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scientists and public engagement

university of groningen

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

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Jihočeská univerzita v Českých Budějovicích
University of South Bohemia in České Budějovice

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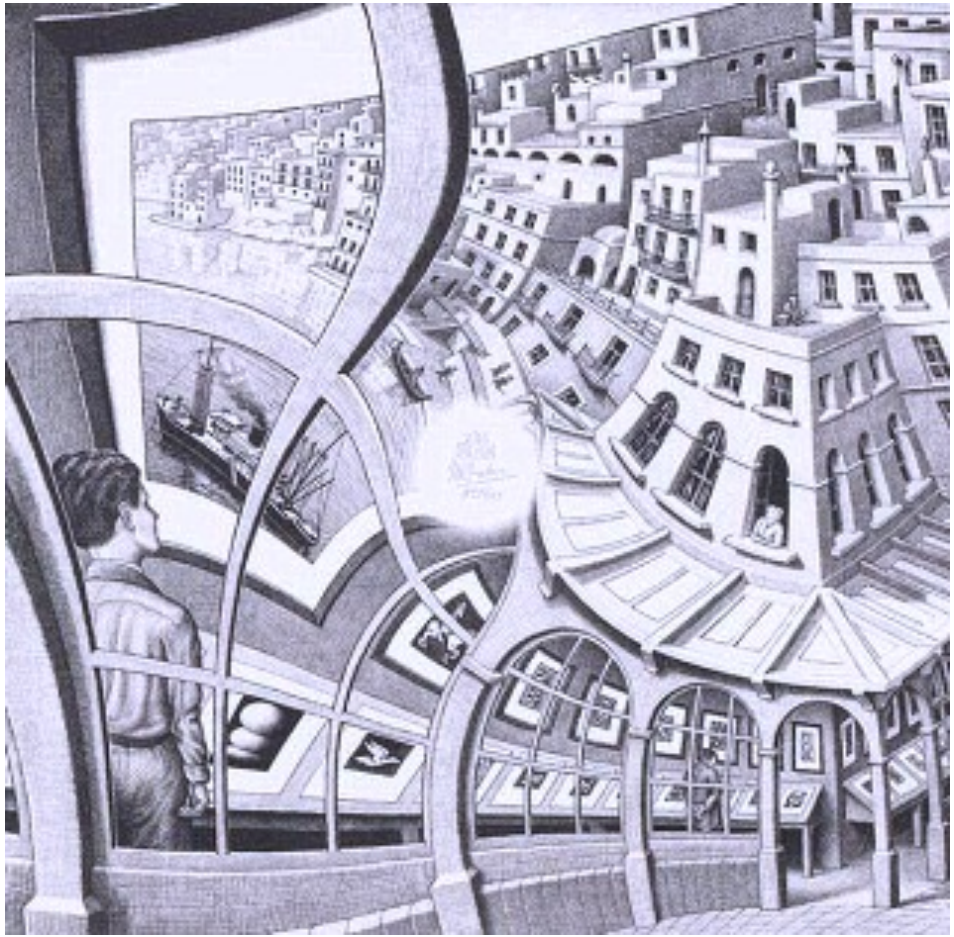
Climate Scenarios: imagination exercise and building narratives

Giulia Tasquier, Laura Rigotti
University of Bologna

STAGE LTTA
Groningen, January 15-17, 2024

Dynamic intertwining, Ferruccio Gard

– Exposed at Museo Boncompagni Ludovisi, Roma 2018 –



(Lithograph Print Gallery by M. C. Escher, 1956; http://www.ams.org/notices/200304/fea-escher.pdf)

*"**People make sense of the world and give meaning to life through the construction of narratives**.*
How people make sense of the world is reflected in their everyday micro-narratives, the anecdotes or "small stories" people tell in social interactions.
Narratives are, therefore, particularly useful for exploring social patterns of cognition. Social knowledge extracted from daily rhetoric can point to what informs decisions, actions, interests, and principles and, thus, may be useful for discovering what is considered public truth and preferable behaviour. Micro-narratives contribute more to participative modes of sensemaking than "big stories" do. Furthermore, these fragments collectively disclose identities, motivations, and attitudes. ***Sensemaking, narrative, and culture are, therefore, interwoven and give feedback to one another in complex ways**."*

(Van der Merwe et al. 2019)

*– "**Narrative** becomes part of **how people understand the world** they live in and they serve as a way of communicating that understanding to others" –*

(Avraamidou & Osborne, 2009)

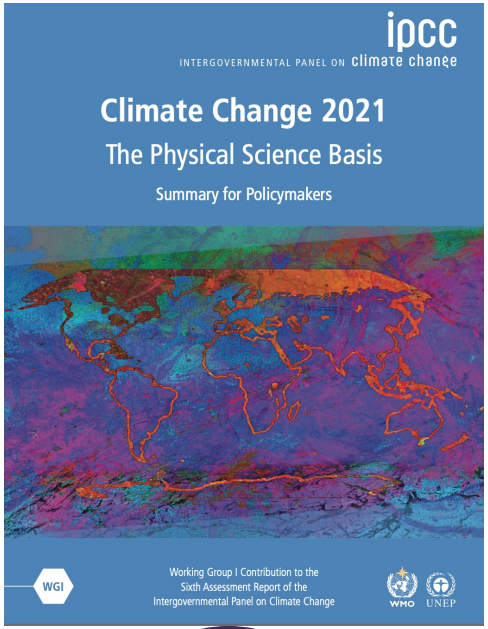
– “ *In the context of such* ***complex problems*** *as today’s sustainability and climate change challenges,* ***narratives become a primary and crucial means for integrating scientific knowledge relevant to science, authentic inquiry and critical thinking skills needed to pursue solutions drawing from science, and the goal-oriented, affective and active engagement in actual action****." –*

(Knain, Jornet, Tasquier et al., AERA 2021)

The urgency of the global climate crisis

The urgency of the global climate crisis

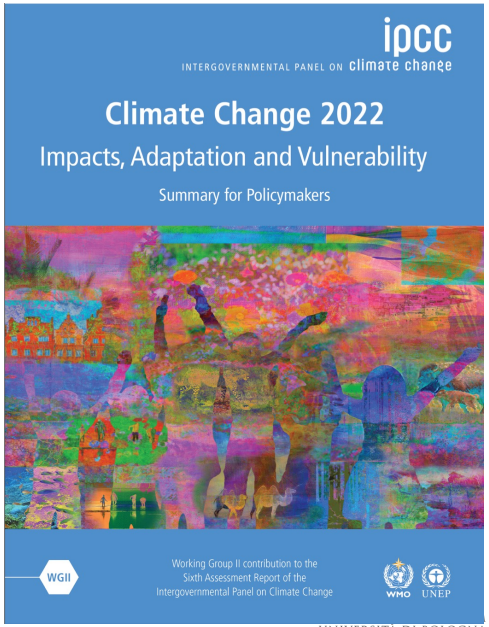
The manifestation of the urgency of the global climate crisis is anytime more and more evident in front our eyes.



The UN Secretary-General António Guterres' statement:

"Today's IPCC Working Group 1 report **is a code red for humanity. The alarm bells are deafening, and the evidence is irrefutable**: greenhouse-gas emissions from fossil-fuel burning and deforestation are choking our planet and putting billions of people at immediate risk. **Global heating is affecting every region on Earth, with many of the changes becoming irreversible**."

(August 9th, 2021 – IPCC WGI Press release)



The IPCC chair Hoesung Lee' statement:

"This report is a **dire warning about the consequences of inaction.** It shows that **climate change is a grave and mounting threat to our wellbeing and a healthy planet. Our actions today will shape how people adapt and nature responds to increasing climate risks"**.

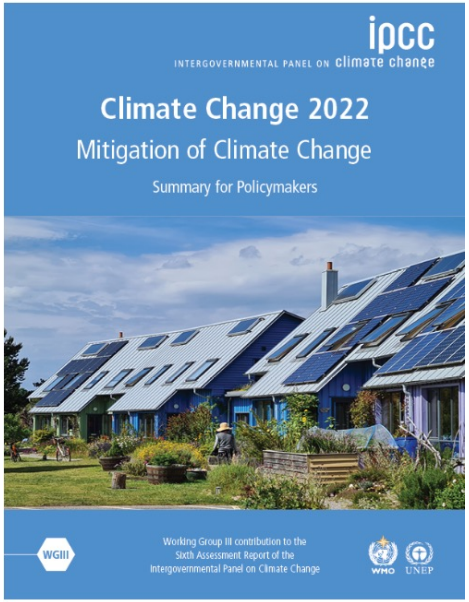
(February 28th, 2022 – IPCC WGII Press release)

2021

...

The urgency of the global climate crisis

The manifestation of the urgency of the global climate crisis is anytime more and more evident in front our eyes.

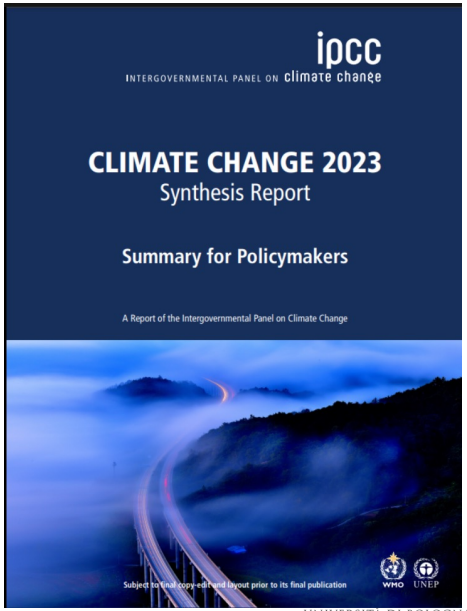


The IPCC chair Hoesung Lee' statement:

"We are at a crossroads. The decisions we make now can secure a liveable future. We have the tools and know-how required to limit warming.." […]

"The evidence is clear: the time for action is now. We can halve emissions by 2030."

(April 4th, 2022 – IPCC WGIII Press release)



…
2023

The IPCC chair Hoesung Lee' statement:

"This Synthesis Report underscores the urgency of taking more ambitious action and shows that, **if we act now, we can still secure a liveable sustainable future for all.**"

(March 20th, 2023 – IPCC Synthesis Report Press release)

… To what extent the world is reacting to all of this?

«The paradox is that we will not be able to solve the problem until we have considered it a problem. We must be very afraid of what lies ahead and at the same time be convinced that with a lash we can recover the right course.»

(Andri Snaer Magnason, *On Time and Water, p.206*

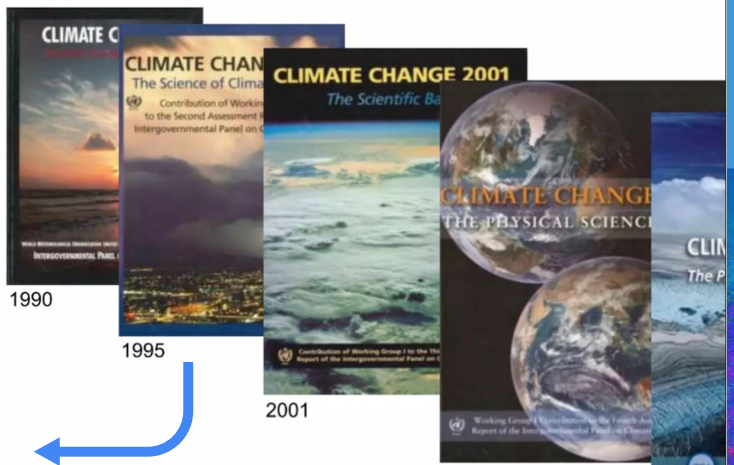
* Freely translated *)

"**We can't solve a crisis without treating it as a crisis**. We need to keep the fossil fuels in the ground, and we need to focus on equity. **And if solutions within the system are so impossible to find, maybe we should change the system itself**. … We have come here to let you know that **change is coming, whether you like it or not**."

(Grete Thunberg at COP24, Katowice, December 2018)

The global **emergence of youth movements** shows the extent to which **young people feel engaged with complex scientific issues** that represent real threats to their present and futures.

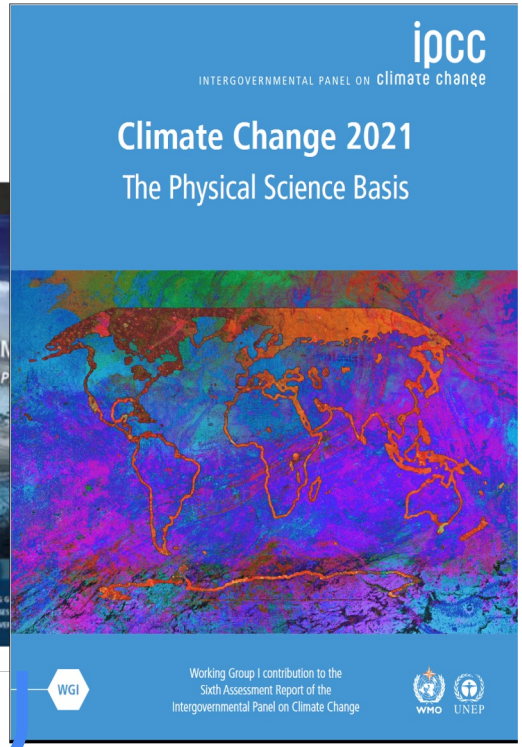
The **IPCC** (Intergovernamental Panel for Climate change) is the most authoritative international body for assessing climate change.



Kyoto Protocol

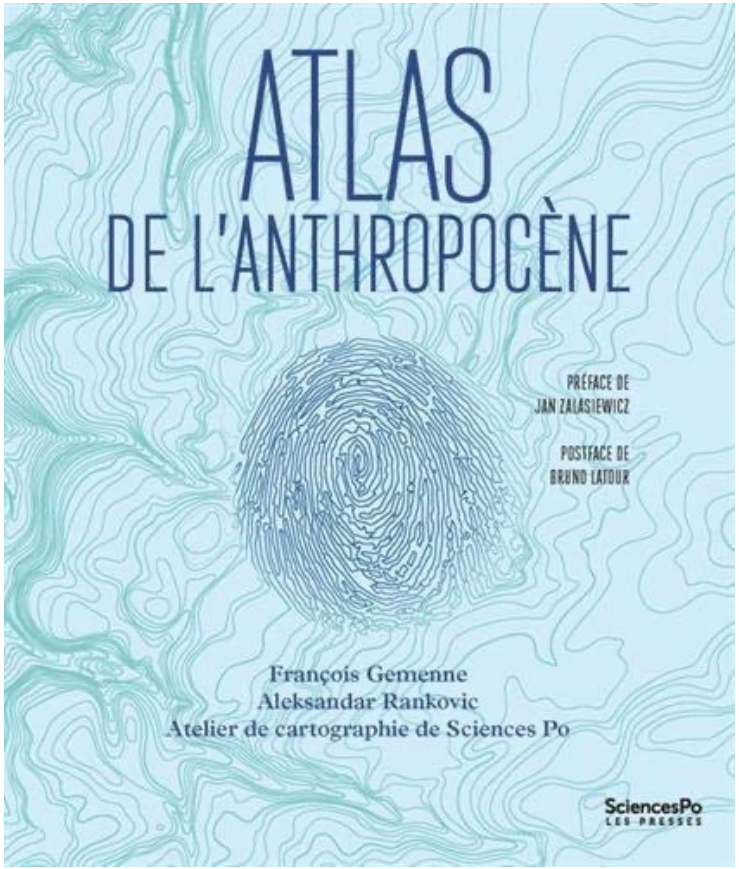
Peace Nobel Prize

Paris Agreement



2021 - Sixth Assesment report (AR6)

It was established in **1988** by the «World Meteorological Organization» (WMO) and the «United Nations Environment Programme» (UNEP) to provide policy makers with periodic assessments (reports) of the scientific basis of climate change, its impacts, future risks and options for adaptation and mitigation.



«The great advantage of being faced with the Anthropocene is that we no longer have to deal with a natural problem, in front of which we would be without strength and resources, but **we are faced with social decisions which we can easily oppose**. If, at a first reading, you may feel lacking in the breadth of such an undertaking, at the second reading you feel in the right stature **to take up the challenge**.»

Bruno Latour (afterword in *Anthropocene Atlas*, p.144

* Freely translated *)

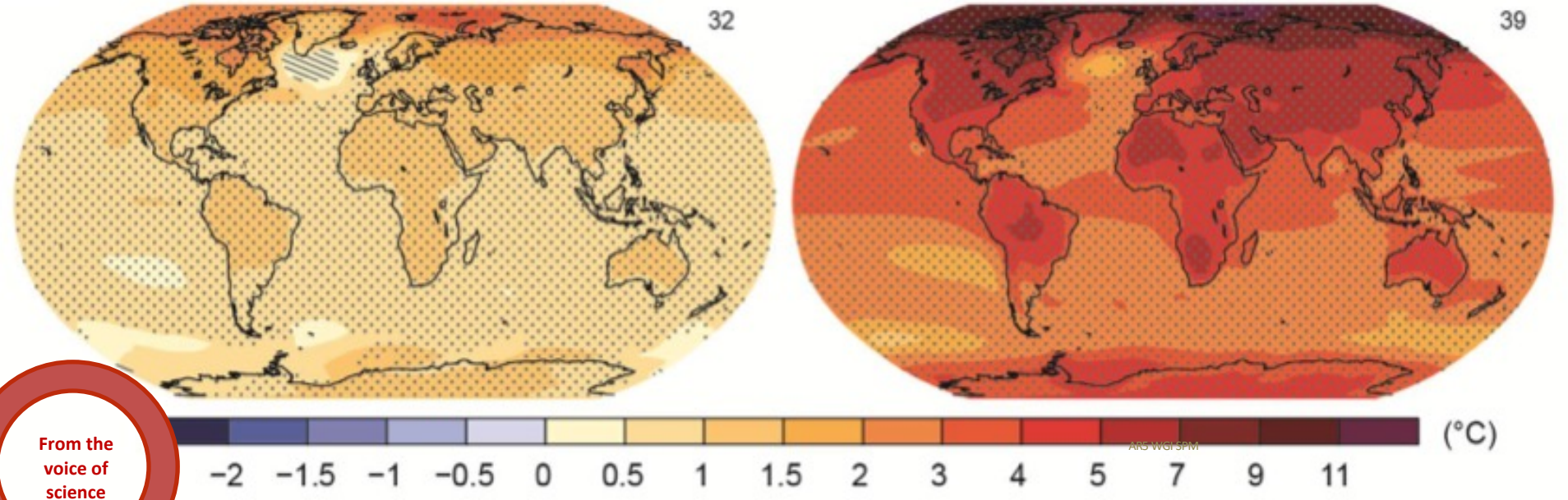
The future is a choice

From the voice of the young

The future is a choice

With substantial mitigation

Without additional mitigation

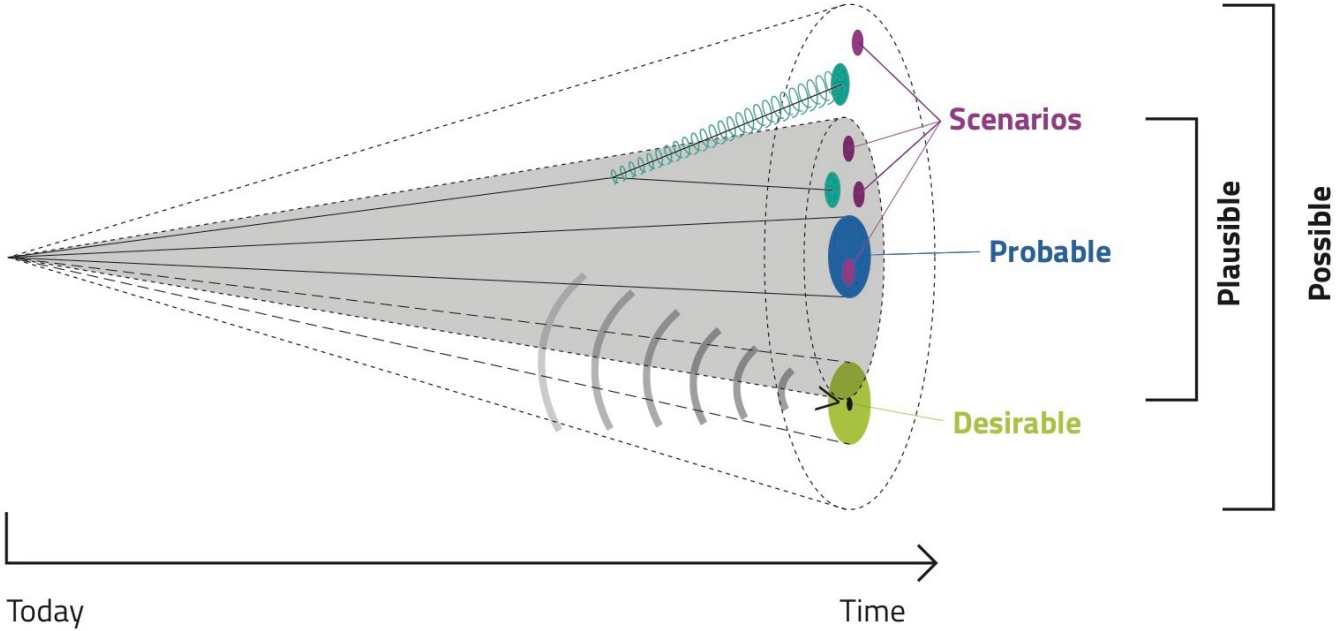


From the voice of science

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

Source: IPCC 2014 (AR5 Synthesis Report)

The future is a choice among different possible futures



From the voice of educational research

The futures cone (re-adapted from Voros 2003)

I SEE
It's your time to imagine the futures

https://iseeproject.eu

@Credits: Olivia Levrini, 2019

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Narrating the futures

Prediction

- Unique result of applying a model
- Partially, this is what also happens in meteorology, although, due to non-linearity, the reliability of the forecast extends for a limited period of time

Vs.

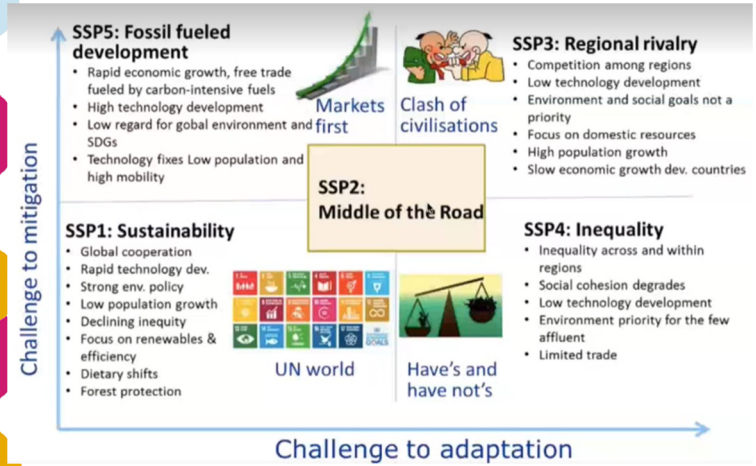
Projection

- We move from univocality to a range of possibilities as wide as the scenarios and future structures are numerous and varied
- Unlike forecasts, they are conditional in assumptions regarding, for example, future socio-economic and technological developments that may or may not be realized

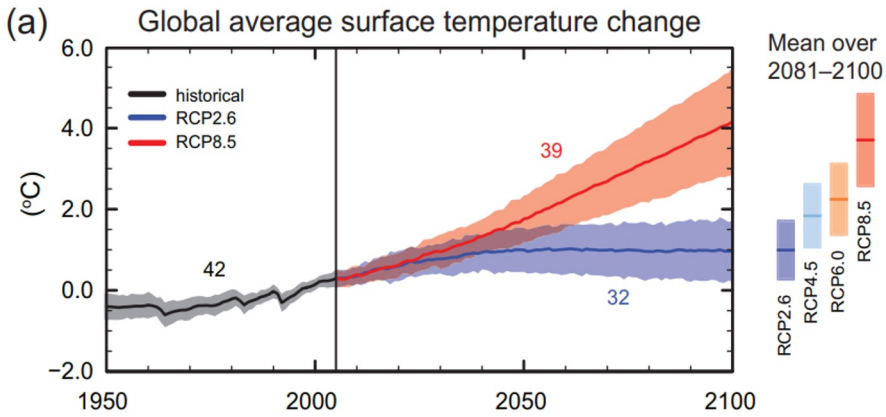
Scenario

A plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces (e.g., rate of technological change, prices) and relationships. Note that scenarios are neither predictions nor forecasts, but are used to provide a view of the implications of developments and actions. See also *Baseline scenario*, *Emission scenario*, *Mitigation scenario* and *Pathways*.

Two types of projections: SSPs e RCPs



The **Shared Socio-Economic Pathways (SSPs)** offer a systematic exploration of possible **socioeconomic** futures in terms of widely different predispositions to mitigate and adapt to climate change. They are narrative scenarios.



Representative Concentration Pathways (RCPs) represent different **emissions**, concentration and radiative forcing projections leading to a large range of global warming levels.

Over the past few years, an international team of climate scientists, economists and energy systems modellers have built a range of new “pathways” that examine how global society, demographics and economics might change over the next century. They are collectively known as the “**Shared Socioeconomic Pathways**” (**SSPs**).

The **SSPs** are **based on five narratives** describing broad socioeconomic trends that could shape future society. These are intended to span the range of plausible futures.

SSP1 - a world of sustainability-focused growth and equality
SSP2 - a “middle of the road” world where trends broadly follow their historical patterns
SSP3 - a fragmented world of “resurgent nationalism”
SSP4 - a world of ever-increasing inequality
SSP5 - a world of rapid and unconstrained growth in economic output and energy use

SSP5: Fossil fueled development

- Rapid economic growth, free trade fueled by carbon-intensive fuels
- High technology development
- Low regard for gobal environment and SDGs
- Technology fixes Low population and high mobility

Markets first

Clash of civilisations

SSP3: Regional rivalry

- Competition among regions
- Low technology development
- Environment and social goals not a priority
- Focus on domestic resources
- High population growth
- Slow economic growth dev. countries

SSP2: Middle of the Road

SSP1: Sustainability

- Global cooperation
- Rapid technology dev.
- Strong env. policy
- Low population growth
- Declining inequity
- Focus on renewables & efficiency
- Dietary shifts
- Forest protection

UN world

Have's and have not's

SSP4: Inequality

- Inequality across and within regions
- Social cohesion degrades
- Low technology development
- Environment priority for the few affluent
- Limited trade

Challenge to mitigation

Challenge to adaptation

SSP1	**Sustainability – Taking the Green Road (Low challenges to mitigation and adaptation)** The world shifts gradually, but pervasively, toward a more sustainable path, emphasizing more inclusive development that respects perceived environmental boundaries. Management of the global commons slowly improves, educational and health investments accelerate the demographic transition, and the emphasis on economic growth shifts toward a broader emphasis on human well-being. Driven by an increasing commitment to achieving development goals, inequality is reduced both across and within countries. Consumption is oriented toward low material growth and lower resource and energy intensity.
SSP2	**Middle of the Road (Medium challenges to mitigation and adaptation)** The world follows a path in which social, economic, and technological trends do not shift markedly from historical patterns. Development and income growth proceeds unevenly, with some countries making relatively good progress while others fall short of expectations. Global and national institutions work toward but make slow progress in achieving sustainable development goals. Environmental systems experience degradation, although there are some improvements and overall the intensity of resource and energy use declines. Global population growth is moderate and levels off in the second half of the century. Income inequality persists or improves only slowly and challenges to reducing vulnerability to societal and environmental changes remain.
SSP3	**Regional Rivalry – A Rocky Road (High challenges to mitigation and adaptation)** A resurgent nationalism, concerns about competitiveness and security, and regional conflicts push countries to increasingly focus on domestic or, at most, regional issues. Policies shift over time to become increasingly oriented toward national and regional security issues. Countries focus on achieving energy and food security goals within their own regions at the expense of broader-based development. Investments in education and technological development decline. Economic development is slow, consumption is material-intensive, and inequalities persist or worsen over time. Population growth is low in industrialized and high in developing countries. A low international priority for addressing environmental concerns leads to strong environmental degradation in some regions.
SSP4	**Inequality – A Road Divided (Low challenges to mitigation, high challenges to adaptation)** Highly unequal investments in human capital, combined with increasing disparities in economic opportunity and political power, lead to increasing inequalities and stratification both across and within countries. Over time, a gap widens between an internationally-connected society that contributes to knowledge- and capital-intensive sectors of the global economy, and a fragmented collection of lower-income, poorly educated societies that work in a labor intensive, low-tech economy. Social cohesion degrades and conflict and unrest become increasingly common. Technology development is high in the high-tech economy and sectors. The globally connected energy sector diversifies, with investments in both carbon-intensive fuels like coal and unconventional oil, but also low-carbon energy sources. Environmental policies focus on local issues around middle and high income areas.
SSP5	**Fossil-fueled Development – Taking the Highway (High challenges to mitigation, low challenges to adaptation)** This world places increasing faith in competitive markets, innovation and participatory societies to produce rapid technological progress and development of human capital as the path to sustainable development. Global markets are increasingly integrated. There are also strong investments in health, education, and institutions to enhance human and social capital. At the same time, the push for economic and social development is coupled with the exploitation of abundant fossil fuel resources and the adoption of resource and energy intensive lifestyles around the world. All these factors lead to rapid growth of the global economy, while global population peaks and declines in the 21st century. Local environmental problems like air pollution are successfully managed. There is faith in the ability to effectively manage social and ecological systems, including by geo-engineering if necessary.

SSP1 and **SSP5** envision relatively optimistic trends for human development, with **"substantial investments in education and health, rapid economic growth, and well-functioning institutions"**. They differ in that SSP5 assumes this will be driven by an energy-intensive, fossil fuel-based economy, while in SSP1 there is an increasing shift toward sustainable practices.

SSP3 and **SSP4** are more pessimistic in their future economic and social development, with **little investment in education or health in poorer countries coupled with a fast-growing population and increasing inequalities**.

SSP2 represents a **"middle of the road"** scenario historical patterns of development are continued throughout the 21st century.

Task 1: Building scenario narrative

A. Read your scenario carefully and analyse it, trying to extrapolate its main ***characteristics***

B. Develop this scenario starting from its characteristics, trying to come up with a more complex narrative which, beyond the basic characteristics, says something more about the type of world one would inhabit if that were the scenario created; decide what role you have in that scenario, that is, what type of ***stakeholder*** you are and how you contribute to maintaining that scenario

C. Give it a name

N.B.: You can use your imagination or interact with ChatGPT as a stakeholder to imagine together

Time: 12 minutes

Task 2: «Playing» the scenario

A. What problem in your scenario particularly concerns you and would you like to see resolved? To which dimension does it belong and/or which ***dimensions*** does it involve (economic, environmental, social, individual, professional...)? What ***types/categories of people and citizens*** does it involve (stakeholders)? Identify one.

B. Project yourself 10 years forward and imagine your success story, how you managed to solve the problem you identified and what your scenario looks like 10 years later. In carrying out these foresight and back-casting operations, you retrospectively reconstruct the story of what happened, the choices that led you to resolve the problems and what role you played.

N.B.: You can use your imagination or interact with ChatGPT as a stakeholder to imagine together

Time: 12 minutes

Highlights

- Complexification (Stakeholders.., dimensions..)
- Extension of the present.. (enlarging the vision, …)
- Hybridization…
- …

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Thanks!