

Keeping a liveable climate: a necessary purpose for the economy

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IPCC Vice-Chair from 2008 to 2015

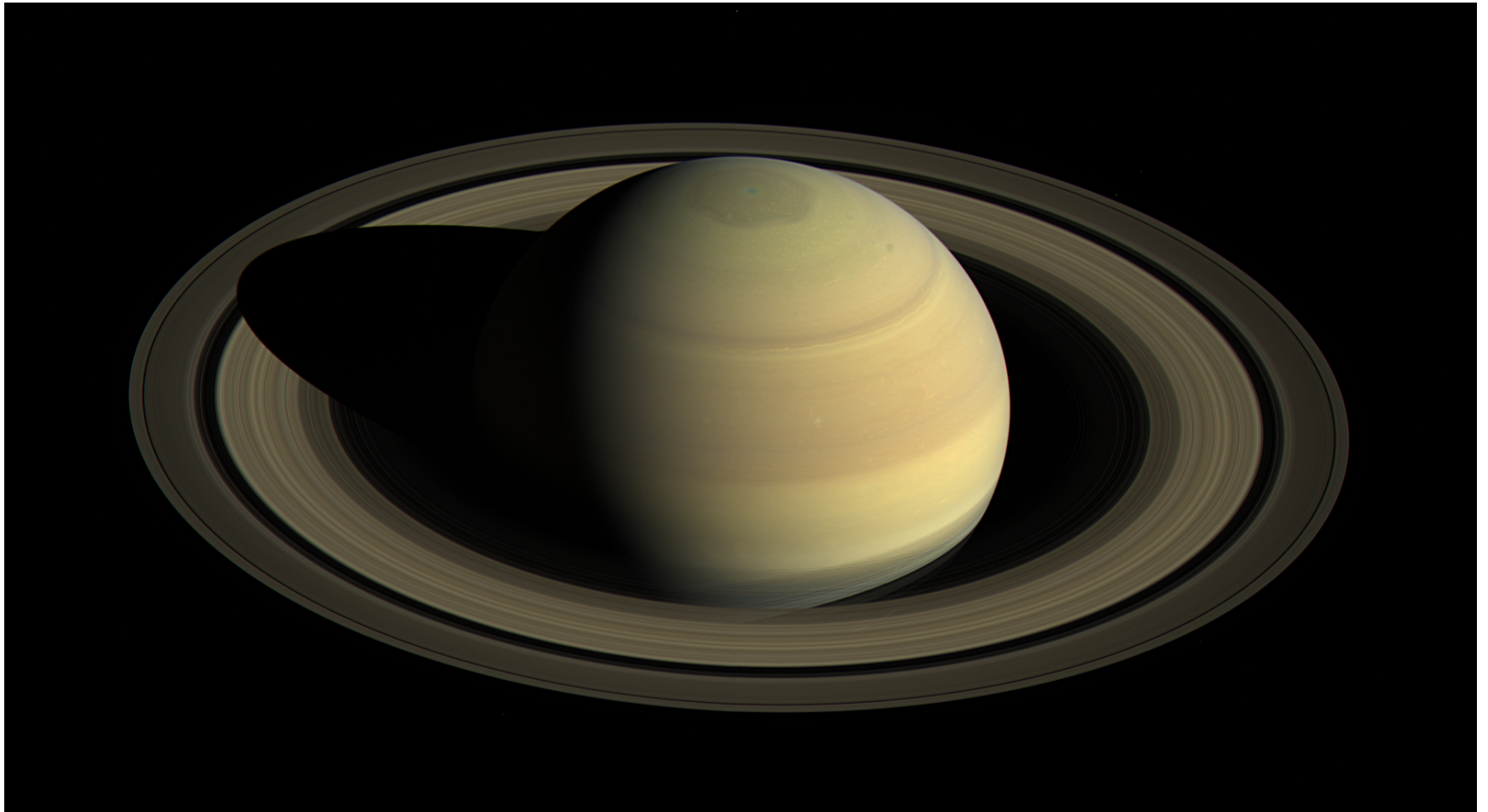
Twitter: @JPvanYpersele

« Leaders Meeting @ Paris », Paris, 23 November 2018

Thanks to the Walloon government for supporting www.pplateforme-wallonne-giec.be & my team at UCLouvain

Reminder: There is no planet B

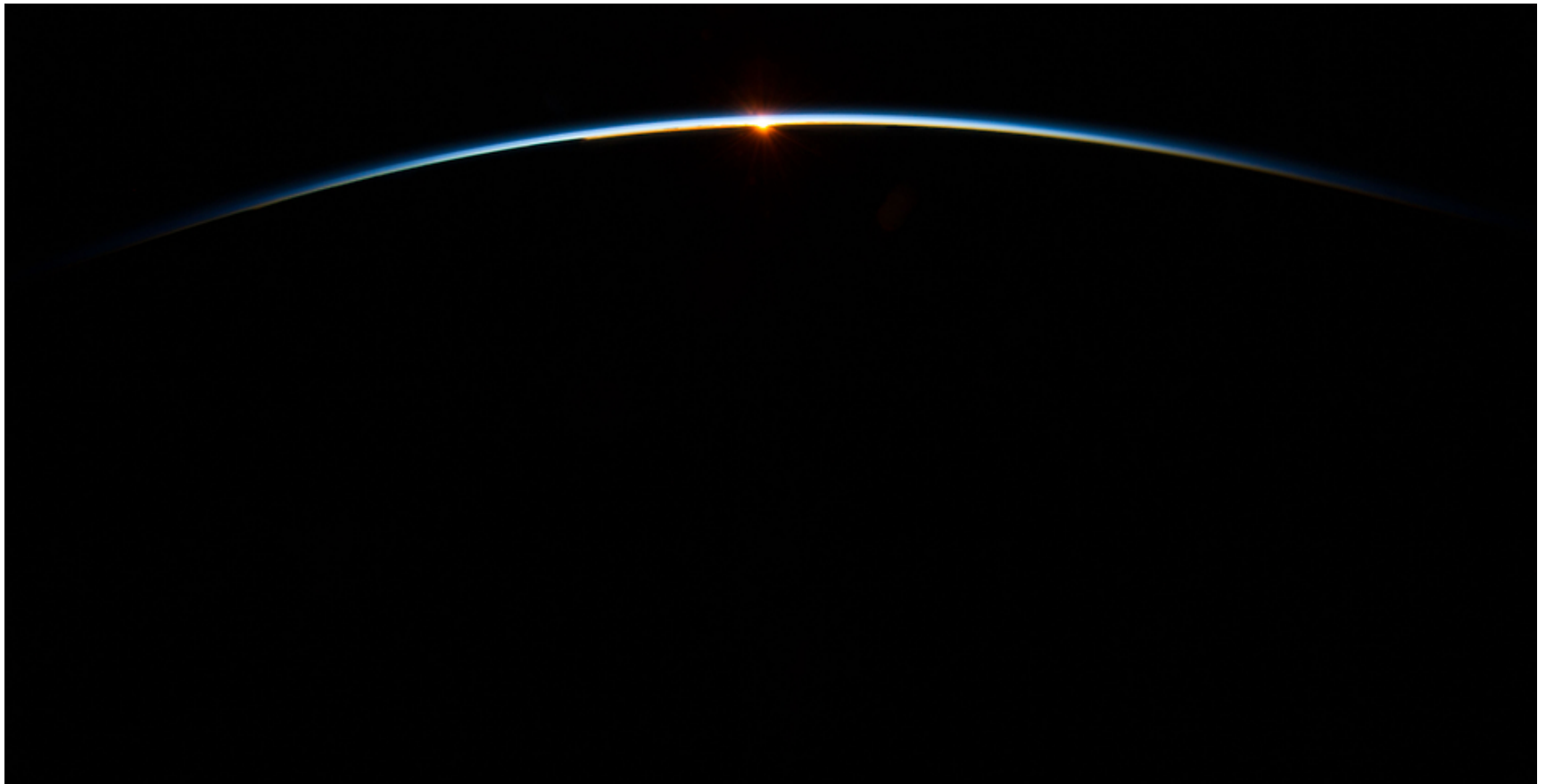
Saturn, as seen on 25-4-2016 from a 3 million km distance by the Cassini satellite launched in October 1997, 40 years after Sputnik



That small blue dot is the Earth, as seen from Cassini, orbiting Saturn, 1.44 billion km from us, on 19-7-2013



Our atmosphere is thin and fragile (as seen by ISS crew on 31 July 2013)



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« Yes, the planet got destroyed. But for a beautiful moment in time we created value for shareholders »



“Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders.”

A worthwhile purpose: keeping our planet liveable

10 facts

10 (elements of) solutions

Fact n° 1: Because we use the atmosphere as a dustbin for our greenhouse gases, we thicken the insulation layer around the planet

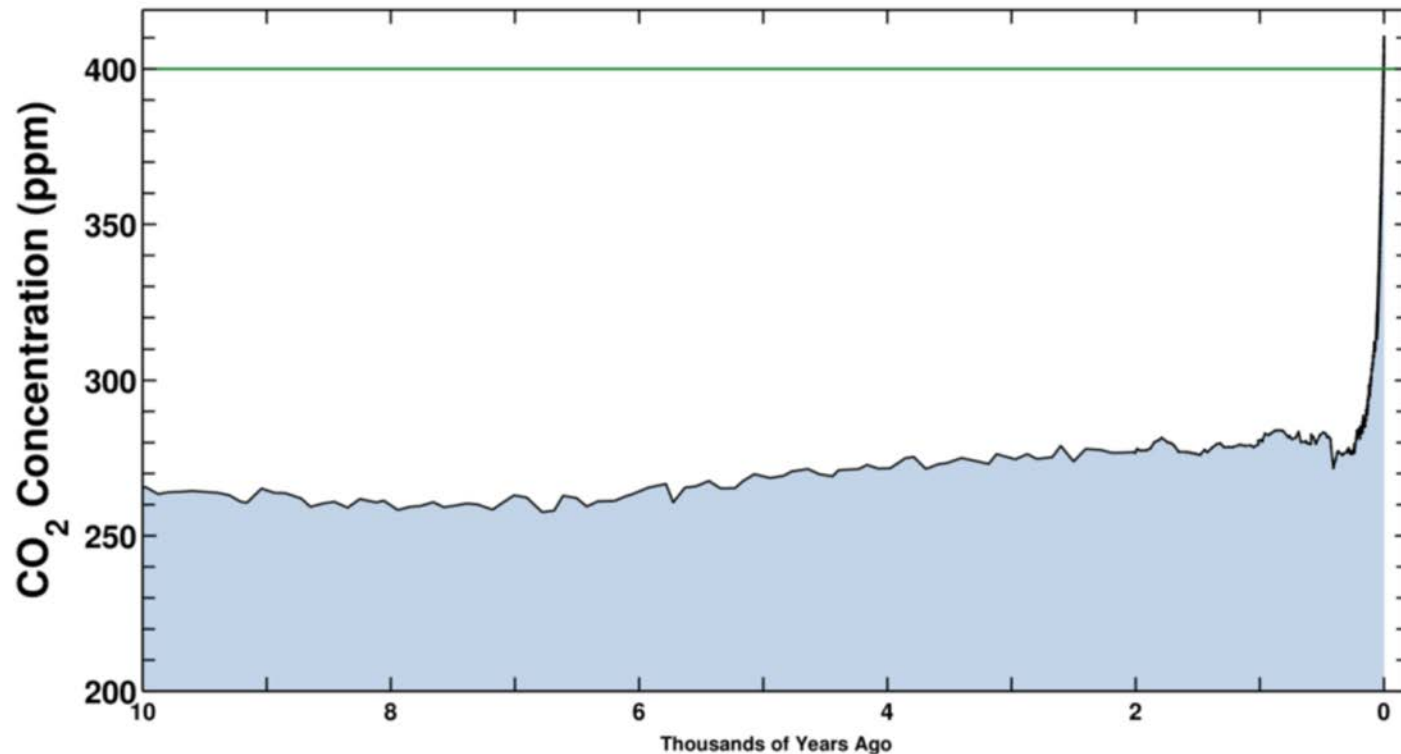
That is why we must cut emissions to ZERO as soon as possible

CO₂ Concentration, 28 May 2018 (Keeling curve)

Latest CO₂ reading
May 28, 2018

411.98 ppm

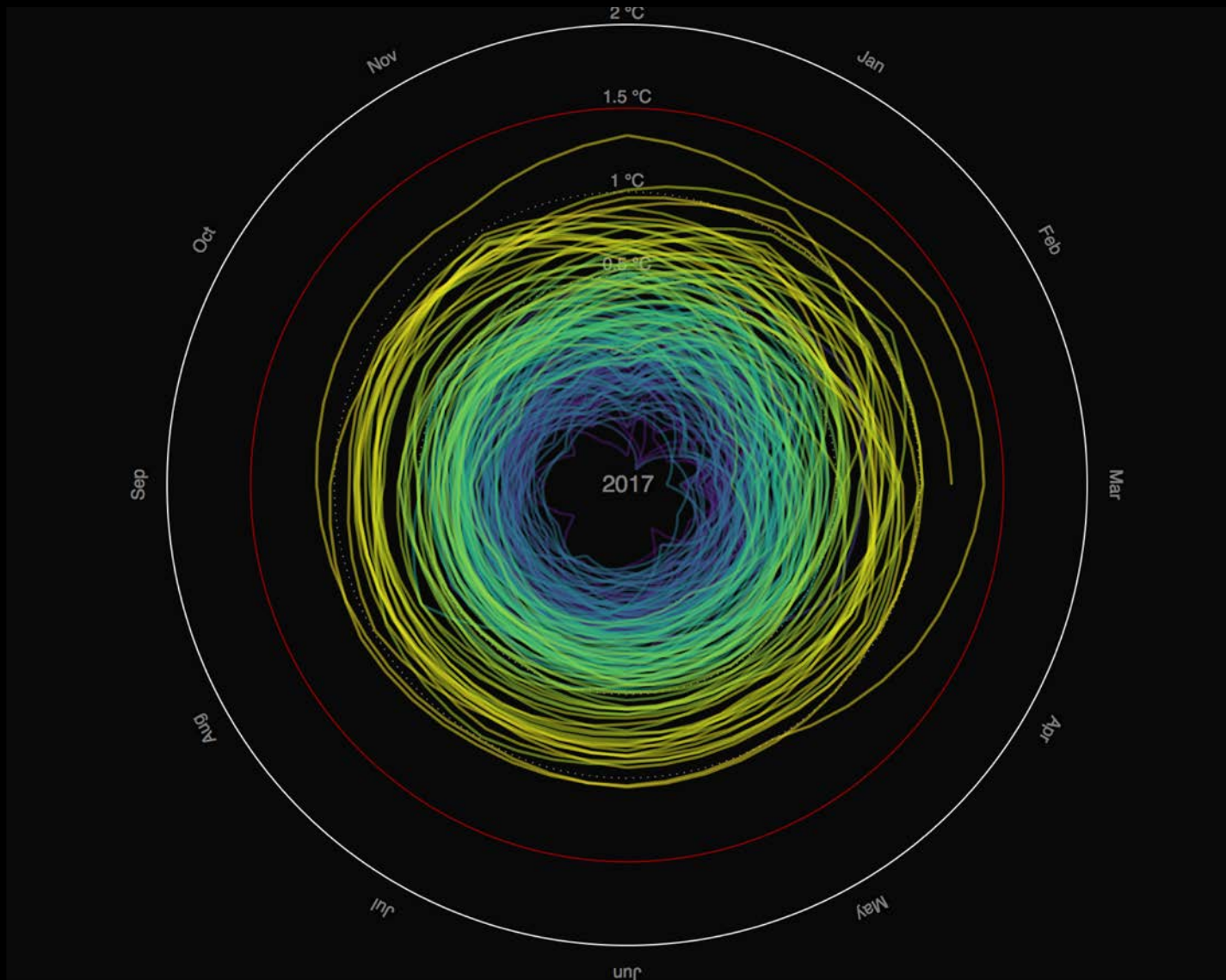
Ice-core data before 1958. Mauna Loa data after 1958.



Source: scripps.ucsd.edu/programs/keelingcurve/

**Fact n° 2: We have changed the
composition of the atmosphere
and disturbed the climate
system**

Temperature spiral



Global Mean Temperature in °C relative to 1850 – 1900

Graph: Ed Hawkins (Climate Lab Book) – Data: HadCRUT4 global temperature dataset

Animated version available on <http://openclimatedata.net/climate-spirals/temperature>

Plateau Glacier (1961) (Alaska)



http://www.weather.com/news/science/environment/alaskas-glaciers-capturing-earth-changing-our-eyes-20131125?cm_ven=Email&cm_cat=ENVIRONMENT_us_share

Plateau Glacier (2003) (Alaska)



http://www.weather.com/news/science/environment/alaskas-glaciers-capturing-earth-changing-our-eyes-20131125?cm_ven=Email&cm_cat=ENVIRONMENT_us_share

Since 1950, extreme hot days and heavy precipitation have become more common



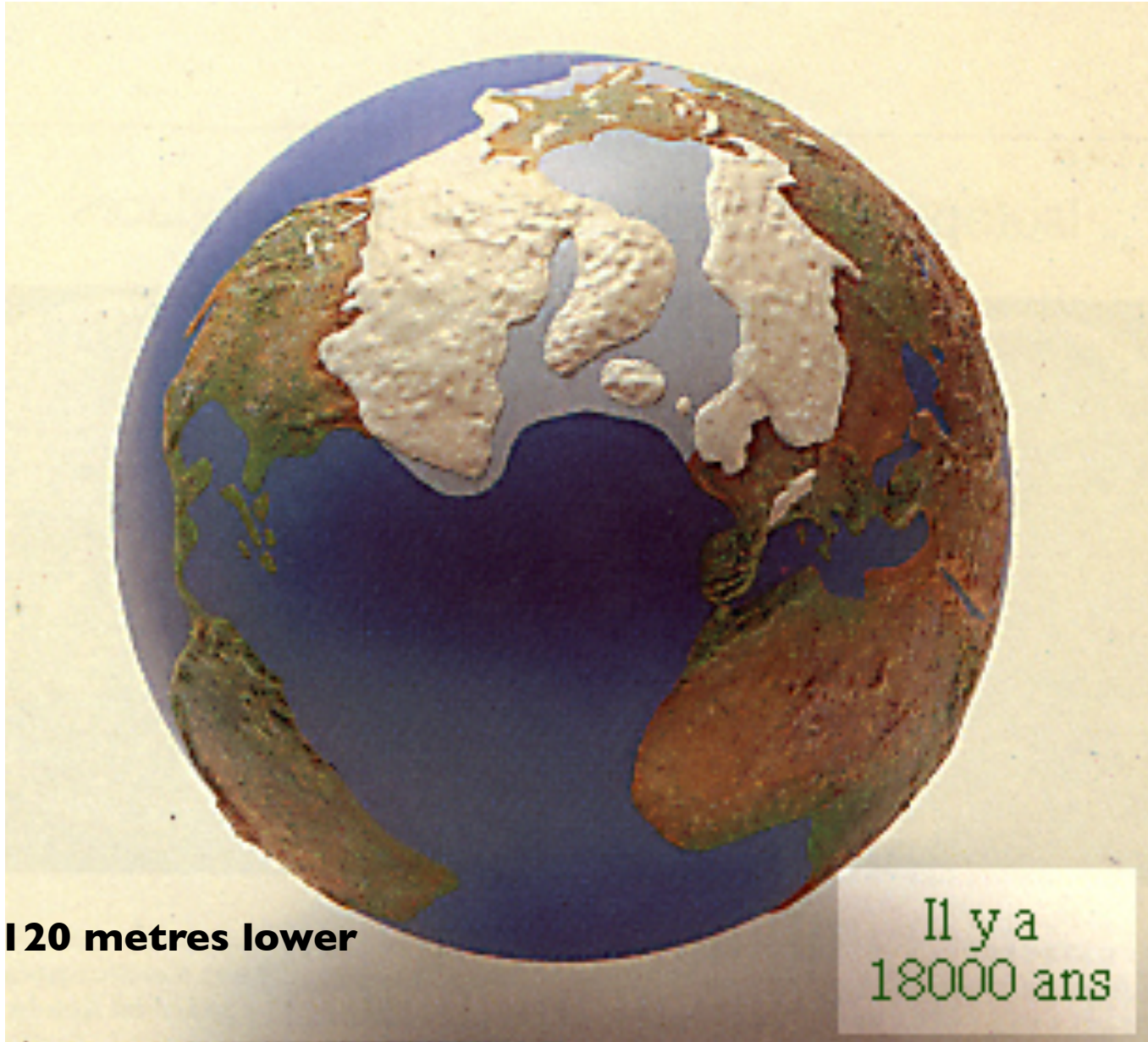
There is evidence that anthropogenic influences, including increasing atmospheric greenhouse gas concentrations, have changed these extremes

Fact n° 3: Average temperature is probably on its way to exceed the « conservation temperature » for the Greenland and (some of the) Antarctic ice sheet

There is therefore a very high risk that average sea level would increase by several metres over the next century or two

18-20000 years ago (Last Glacial Maximum)

With permission from Dr. S. Jousaume, in « Climat d'hier à demain », CNRS éditions.



Sea level: 120 metres lower

Today, with +4-5° C globally

With permission from Dr. S. Joussaume, in « Climat d'hier à demain », CNRS éditions.



Fact n° 4: World Health Organization (2018): Air pollution kills 7 million people per year (inc. 500 000 in Europe)

Sources of air pollution are broadly the same as those affecting climate: fossil fuels, wood and biomass combustion

Fine particulates from fossil fuel and wood burning kill



Photo: Jerzy Gorecki, Pixabay

Children are particularly sensitive to air pollution



Photo: Indiatoday.in, 6-12-2017

**Fact n° 6: Climate change
impacts poor people first, but we
are all on the same spaceship**

Belgian Prime Minister Charles Michel (RTBF,
4 May 2018): « when there is a geopolitical
instability, we pay the cost as well »

Risk = Hazard x Vulnerability x Exposure

(Victims of New Orleans floods after Katrina in 2005)



Effects on the Nile Delta, where more than 10 million people live less than 1 m above sea level



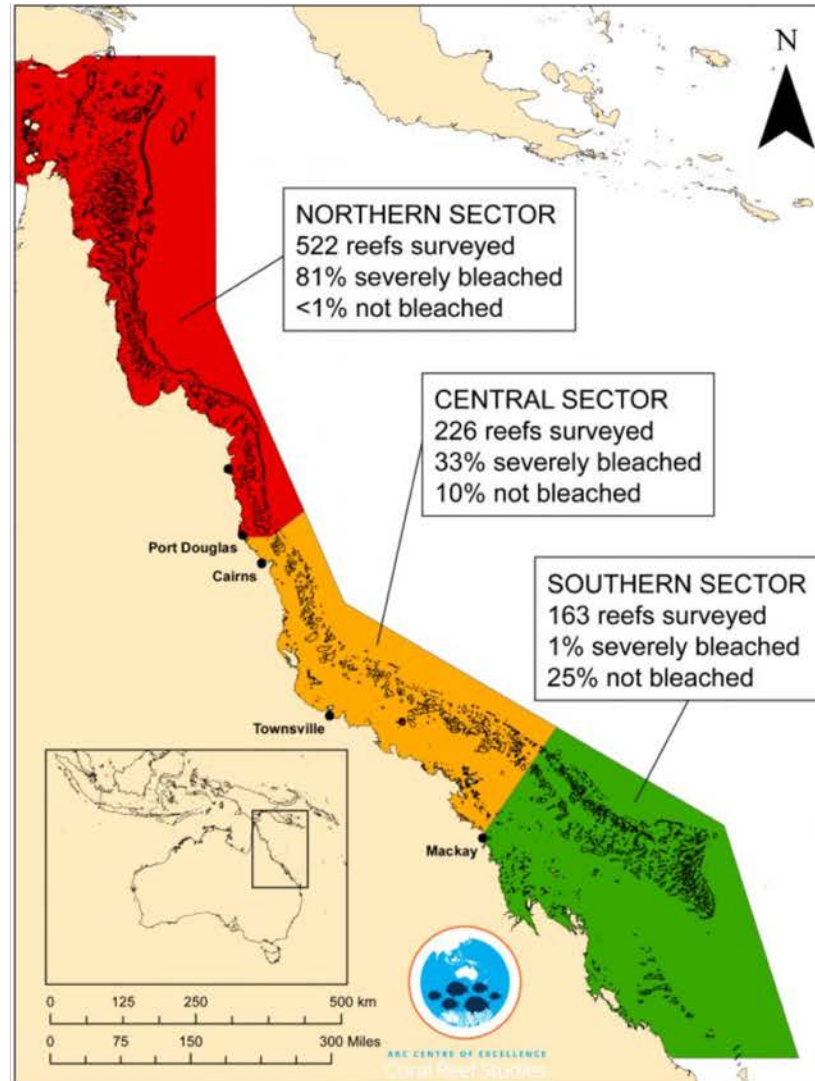
NB: + 1 m is possible
in the next 100 years...

(Time 2001)

Fact n° 6: Ecosystems suffer more and more, while our wellbeing depends on their good state

The « Sixth Extinction » has started, and climate change is one of the causing factors

2016: Only 7% of the Great Barrier Reef has avoided coral bleaching



**Fact n° 7: In the USA alone,
organizations which sow doubt
about climate change spend almost
a billion dollars/year! (Brulle 2014, average
numbers for 2003-2010)**

The European Union fares a little better, but many Brussels lobbyists try to dilute the EU environmental efforts (see the car industry...)

The « merchants of doubt » have evolved in their arguments:

- Existence of global warming
- Human responsibility in the warming
- Cost of decarbonization
- Drawbacks from alternatives

(recent example: so-called enormous needs of cobalt for electric mobility reported on CNN; see critical analysis on <https://www.desmogblog.com/2018/05/02/cnn-wrongly-blames-electric-cars-unethical-cobalt-mining>)

**Fact n° 8: European Union
spends at least 1 billion euros
per day simply to buy fossil fuels
outside its borders.**

True, decarbonizing the EU economy will cost, but not doing it could cost much more in impacts. Saving these 400 billions €/year could offer many opportunities

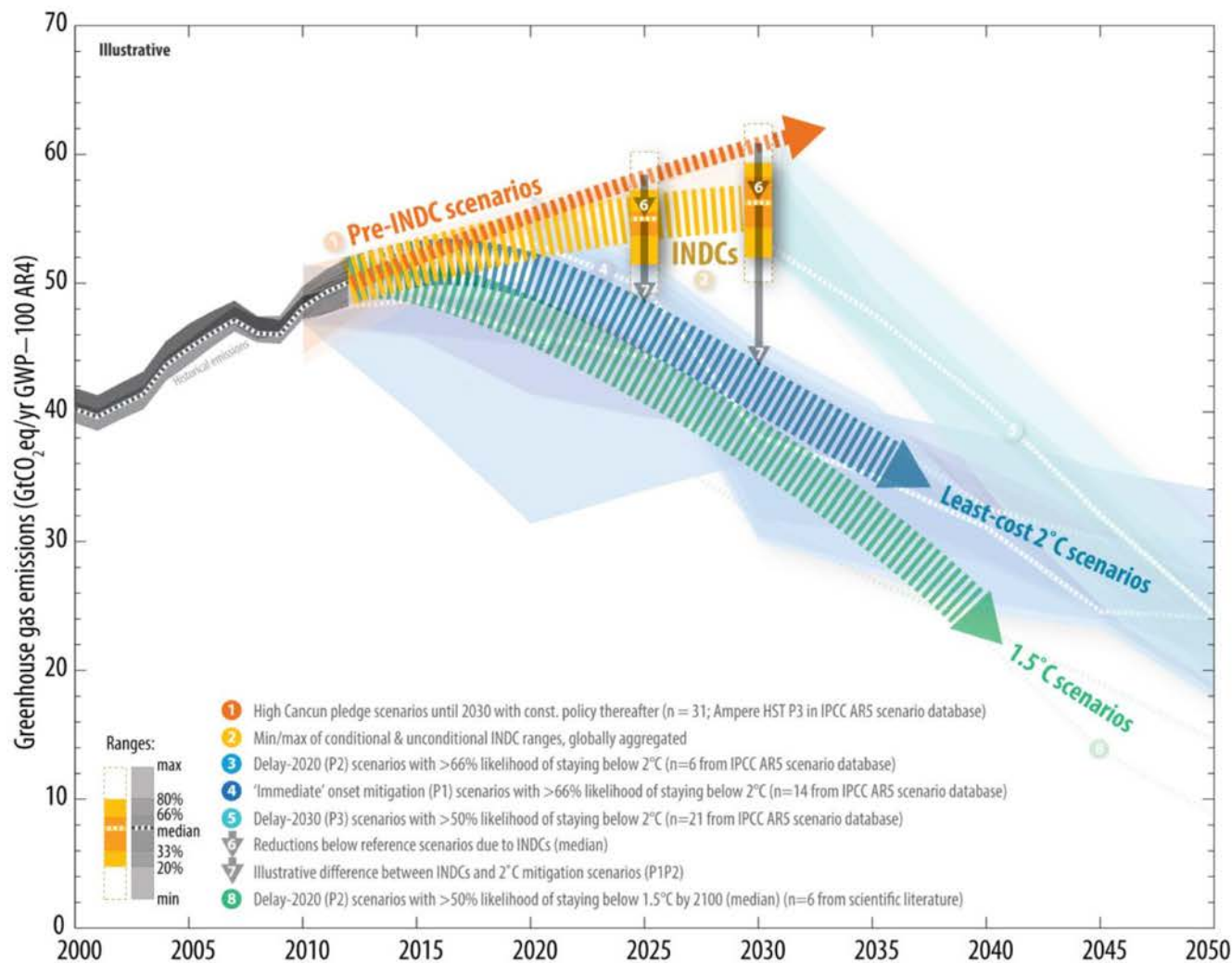
Fact n° 9: China is waking up to the climate and pollution challenge. It might become the world climate leader if the EU (5% of world population in 2050 ?) does not raise its ambition level in line with the Paris Agreement

The US economy will become less and less attractive, as it risks missing the decarbonizing trend. Hopefully, climate measures at the level of US cities and states can somewhat compensate federal actions

Fact n° 10: The present national plans (NDCs) introduced ahead of the Paris Agreement are far from what is needed to respect the 1.5° C objective, and even to stay below 2° C warming

Please note that the Paris Agreement speaks about 1.5° C and « *well below* 2° C » warming, not 2° C

Comparison of global emission levels in 2025 and 2030 resulting from the implementation of the intended nationally determined contributions



UNFCCC, Aggregate effect of the intended nationally determined contributions: an update

<http://unfccc.int/resource/docs/2016/cop22/eng/02.pdf>

**(Element) of solution n° 1: The
survival of humanity and
ecosystems must become a
much higher political priority**

... as if we were all running for our life.

The Paris Agreement (COP21, December 2015)

Vision

« ...strengthen the **global response to the threat of climate change**, in the context of **sustainable development** and efforts to **eradicate poverty** »

Objectives

a) Holding the increase in the global average temperature:

- « *to well below 2°C above pre-industrial levels* »
- « *pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change* »

b) Adaptation and Mitigation

- « *Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and*
- *low greenhouse gas emissions development, in a manner that does not threaten food production*»

c) Finances

- « *Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.* »

Solution n° 2: Economic actors must be confronted much more clearly with their responsibilities

Degrowth of climate-unfriendly activities must be accepted, while growth of activities helping climate protection and poverty eradication must be encouraged

**100 fossil-fuel related
companies were responsible for
71 % of world industrial GHG(*)
emissions between 1988 and
2016**

Of course, their products are bought by billions
of people, but they have a particular
responsibility

Source: The Carbon Majors Database, CDP Carbon Majors Report 2017, CDP, 2017, www.cdp.net
(*) GHG= greenhouse gas

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Solution n° 3: The best understood language is the price. Destroying the environment must become more and more expensive. Collected funds must be used to help the decarbonization, and avoid impacting the poor disproportionately

EU Emission Trading System, CO₂ taxes, fines, internal CO₂ price (firms do « as if » CO₂ emission was expensive). NB: Price must match the effect desired!

**Solution n° 4: Transition towards
a clean and sustainable economy
and energy system must be
« just », and other synergies with
the SDGs must be sought**

**Ex : The Polish energy system cannot
be transformed without facilitating
the coal miners reconversion**



SUSTAINABLE DEVELOPMENT GOALS



Solution n° 5: Before looking at how to produce energy cleanly, much more attention must be given to reducing energy demand and efficiency, in all sectors

All production and consumption patterns must be reconsidered, helped by energy audits, etc.

- **Substantial reductions in emissions to stay under 2° C would require large changes in investment patterns e.g., from 2010 to 2029, in billions US dollars/year:** (mean numbers rounded, IPCC AR5 WGIII Fig SPM 9)

- **energy efficiency: +330**
- **renewables: + 90**
- **power plants w/ CCS: + 40**
- **nuclear: + 40**
- **power plants w/o CCS: - 60**
- **fossil fuel extraction: - 120**

Solution n° 6: Building sector: offers many opportunities in energy saving, economic activity, improving wellbeing...

Trying to practice what I « preach »



Trying to practice what I « preach »



Solution n° 7: Mobility : much more space and priority to pedestrians, bicycles, and public transport; reduce priority given too long to individual transport in urban planning

Electrify remaining vehicles (with clean electricity). Fly less, only if essential.

**Solution n° 8: Food and
agriculture. A possible change with
big positive impact: eat less (red)
meat and cheese, of better quality!
Eat more plant-based food
(produced cleanly)^(*)**

...It is good for health as well!

(*) See « Beyond-Meat », page 14 of De Tijd, page 13 of L'Écho, 23 November 2018

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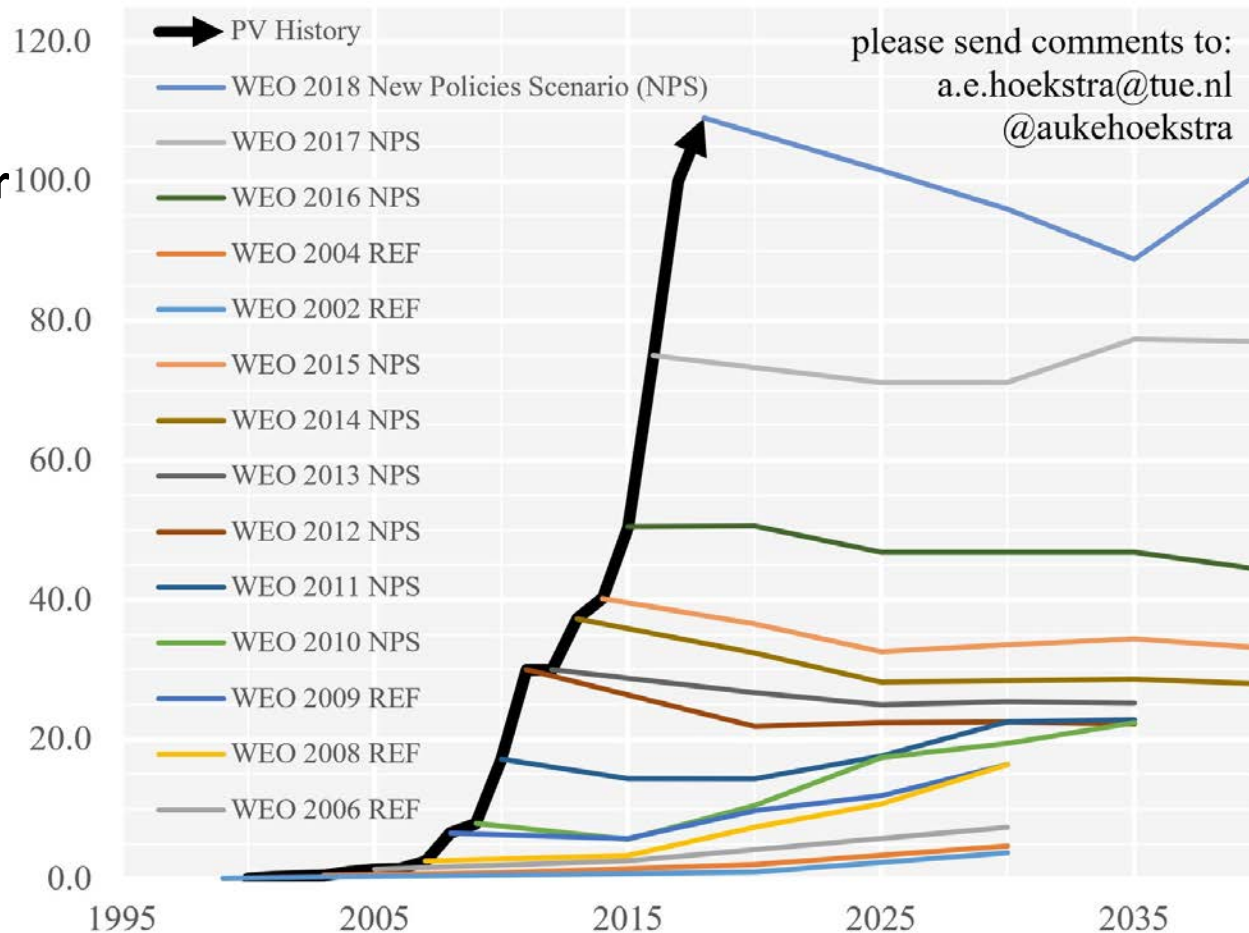
**Solution n° 9: The Sun gives us
in two hours about as much
energy as the world uses in *one*
year, all forms of energy
considered**

The cost of solar kWh is crashing, wind power, heat and electricity storage, and smart grids are moving forward

The International Energy Agency has missed that point...

Annual PV additions: historic data vs IEA WEO predictions
In GW of added capacity per year - source International Energy Agency - World Energy Outlook

GW capacity added per year



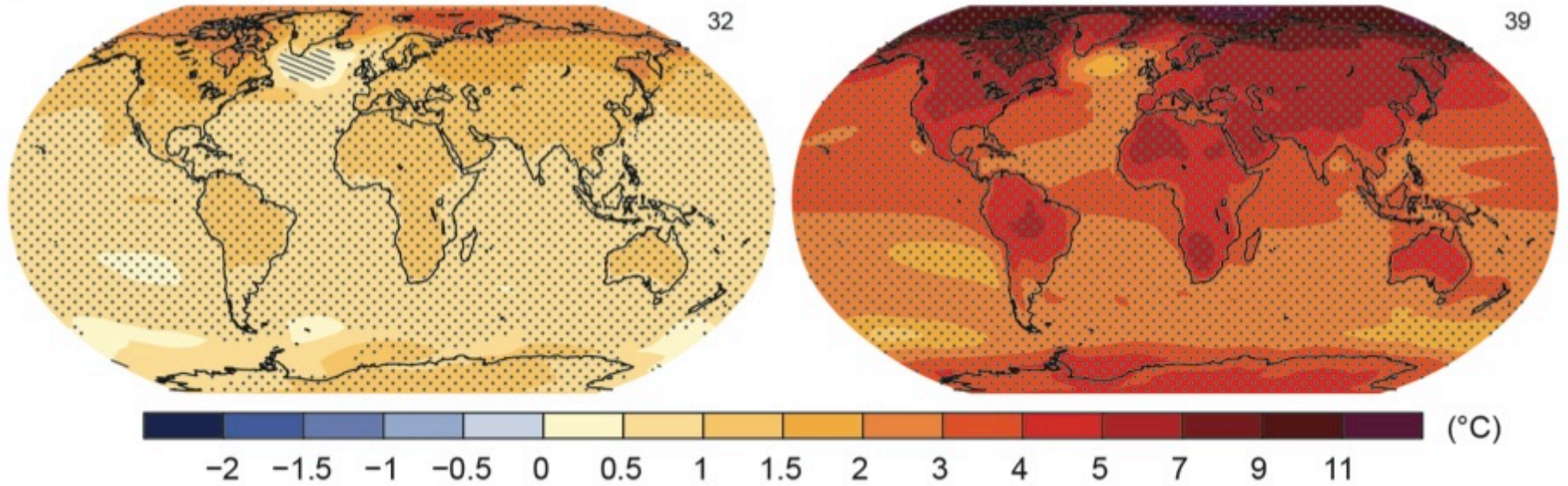
**Solution n° 10: Banks and the
finance sector increasingly see the
opportunities in climate-friendly and
ethical investments promoting the
17 Sustainable Development Goals**

... but their ethical/green
investments are still marginal for
most banks

RCP2.6

RCP8.5

Change in average surface temperature (1986–2005 to 2081–2100)



Humanity has the choice

Bij EPO (2018)

**Voorwoord:
Jill Peeters**



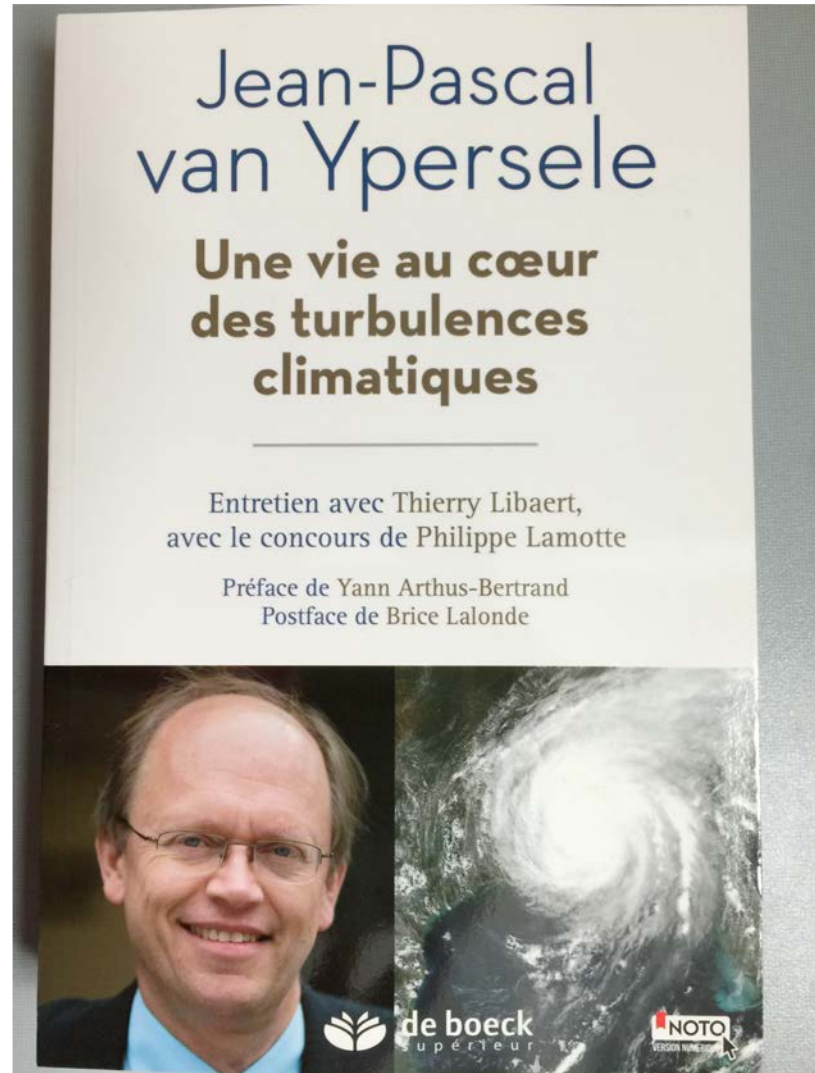
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To go further :

- www.climate.be/vanyp : my slides (under « conferences)
- www.ipcc.ch : IPCC
- www.realclimate.org : answers to the merchants of doubt arguments
- www.skepticalscience.com : same
- www.plateforme-wallonne-giec.be : IPCC-related in French, Newsletter, latest on SR15
- **Twitter: @JPvanYpersele & @IPCC_CH**