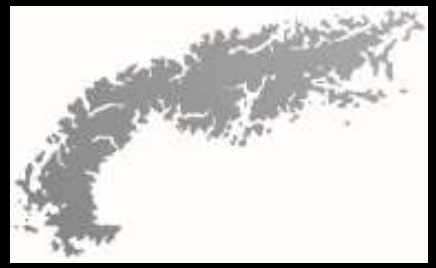
De la vision à la réalité : besoins, opportunités et contraintes

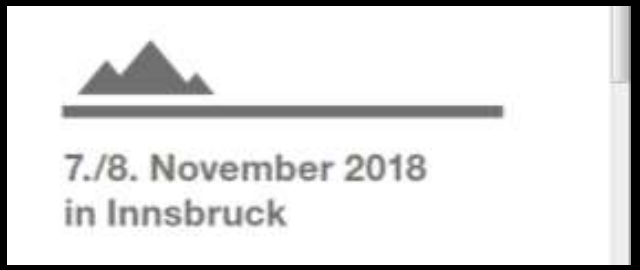
Dalle visioni climatiche alla realtà: bisogni, opportunità e limitazioni

Wie Klimavisionen Wirklichkeit werden: Bedürfnisse, Möglichkeiten und Einschränkungen

Kako podnebne vizije postanejo realnost: potrebe, priložnosti in omejitve

Lučka Kajfež Bogataj
University of Ljubljana





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High temperature record broken in Swiss Alps

22/04/2018 BY LE NEWS

Friday 21 April 2018 saw the mercury climb to 28.9 degrees in Sion, the capital city of the Swiss canton of Valais, according to Meteo Swiss, Switzerland's metrological service.

RELATED POSTS

New Swiss heat records

Temperatures as high as 30 degrees predicted for parts of Switzerland today

Severe Weather Europe

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Exceptionally hot weather across southeastern Europe: Albania hits 32 °C – Nov 3, 2018

By SWS | Recent events | 04 November 2018

Saturday was a very warm and locally hot day in parts of southeast Europe. Temperatures peaked in Albania with 32 °C!

Temperatures in Albania reached up to 31.8 °C (Qyteti Stalin) and 31.3 °C (capital Tirana), the extreme south of Croatia pushed up to 28 °C. All these location experienced moderate Foehn

tele 1

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SPÄTESTER HITZETAG IN DER SCHWEIZ GEMESSEN

In Locarno war es heute Nachmittag 30.5 Grad heiss

Mittwoch, 24. Oktober 2018 um 17:16

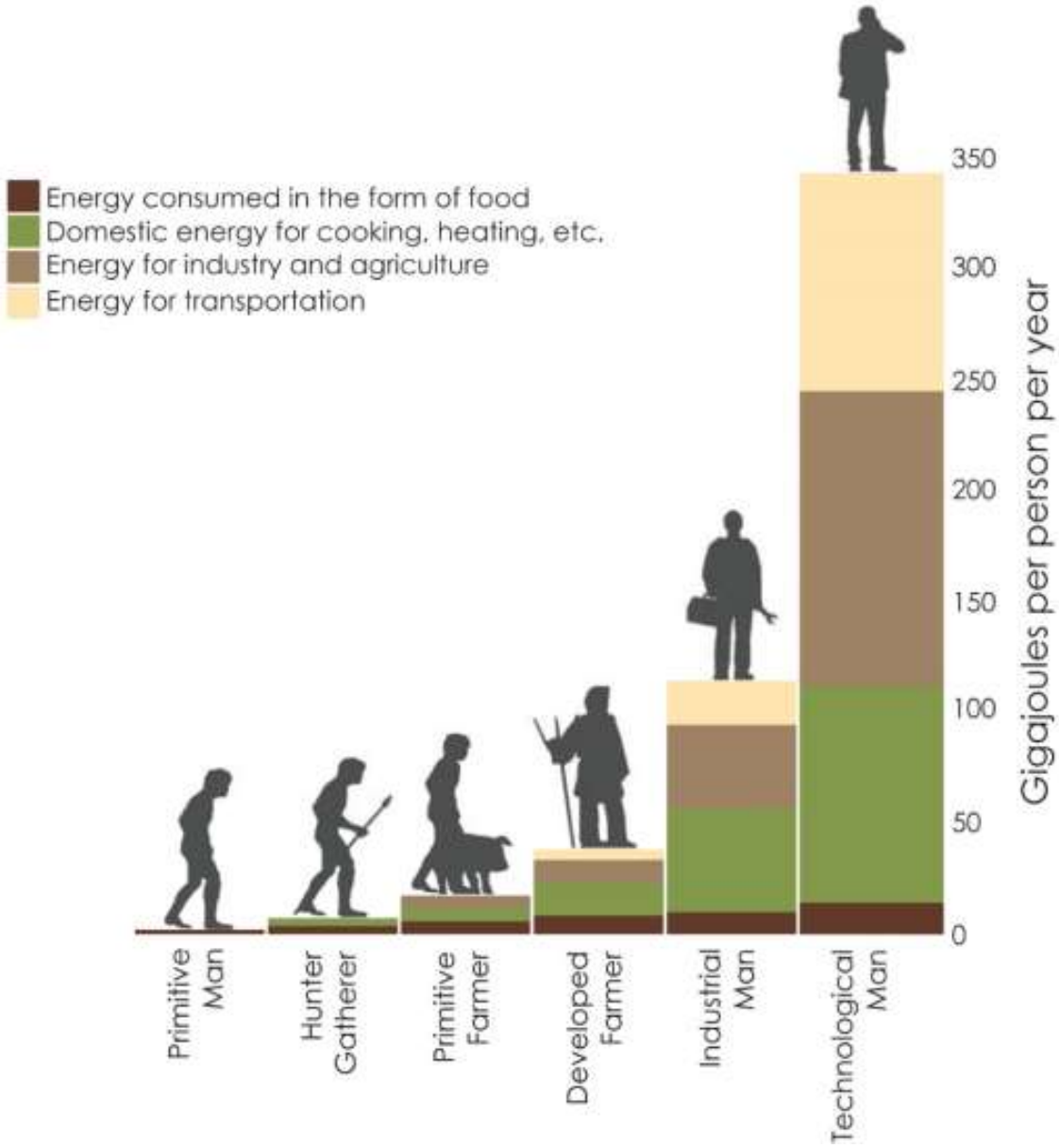
Im Tessiner Locarno sind heute Nachmittag 30.5 Grad gemessen worden Foto: © rangizzz - Fotolia.com

21st Century changes in climate

Four distinctive characteristics:

- They are cumulative
- The effects are irreversible
- Large time lags – today's actions are tomorrow's problems
- They are global

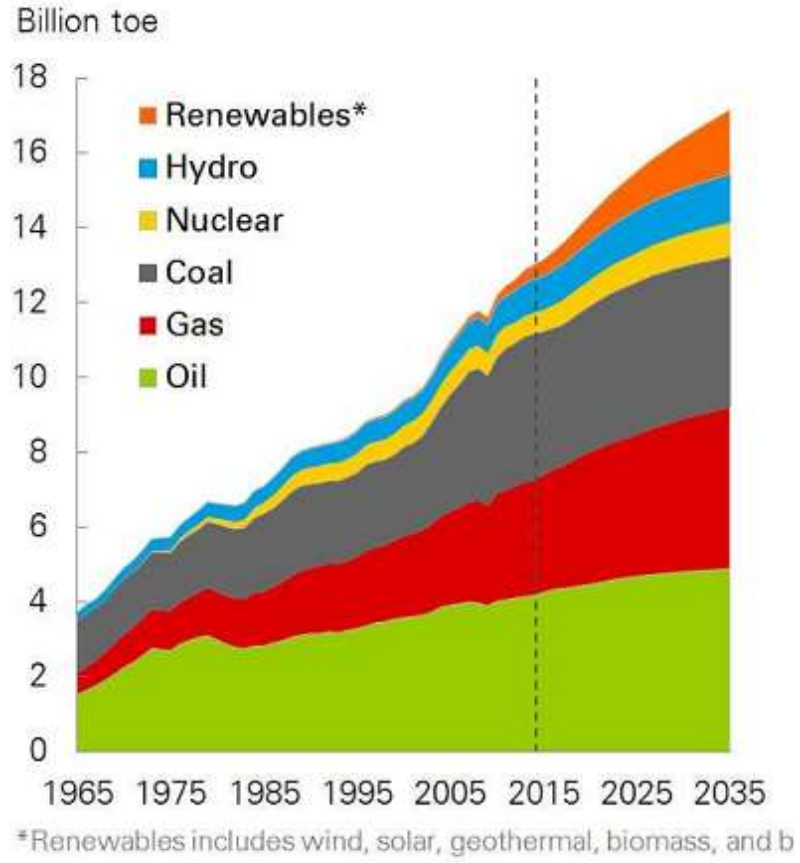
LIFESTYLE TODAY IS HIGLY ENERGY CONSUMING

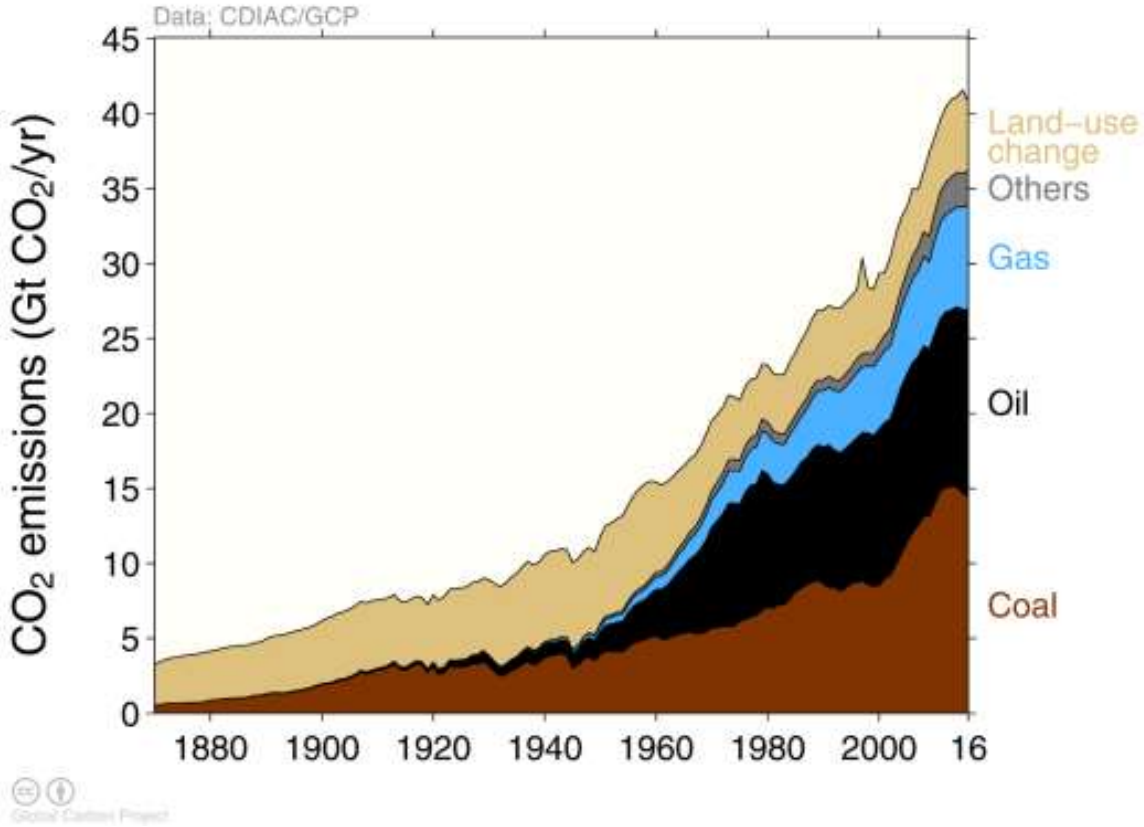


One person energy need

≈ 1GigaJ per day

Primary energy consumption and total global emissions are increasing

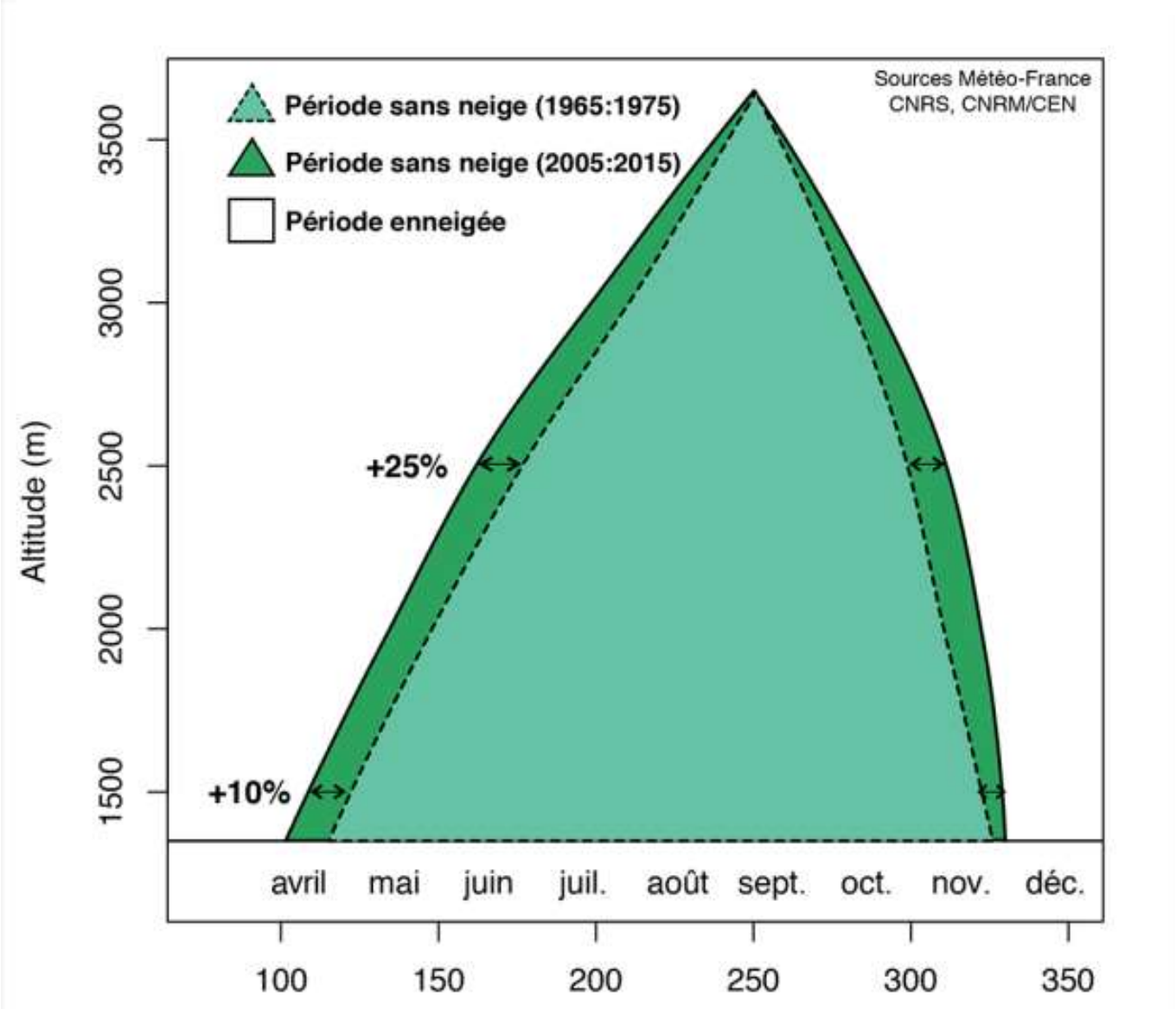




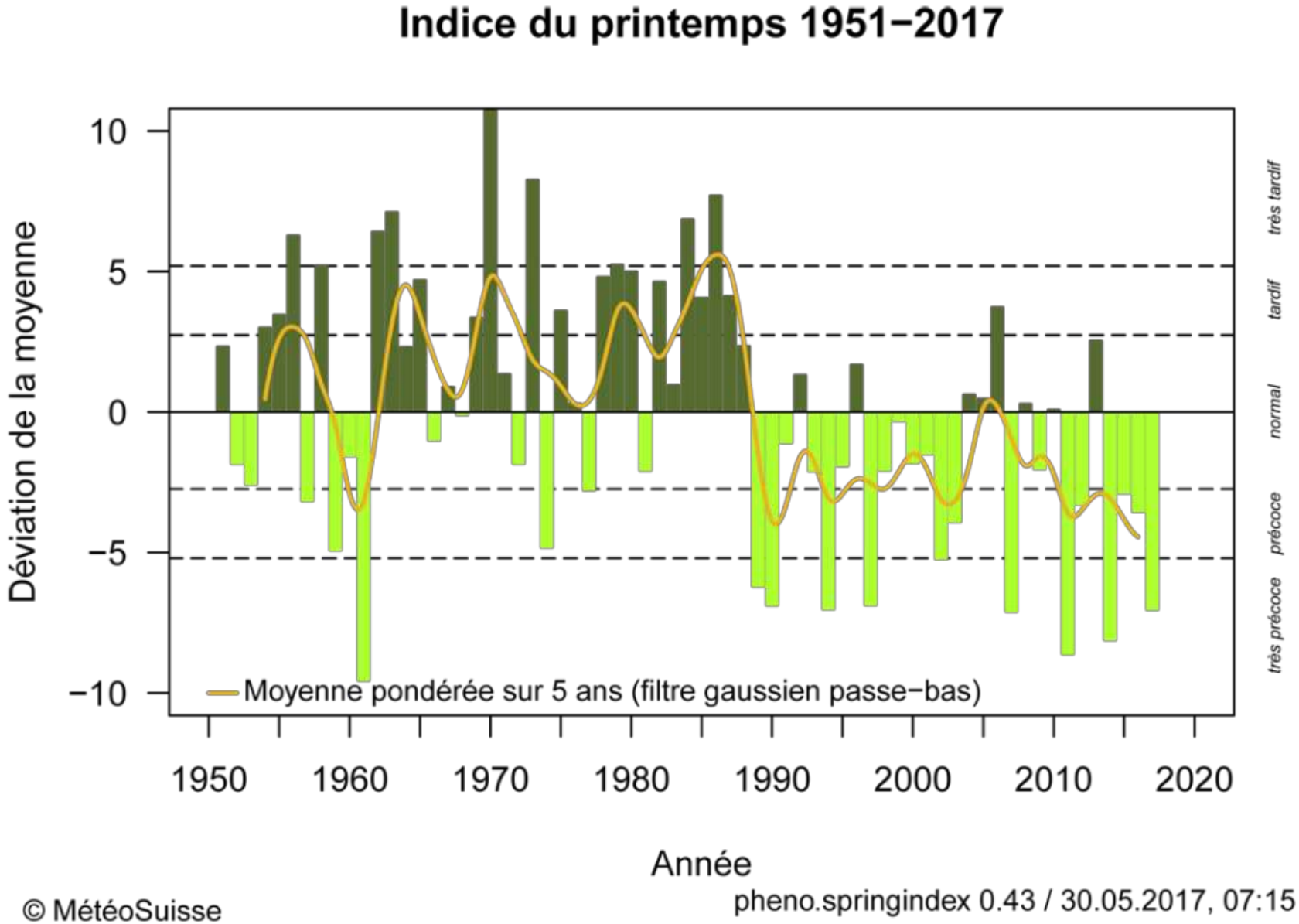
The climate change challenge in a nutshell

- Average temperature of the earth has risen by 1 degree Celsius since 1900. Average increase of the temperature in the Alps during the last century has been the double of the average increase.
- Patterns of seasonal precipitation are being modified, snow line rises and the duration of snow cover is decreased
- Temperature rise results in extreme weather events and impacts (e.g. flooding, droughts, etc.)
- Human action mainly responsible for observed and projected climate change
- Risk of major economic and social disturbances
- Swift action required to:
  - Reduce the causes of climate changes (mitigation)
  - Prepare for the impacts of climate change (adaptation)

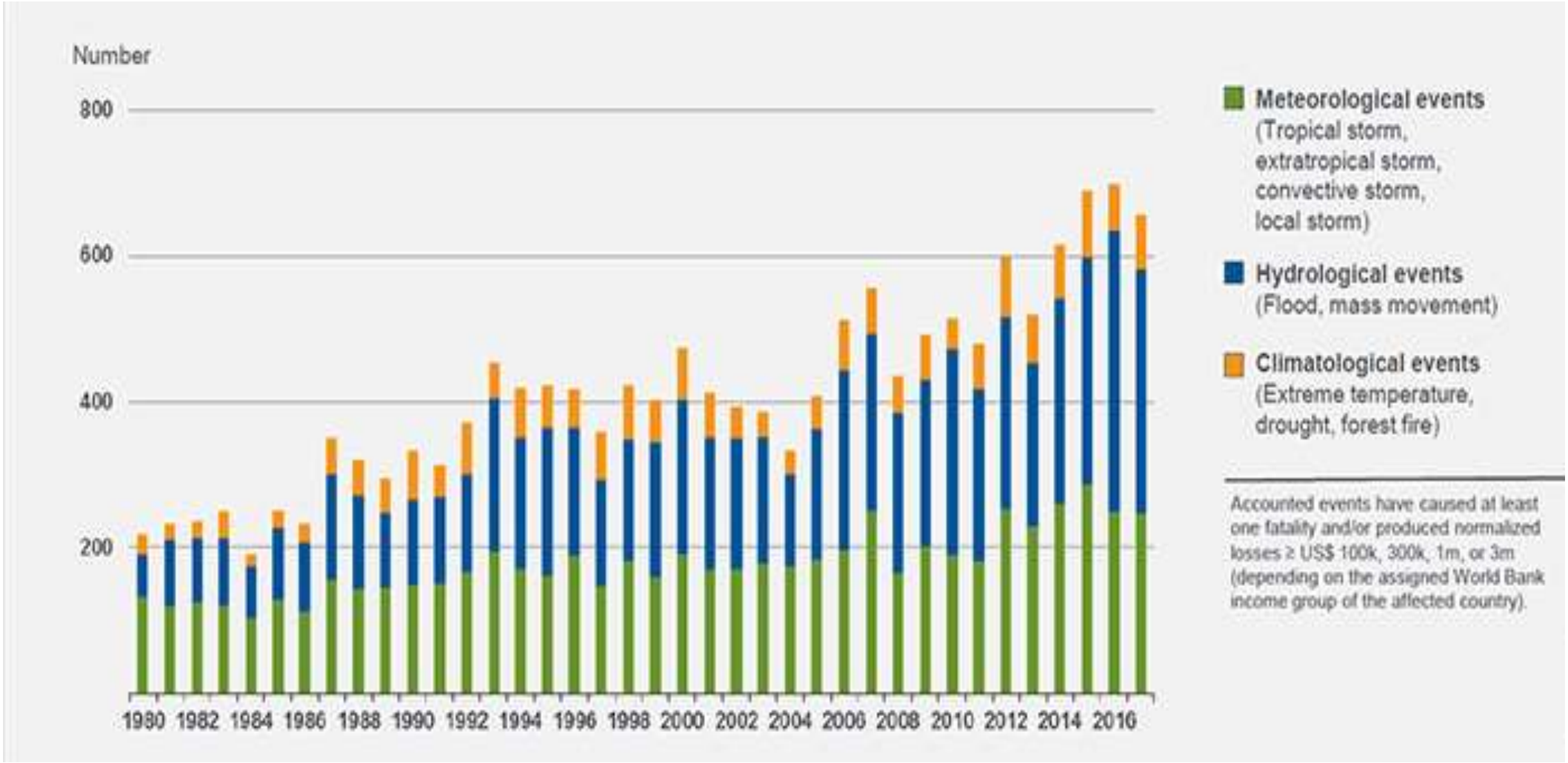
Mont Blanc
at 2,500 m duration of the snow-free period has increased by 25% and 12% at 1,500m.

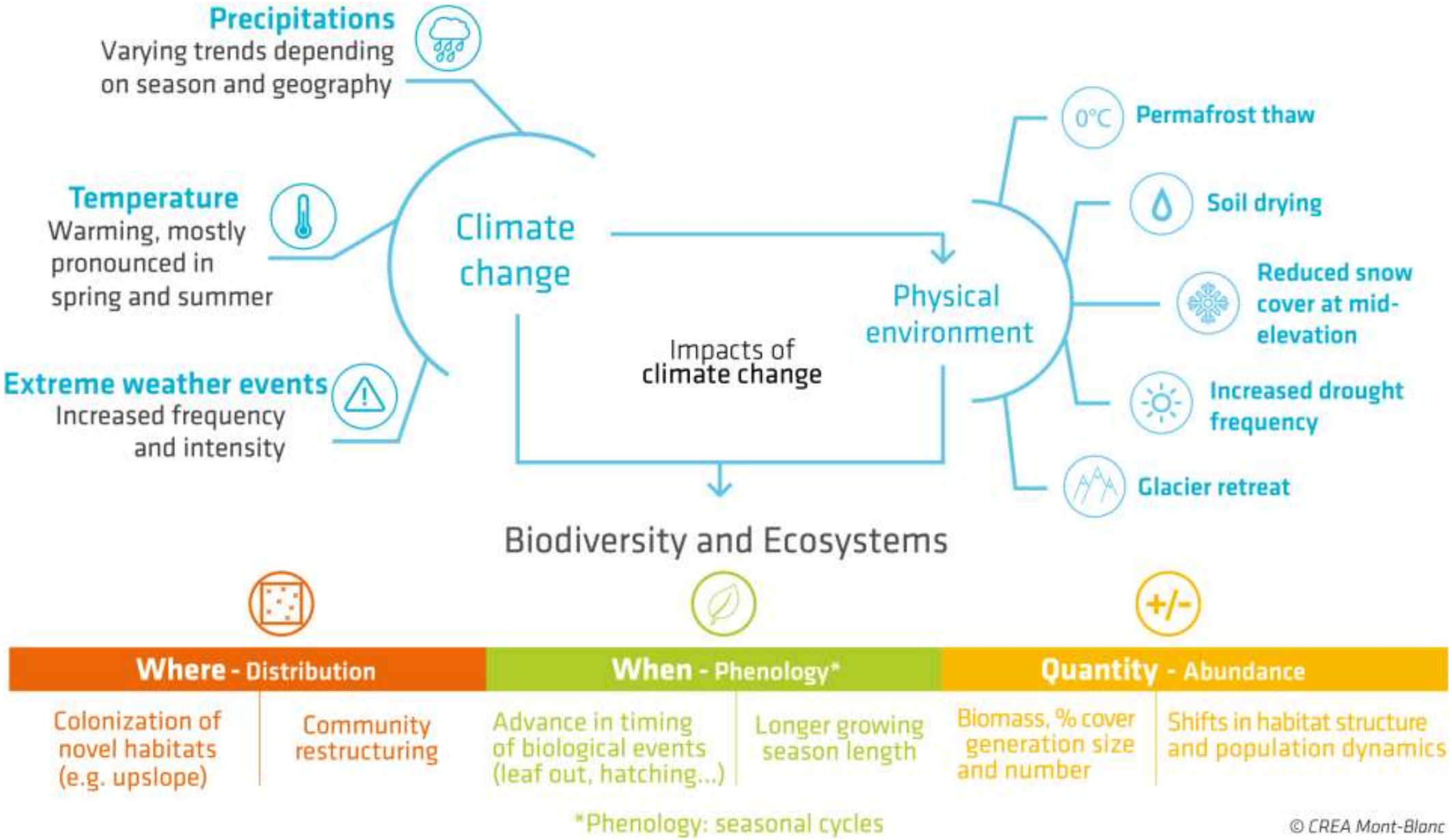


Over the past 50 years seasonal events have advanced by 2 to 5 days per decade

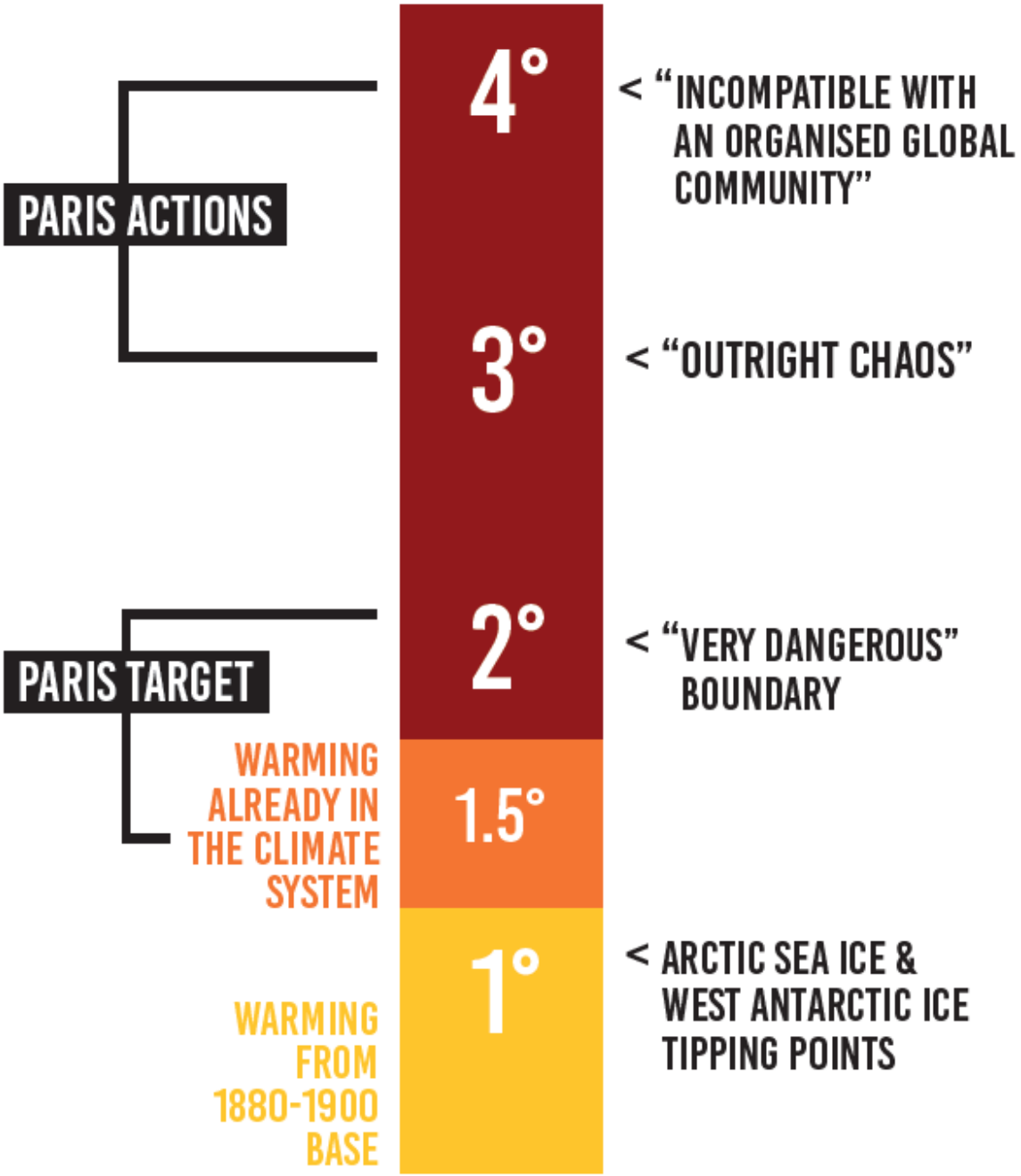


Number of world natural catastrophes 1980-2017



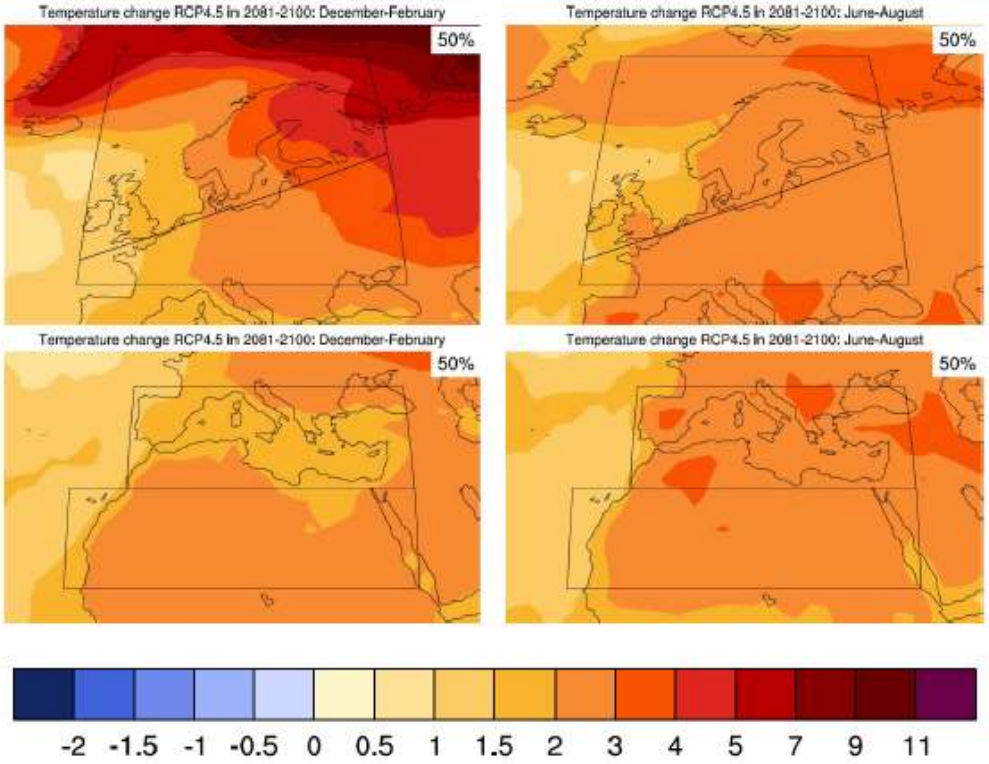

Precipitations
Varying trends depending on season and geography
Temperature
Warming, mostly pronounced in spring and summer
Extreme weather events
Increased frequency and intensity
Climate change
Impacts of climate change
Physical environment
0°C
Permafrost thaw
Soil drying
Reduced snow cover at mid-elevation
Increased drought frequency
Glacier retreat
Biodiversity and Ecosystems
Where - Distribution
When - Phenology*
Quantity - Abundance
+/-
Colonization of novel habitats (e.g. upslope)
Community restructuring
Advance in timing of biological events (leaf out, hatching...)
Longer growing season length
Biomass, % cover generation size and number
Shifts in habitat structure and population dynamics
*Phenology: seasonal cycles
© CREA Mont-Blanc

PARIS EMISSIONS PATH & CLIMATE RISKS



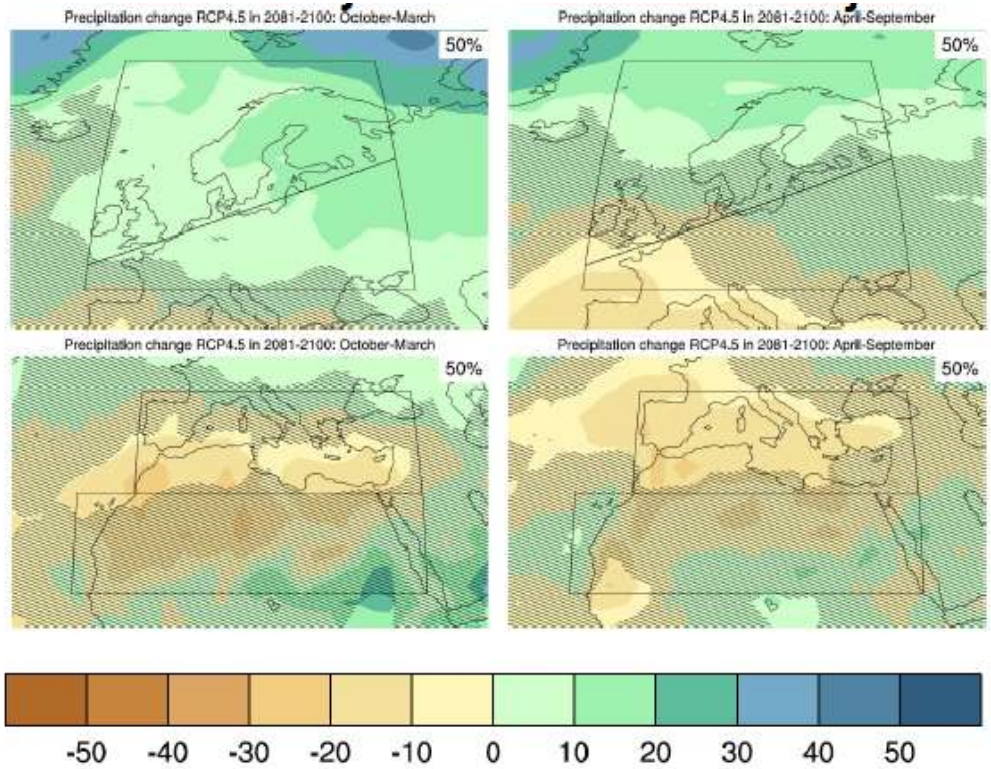
Projections Europe (RCP4.5)
2081-2100 versus 1986-2005

Temperature (°C)

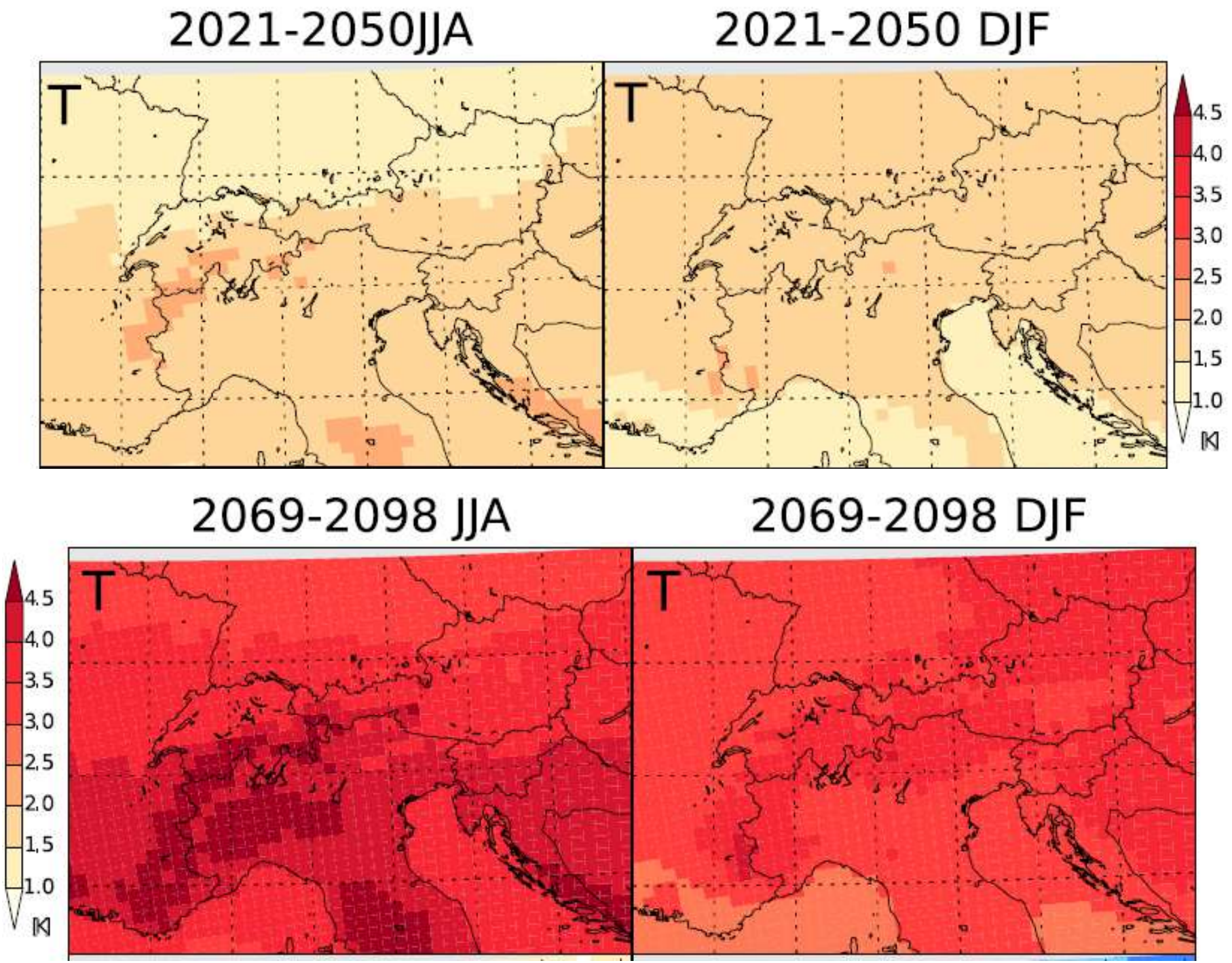


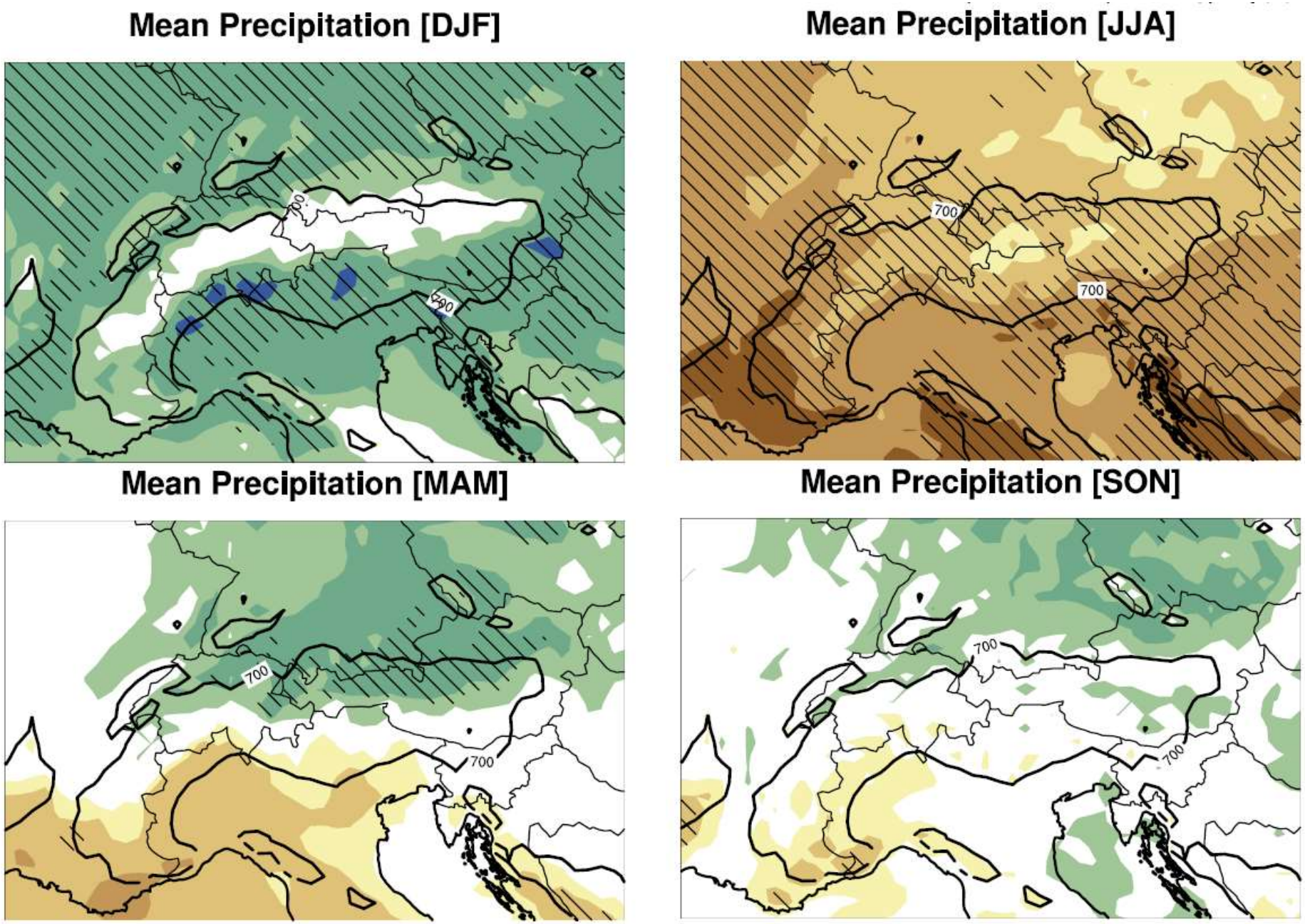
winter summer

Precipitation (%)



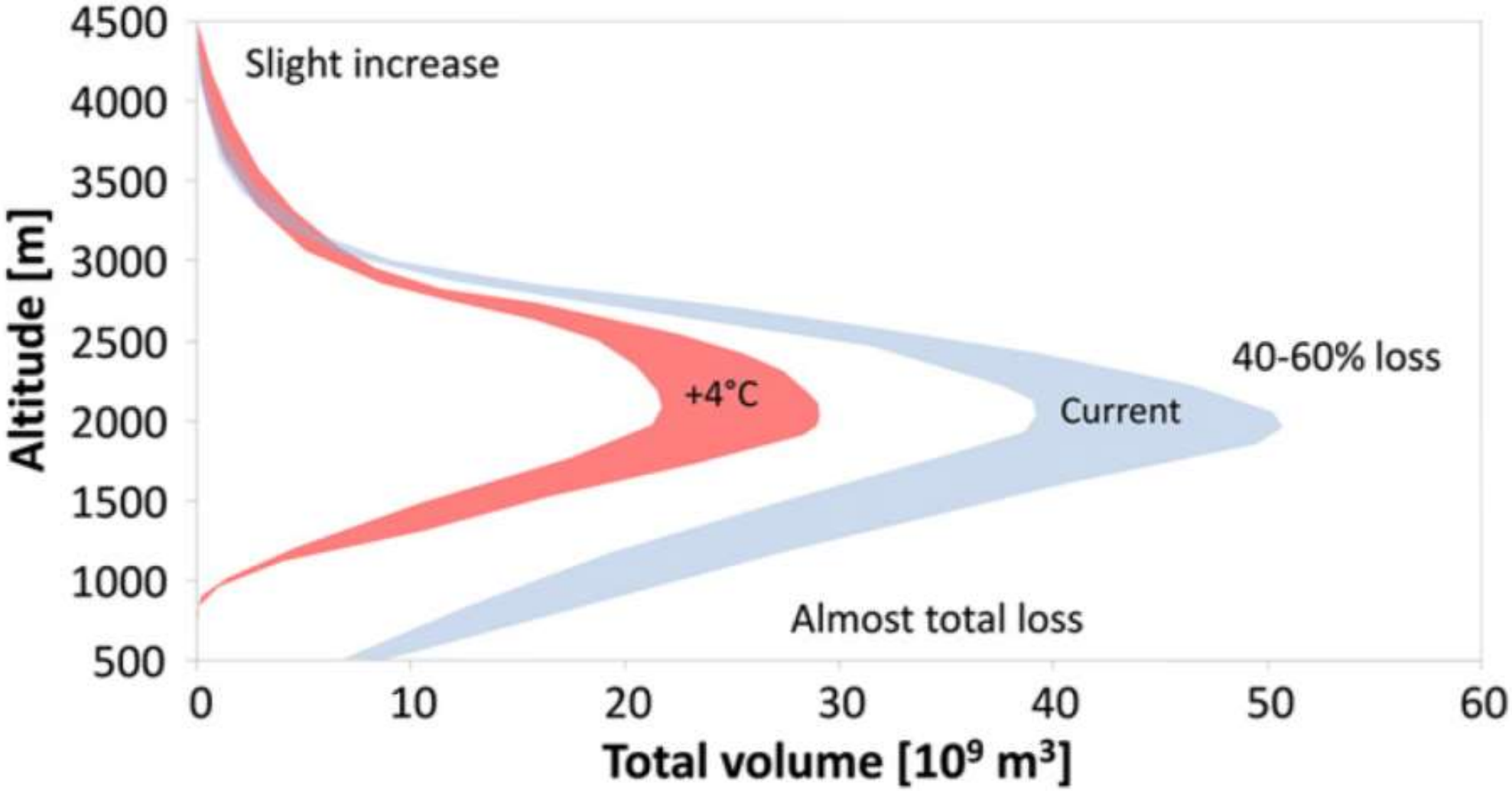
winter half summer half


2021-2050JJA
2021-2050 DJF
2069-2098 JJA
2069-2098 DJF
T
T
T
T
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
K
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
K


Mean Precipitation [DJF]
Mean Precipitation [JJA]
Mean Precipitation [MAM]
Mean Precipitation [SON]
700
Percentage change for 2070–2099 with respect to 1970–1999
-30
-20
-10
-5
5
10
20
30

Snow volume

under current climate and a possible future winters 4 °C warmer than today



What is the difference between a 2°C world and a 4°C world?

+2°

PROBLEMATIC

- 1 - 2 billion additional people with water stress
- Impacts on cereal productivity
- Increased coastal flooding and storms
- Greater depth of seasonal permafrost thaw

+4°

DISASTROUS

- Up to 3.2 billion additional people with water stress
- Risk of major extinctions around the globe
- Substantial global impact on major crops
- Long-term prospect of sea level rise
- There is no certainty that adaptation to a 4 C world is possible

What is the difference between a 2°C world and a 4°C world?

+2°

+4°

Reply in just 2 words

"Human civilisation".

Prof. Hans Joachim Schellnhuber

RUSSIAN ROULETTE

Probability to survive

5/6 or 83 %

The Paris agreement emisionns path has a 50% chance of exceeding 4ºC

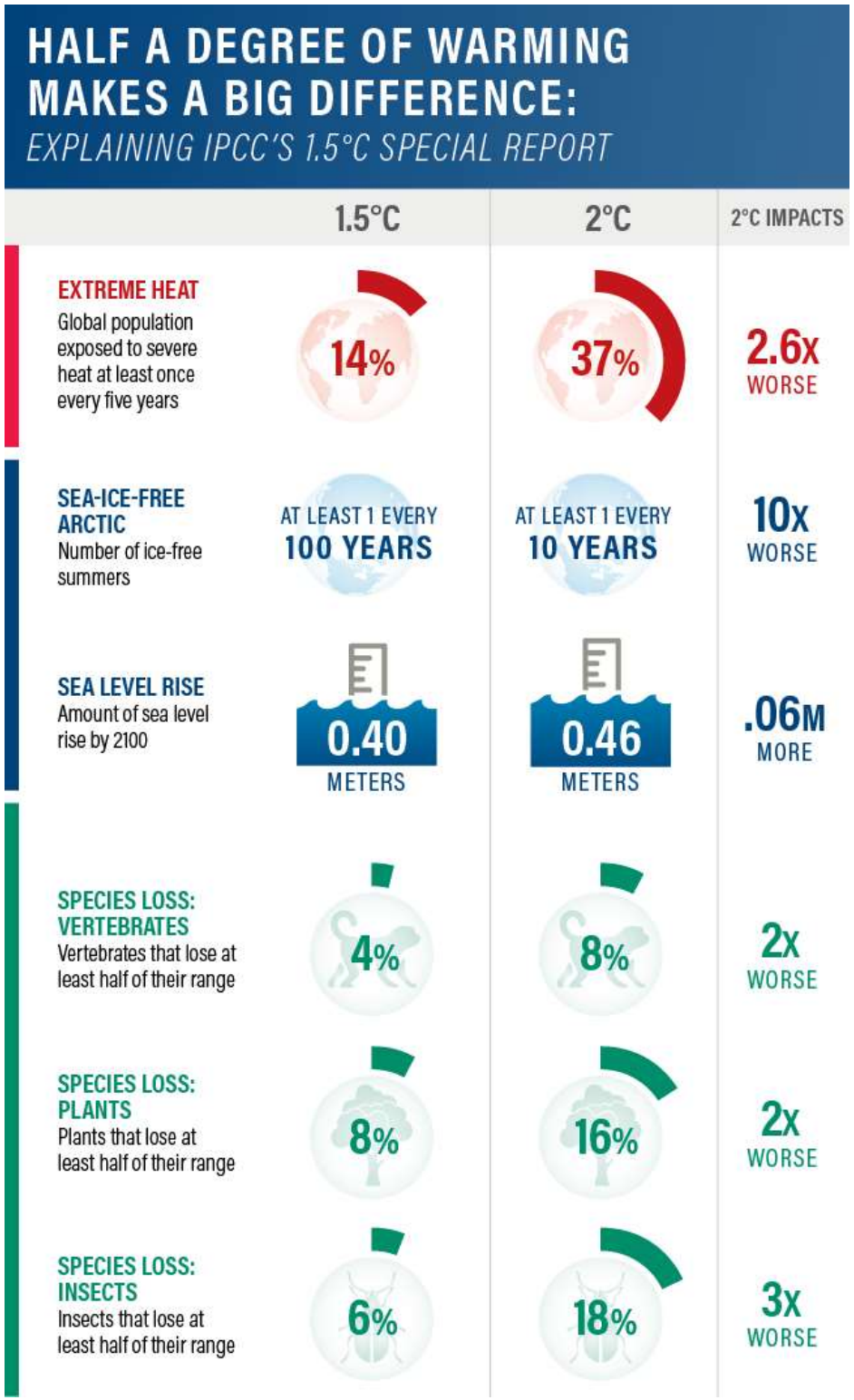
(probability to “survive” 50%)

1.5°C in the Paris Agreement

- Paris Agreement included the aim to hold the increase in the global temperature to well below 2 °C and to pursue efforts to limit the temperature increase to 1.5 °C above preindustrial levels.
- New science outlines how the risks and impacts of climate change increase between 1.5°C and 2°C .

HALF A DEGREE OF WARMING MAKES A BIG DIFFERENCE:

EXPLAINING IPCC'S 1.5°C SPECIAL REPORT



HALF A DEGREE OF WARMING MAKES A BIG DIFFERENCE:

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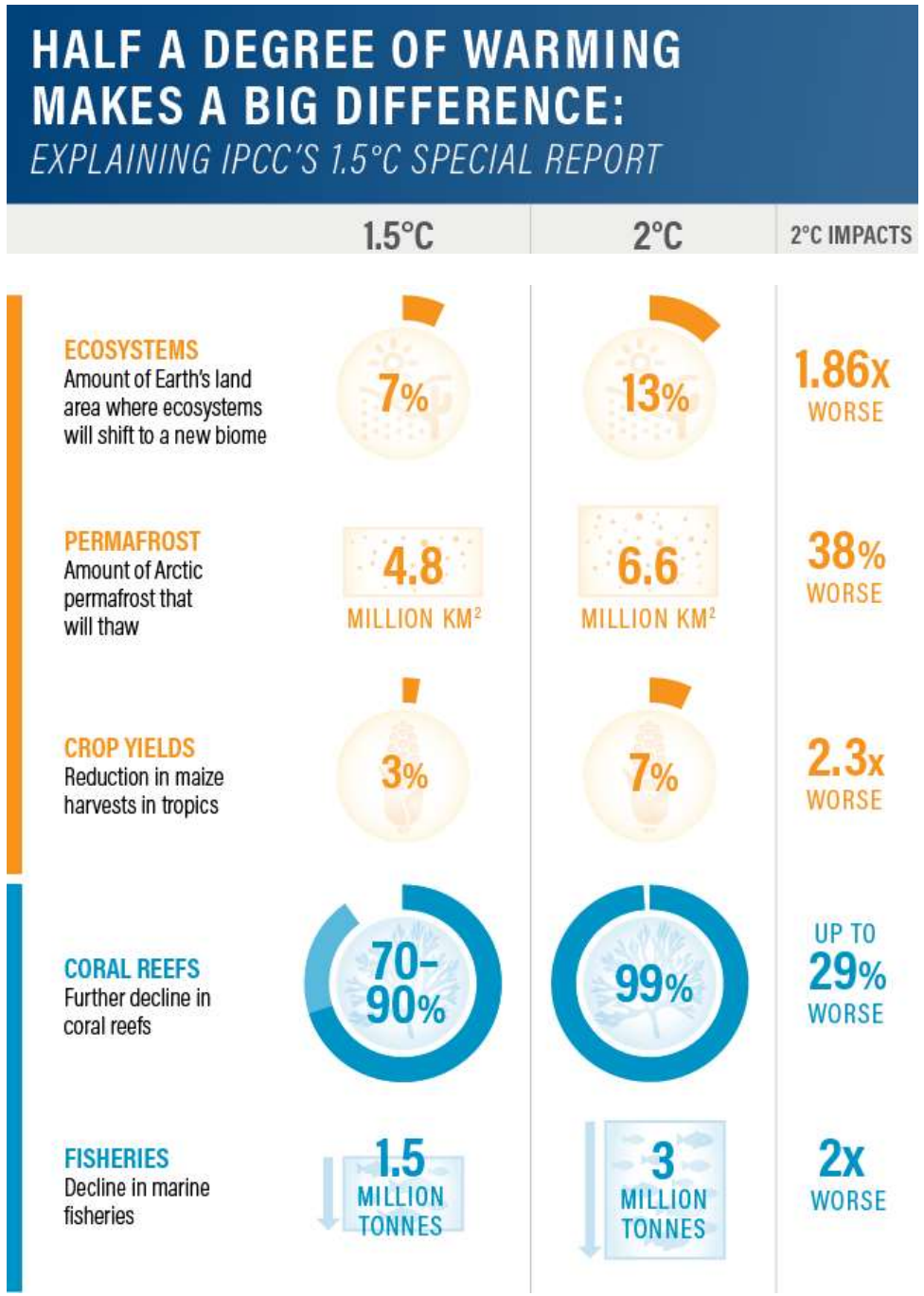
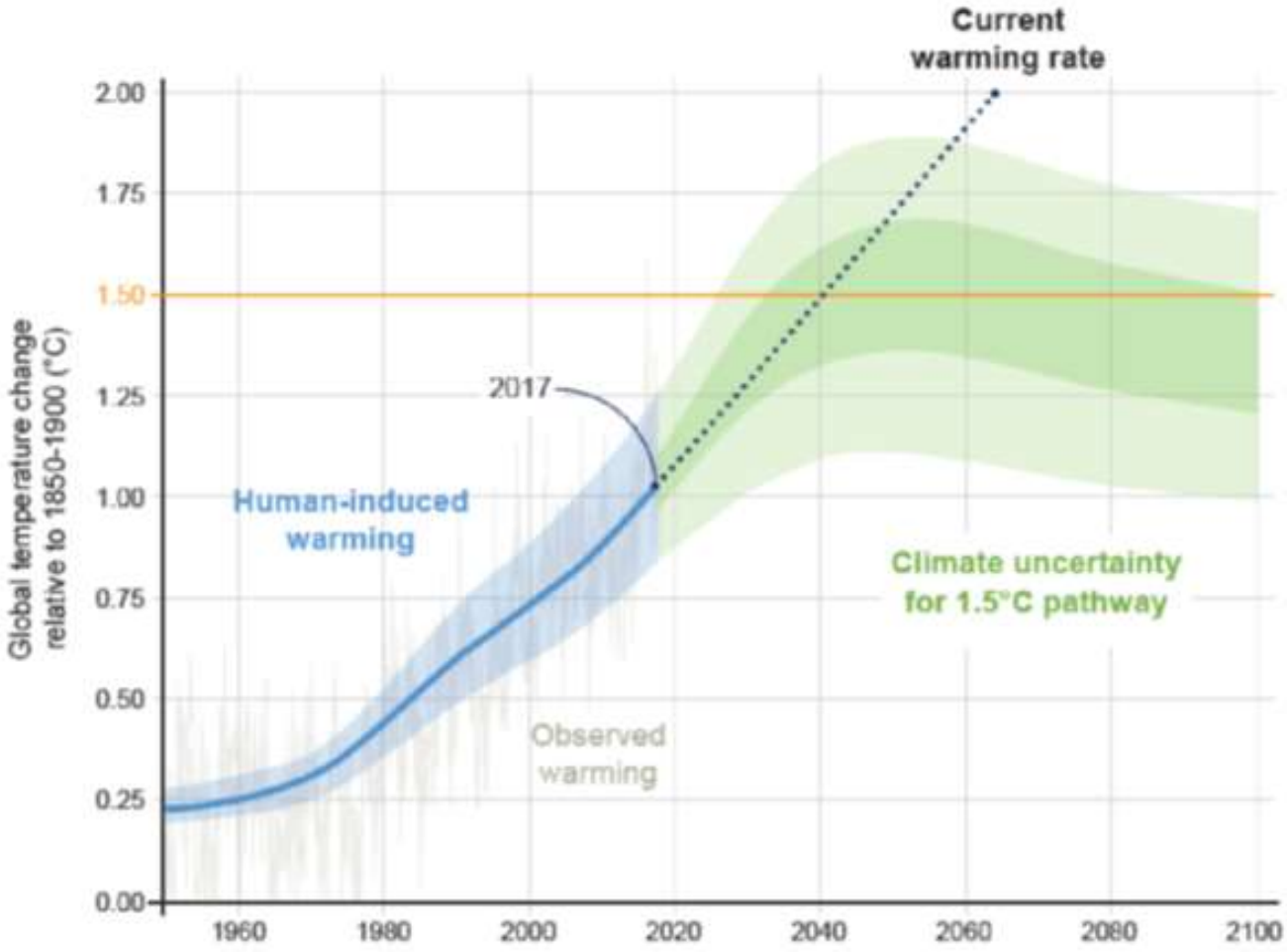
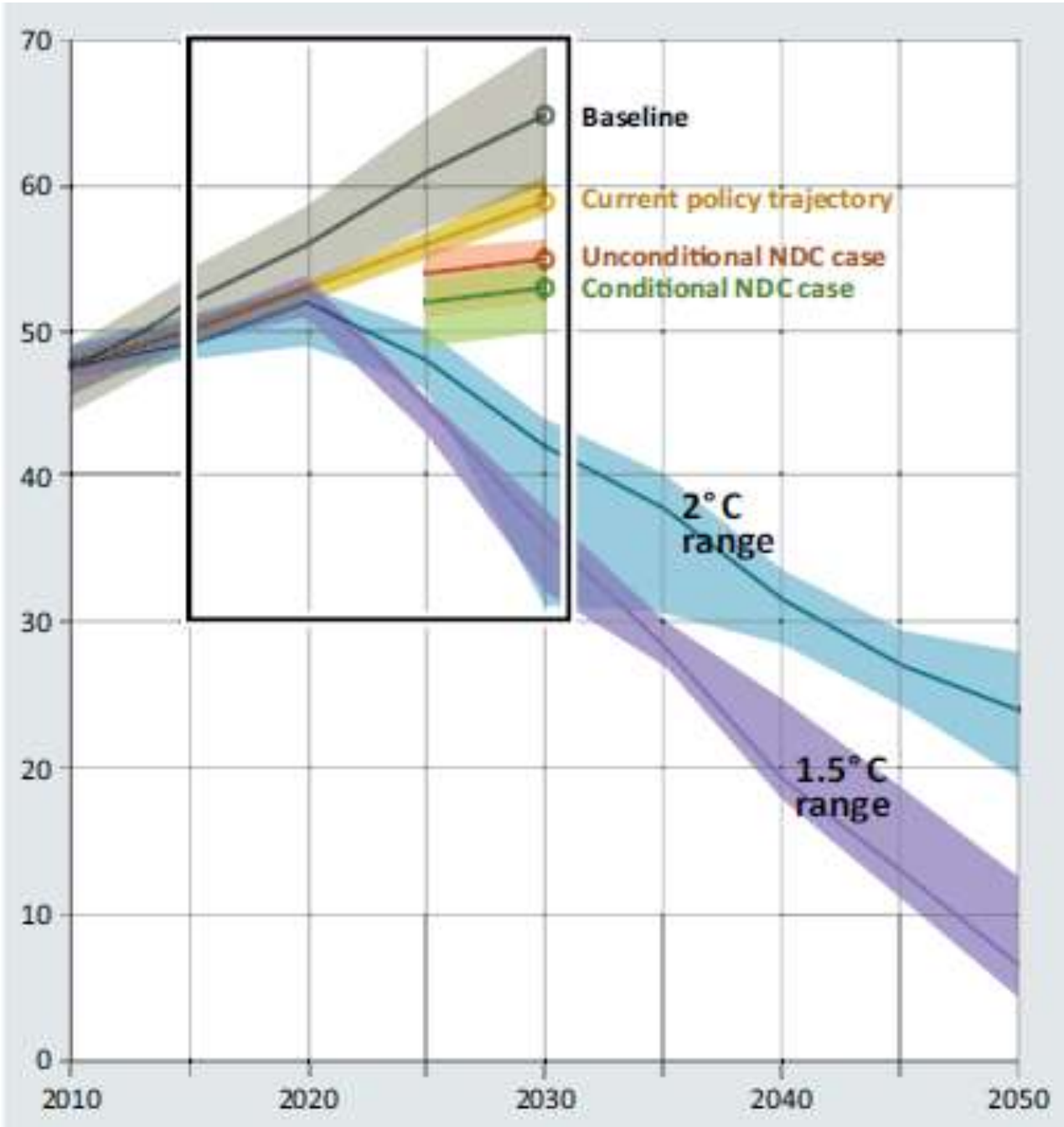


How Close Are We to 1.5°C?



If the current warming rate continues, the world would reach human-induced global warming of 1.5°C around 2040

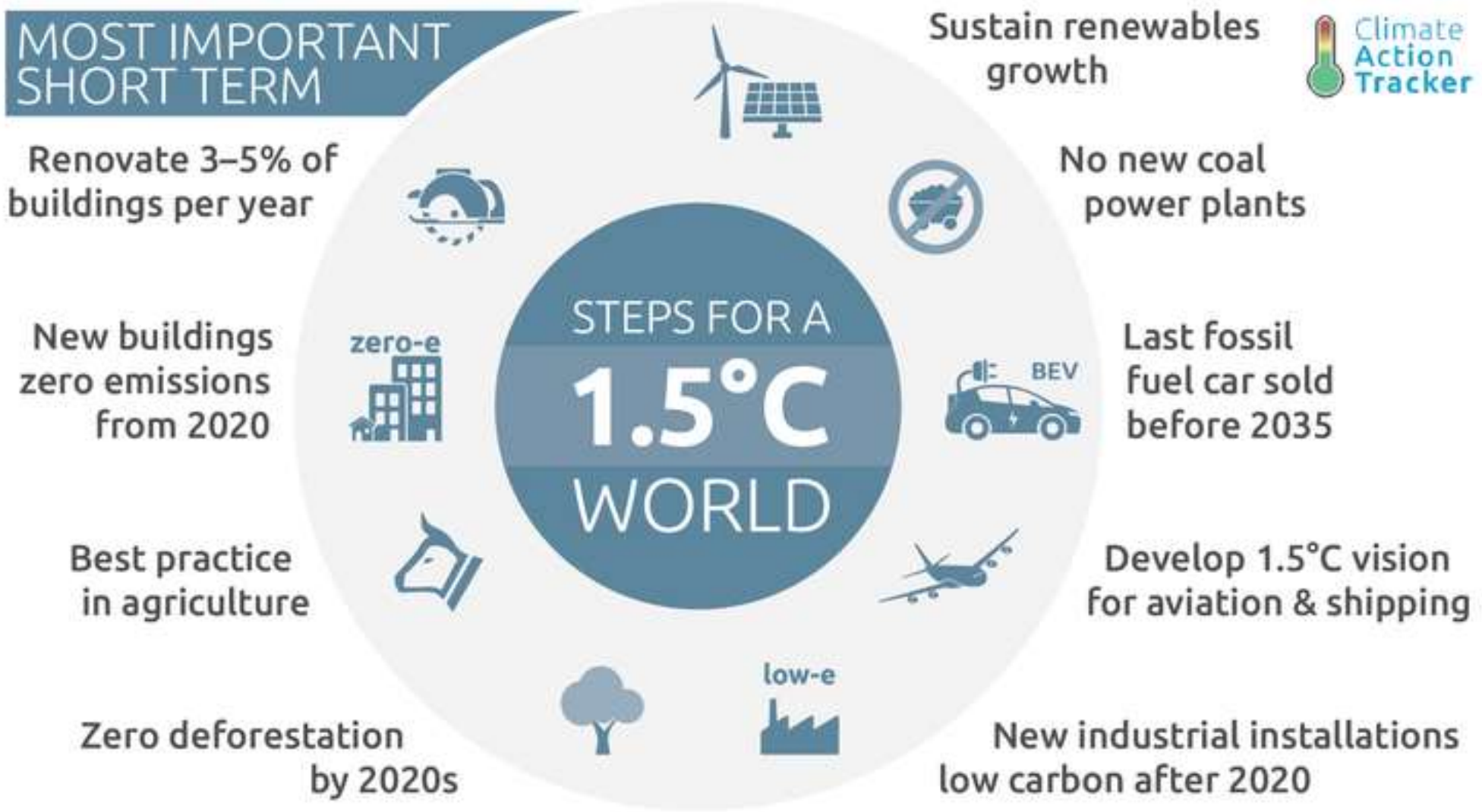
The view to 2050 and beyond



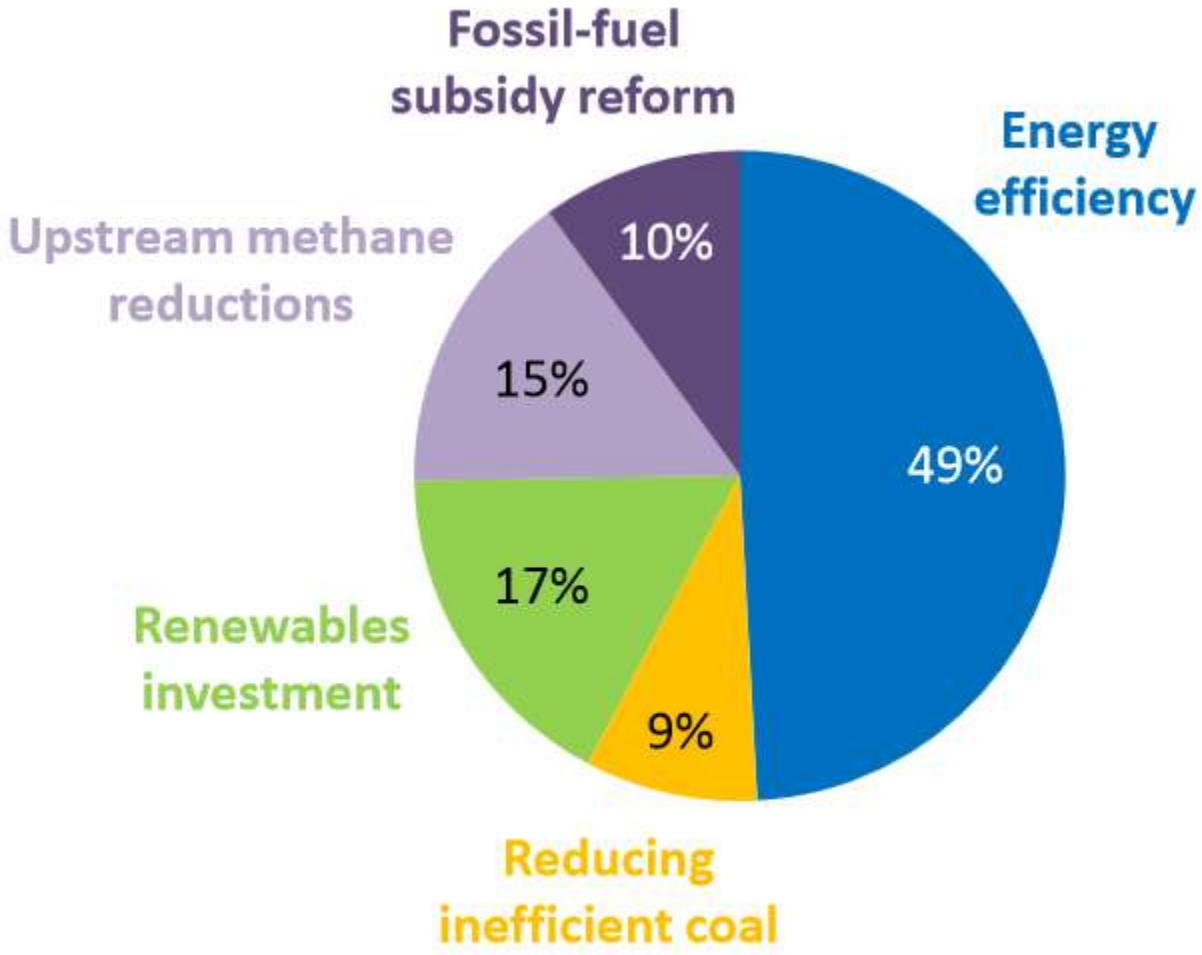
Source: UNEP

How we can limit global warming to 1.5°C

The most important things to do in the next 5 to 10 years



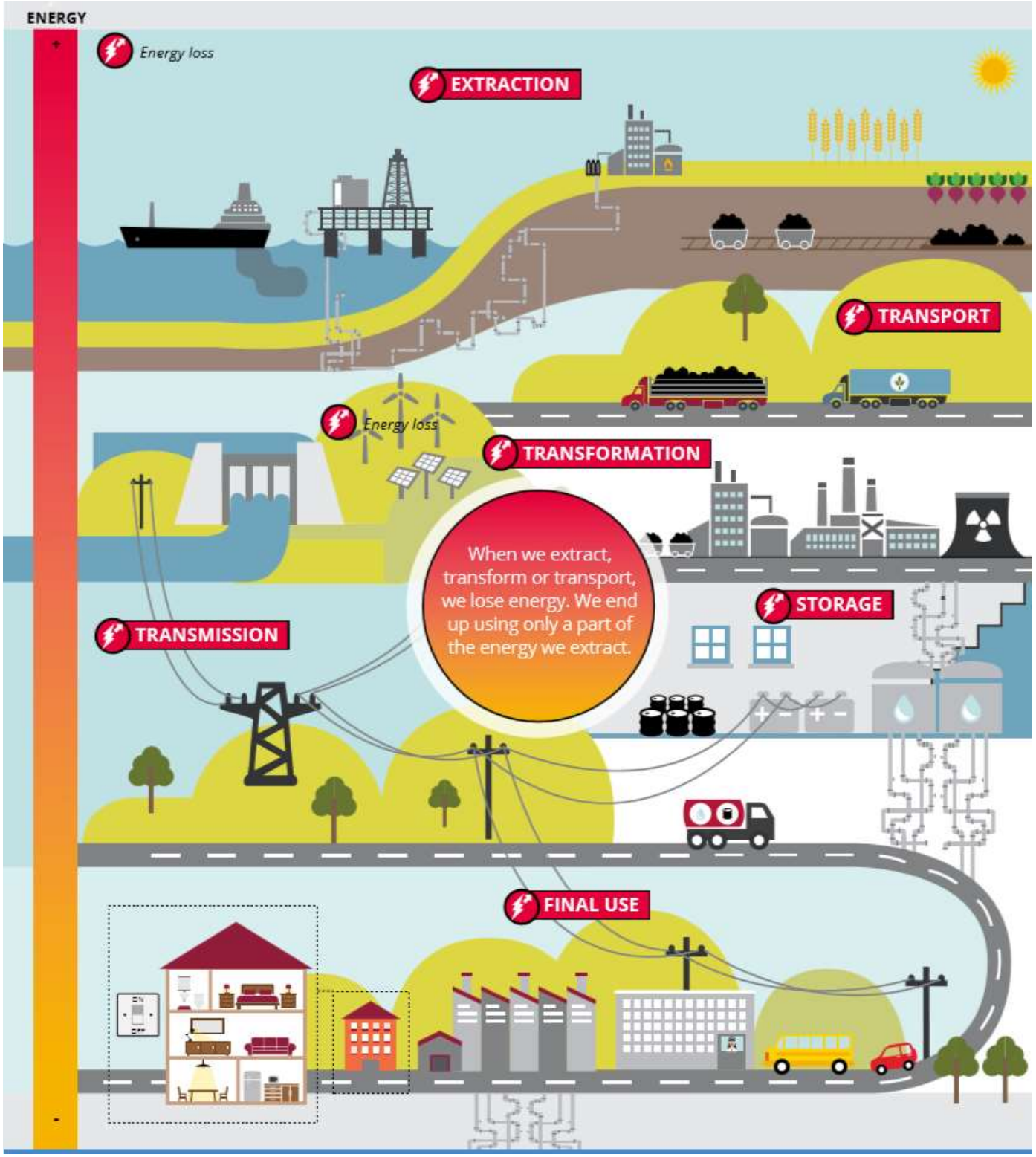
How to invest in mitigation



IEA, 2015

EU Energy Efficiency strategy

- 2015, the Energy Union strategy set five objectives including 'putting energy efficiency first' in order to lower the demand for energy.
- 2016, the European Commission put forward the Clean Energy for All Europeans proposals (binding target of 30% improvement in EU energy efficiency)
- April 2018, the European Parliament adopted new parts of the package, specifically "energy performance of buildings", "renewable energy" and "energy efficiency".
- July 2018 the revised Energy Performance of Buildings Directive came into force (huge potential for energy efficiency gains in the EU building sector, includes measures that advance the rate of building renovation and enhance the energy performances of new buildings, investing in smart technology)

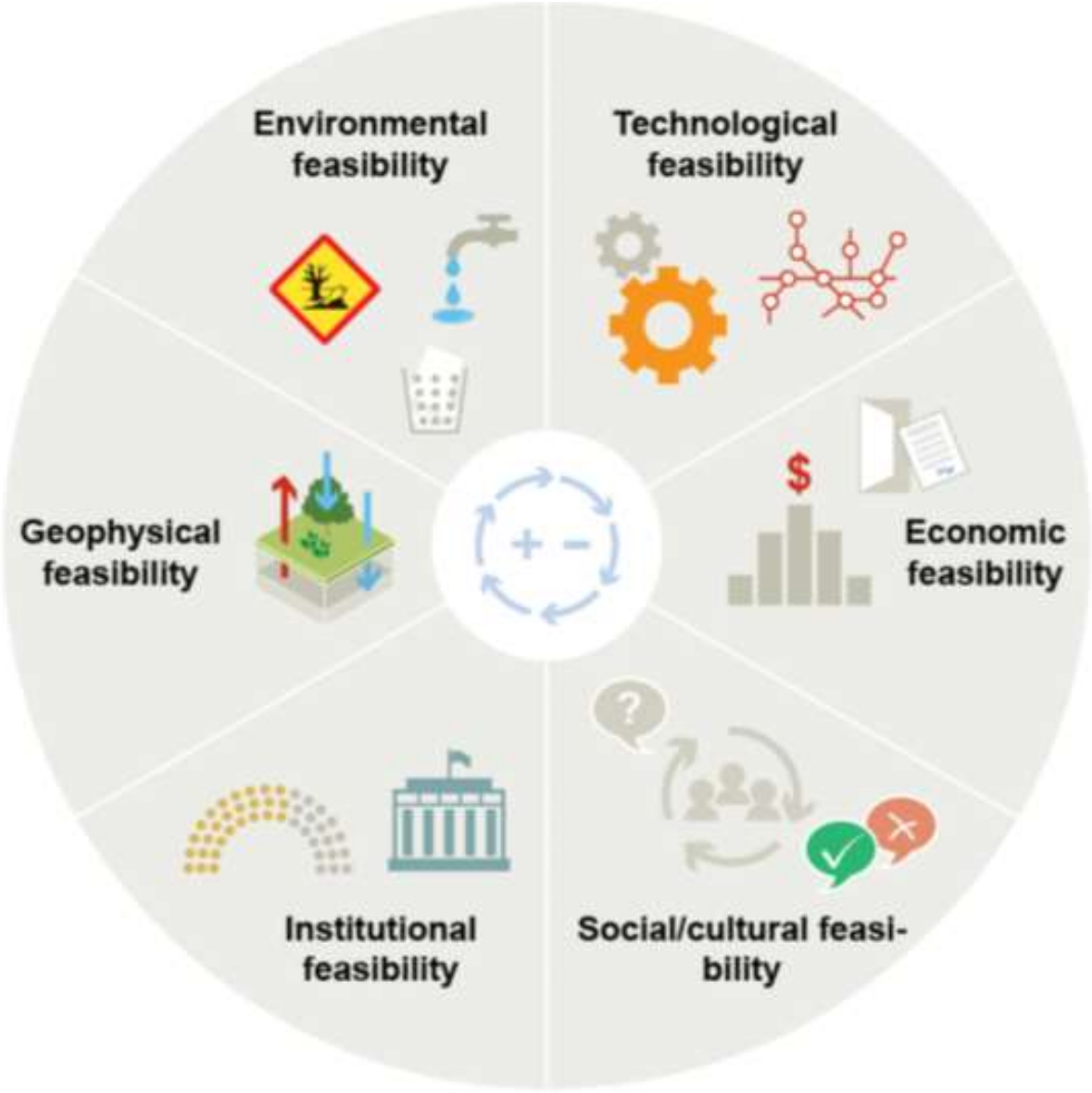


Energy efficiency:

tackling energy loss is essential

Innovative solutions must fundamentally change the way we produce, store, transport and use energy

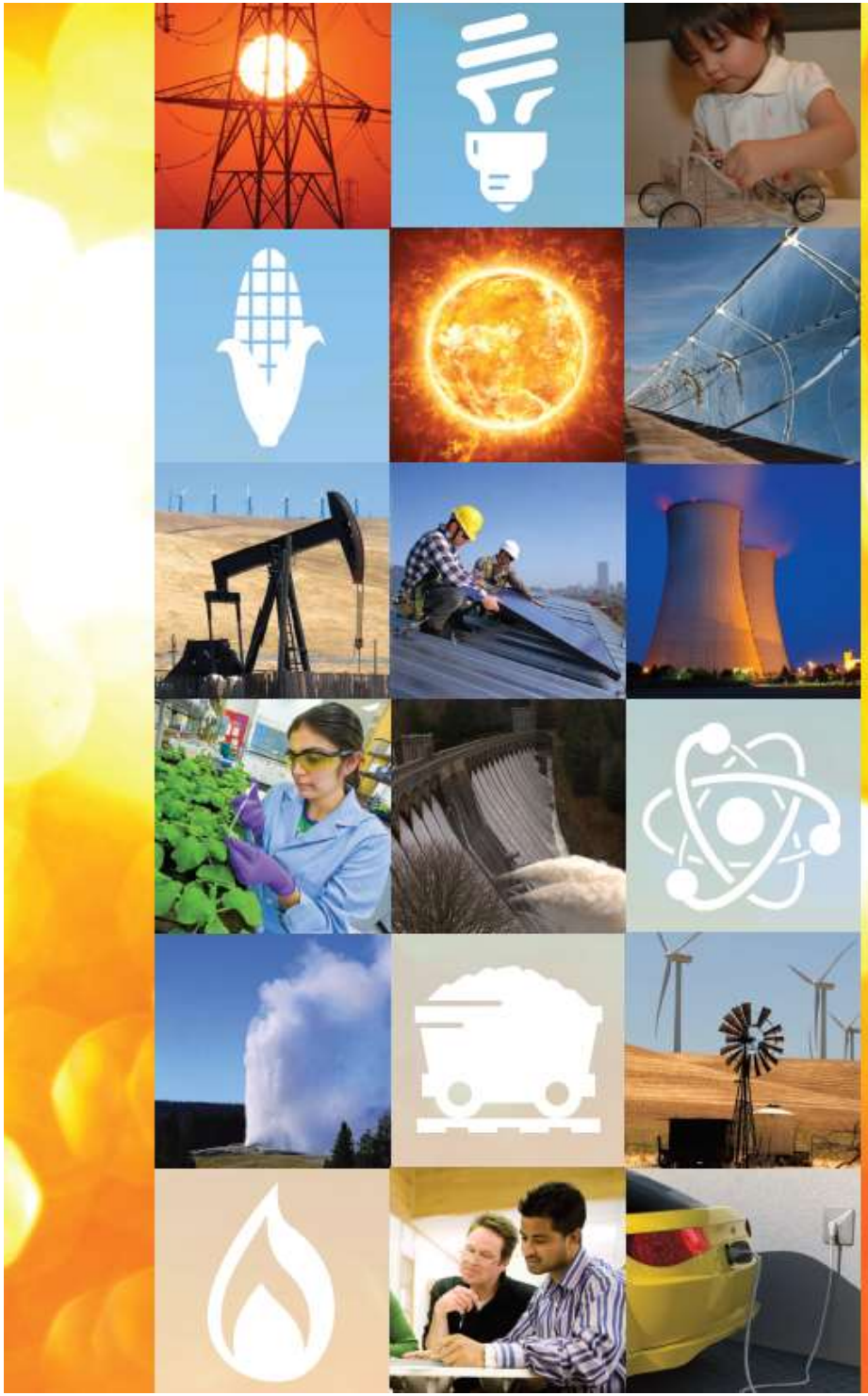
There are many factors that affect the feasibility of different adaptation and mitigation options



Adaptation + Mitigation Synergies

Partnerships for Local Climate Action what shoud they stand for

- Challenging the government on its plans to deeply cut GHG emissions and to raise the price of carbon to put a fair price on pollution
- Planing how to change the energy mix (more RE)
- Opposing subsidies to fossil fuels
- Campaigning for action on increase of energy efficiency (consume less energy)
- Drum up support among society: citizens must be able to play an active part in climate-oriented initiatives
- Improving energy literacy (general public, policy makers)



Energy Literacy

Essential Principles and Fundamental Concepts for Energy Education

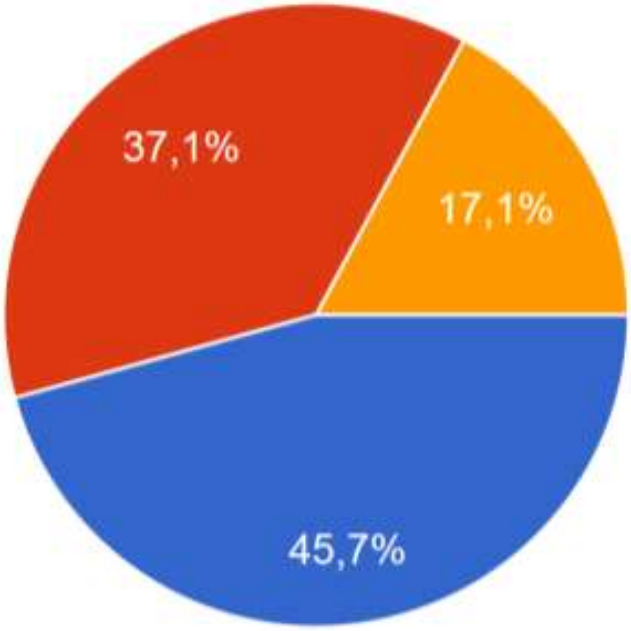
A Framework for Energy Education for Learners of All Ages

An energy-literate person

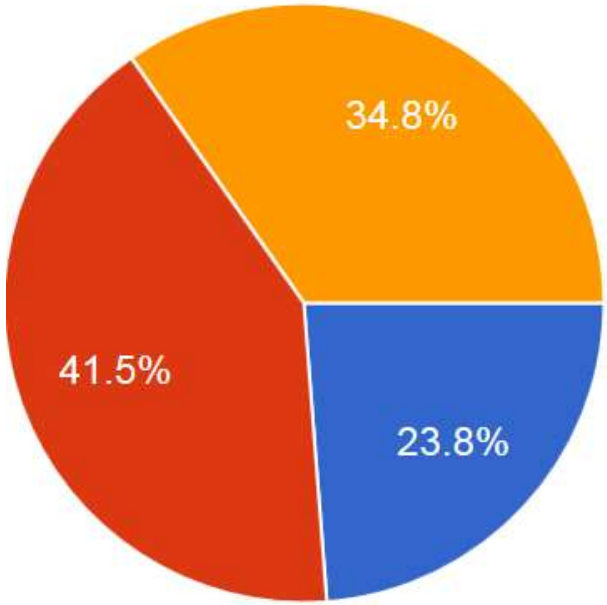
- Knows how much energy he or she uses, for what, and where the energy comes from
- Can assess the credibility of information about energy
- Can communicate about energy and energy use in meaningful ways
- Is able to make informed energy and energy use decisions based on an understanding of impacts and consequences

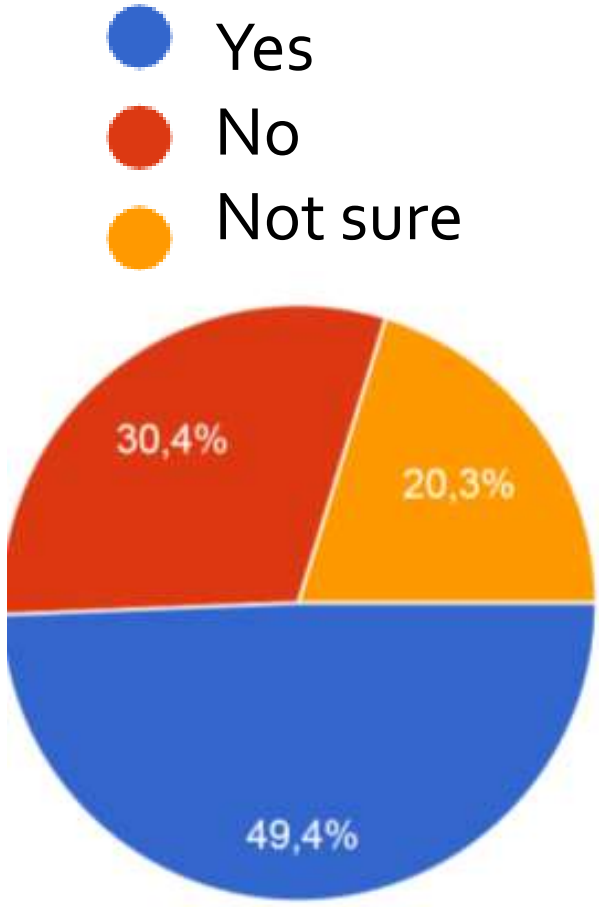
Are you familiar with **national energy action plans** (general public)

Italy, 2018



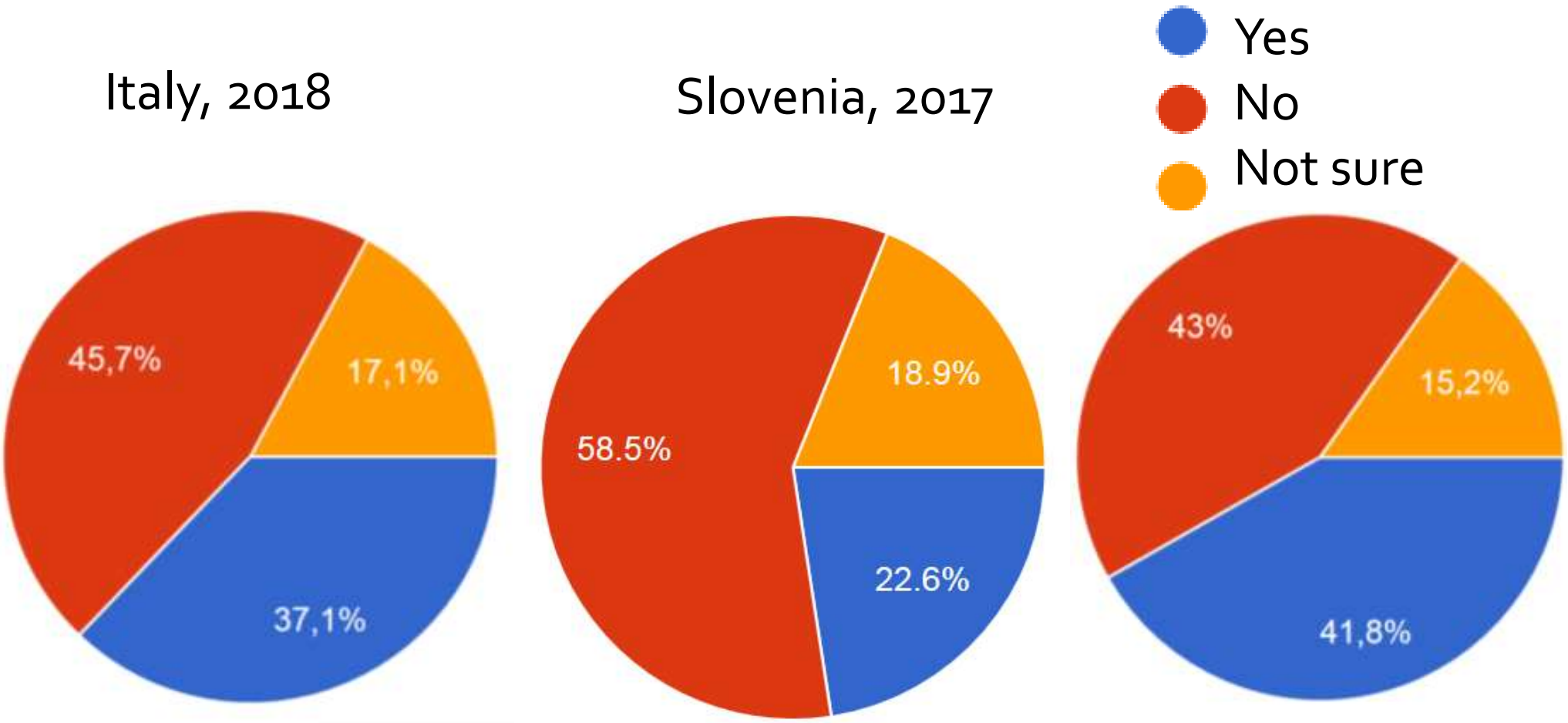
Slovenia, 2017





Croatia, 2018

Are you familiar with **local energy action plans** (general public)



Partnerships for Local Climate Action what shoud they act upon

- Generate carbon-free electricity
- Develop clean mobility that is accessible to everyone
- Eradicate fuel poverty renovate poorly insulated, energy-draining buildings
- Design future solutions together with research
- Harness agriculture in the fight against climate change: transform agricultural systems with a view to curtailing emissions and improving the capture and storage of carbon in the ground.
- Adapt to climate change: more effective protection against extreme weather events and to build resilience among the main economic sectors

If we are serious about “saving the planet”, then this will require a fundamental rethinking in economy model

- Reduction of resource consumption
- Management that emphasize optimization, not maximization
- Behavioural changes