

# **Shaping and funding Belgium's energy transition: Why it's so urgent, what can be done**

**Jean-Pascal van Ypersele**

**Université catholique de Louvain, Belgium**

**IPCC Vice-Chair from 2008 to 2015**

**Chair, Energy & Climate WG, Federal Sustainable  
Development Council (CFDD-FRDO)**

**Twitter: @JPvanYpersele**

**Outlook for Renewable Energies in Belgium,  
EUFORES Workshop, Federal Parliament, Brussels, 5 February 2019**

**Thanks to the Walloon government for supporting [www.pplateforme-wallonne-giec.be](http://www.pplateforme-wallonne-giec.be) & my team at UCLouvain**

# Simple ideas (1)

- We are installing insulation material in the wrong place: in the atmosphere!
- The #YouthForClimate who demonstrate these days will suffer a lot from that mistake
- Emissions need to go to ZERO asap!

## Simple ideas (2)

- Energy efficiency and renewables are key
- Technology is not sufficient: societal changes needed as well
- Much more political will, and a much better coordination of policies are needed in Belgium (see « climate law »)

## Simple ideas (3)

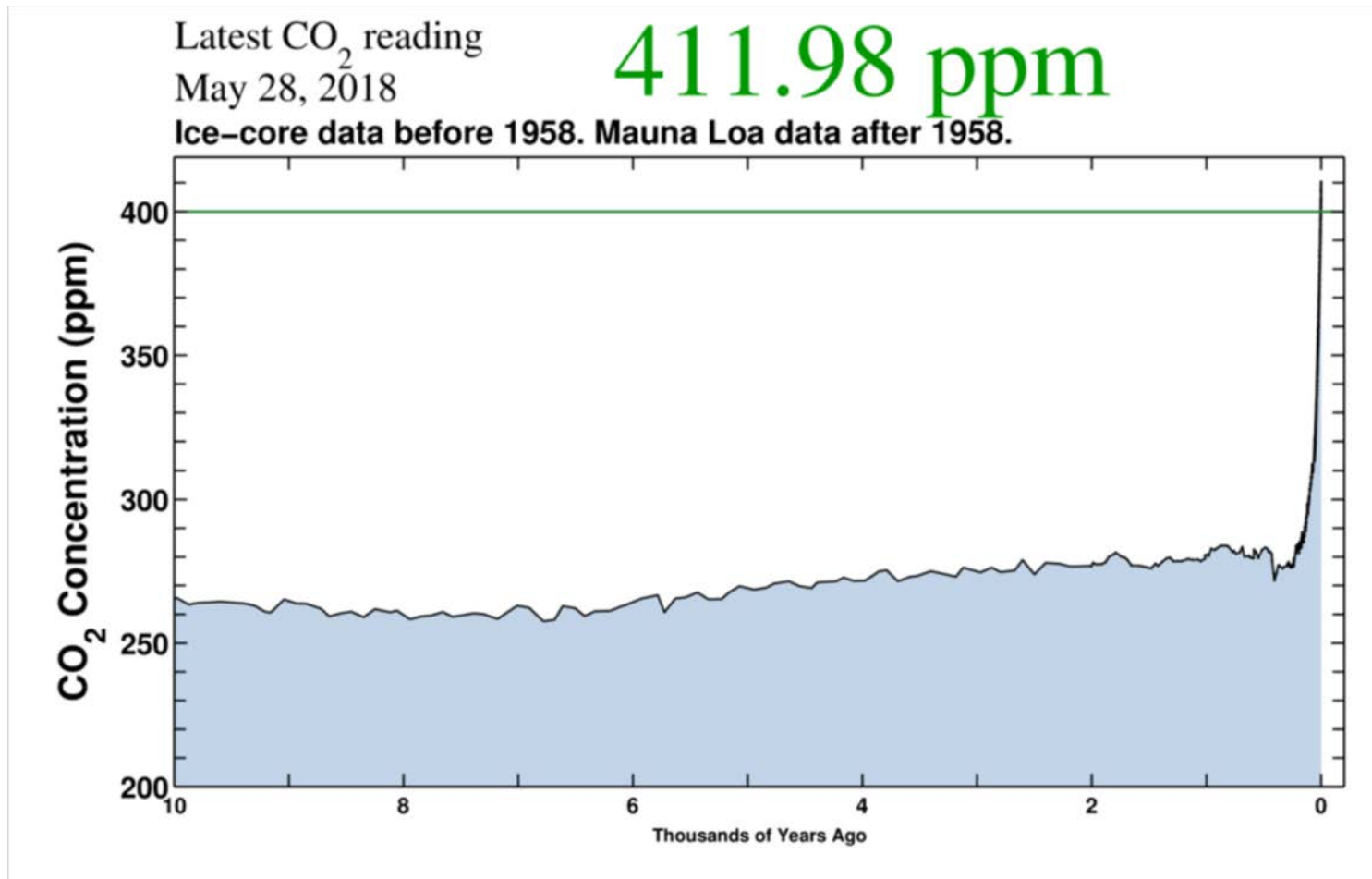
- The transition must be just (see the « gilets jaunes »), and it's possible
- Many synergies are possible with the other SDGs (Sustainable Devt Goals)
- Much money is available, but most of it is focused on short-term profit, and this must change

**Fact: 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**

@JPvanYpersele

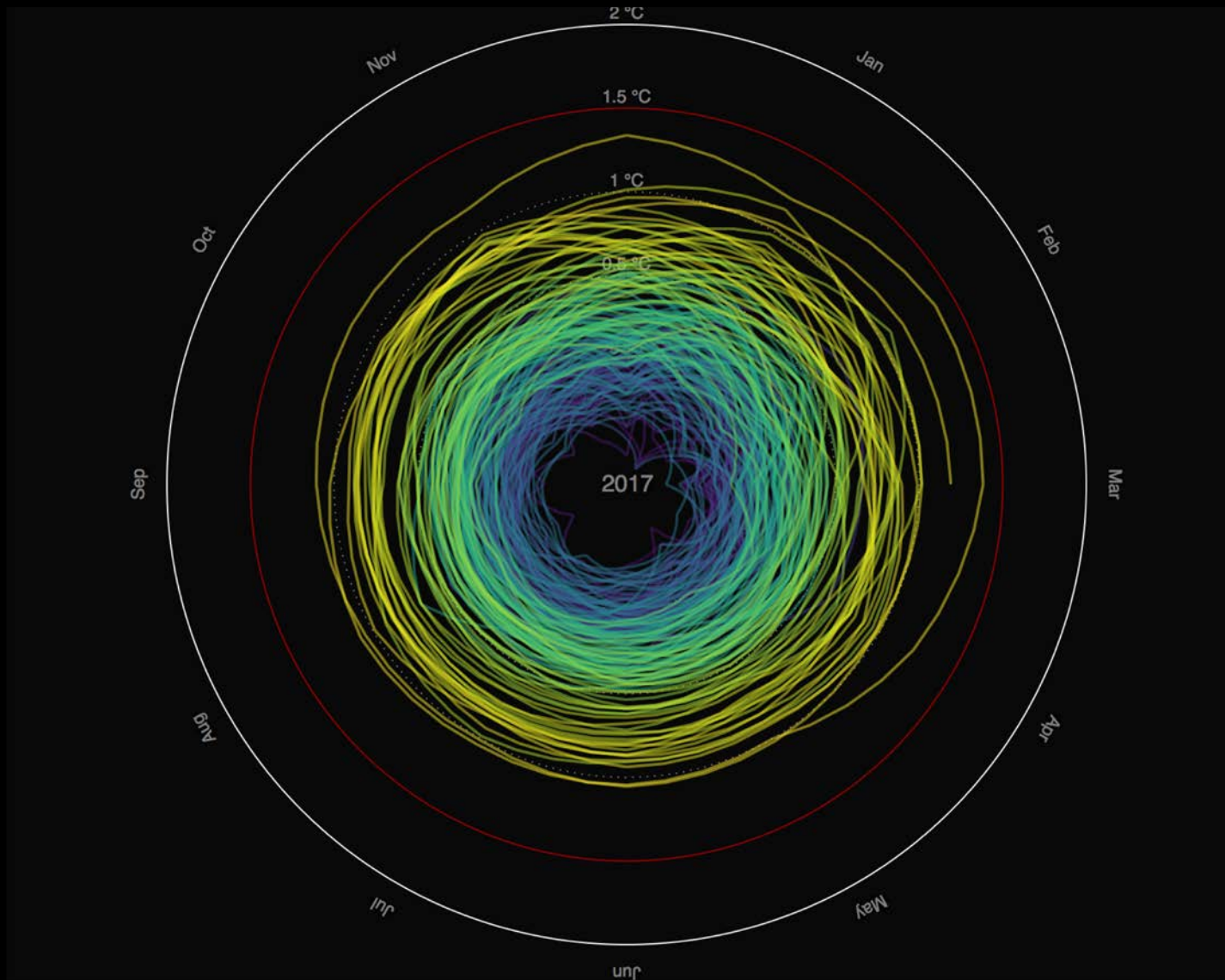
# CO<sub>2</sub> Concentration, 28 May 2018 (Keeling curve)



Source: [scripps.ucsd.edu/programs/keelingcurve/](https://scripps.ucsd.edu/programs/keelingcurve/)

**Fact: 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>

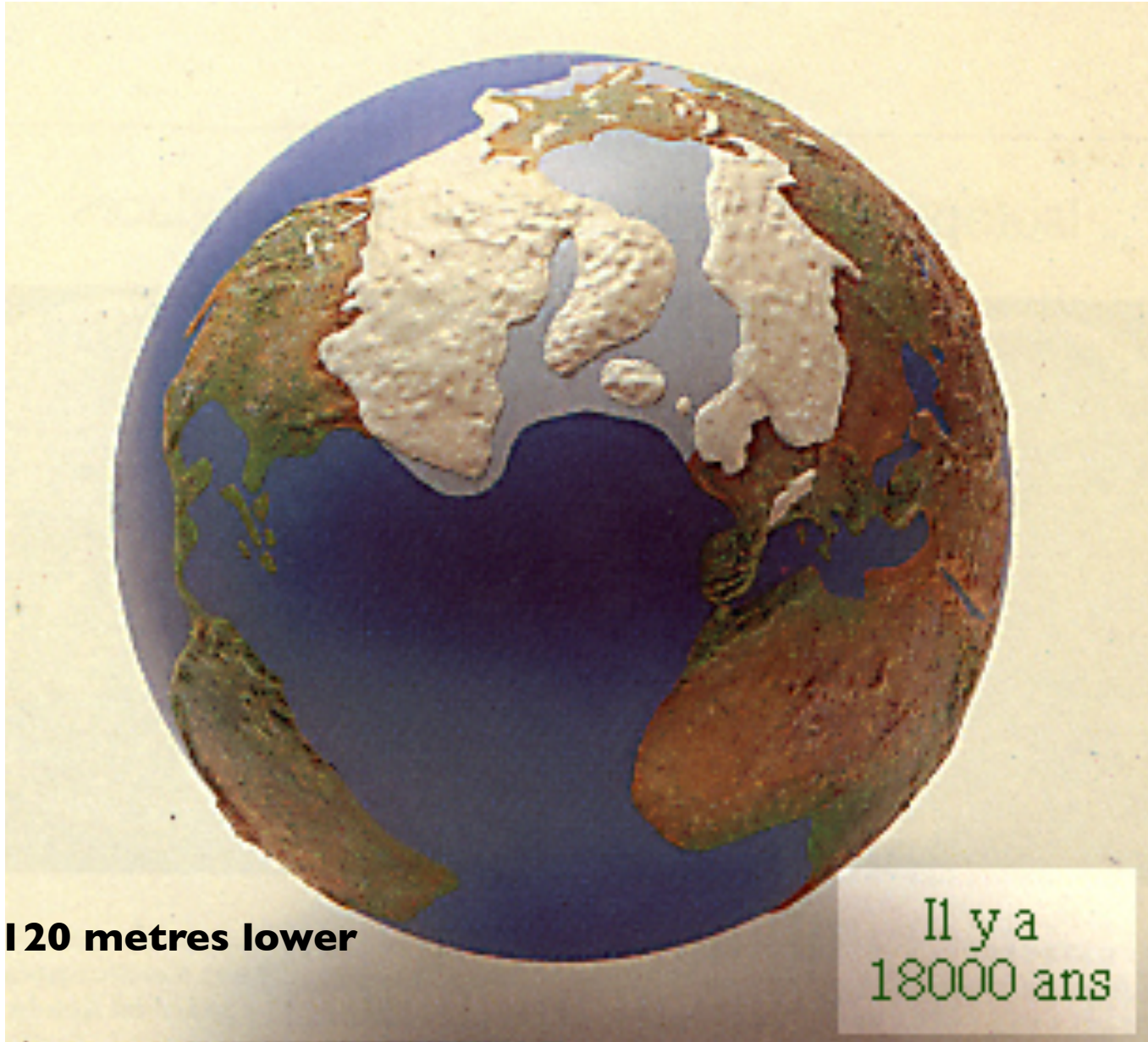


**Fact: Average temperature is probably on its way to exceed the « conservation temperature » for the Greenland and (some of the) Antarctic ice sheet**

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: Air pollution kills 7 million people per year (inc. 500 000 in Europe) (World Health Organization, 2018)**

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

# Children are particularly sensitive to air pollution

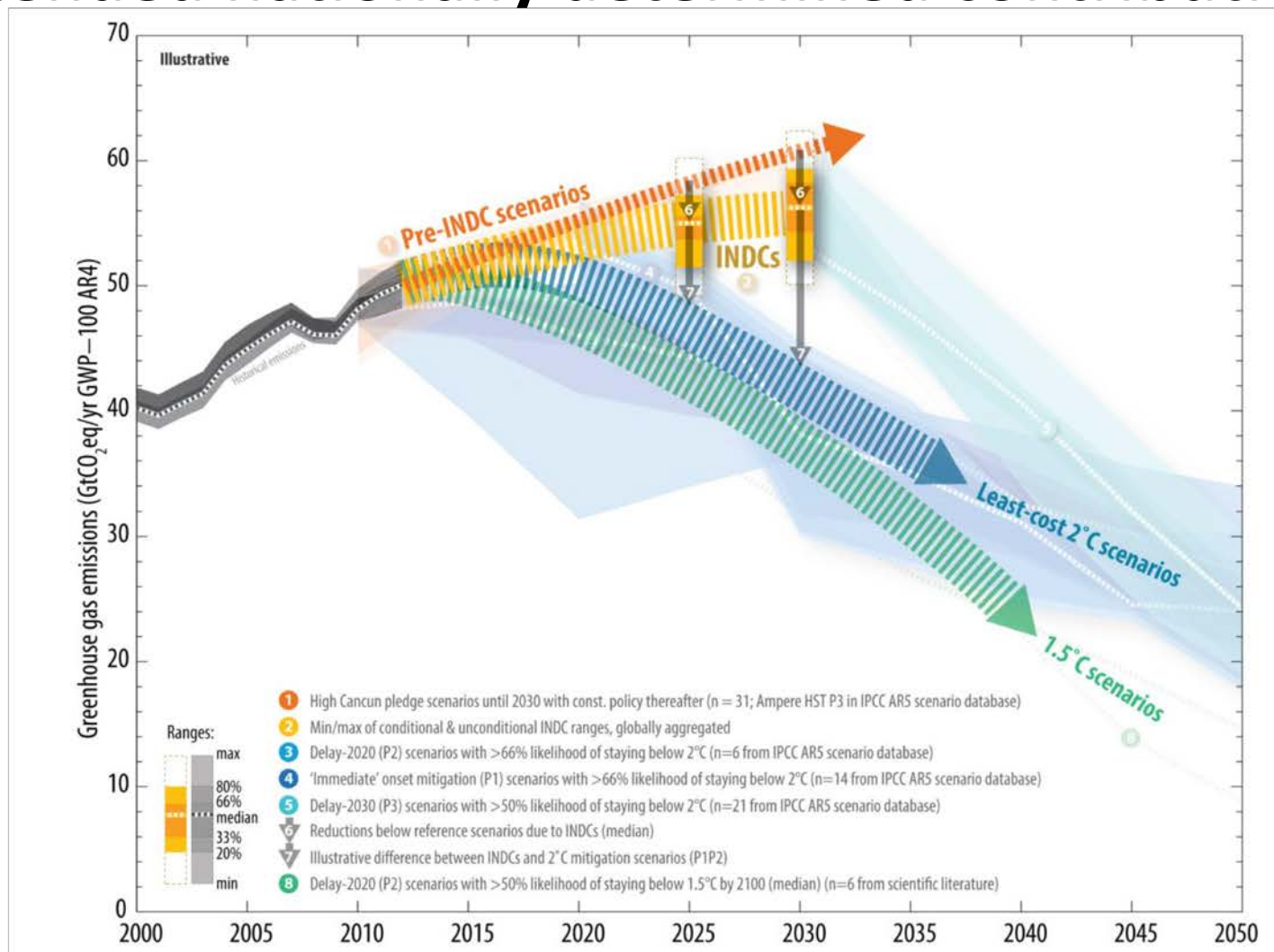


Photo: Indiatoday.in, 6-12-2017

**Fact: 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



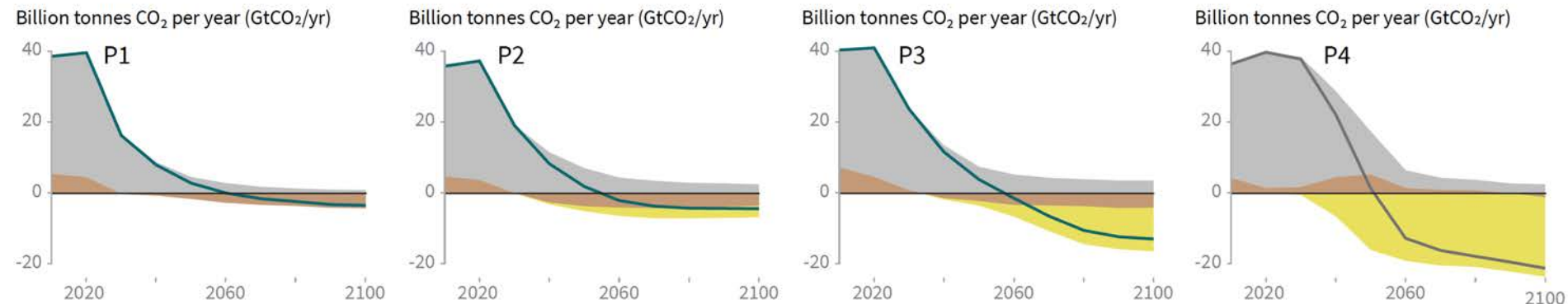
UNFCCC, Aggregate effect of the intended nationally determined contributions: an update

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

# Four illustrative model pathways in the IPCC SR15:

## Breakdown of contributions to global net CO<sub>2</sub> emissions in four illustrative model pathways

● Fossil fuel and industry ● AFOLU ● BECCS



**P1:** A scenario in which social, business, and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A down-sized energy system enables rapid decarbonisation of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

**P2:** A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

**P3:** A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

**P4:** A resource and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.



# Four illustrative model pathways in the IPCC SR15:

Global indicators	P1	P2	P3	P4	Interquartile range
Pathway classification	No or low overshoot	No or low overshoot	No or low overshoot	High overshoot	No or low overshoot
CO <sub>2</sub> emission change in 2030 (% rel to 2010)	-58	-47	-41	4	(-59,-40)
↳ in 2050 (% rel to 2010)	-93	-95	-91	-97	(-104,-91)
Kyoto-GHG emissions* in 2030 (% rel to 2010)	-50	-49	-35	-2	(-55,-38)
↳ in 2050 (% rel to 2010)	-82	-89	-78	-80	(-93,-81)
Final energy demand** in 2030 (% rel to 2010)	-15	-5	17	39	(-12, 7)
↳ in 2050 (% rel to 2010)	-32	2	21	44	(-11, 22)
Renewable share in electricity in 2030 (%)	60	58	48	25	(47, 65)
↳ in 2050 (%)	77	81	63	70	(69, 87)
Primary energy from coal in 2030 (% rel to 2010)	-78	-61	-75	-59	(-78, -59)
↳ in 2050 (% rel to 2010)	-97	-77	-73	-97	(-95, -74)
from oil in 2030 (% rel to 2010)	-37	-13	-3	86	(-34,3)
↳ in 2050 (% rel to 2010)	-87	-50	-81	-32	(-78,-31)
from gas in 2030 (% rel to 2010)	-25	-20	33	37	(-26,21)
↳ in 2050 (% rel to 2010)	-74	-53	21	-48	(-56,6)
from nuclear in 2030 (% rel to 2010)	59	83	98	106	(44,102)
↳ in 2050 (% rel to 2010)	150	98	501	468	(91,190)
from biomass in 2030 (% rel to 2010)	-11	0	36	-1	(29,80)
↳ in 2050 (% rel to 2010)	-16	49	121	418	(123,261)
from non-biomass renewables in 2030 (% rel to 2010)	430	470	315	110	(243,438)
↳ in 2050 (% rel to 2010)	832	1327	878	1137	(575,1300)
Cumulative CCS until 2100 (GtCO <sub>2</sub> )	0	348	687	1218	(550, 1017)
↳ of which BECCS (GtCO <sub>2</sub> )	0	151	414	1191	(364, 662)
Land area of bioenergy crops in 2050 (million hectare)	22	93	283	724	(151, 320)
Agricultural CH <sub>4</sub> emissions in 2030 (% rel to 2010)	-24	-48	1	14	(-30,-11)
in 2050 (% rel to 2010)	-33	-69	-23	2	(-46,-23)
Agricultural N <sub>2</sub> O emissions in 2030 (% rel to 2010)	5	-26	15	3	(-21,4)
in 2050 (% rel to 2010)	6	-26	0	39	(-26,1)

NOTE: Indicators have been selected to show global trends identified by the Chapter 2 assessment. National and sectoral characteristics can differ substantially from the global trends shown above.

\* Kyoto-gas emissions are based on SAR GWP-100

\*\* Changes in energy demand are associated with improvements in energy efficiency and behaviour change

# For 3 illustrative model pathways that limit warming with no or limited overshoot

(%rel to 2010)	P1	P2	P3
CO <sub>2</sub> (2030/2050)	-58 / - 93	-47 / -95	-41 / -91
Final energy demand (2030/2050)	-15 / -32	-5 / +2	+17 / +21
Primary energy from coal (2030/2050)	-78/-97	-61/-77	-75/-73
Primary energy from non-biomass renewables (2030/2050)	+430/+832	+470/+1327	+315/+878
Primary energy from nuclear (%rel to 2010) (2030/2050)	+59/+150	+83/+98	+98/+501

IPCC SR15  
Fig SPM 3b

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

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

**Fact: 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

- **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: 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, reduce other taxes, and avoid impacting the poor disproportionately**

EU Emission Trading System, CO<sub>2</sub> taxes, fines, internal CO<sub>2</sub> price (firms do « as if » CO<sub>2</sub> emission was expensive). NB: Price must match the effect desired!



# SUSTAINABLE DEVELOPMENT GOALS



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

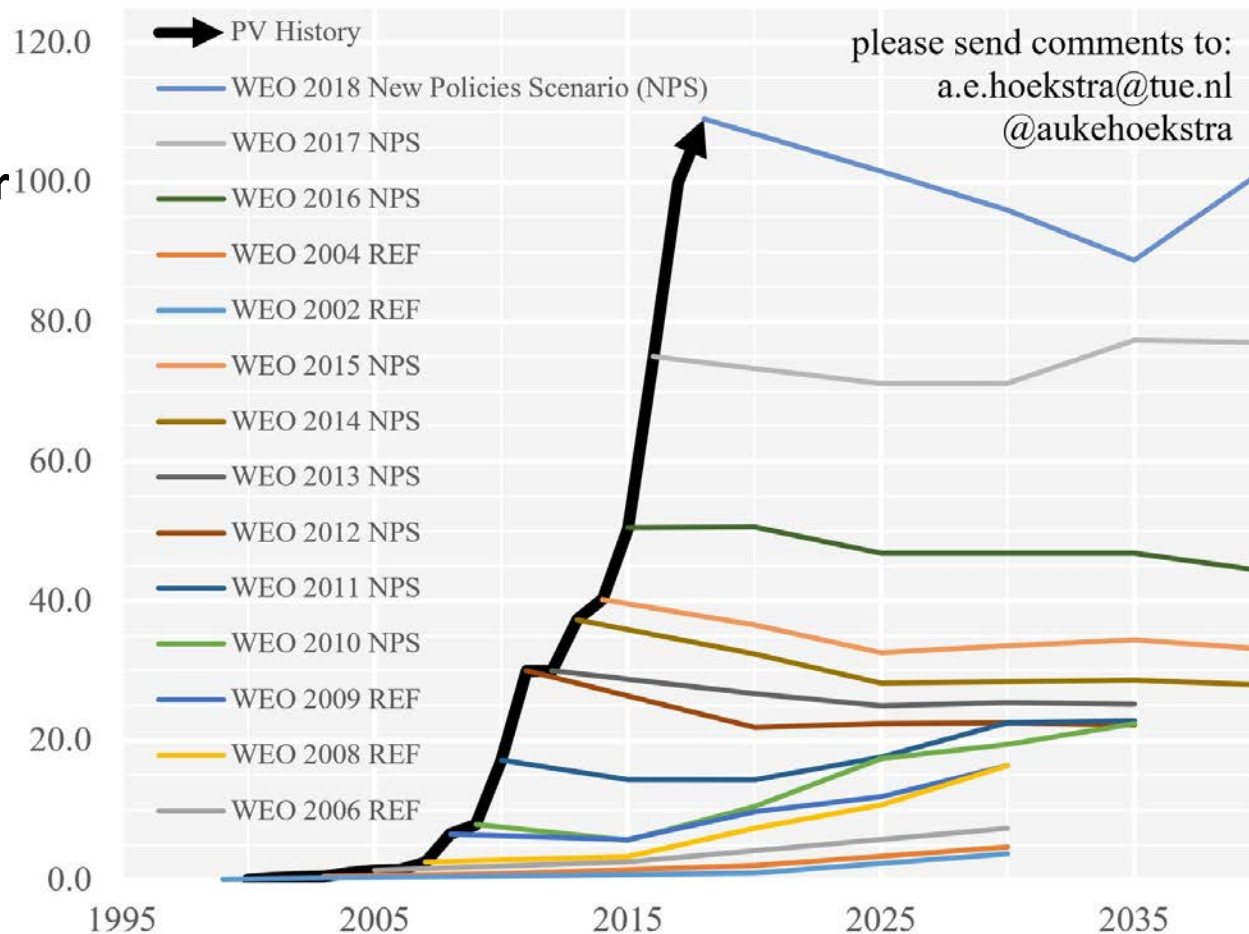
The cost of solar kWh is crashing, wind  
power, heat and electricity storage, and  
smart grids are moving forward



# 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**



**Fact: 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 (renewables, electromobility...)

(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> )

# Opinions of the Federal Council for Sustainable Development

EUFORES Workshop at Federal  
Parliament of Belgium

05/02/2019

Prof. Jean-Pascal van Ypersele  
President WG Energy & Climate FCSD



# Opinion on the National Energy and Climate Plan 2030

[12] A revision of energy fiscal policy, progressively integrating the environmental dimension and carbon pricing.

[13] Complete information needed on the life cycle impact of policies and measures and their potential transfers (reporting on emissions and *carbon leakage*...).

[14] Sufficient means for all departments.

[15] Put in place mechanisms to ensure a good coordination.

(See [www.frdo-cfdd.be](http://www.frdo-cfdd.be) : Federal Council Sustainable Devt)



# Opinion on the National strategic investments pact

[4] → [10]: Options to higher public investments within the European context.

[19] – [20]: Options to reinforce credit to sustainable projects.

[21] How to redirect households savings.

[22] Role of pension funds.

[23] Role of sustainable cooperatives.

# Opinion on the governance of climate policy (27/05/2014)

[5] Because the Federal State and the Regions have competencies to achieve the transition, a systematic coordination at Belgian level will be needed to succeed → mutual principle : each entity should act in a way that reinforces the efficiency of the policies of other entities.

# Opinion on the transition of Belgium towards a low carbon society in 2050 (27/06/2014)

[18] To facilitate the transition towards a low carbon society, energy savings are essential → huge potential in the Belgian building sector.

[51] System of third-party investor useful to finance low carbon investment (energy renovation of buildings,...).



Trying to practice what I « preach »



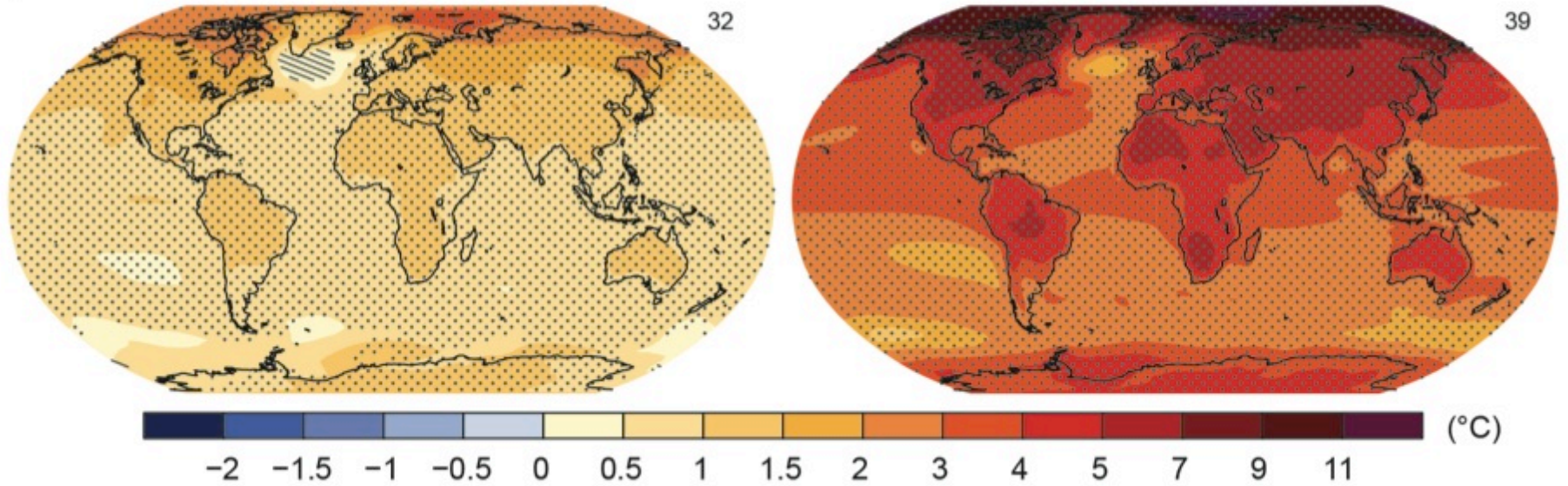
Trying to practice what I « preach »



# RCP2.6

# RCP8.5

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



Humanity has the choice

This gives me  
hope:

Well-  
informed  
young people  
speaking  
truth to  
power



With @GretaThunberg at COP24

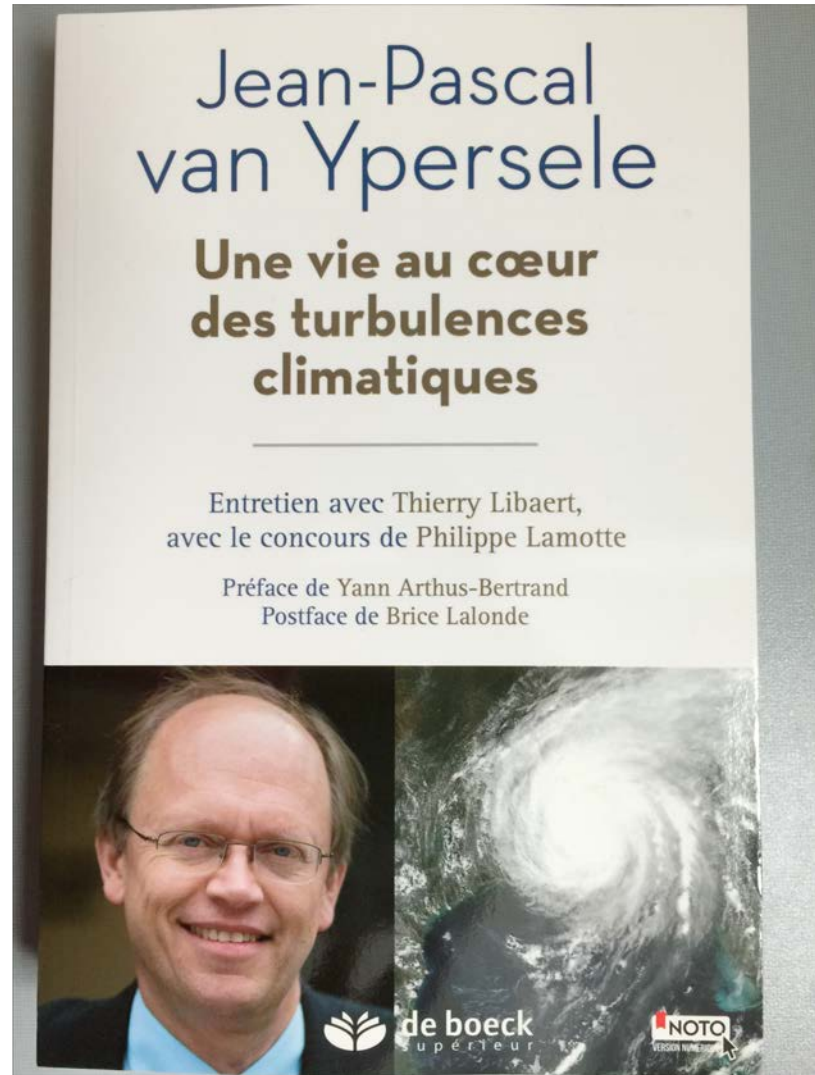
**Pour en savoir plus:**

**Lisez mon livre, où  
j'aborde tous ces sujets**

**Publié chez De Boeck  
supérieur**

**Préface: Yann Arthus-  
Bertrand**

**Postface: Brice Lalonde**



**Bij EPO (2018)**

**Voorwoord:  
Jill Peeters**



# To go further :

- [www.climate.be/vanyp](http://www.climate.be/vanyp) : my slides (under « conferences) & my letter to my great-grandchildren
- [www.ipcc.ch](http://www.ipcc.ch) : IPCC
- [www.frdo-cfdd.be](http://www.frdo-cfdd.be) : Federal Council Sustainable Devt
- [www.realclimate.org](http://www.realclimate.org) : answers to the merchants of doubt arguments
- [www.skepticalscience.com](http://www.skepticalscience.com) : same
- [www.pplateforme-wallonne-giec.be](http://www.pplateforme-wallonne-giec.be) : IPCC-related in French, Newsletter, latest on COP24 and SR15
- **Twitter: @JPvanYpersele & @IPCC\_CH**