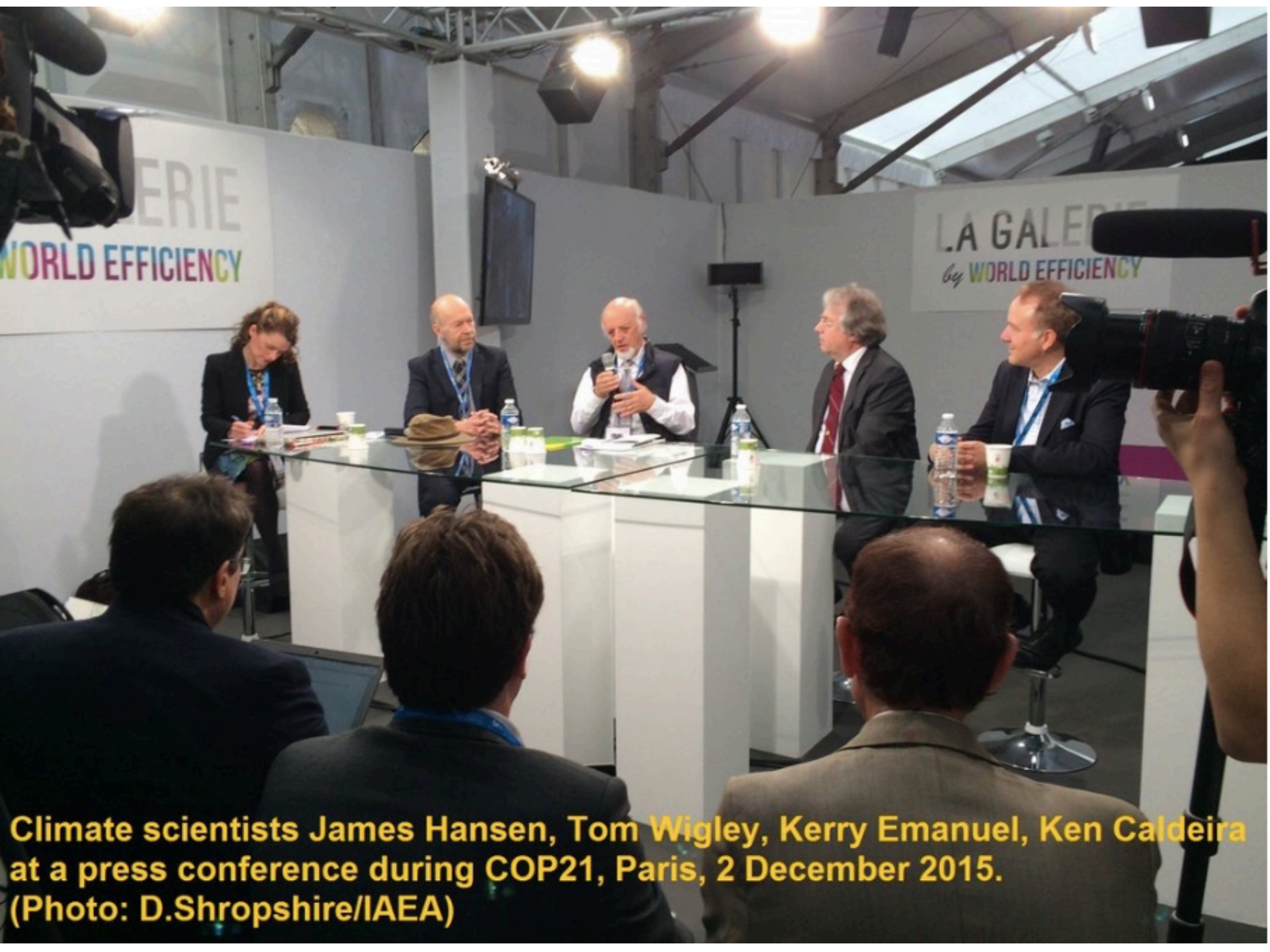
What can we learn from the Swedish energy transition?

No renewable energy technology or energy efficiency approach has ever been implemented on a scale or pace which has resulted in the magnitude of reductions in CO² emissions that is needed to avert catastrophic climate change.

Real world experience shows that a replacement of current fossil fuel electricity by nuclear at a pace which might limit the more severe effects of climate change is technologically and industrially possible.

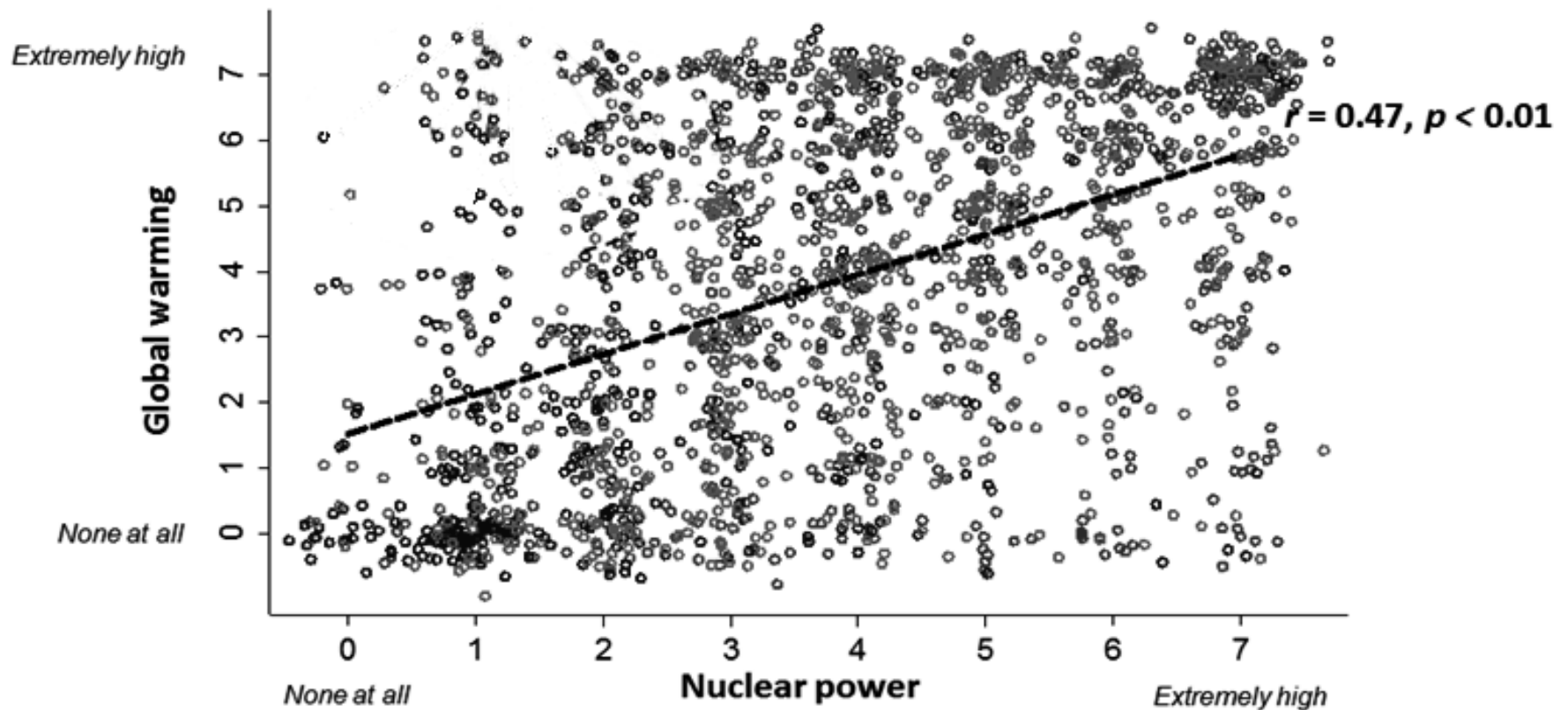
Whether this will happen depends primarily on political will, strategic economic planning and public acceptance.



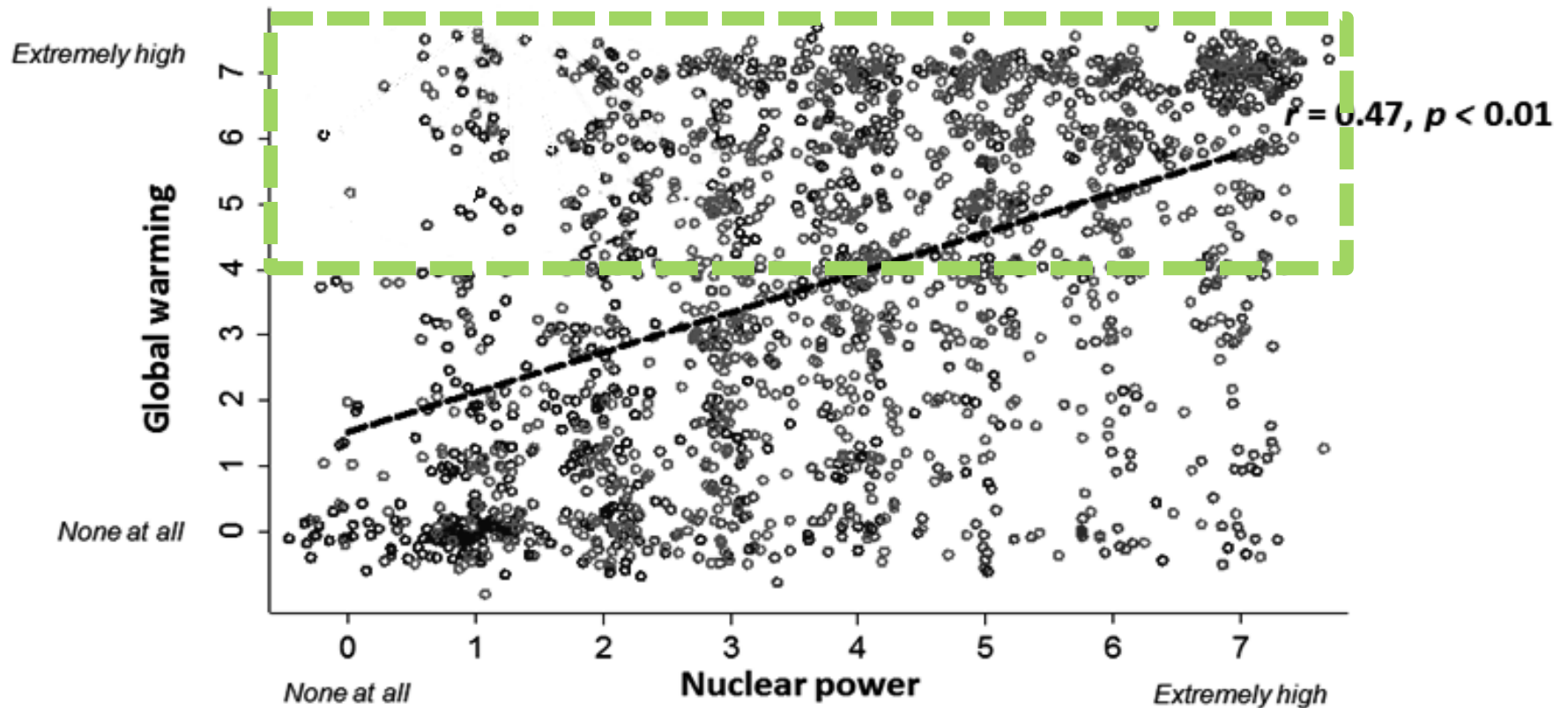


Climate scientists James Hansen, Tom Wigley, Kerry Emanuel, Ken Caldeira at a press conference during COP21, Paris, 2 December 2015. (Photo: D.Shropshire/IAEA)

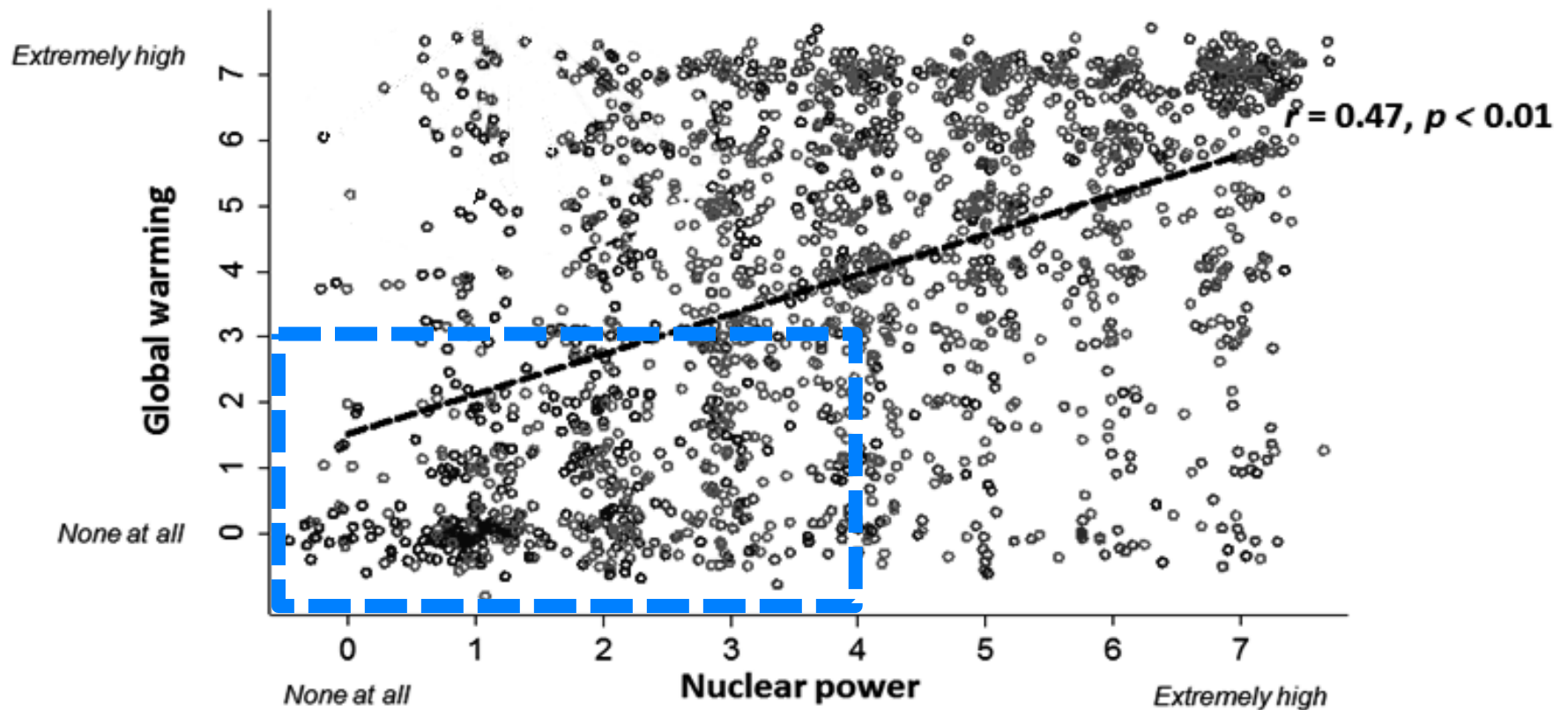
“How much risk do you believe . . . poses to human health, safety, or prosperity?”



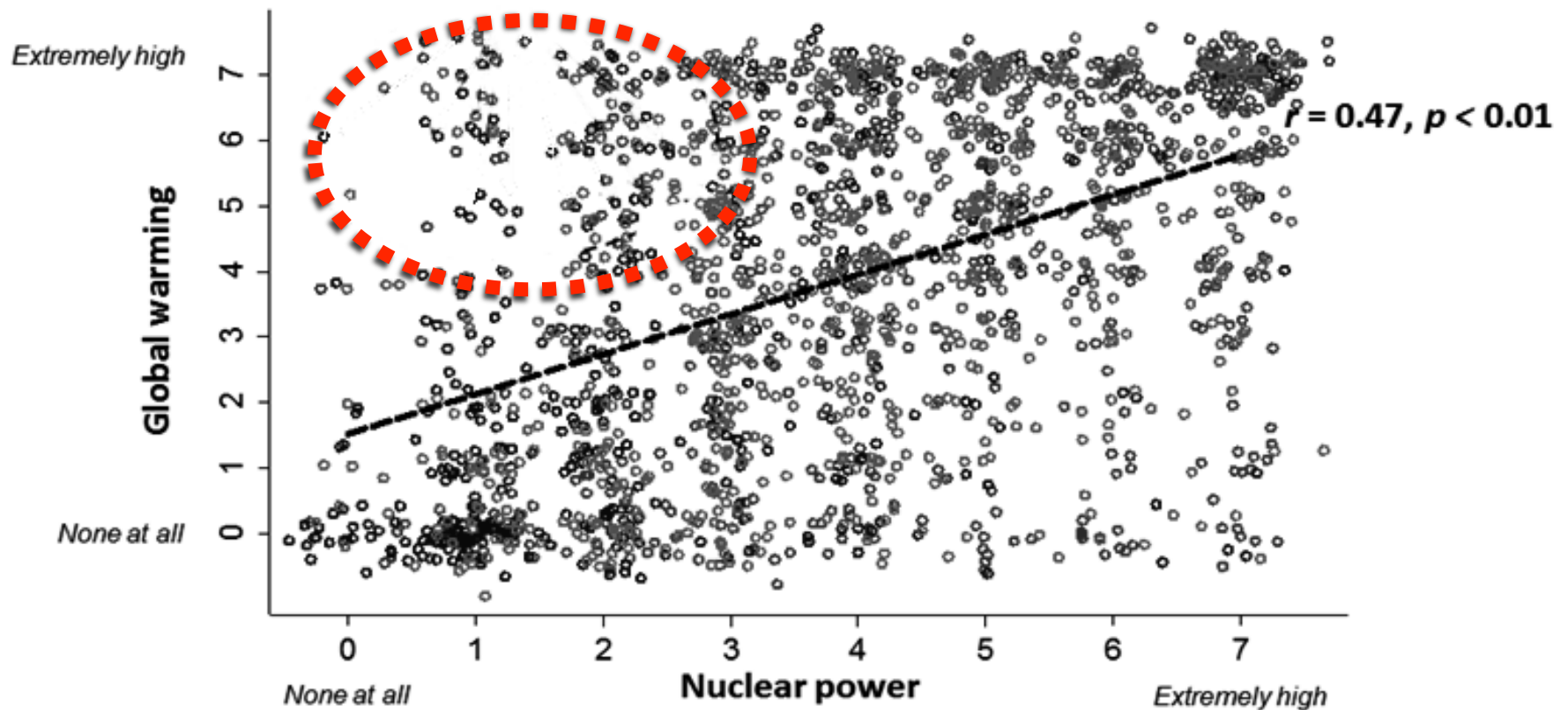
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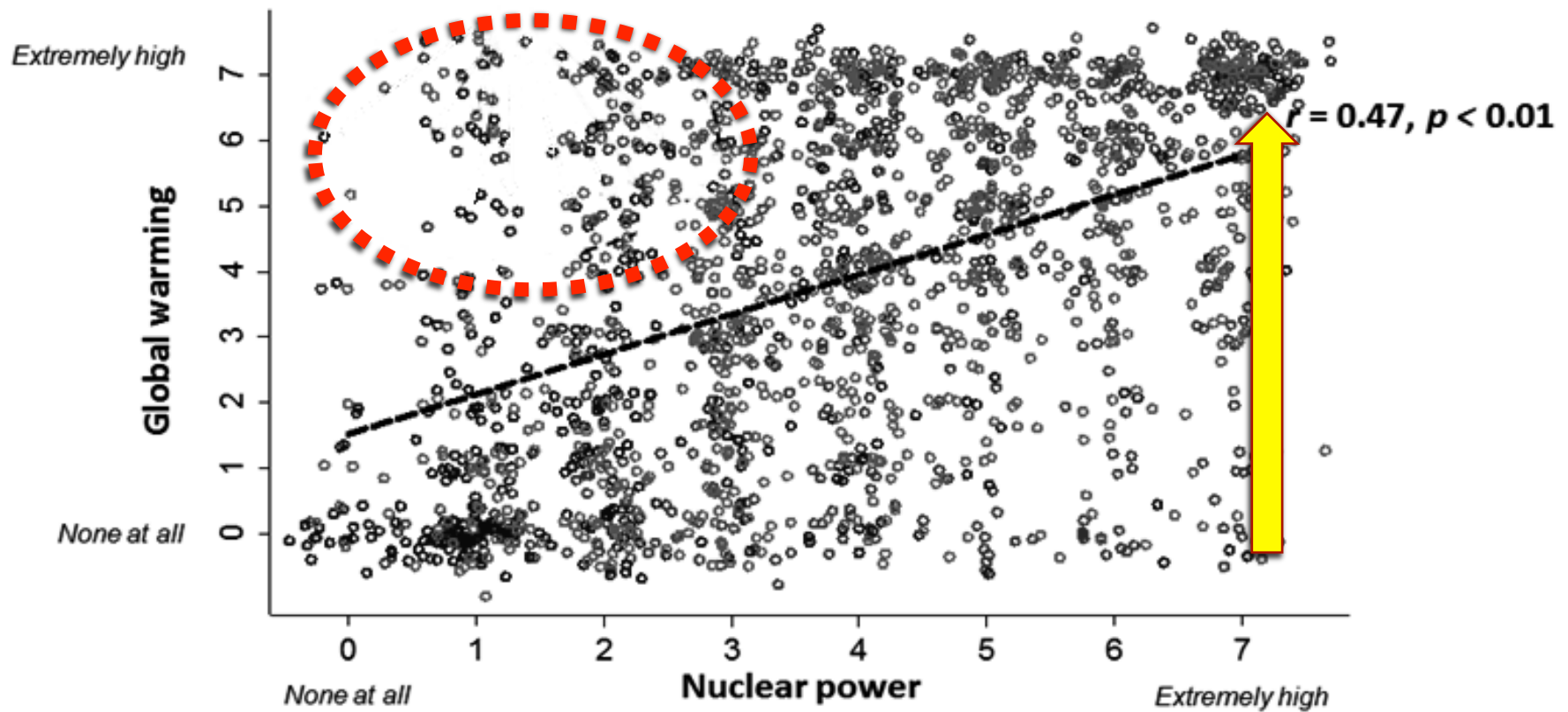
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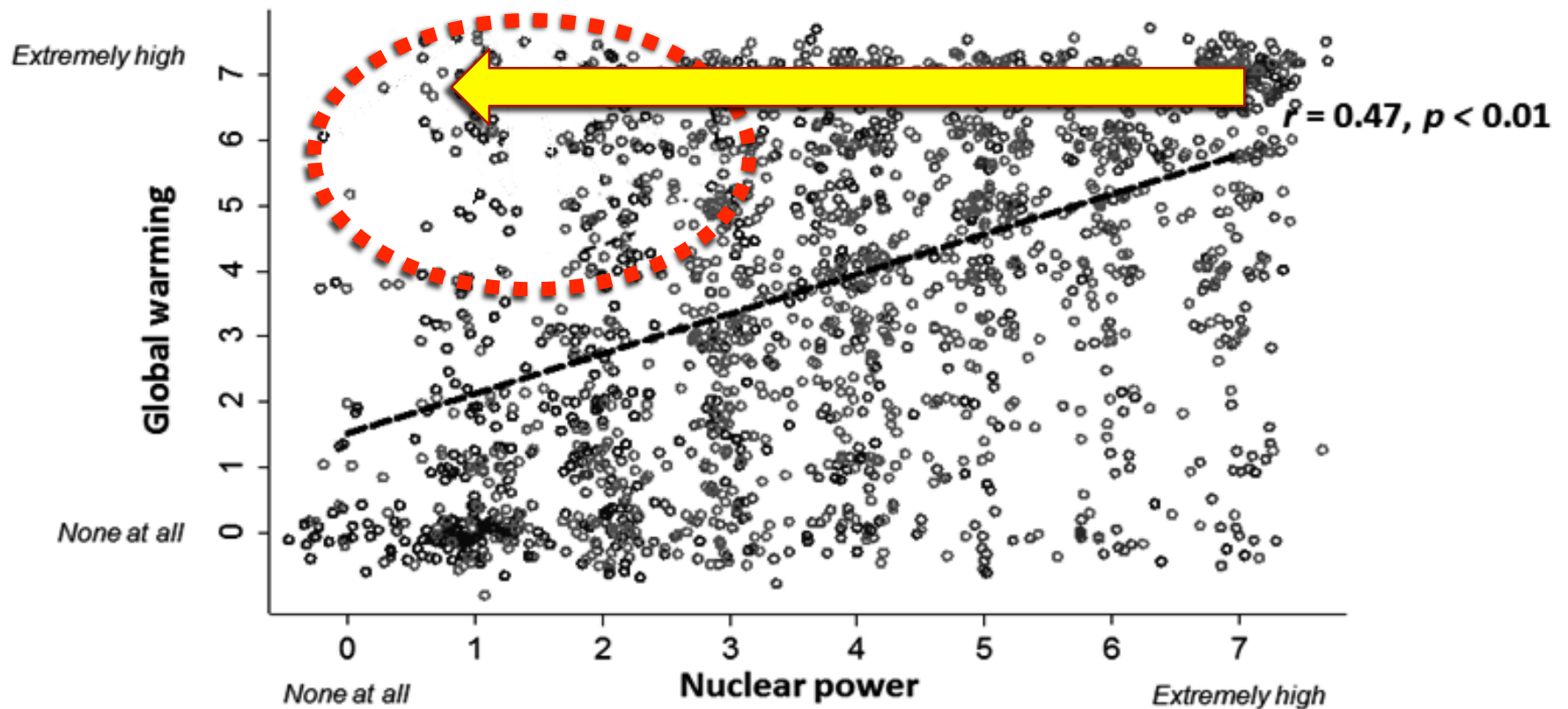
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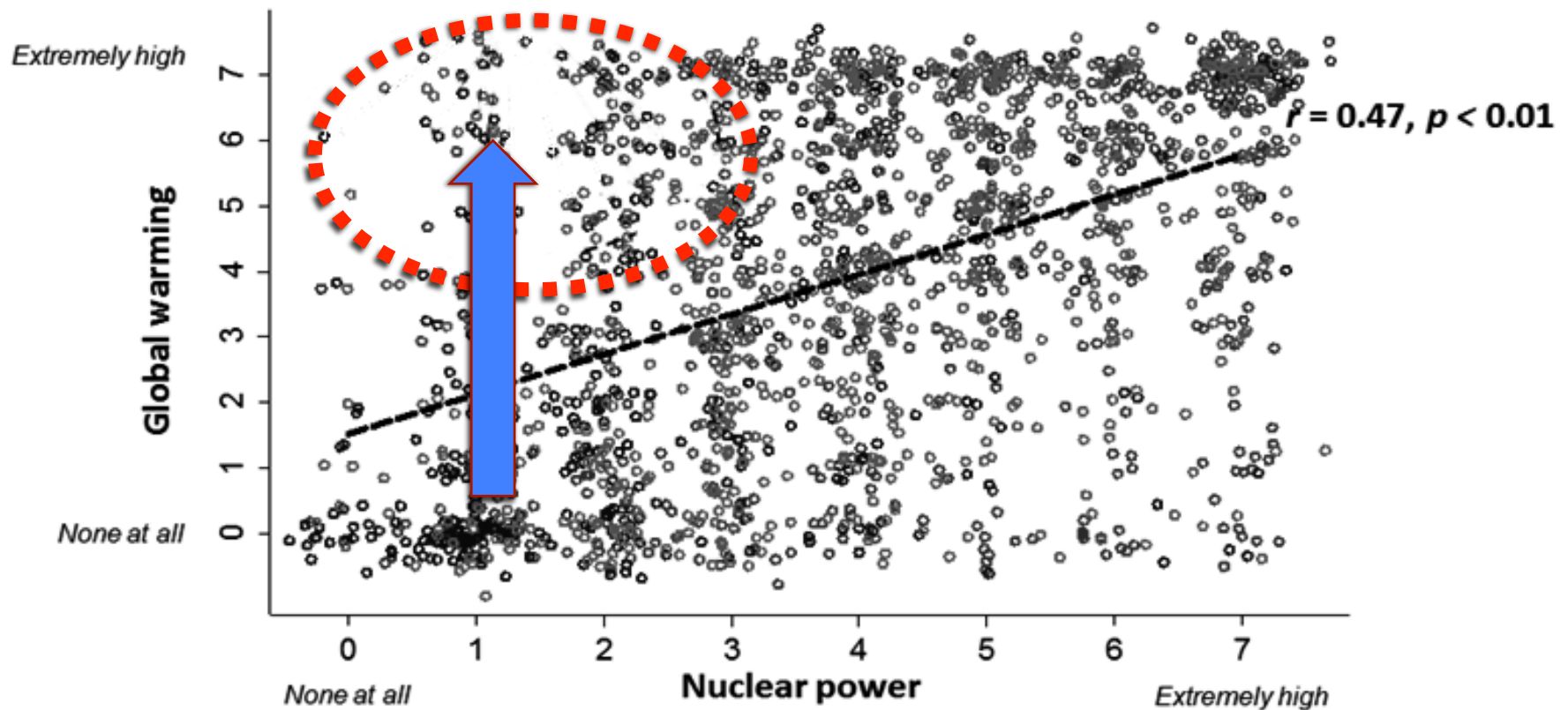
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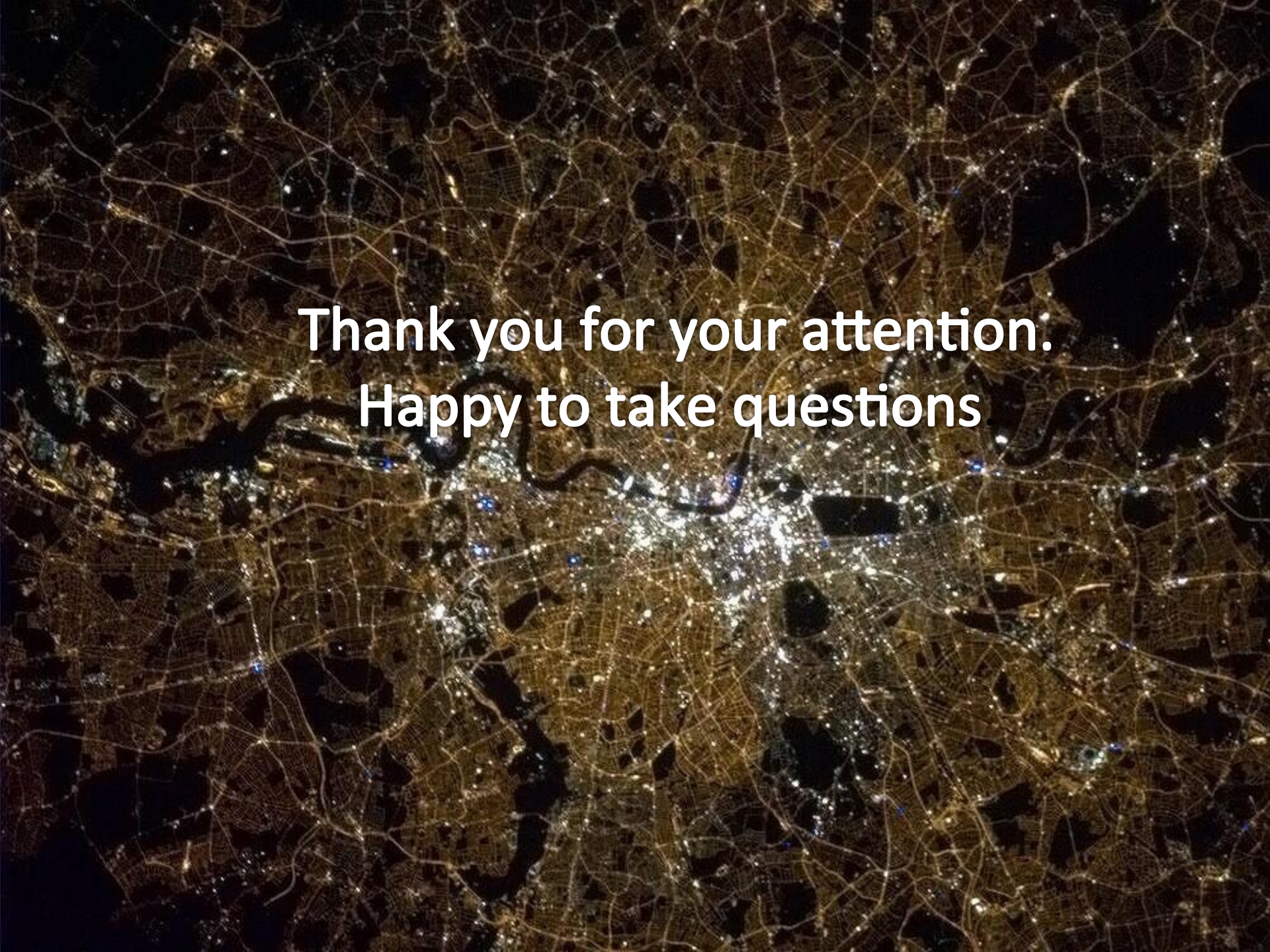


“How much risk do you believe . . . poses to human health, safety, or prosperity?”



Racing Extinction. I want my daughter to see a whale shark.



An aerial night photograph of a city, showing a dense network of roads and buildings illuminated by streetlights and city lights. The lights create a complex, glowing pattern against the dark background of the city and surrounding areas. The text is centered over the image.

**Thank you for your attention.
Happy to take questions**