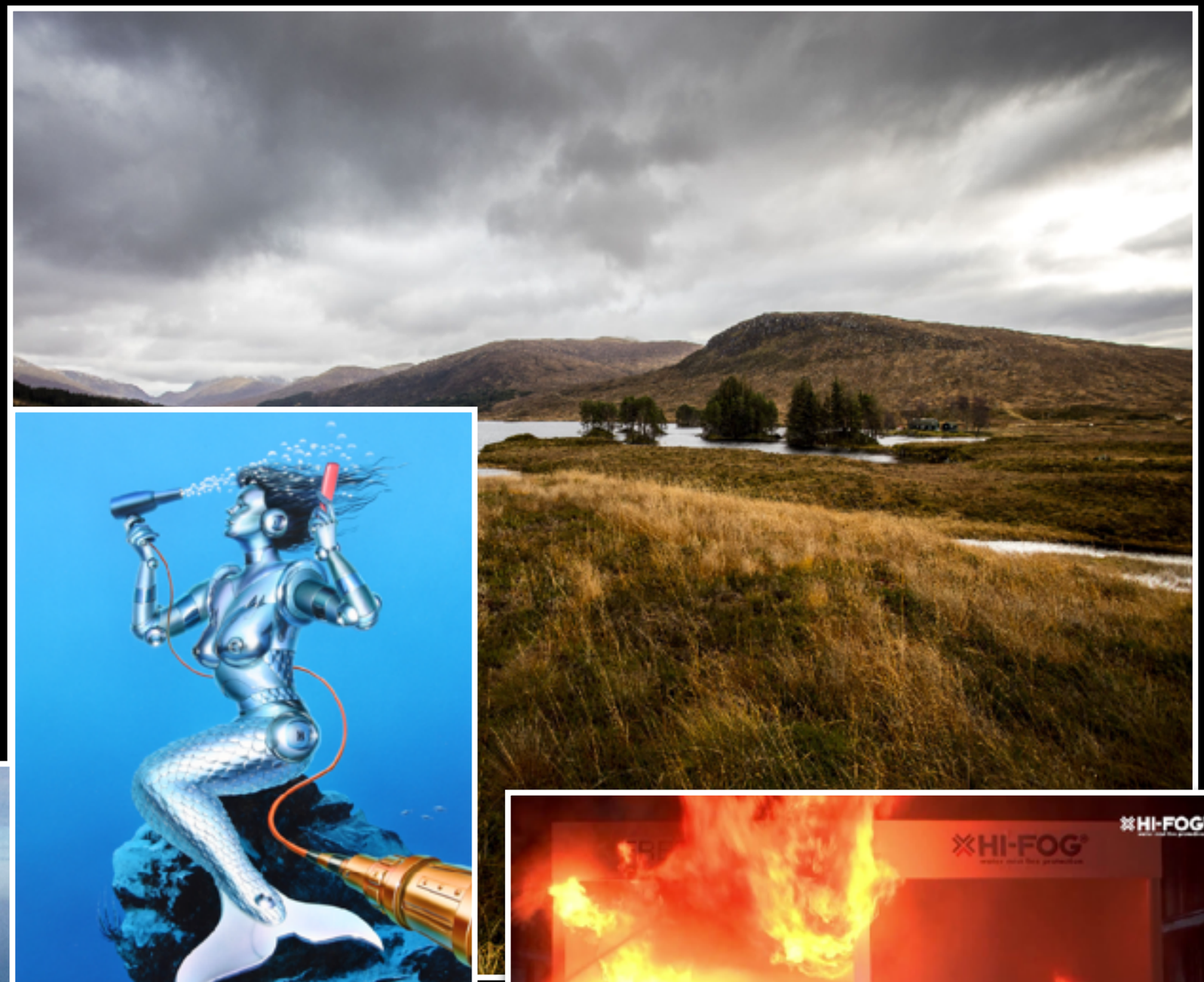
What are people for?

accelerating the energy revolution

Antony Turner

PEP2040, Rotterdam, 11 May 2023



Background

Schumacher College

CARBONSENSE

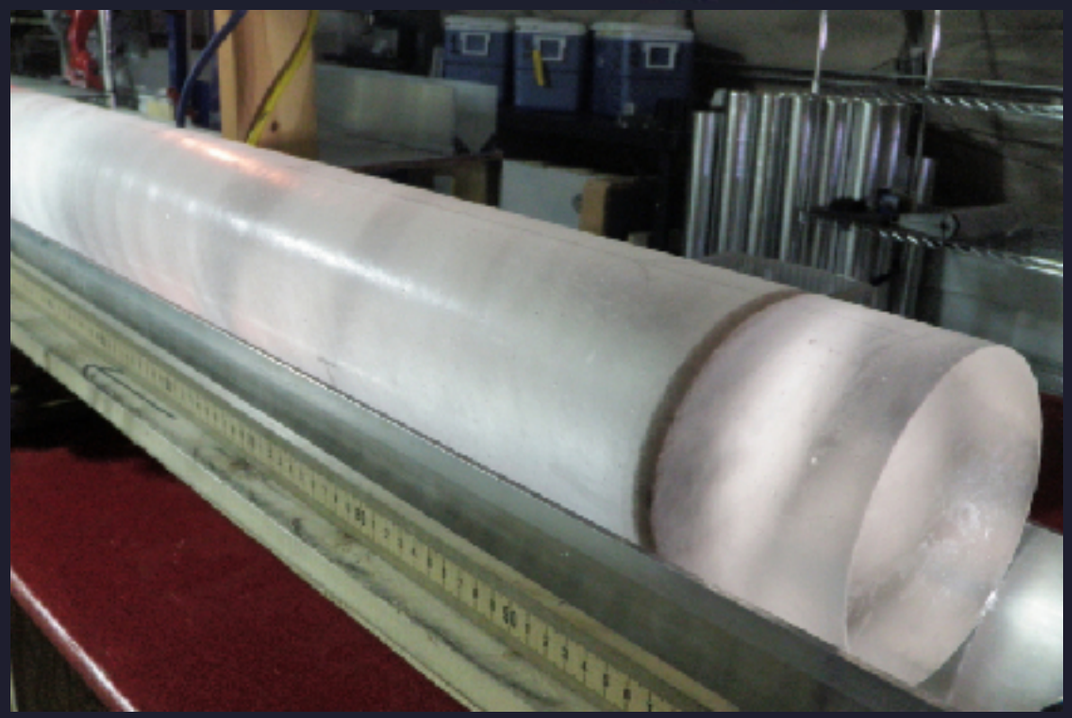
Image: size of the atmosphere (Adam Nieman)

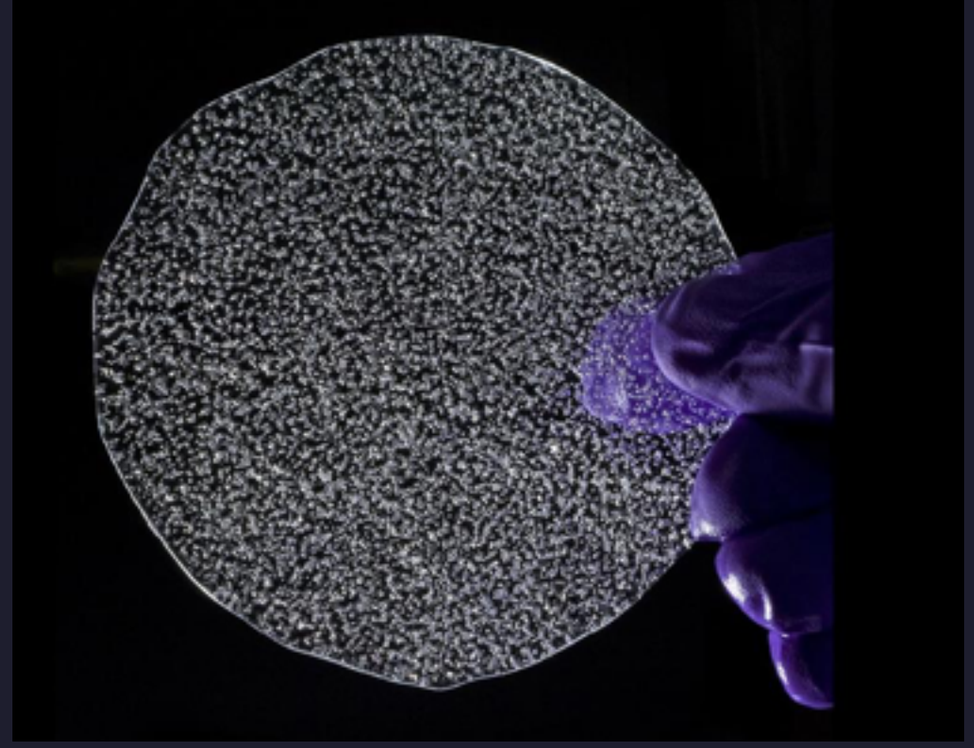
“the air itself is a biological product -a result of active exchange of gases with living organisms.”

James Lovelock
GAIA – The practical science of planetary medicine

carbonsense
making sense of climate change


1 kg CO_2





Vostok

temperature change from present

4°C

0°C

-8°C

carbon dioxide level in atmosphere

2020: 410 ppm

300ppm

200ppm

-400,000

-300,000

-200,000

-100,000

today

Vostok

carbonsense

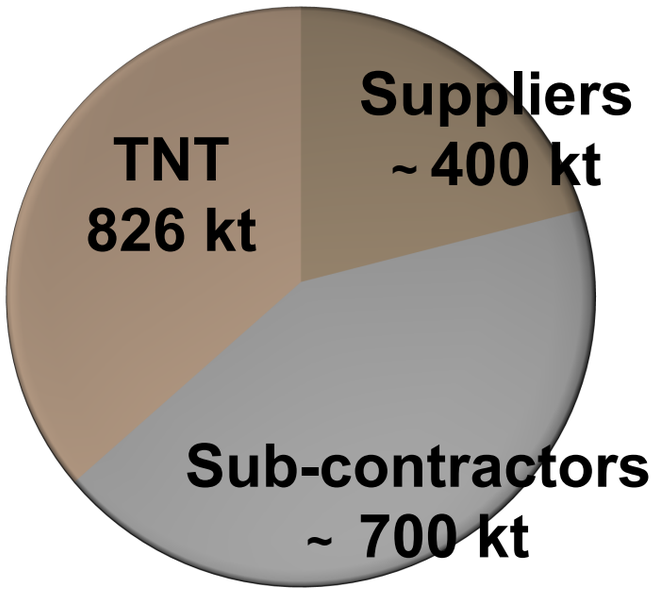
making sense of climate change

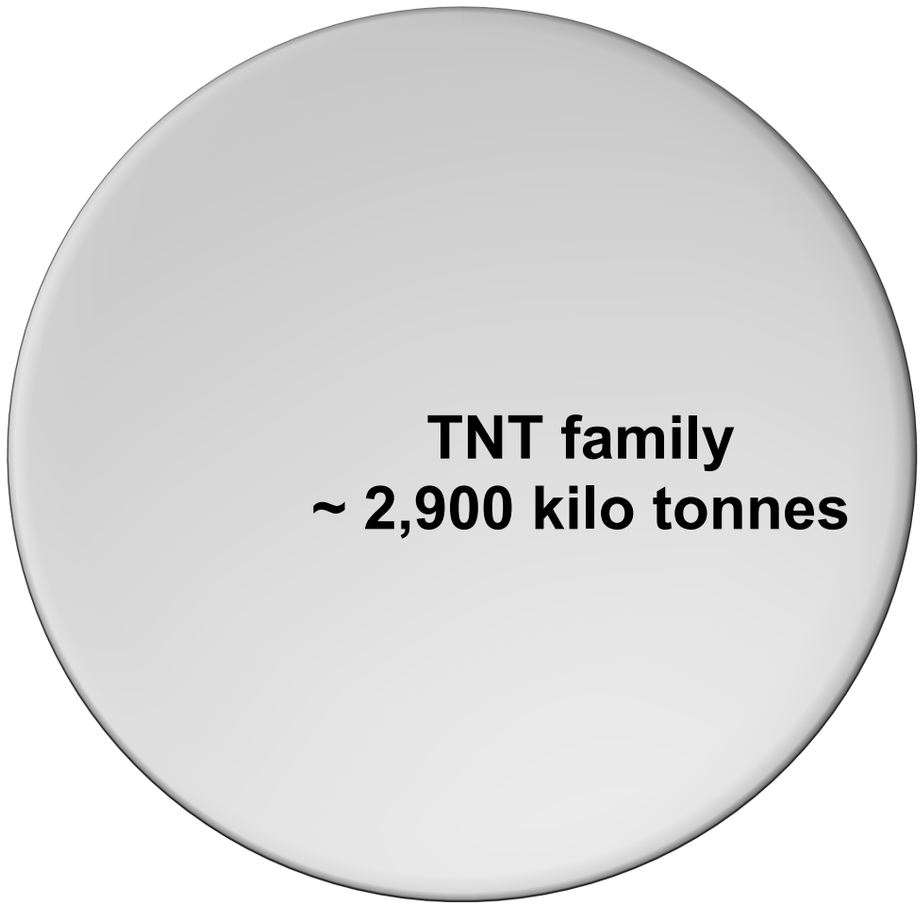
carbonsense
creative climate change solutions

delivering zero carbon

choose orange

CO_2 impact of TNT family



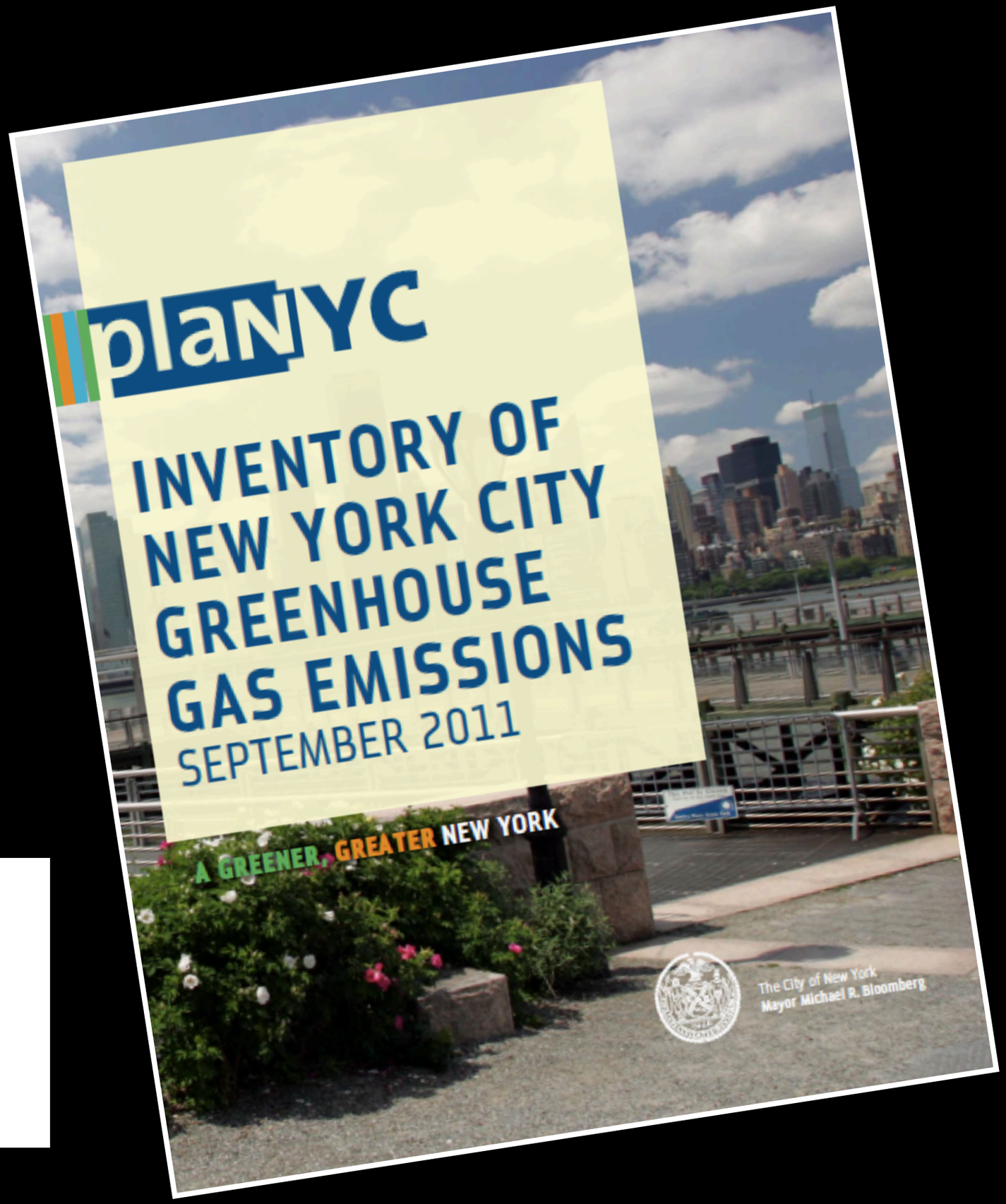


planet me

TNT and climate change

carbonsense
making sense of climate change

CARBON VISUALS



Environmental Defense Fund

Citywide Inventory

Citywide GHG emissions were 1.1 percent lower in 2010 than 2009 due to reduced electricity use, cleaner imported electricity, and more efficient steam generation

To most accurately and consistently assess and report a city's carbon emissions, a clear scope of analysis and boundaries specifying the emissions sources assessed is essential. Following standard international convention for the completion of city GHG inventories, the citywide inventory consists of all direct and indirect emissions from energy used by buildings, on-road transportation, and public transit (excluding aviation and marine transportation) within New York City; fugitive emissions from wastewater treatment, solid waste disposed both in and outside the city, and electricity and natural gas distribution within New York City; and emissions associated with solid waste exported outside of the city.

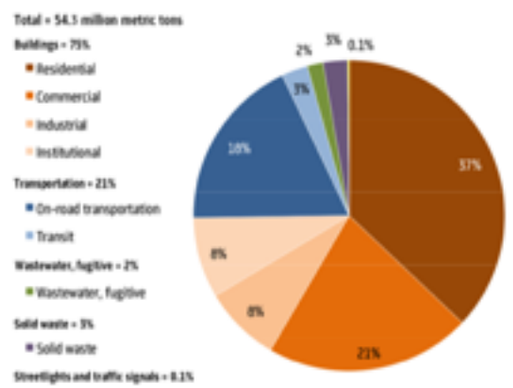
Citywide inventory results

In 2010 total GHG emissions in New York City were 54.3 $MgCO_2e$, 11.7 percent below 2005 base year emissions of 61.6 $MgCO_2e$. 2010 GHG emissions are broken down as follows:

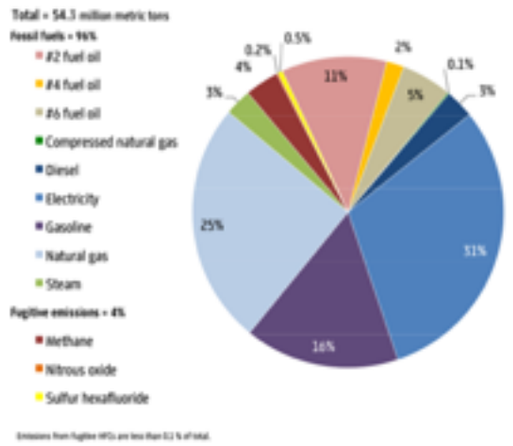
- Scope 1 GHG emissions (direct emissions from on-site fossil fuel combustion or fugitive emissions): 36,236,992 $MgCO_2e$
- Scope 2 GHG emissions (ndirect emissions from energy generated in one location, but consumed in another, such as electricity and steam): 18,112,658 $MgCO_2e$
- Scope 3 GHG emissions (sources not counted toward an entity's total emissions levels, such as biogenic CO_2 from biofuels—reported for information only): 14,321,140 $MgCO_2e$

2010 citywide GHG emissions were 1.1 percent below 2009 levels of 55.0 $MgCO_2e$. While this annual reduction is less than reported last year, emissions were again lower despite continued growth in population and building floor area and a significant increase in summer temperatures in 2010. One year of data cannot be used to determine a certain trend. However, reductions reported in 2010 show that significant progress continues to be made toward achieving the City's GHG reduction goal. The full impact of many policies and programs launched by the City as part of PlaNYC, including the energy efficiency laws that are part of the Greener, Greater Building Plan and the creation of the New York City Energy Efficiency Corporation (NYCEEC) and development of related financing tools for energy efficiency in the private sector, have yet to be realized as the programs are now beginning to scale up. While reporting overall GHG emissions levels indicates progress the City is making toward achieving its goals, understanding the drivers of these changes is critical to ensuring the most efficient development and implementation of policies necessary to keep the City's GHG reductions on track to fulfilling this mandate.

2010 Citywide CO_2e Emissions by Sector



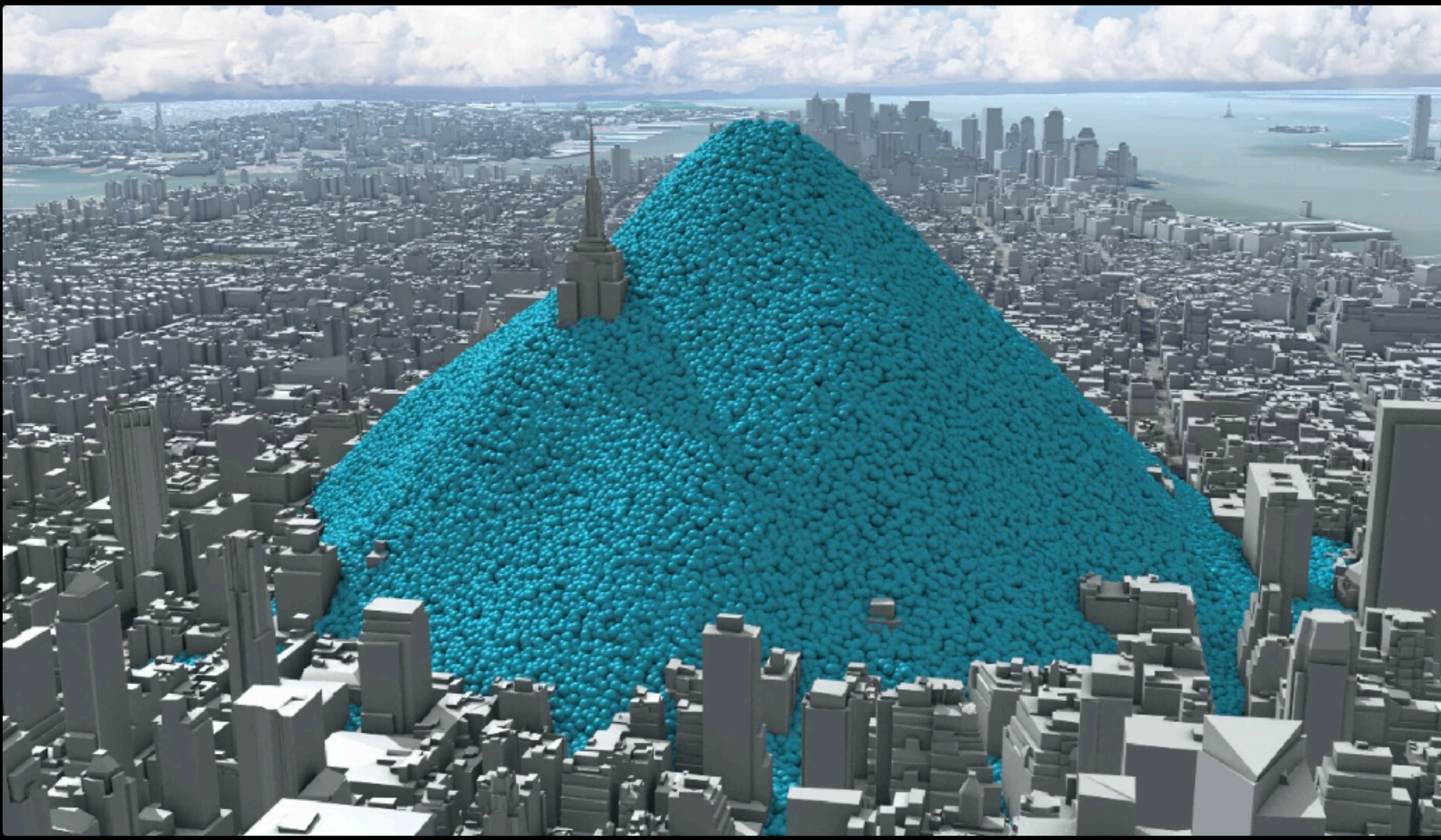
2010 Citywide CO_2e Emissions by Source



Citywide inventory results

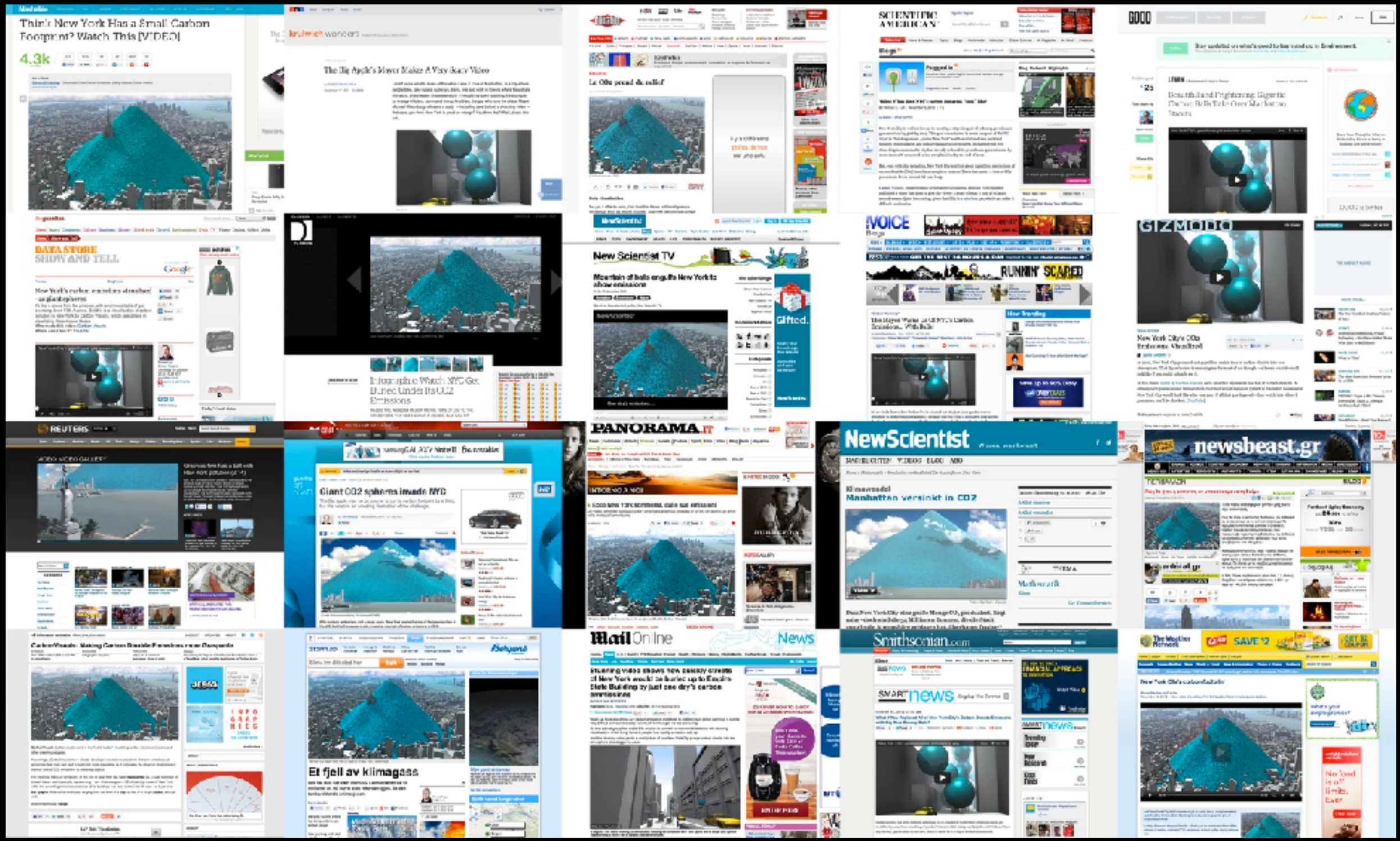
In 2010 total GHG emissions in New York City were 54.3 $MgCO_2e$, 11.7 percent below 2005 base year emissions of 61.6 $MgCO_2e$. 2010 GHG emissions are broken down as follows:

New York City carbon emissions video (2012)



New York City's daily carbon dioxide emissions as one-tonne spheres. In 2010 New York City added 54 million metric tons of carbon dioxide (equivalent) to the atmosphere. Environmental Defense Fund enabled us to make this video, first shown in The White House. https://www.realworldvisuals.com/cv-projects/new-yorks-carbon-emissions

New York City emissions video - on over 100 websites and blogs, and viewed on YouTube by over 430,000 since launch.

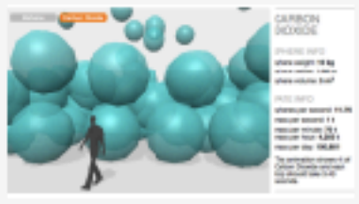


http://www.carbonvisuals.com/work/new-yorks-carbon-emissions-in-real-time

ALL PROJECTS

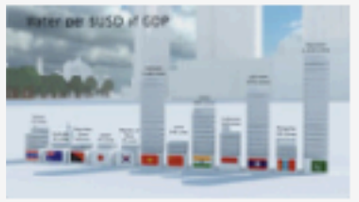
We have created films, animations, images, interactive tools and apps for organisations from global to local. The breadth of our work can be seen below or viewed by sector Business, Campaigns and NGOs, Government and Education.

University of exeter trials Emissions Visualiser
23 Mar 2016



California's massive methane leak
14 Jan 2016

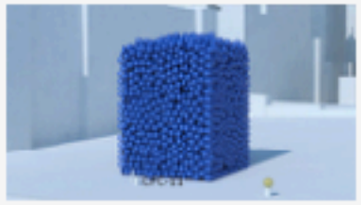
Communicating vital scientific services
8 Dec 2015



Resource efficiency in Asia Pacific
23 Jun 2015

Ireland's carbon footprint
22 Jun 2015

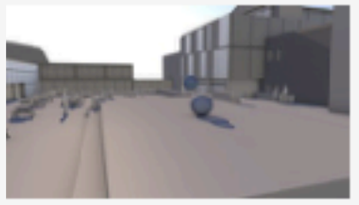
How do you sell low carbon?
23 Feb 2015



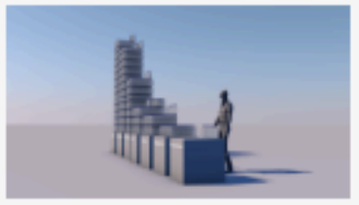
Ozone campaign meets climate change
4 Nov 2015

The Ozone Song
9 Sep 2015

Ozone interactives
9 Sep 2015



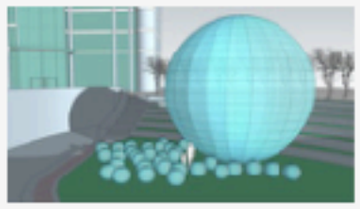
University of Plymouth - The Carbon Footprint
10 Feb 2015



Visualising water use for AGM
1 Feb 2015

UK 80% reduction target – in Piccadilly Circus
29 Jan 2015

UN ozone celebrations
21 Jul 2015



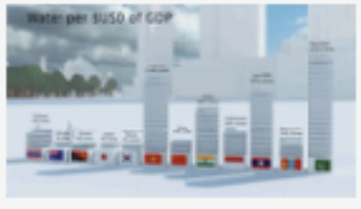
Get Positive
8 Jul 2015

Past, present and future - Oundle School
1 Jul 2015

The case for Carbon Capture & Storage
1 Jan 2015

NHM sustainability engagement
21 Dec 2014

Making sense of carbon, trees and timber
11 Nov 2014



Resource efficiency in Asia Pacific
23 Jun 2015

Ireland's carbon footprint
22 Jun 2015

How do you sell low carbon?
23 Feb 2015

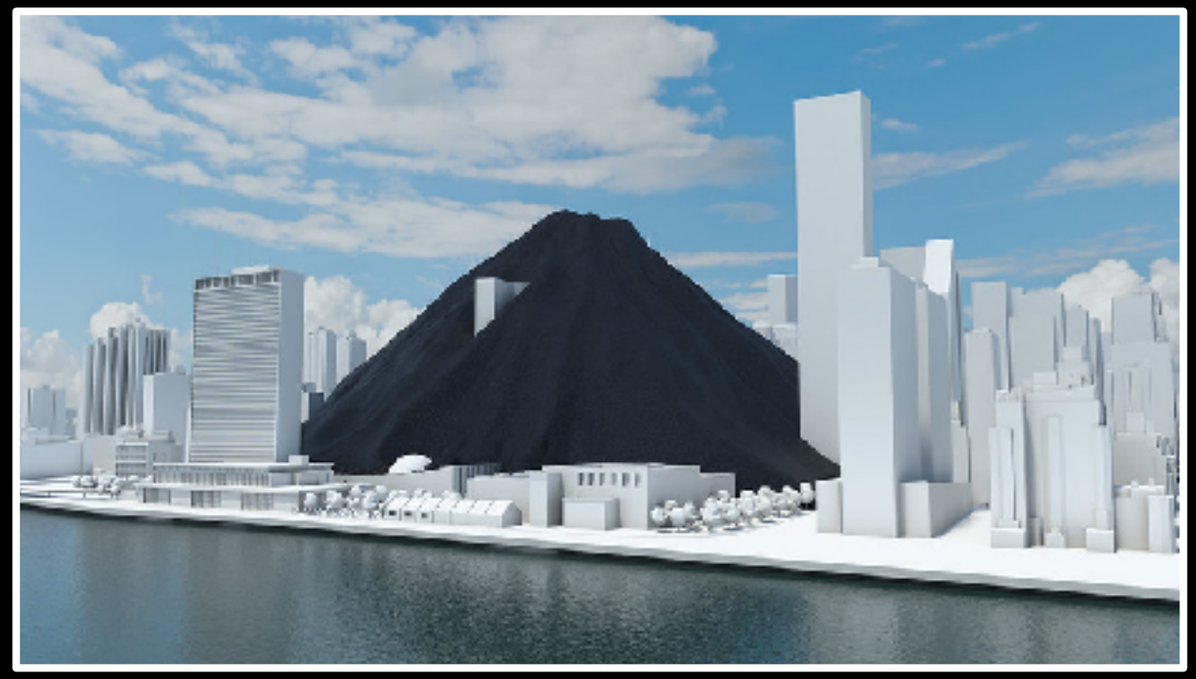
Illustrating the world's first Carbon Neutral Engine Oil
8 Oct 2014

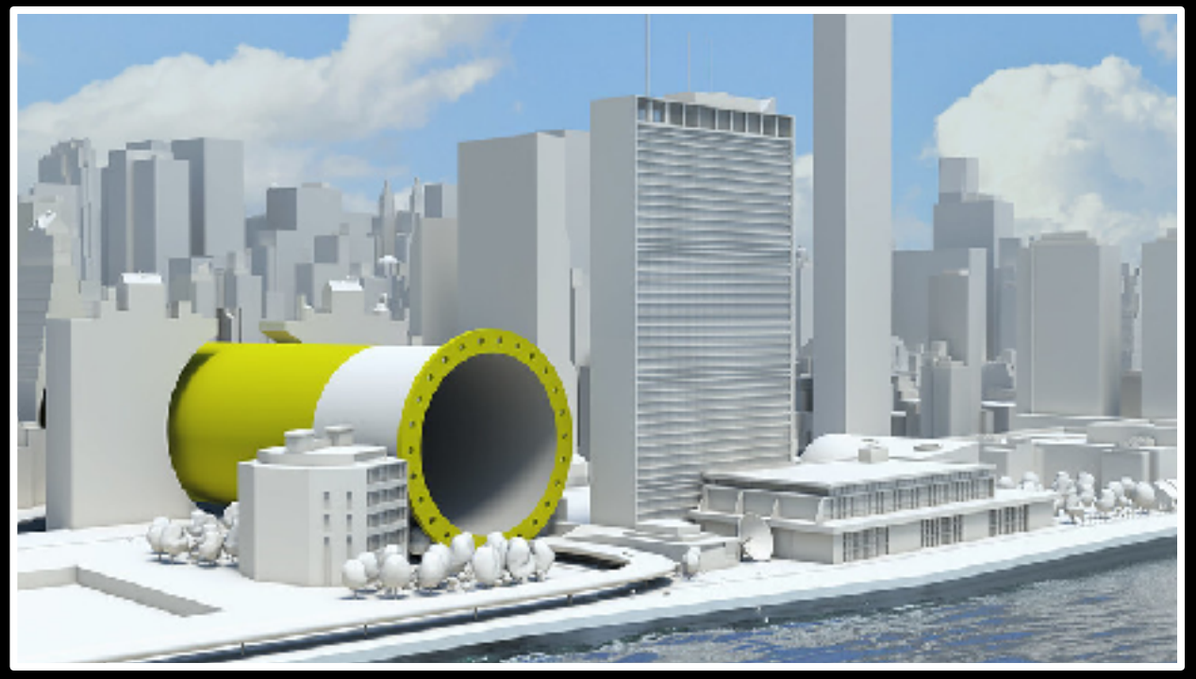
Visualising a 90% carbon reduction
25 Sep 2014

Animating the world's cars
2 Aug 2014

www.carbonvisuals.com

REAL WORLD VISUALS



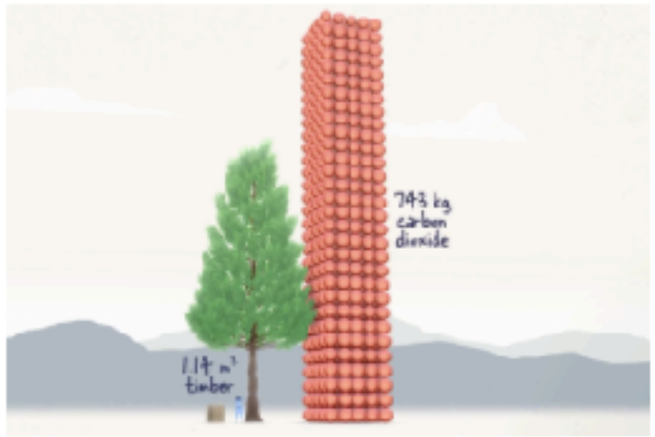


Film showing actual quantities of global fossil fuel consumption designed to engage world leaders, industry experts, campaigners and scientists at the UN Climate Summit, New York, September 2014. Client: WBCSD (World Business Council for Sustainable Development)
https://www.realworldvisuals.com/cv-projects/the-worlds-fossil-fuel-use-and-emissions

Helping tell Porsche's carbon story

How can global car manufacturers show climate change leadership? Phasing out petrol and diesel vehicles alone is not enough as making electric cars uses a lot of energy, particularly in the manufacture of the batteries. So the challenge is to engage with the supply chain and get them also to reduce emissions - primarily by only using renewable electricity.

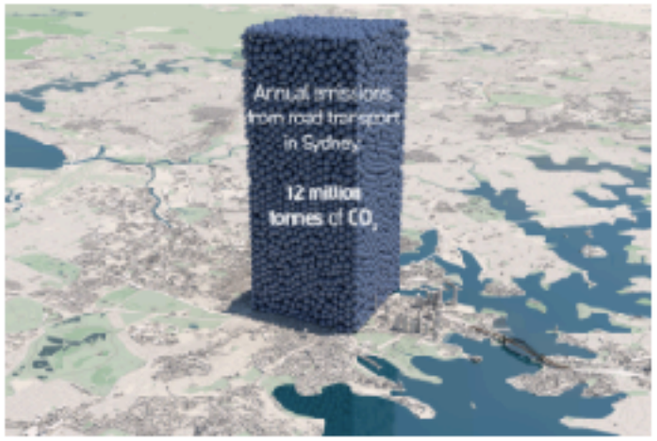
Apr 18, 2023



Trees store carbon

In 2014 we made a video set for Wood for Good, the UK timber industry's promotional campaign, showing the carbon benefits of using wood and timber in the UK construction sector. The brief, eight years later, was to make and shorter versions of the films suitable for educational use and social media sharing

Nov 23, 2022



Transport emissions come to life

How do you highlight the climate benefits of using electric bikes and e-scooters in cities? This was the challenge set by Beam Mobility, the largest micro-mobility operator in the Asia Pacific region.

Aug 1, 2022

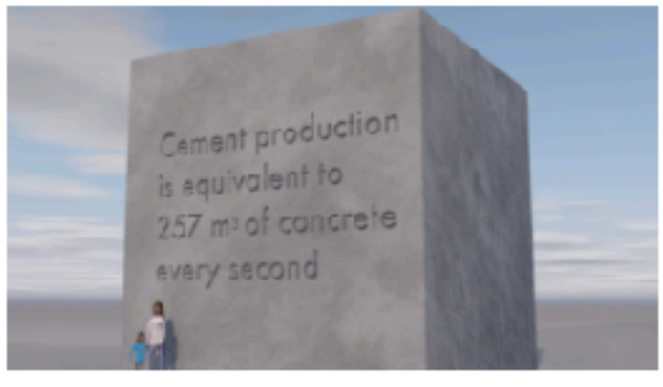
GLOBAL

In this section you will find a range of our projects highlighting global emissions and the sources of those emissions over the years.

Electric vehicles - the raw materials

Electric vehicles are at the heart of the clean energy transition. But as prices reduce and manufacturers increase their model line ups where are the raw materials needed to produce rapidly increasing volumes of EVs going to come from?

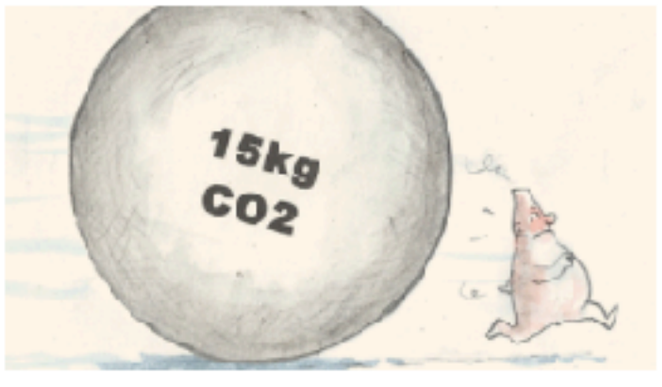
Dec 15, 2021



What's the carbon footprint of cement?

The global cement / concrete supply chain currently produces a disproportionate amount of greenhouse gas emissions. Innovative solutions that make cement and concrete production and usage sustainable are urgently needed. But how do you bring together different technology, fina cakeholders to rapidly reduce t

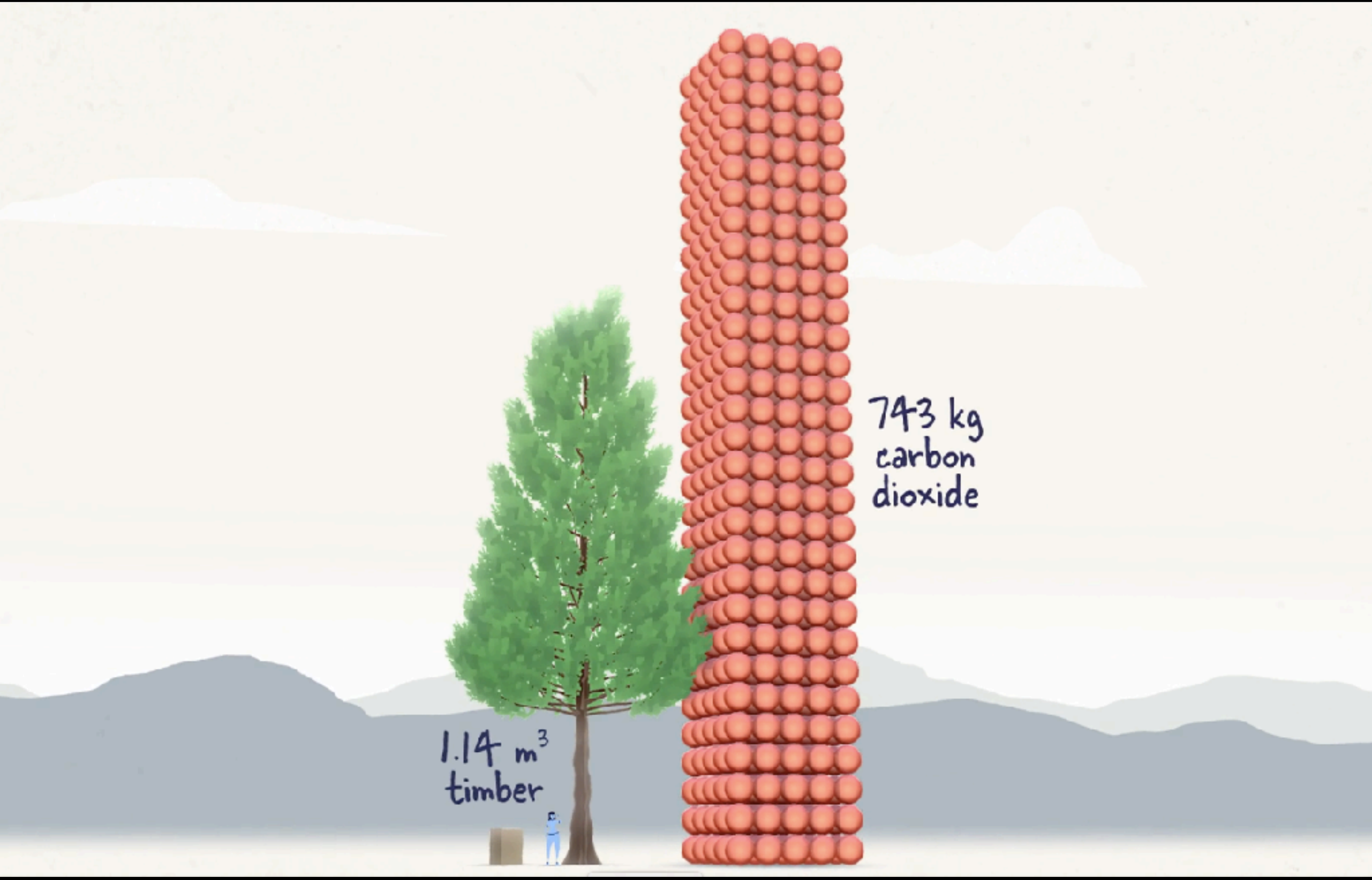
Screenshot



Can humour help the climate crisis?

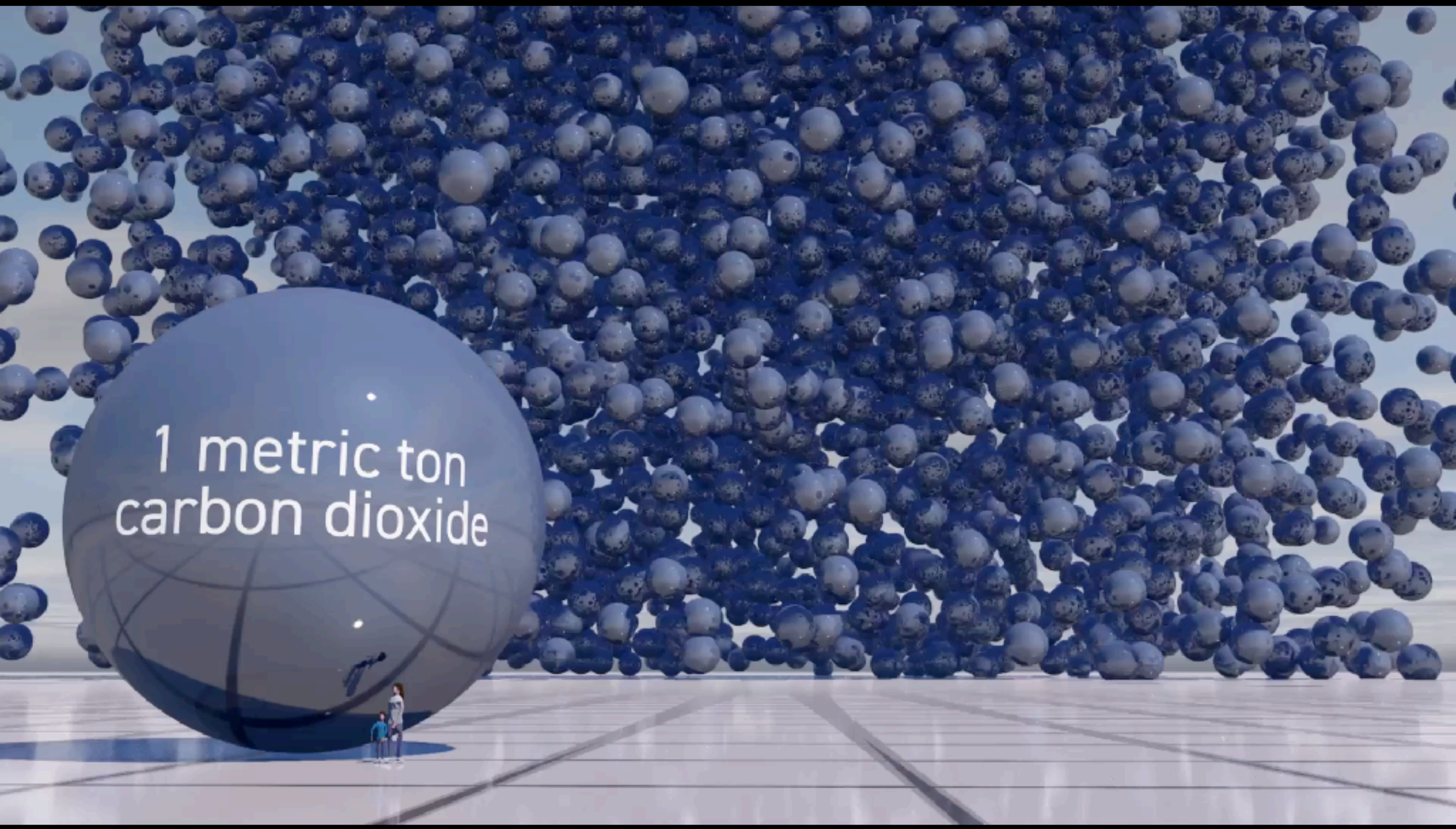
The world is waking up to the climate crisis. Children are protesting and Extinction Rebellion has gone global. But many people are still unaware of the carbon emissions associated with everyday activities. That's why we have teamed up with innovative multi-media theatre company Forkbeard Fantasy to see if humour could help.

Oct 18, 2019



A video for Wood for Good, the UK timber industry's promotional campaign, showing the carbon benefits of using wood and timber in the UK construction sector.
https://www.realworldvisuals.com/rwv-projects/trees-store-carbon

we add a paper thick layer of CO_2 to the atmosphere

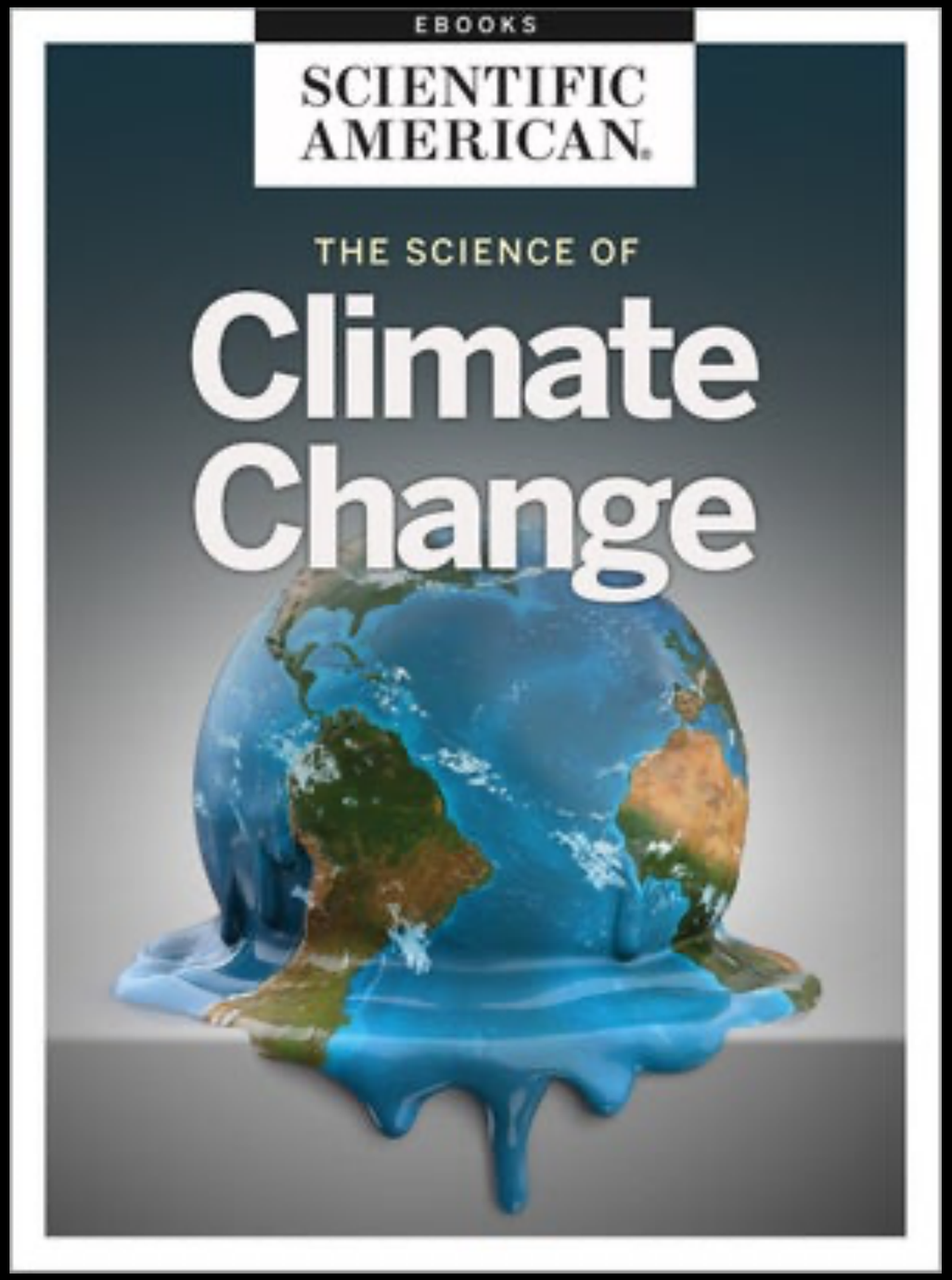


…EVERY DAY

WHAT HAS CHANGED?


1 kg CO_2

CLIMATE CHANGE


EBOOKS
SCIENTIFIC AMERICAN
THE SCIENCE OF
Climate Change


The Economist
NOVEMBER 27TH–DECEMBER 3RD 2010
Economist.com
The euro crisis, continued
Attacking the Fed
What's up with North Korea
Germany's model Mittel-management
Saving Fiat from Italy
How to live with climate change

Photo: Alex Treadway/ICIMOD


MOLDEH
Gamot
PUBLIKO
NO PARKING - EITHER SIDE

Pakistan floods kill 580 and bring misery to millions

ENERGY REVOLUTION

the energy revolution

Demonstrator project, 2000, off Northumberland coast,
2 x 2 MW turbines, 66m diameter - 2000 homes

Hornsea 1 wind farm, 2019,
174 x 7 MW turbines, 190m
diameter - 1 million homes

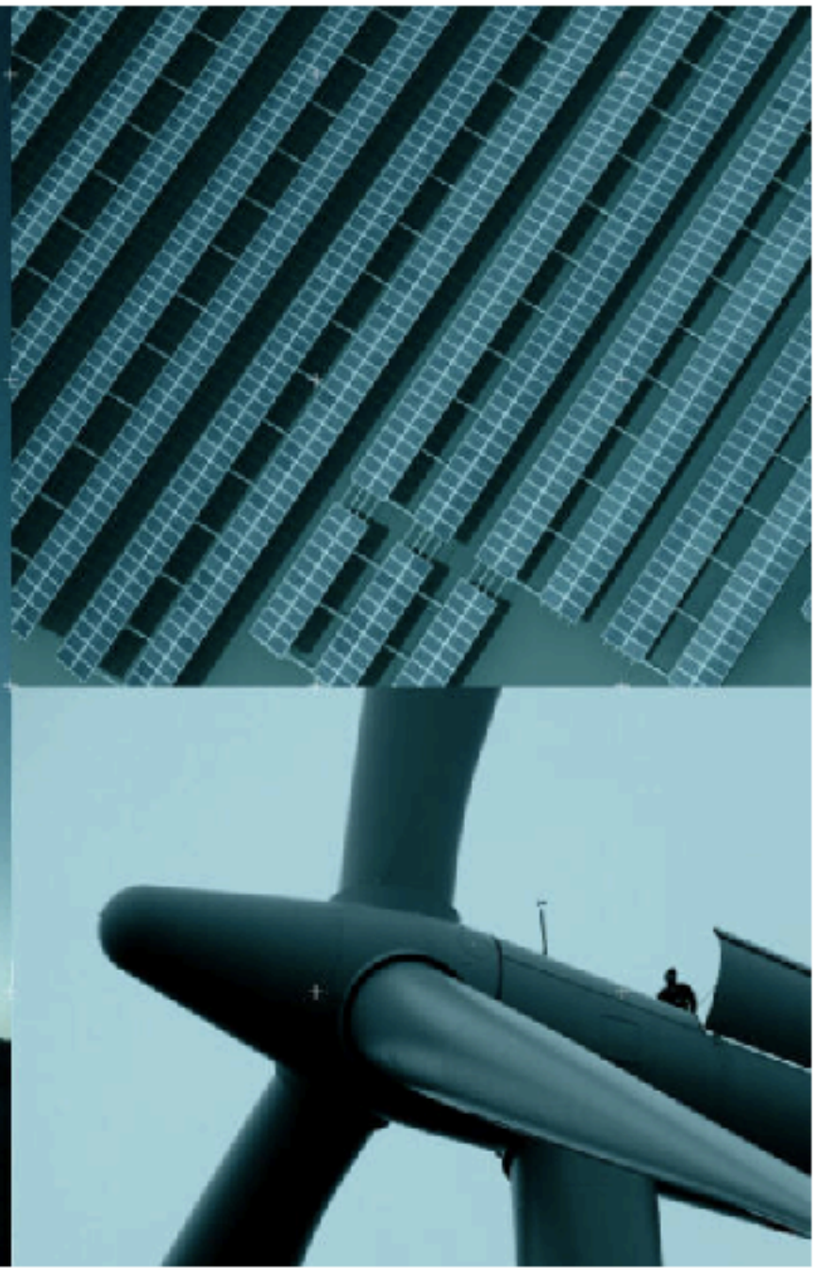
Hornsea 3 wind farm, 2027,
2,200 MW - 2 million homes

Bhadla Solar Park, India, 2.25 GW
5,700 ha (14,000 acres)

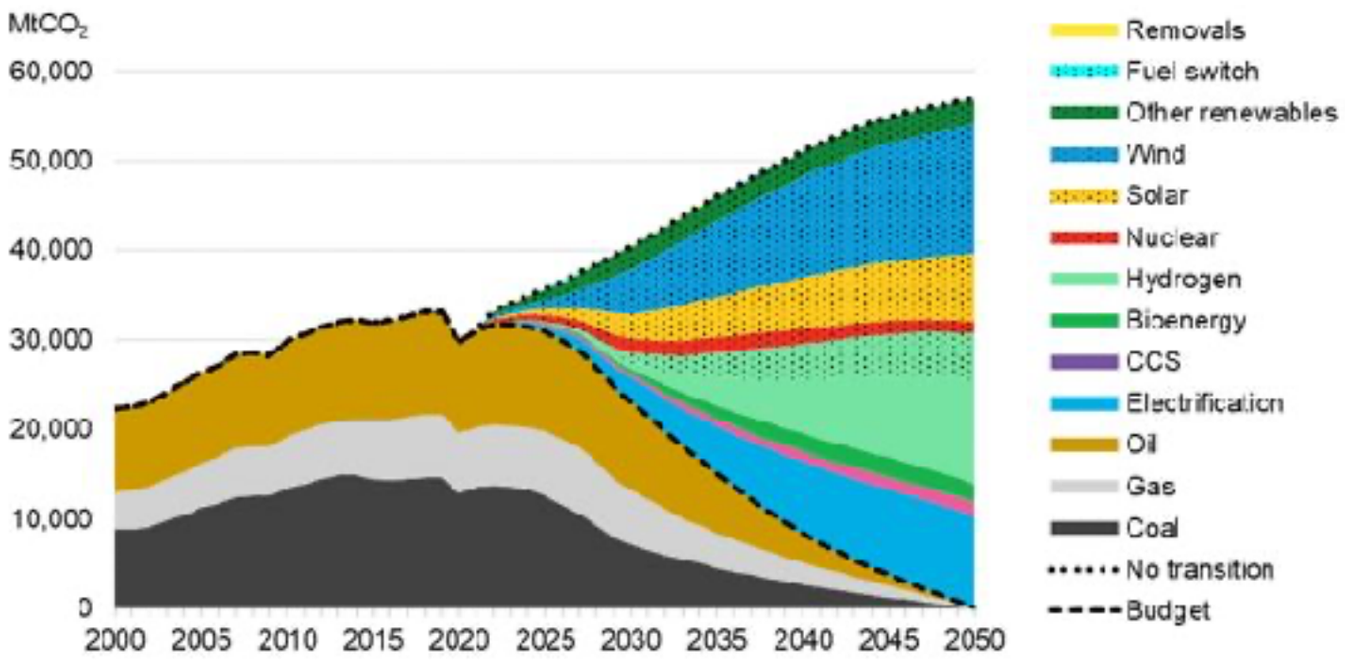
BloombergNEF

N E O 21

New Energy Outlook 2021



Emissions and abatement, by source, Green Scenario



Source: BloombergNEF


WHAT ABOUT
PEOPLE?

temperature change from present

4°C

0°C

-8°C

carbon dioxide level in atmosphere

2020: 410 ppm

300ppm

200ppm

-400,000

-300,000

-200,000

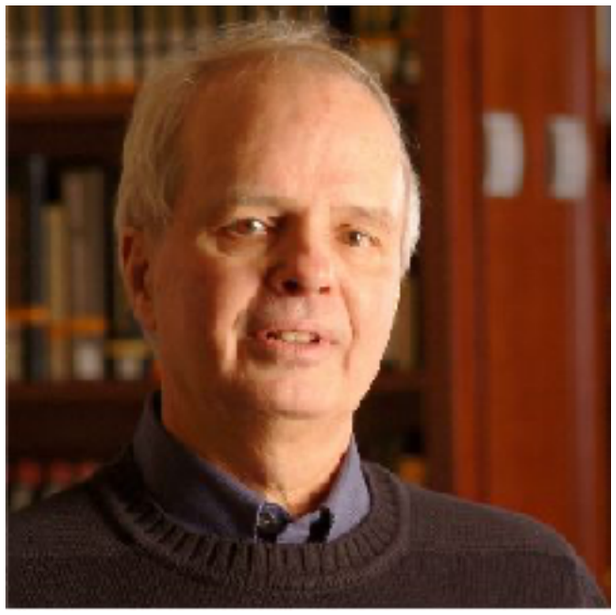
-100,000

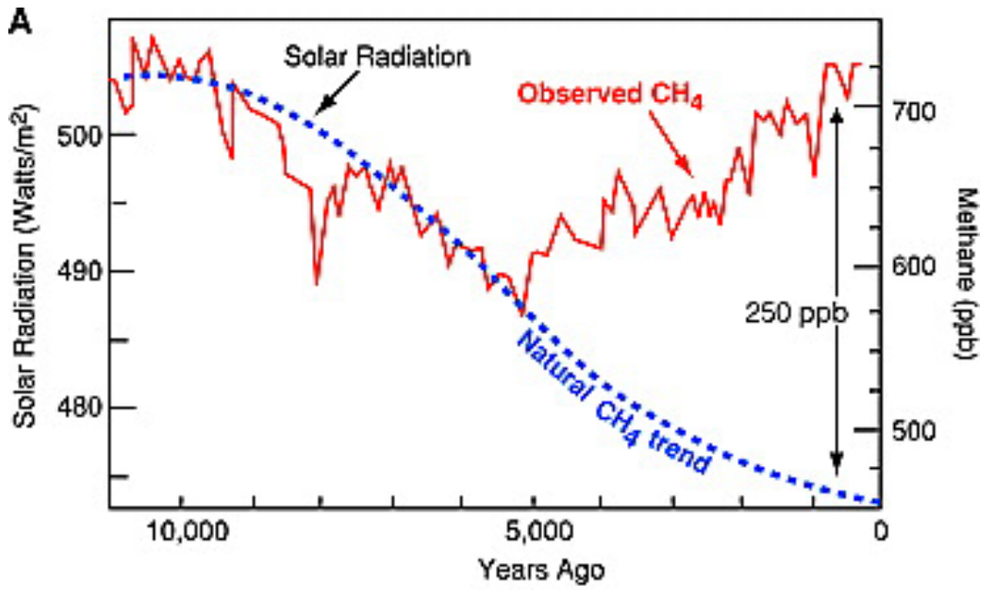
today

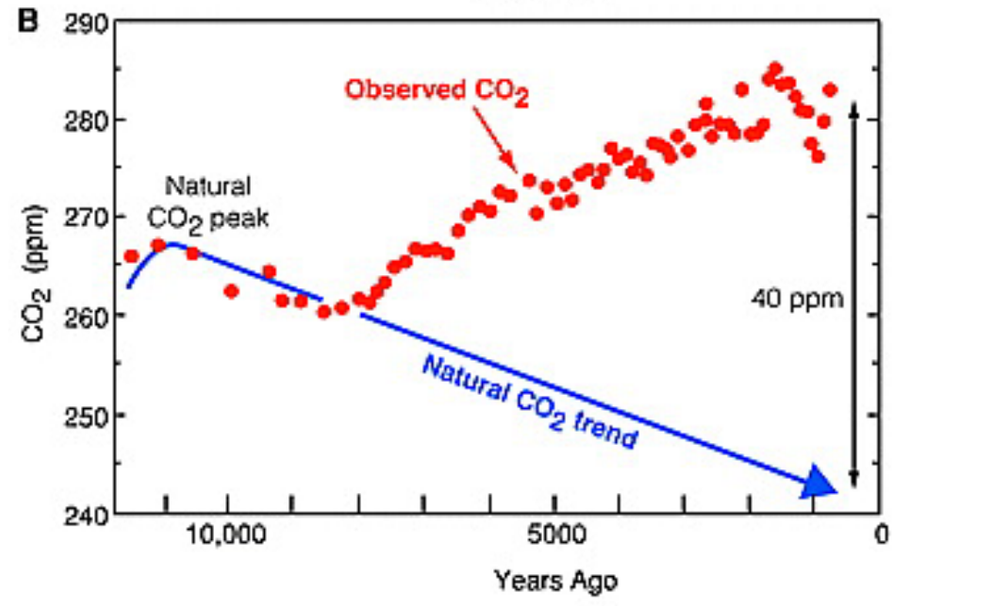
Vostok

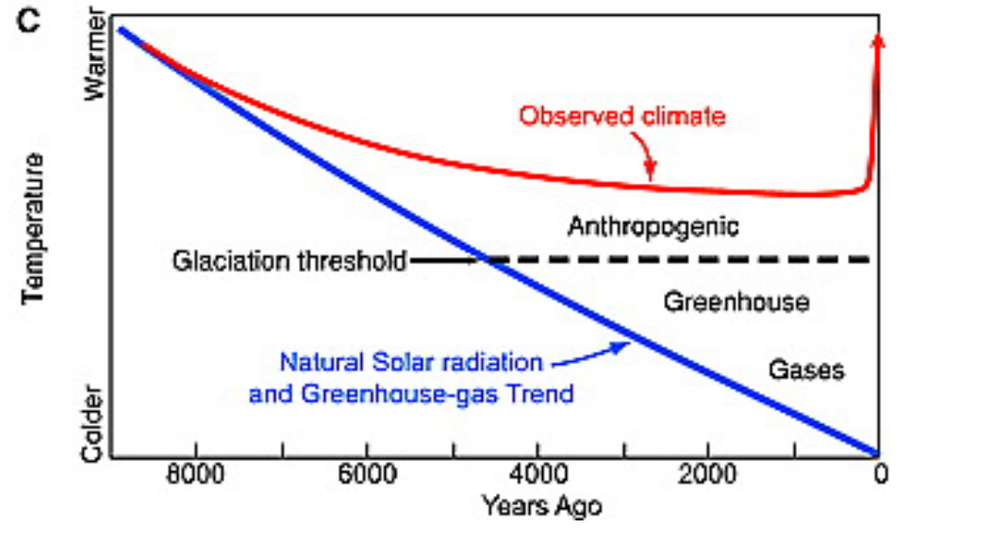
carbonsense

making sense of climate change









HOW DID HUMANS FIRST ALTER GLOBAL CLIMATE?

A bold new hypothesis suggests that our ancestors' farming practices kicked off global warming thousands of years before we started burning coal and driving cars

By William F. Ruddiman

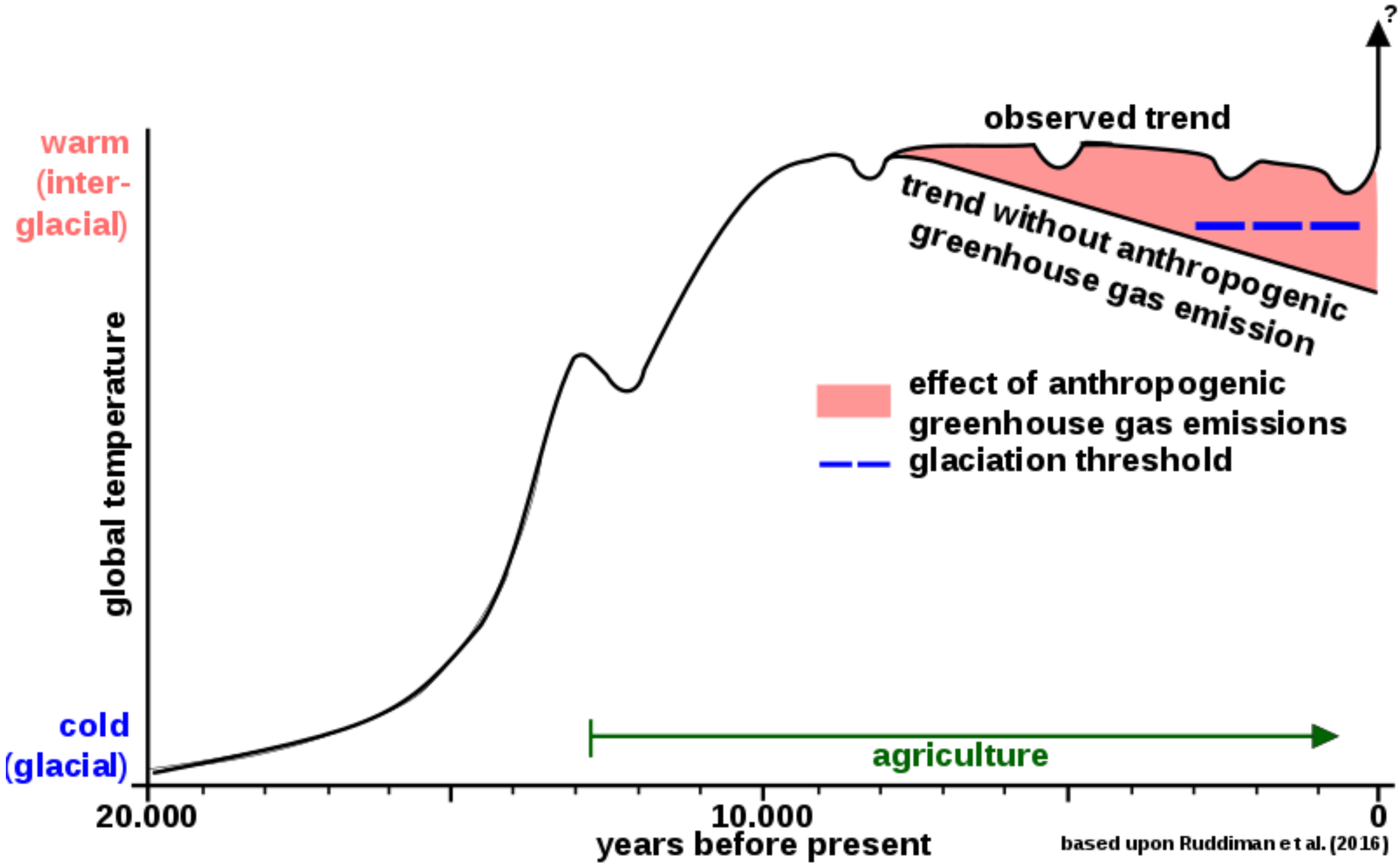
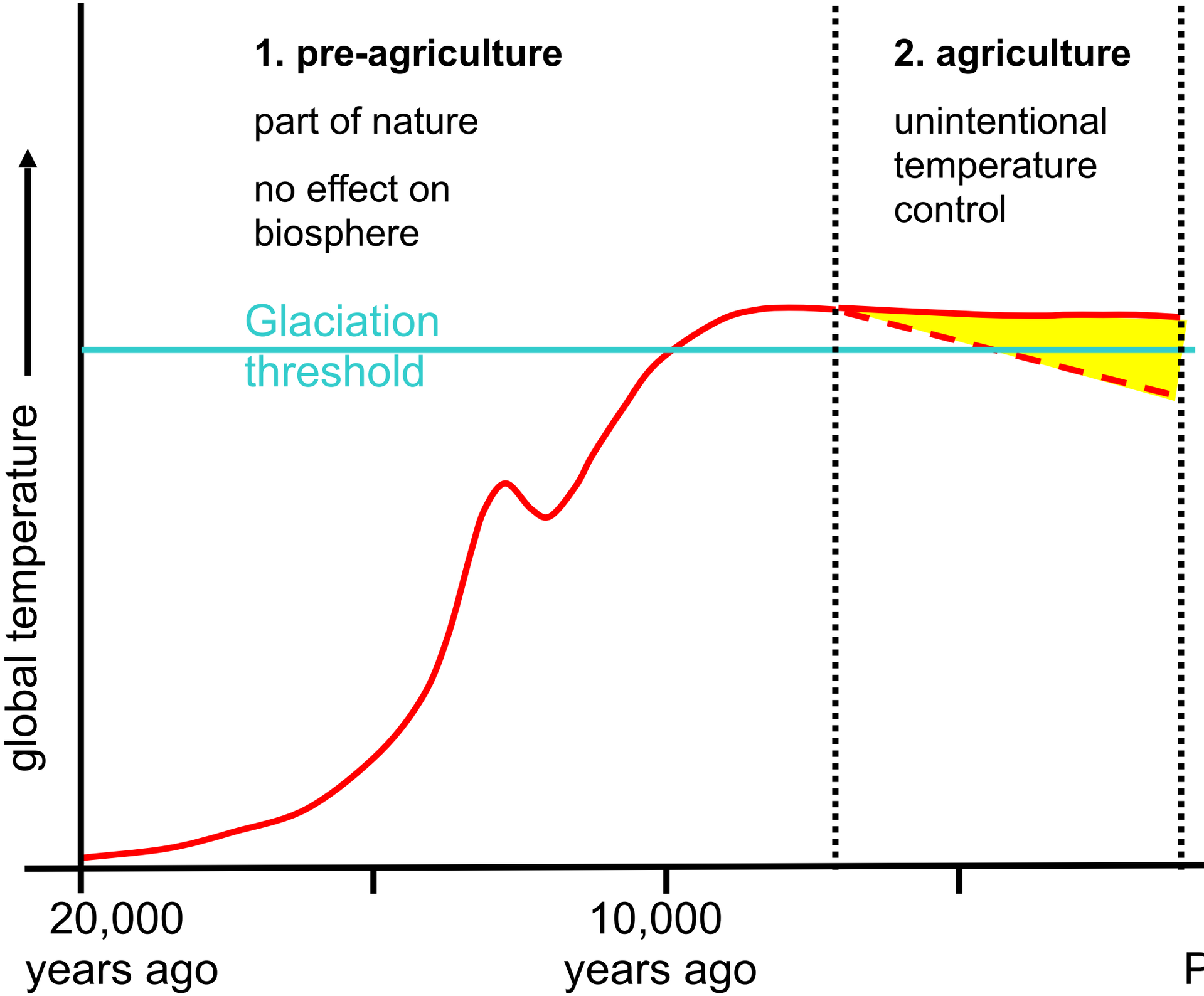

warm
(inter-
glacial)
global temperature
cold
(glacial)
observed trend
trend without anthropogenic
greenhouse gas emission
?
effect of anthropogenic
greenhouse gas emissions
glaciation threshold
agriculture
20.000
10.000
0
years before present
based upon Ruddiman et al. (2016)

diagram: W.F. Ruddiman / Scientific American



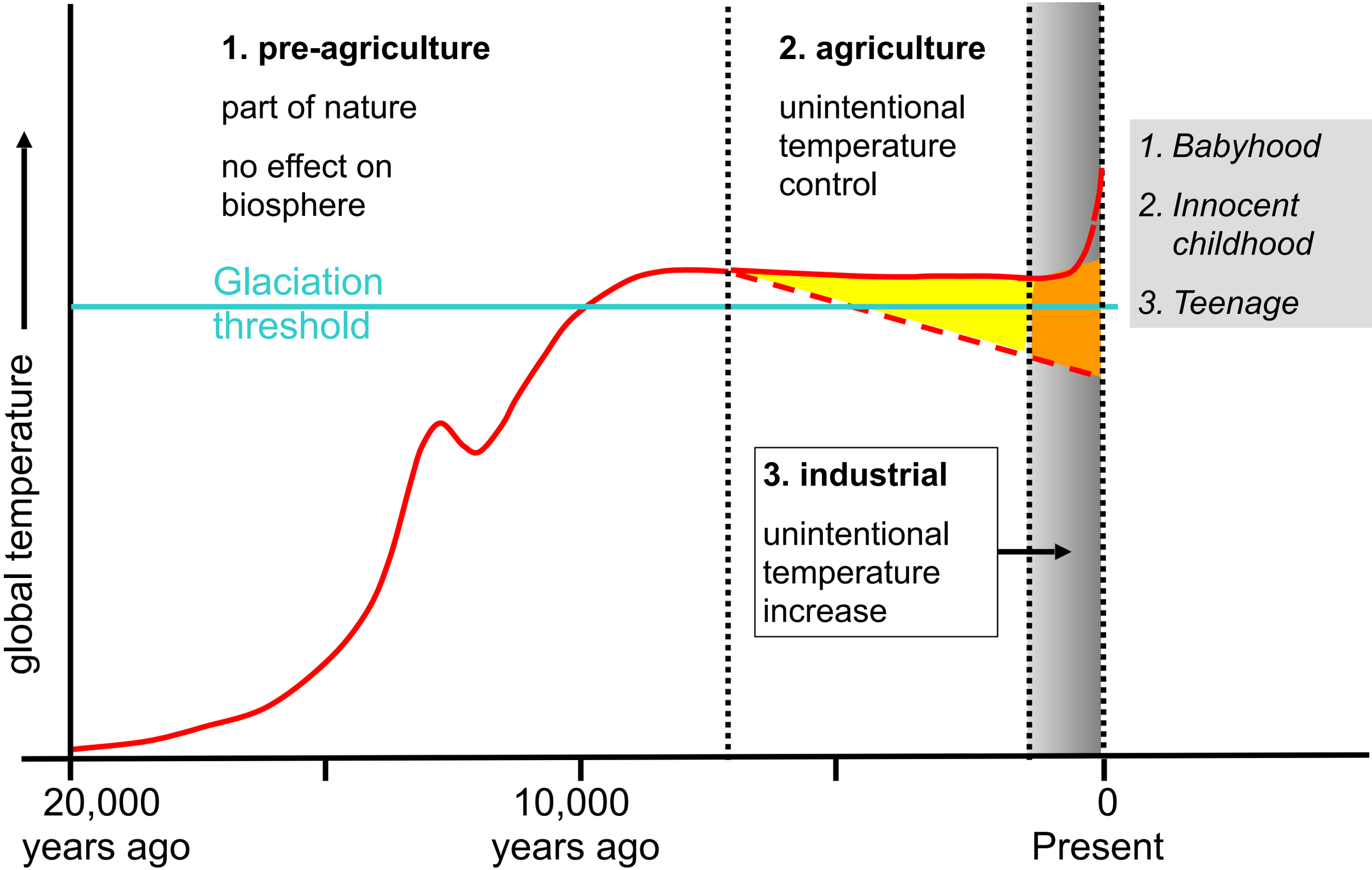
"as I see it, nature would have cooled earth's climate.

But our ancestors kept it warm by discovering agriculture."

Bill Ruddiman

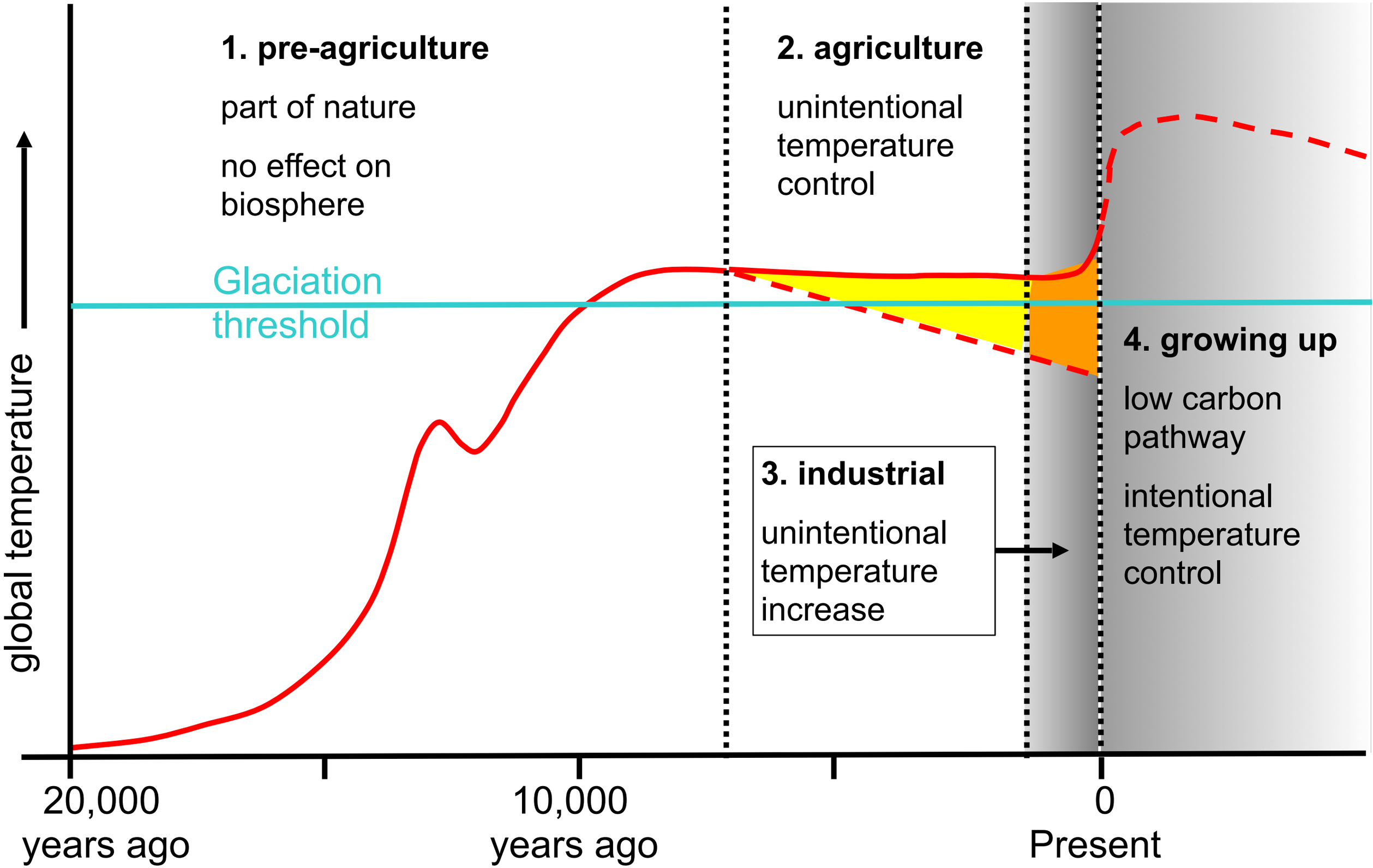
stages of human / planetary relationship

diagram: W.F. Ruddiman / Scientific American



stages of human / planetary relationship

diagram: W.F. Ruddiman / Scientific American

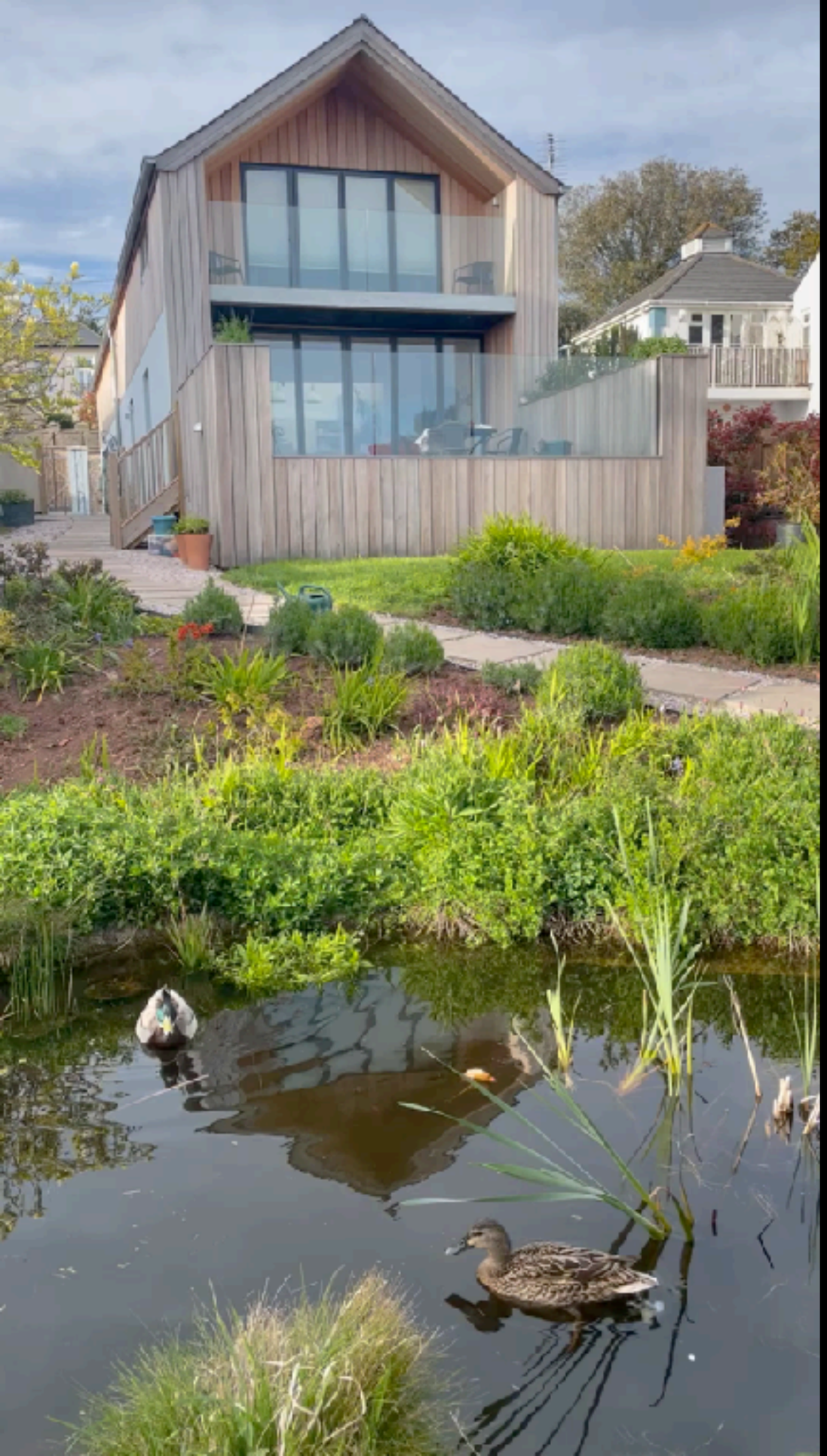


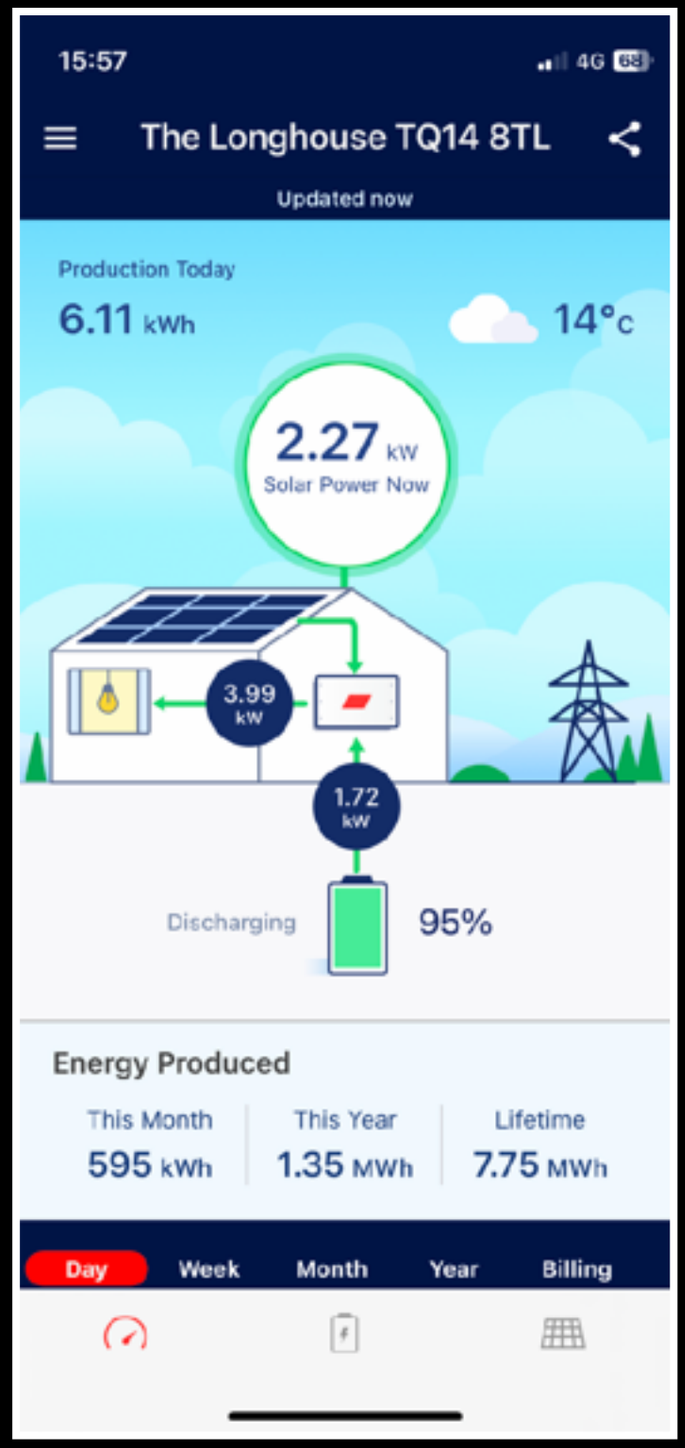
stages of human / planetary relationship

where are the grown-ups?

where are the grown-ups?


CHOICE




15:57
4G
The Longhouse TQ14 8TL
Updated now
Production Today
6.11 kWh
14°c
2.27 kW
Solar Power Now
3.99 kW
1.72 kW
Discharging
95%
Energy Produced
This Month
595 kWh
This Year
1.35 MWh
Lifetime
7.75 MWh
Day
Week
Month
Year
Billing


13:17
My home
0.5 kW
ZAPPI
1.3 kW
100%
1.8 kW
myenergi

what’s your beef?

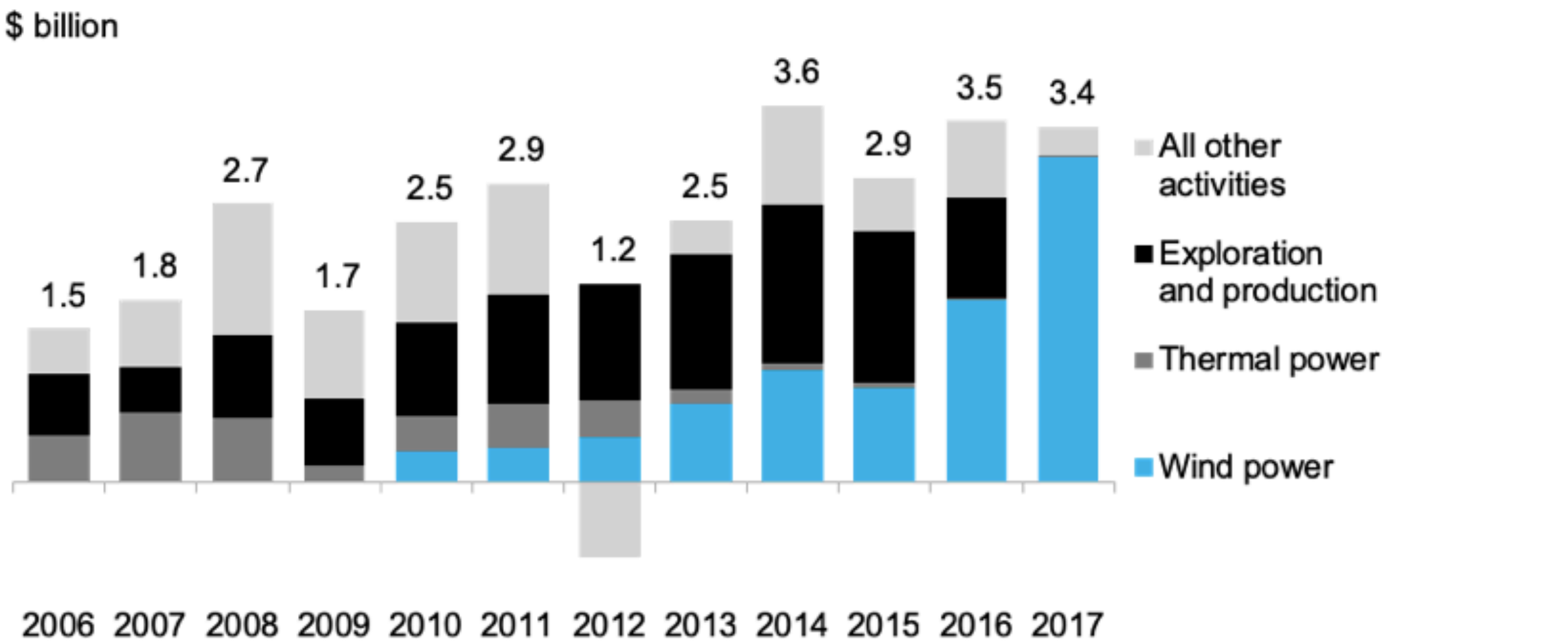
	Beef CO2 data		
	kilo CO2e per kilo*	**sequestration****	**kilo CO2e per steak****
Global average	46	0	10
UK grass fed average	17.12	0	4
Woodland Valley Farm	35	-66	-7
Average PFLA farm (estimate)	15	-10	1
			** average UK steak is 225 grams (8 oz)

Anders Eldrup, CEO, DONG, 2009

“We will transform our company from 15% renewable energy and 85% of fossil-fuel based energy to the opposite”.

DONG energy

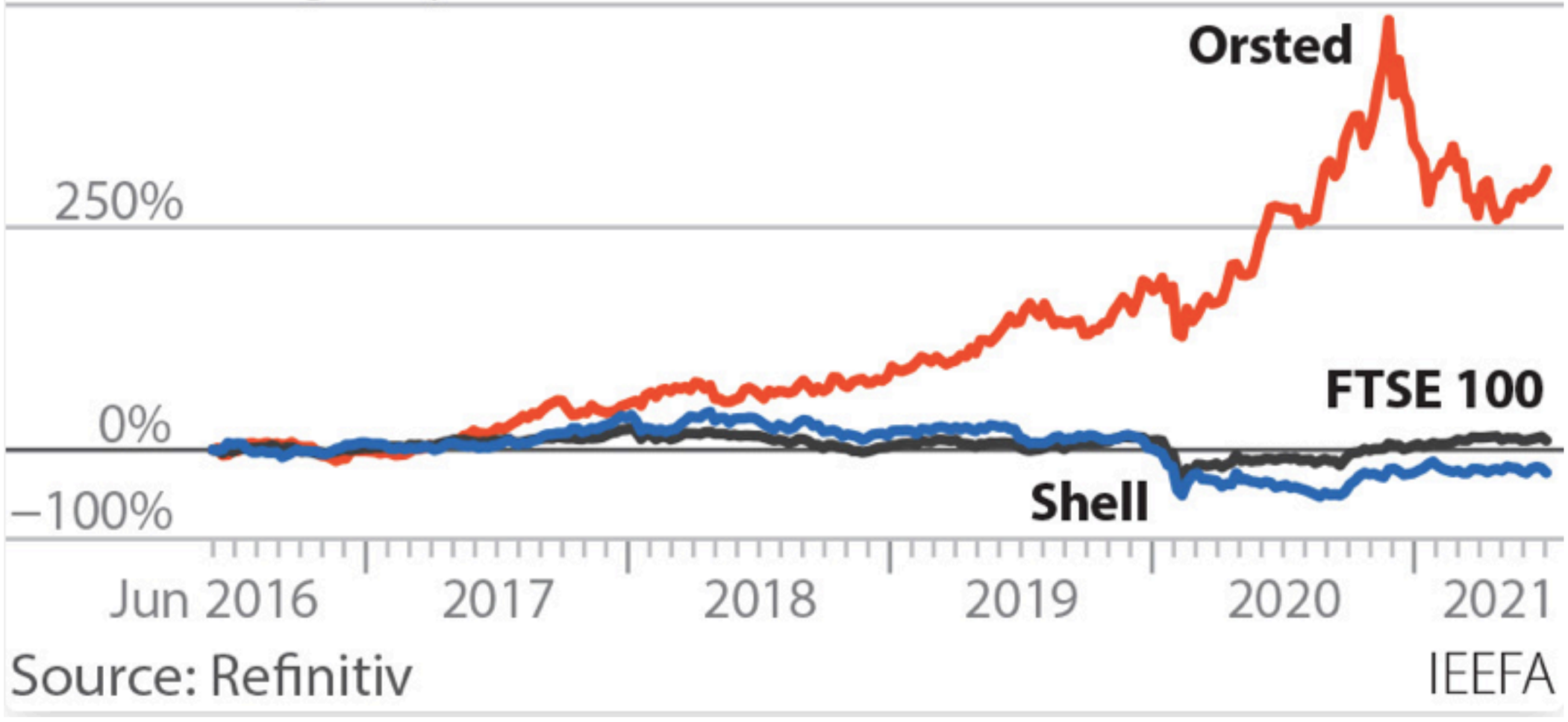
Figure 3 : Orsted Ebitda by business segment



(Source: Bloomberg LP, BloombergNEF.)

Danish Utility's Green Energy Transition

Orsted's shift to renewables yields gains for shareholders



Source: Refinitiv

IEEFA

REGENERATION

Regeneration De klimaatcrisis opgelost in één generatie

Paul Hawken

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www.regeneration.org

This comes first because it encompasses everything. All that needs to be done must be infused by equity. Fairness is about social systems—how we treat one another, how we treat ourselves, and how we treat the living world. The planet has been transformed in a blink of an eye. If we are to transform the climate crisis, we need to transform ourselves, and we had best not blink. Time is of the essence. Social systems require the same level of care, attention, and kindness as ecosystems. They are incomparable yet inseparable. The state of the environment accurately reflects the violence, injustice, disrespect, and harm we do to people of different cultures, beliefs, and skin color. As Jane Goodall points out, you save forests and species by helping to create better lives for people.

The primary method of reversing global greenhouse gas emissions is simple: stop putting them into the atmosphere. It is also the most difficult, while being the greatest economic opportunity. The amount of carbon-emitting fossil fuel consumed is astonishing. Every day, the world burns 100 million barrels of oil, 47 billion pounds of coal, and 11 billion cubic meters of natural gas, which together emit 34 billion tons of carbon dioxide every year. Reduce puts an end to the emissions from agriculture, transport, food systems, deforestation, desertification, and ecosystem destruction. The implementation of renewable energy from wind, solar, energy storage, and microgrids are critical, and well on their way. Equally important is the reduction of energy and material use. Reduce solutions include electric vehicles, micro-mobility, carbon-positive buildings, walkable cities, carbon architecture, electrified buildings, minimized food waste, and the next category: Protect.

Screenshot

Protect is synonymous with preserving, safeguarding, and defending. Terrestrial systems hold 3.3 trillion tons of carbon in and above ground. That is about four times as much carbon than is in the atmosphere. The carbon is contained in forestlands, peatlands, wetlands, grasslands, mangroves, tidal salt marshes, farmland, and rangeland. We need to keep it here on earth. Every year, some portion of each of these ecosystems is degraded, developed, converted, or lost. It is a relatively small percentage, but it adds up. When living systems break down or are destroyed, the plants and organisms below and above ground die, resulting in carbon dioxide emissions. If we lose 1.0 percent of the earth's terrestrial systems, these emissions could increase carbon dioxide in the atmosphere by as much as 100 parts per million.

There is a natural carbon cycle that has been functioning for hundreds of millions of years. Carbon moves in and out of the atmosphere. Forests, plants, and phytoplankton take in carbon dioxide and convert it to oxygen and carbohydrates. Roughly 25 percent of our carbon emissions are absorbed by oceans and transformed into fish, kelp, whales, shells, seals, and bones, but most of it is converted to carbonic acid, which is slowly killing sea life and is leading to a dead ocean. The primary way human beings can sequester is through regenerative agriculture, managed grazing, proforestation, afforestation, degraded land restoration, replanting mangroves, bringing back wetlands, and protecting existing ecosystems. The oft-used term net-zero emissions is not the goal. It is the threshold where the world begins to reduce atmospheric carbon levels back to pre-industrial levels.

Screenshot

Influence encompasses laws, regulations, subsidies, policies, and building codes. It is one thing to cease using plastic bags. It is better to get single-use plastic banned. As each of us endeavors to examine and modify our impact, we gain insight into the cause of degenerative processes, products, and services. You can't fix pollution, degradation, or plastic downstream. The cause is upstream, and that is where influence needs to be directed. It can start with the purchasing policies of one's school, city, or business. Influence can be exerted in the form of letters, emails, or messages to corporations and trade associations. It can mean speaking with or writing to city councils, provincial or state legislators, governors, presidents, and members of Congress or Parliament. It can take the form of boycotts and protests. Each of us has but one voice. When one voice becomes "we," change happens.

In virtually every area of climate, social justice, and the environment, there are organizations that are highly competent at what they do, that are ahead of the curve and embody knowledge and networks that make them the most effective change agents. Links within Nexus in the Action + Connection section offer lists of the organizations around the world that are true regenerators, leaders who are often working with limited resources, citizens doing the extraordinary activities that governments and big business should be undertaking but are not. The lists in Nexus are specific to place, ecosystems, species, social justice, food, pollution, water, and more. You can find them quickly and easily to match the geographies and areas in which you want to help make change.

Screenshot

It's not your job to save the planet. The idea of saving the Earth is a heavy burden and you can't do it anyway.

There is no such thing as carbon pollution. It is part and parcel of virtually everything we need, make, and touch, everything that is alive, delicious, astonishing, and sacred.

We have placed extraordinary amounts of carbon into the atmosphere, and we know exactly how we did it. Today, we know how to bring it back home to bring the planet into balance.

The carbon we bring home is the food needed to regenerate life on Earth. When we feed the Earth we heal the climate.

Regeneration is the default mode of life. You are able to read this sentence because the 30 trillion cells in your body or regenerating every nanosecond.

We can kill, poison, burn, or well life on Earth, but when that ceases, regeneration begins.

Now is the time to bring our life, practices, products, cities, agriculture, and all else into alignment with the living world and end the climate crisis.

Welcome to regeneration.

What are people for?

accelerating the energy revolution
(& maintaining healthy planet)

Antony Turner

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