

“Building Armenia’s National Transparency Framework
under Paris Agreement” UNDP-GEF Project/00110252

Training Day 1

Climate action and climate governance: the science and regulatory contexts

Our Content today

This first training session will begin to set the context for climate action (e.g. sustainable investment green finance) and the surrounding governance

1) Introduction to the team and to the assignment

2) Brief introduction on the the science, policy and overall context of sustainable climate and environmental action (introducing the global perspective, and then zooming towards the specific Armenian context)

3) Looking at science data and projections for Armenia; Understanding transitions and physical risks in climate assessments; risk disclosure

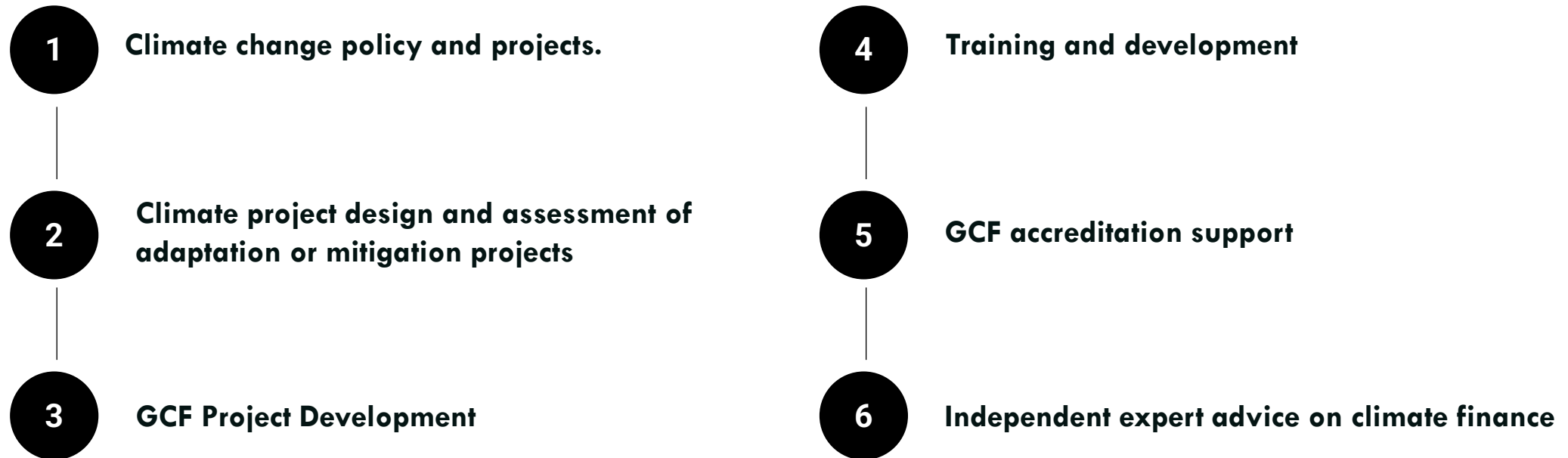
Training Day 1

Introduction to the team



About Globalfields

Globalfields (www.Globalfields.co.uk) was established in 2018 in the United Kingdom and is a boutique consultancy specializing in climate finance, aiming to scale up financial flows to help developing countries contribute to climate change mitigation and enhance their resilience to the impacts of the climate crisis. Globalfields works at the intersection of the public and private sectors, primarily with institutions and investors working in development finance, green finance, national institutions and NGOs, for which it provides advisory services around several pillars:



Working with...



Globalfields

The Team



Marta Simonetti
Team Lead



Andreas Biermann
Mitigation and Specific MRV



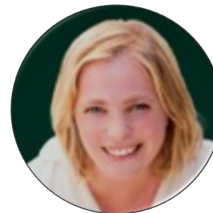
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GHG Inventory



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Rory Dunn-Lowes
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The Trainer

Marta Simonetti



Marta Simonetti is an experienced green finance director based in London. She worked in the City of London, initially in marketing and then in development and transition banking for the European Bank for Reconstruction and Development. In 2018 she set up her consultancy, Globalfields Ltd, which specializes in advisory, consultancy and training services in green finance and sustainable leadership.

Through the Globalfields, Marta has carried out several assignments at senior level for the Green Climate Fund, Asian Development Bank, WWF-US, GIZ, IPC GmbH, Absolute Energy Capital, as well as for private equity companies and governments. She is now focusing on the green transformation of financial markets, working with governments, financial institutions and the consultancy sector in Europe, Africa, Central Asia and south-east Asia. Her main skills are in fund management (legal and institutional structuring), blended finance structuring (mixed participation equity and loans; revolving funds; guarantee funds), resource mobilization, program structuring in climate and environmental finance.

Marta is also a researcher and member of the Centre for Internal Environmental Law and Development of the School of Oriental and African Studies (SOAS).

Training Day 1

Scope of the Project and Training Needs



Building Armenia's National Transparency Framework under Paris Agreement" UNDP-GEF Project

The key objective of the project is to meet enhanced transparency requirements as defined in Article 13 of the Paris Agreement by strengthening institutional and technical capacity for measuring and reporting on emissions, mitigation and adaptation activities, and support received

1) Strengthening national institutions for Measurement, Reporting and Verification (MRV) and aligning transparency activities with country priorities

2) Ensuring that organizations and individuals have the necessary training and tools to conduct MRV activities

3) Transitioning arrangements for data collection, analysis, and reporting from a project-based cycle to a continuous process.

Building Armenia's National Transparency Framework – Focus on Training

There are three components in this project, the third focusing in training to build awareness, knowledge, and tools to meet the provisions stipulated in Article 13 of the Agreement

1) The training will ensure that Armenian experts and decision-makers have the capacity to use the MRV framework that is established and to communicate their transparency activities.

2) Overall, the provision of tools, training, and assistance – as set in this inception report - will focus on three areas: 1) Improvements in the greenhouse gas (GHG) inventory; 2) Improvements in the frameworks for transparency of action and support; and 3) International information and knowledge exchange.

3) Additional considerations for this training programme will be to ensure equal participation by women in training and in capacity strengthening activities, and it will develop guidance on mainstreaming gender considerations into the three areas listed above.

Training Overview

2 Full Days

Day 1

Climate Change: regulatory and scientific contexts; causes, impacts and the Armenian context; the Enhanced Transparency Framework, basics of MRV and the Armenian Context, MRV in adaptation

Day 2

Specific MRV Approaches in mitigation, GHG tracking and support, with reference to Armenia and country comparators

The training curriculum is split across two days, covering approximately 14-16 hours of training (contact hours) and 2-4 hours individual learning (non-contact hours, through additional reading and quizzes). Delivery is both in person and digital. Course material (slides) will be presented in English and translated into Armenian too.

Training Day 1

The Scientific Context



Context Of Change: Climate Change Regime

Climate change refers to the complex shifts that emerge due to human activity (greenhouse gas emissions into the atmosphere) that affect the planet's weather and climate systems (The National Geographic).

Climate change encompasses extreme weather events, shifting wildlife populations and habitats, rising seas etc.

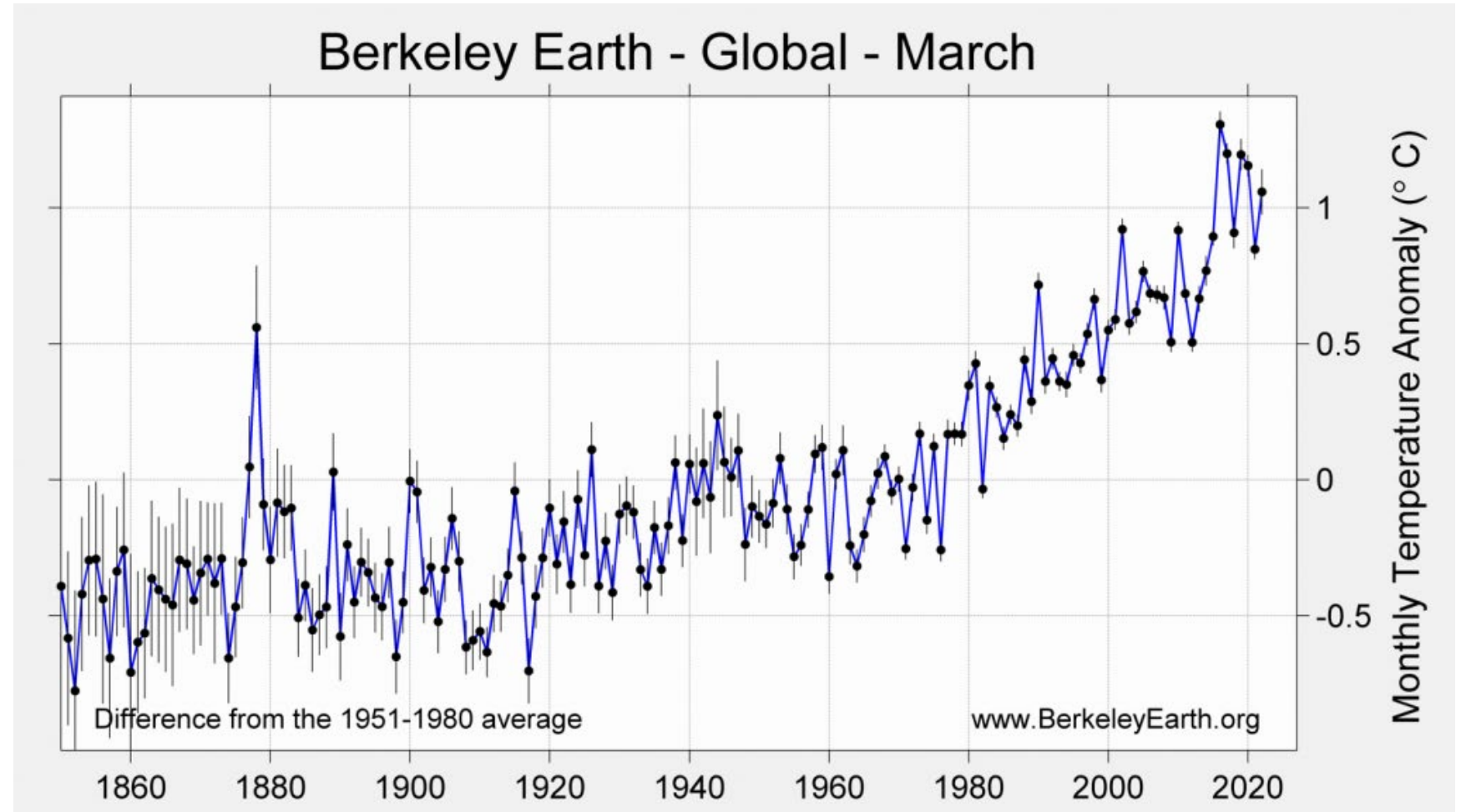
Global warming: “Global warming is the long-term heating of Earth's climate system observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in the Earth's atmosphere” (NASA).



The Scientific Context

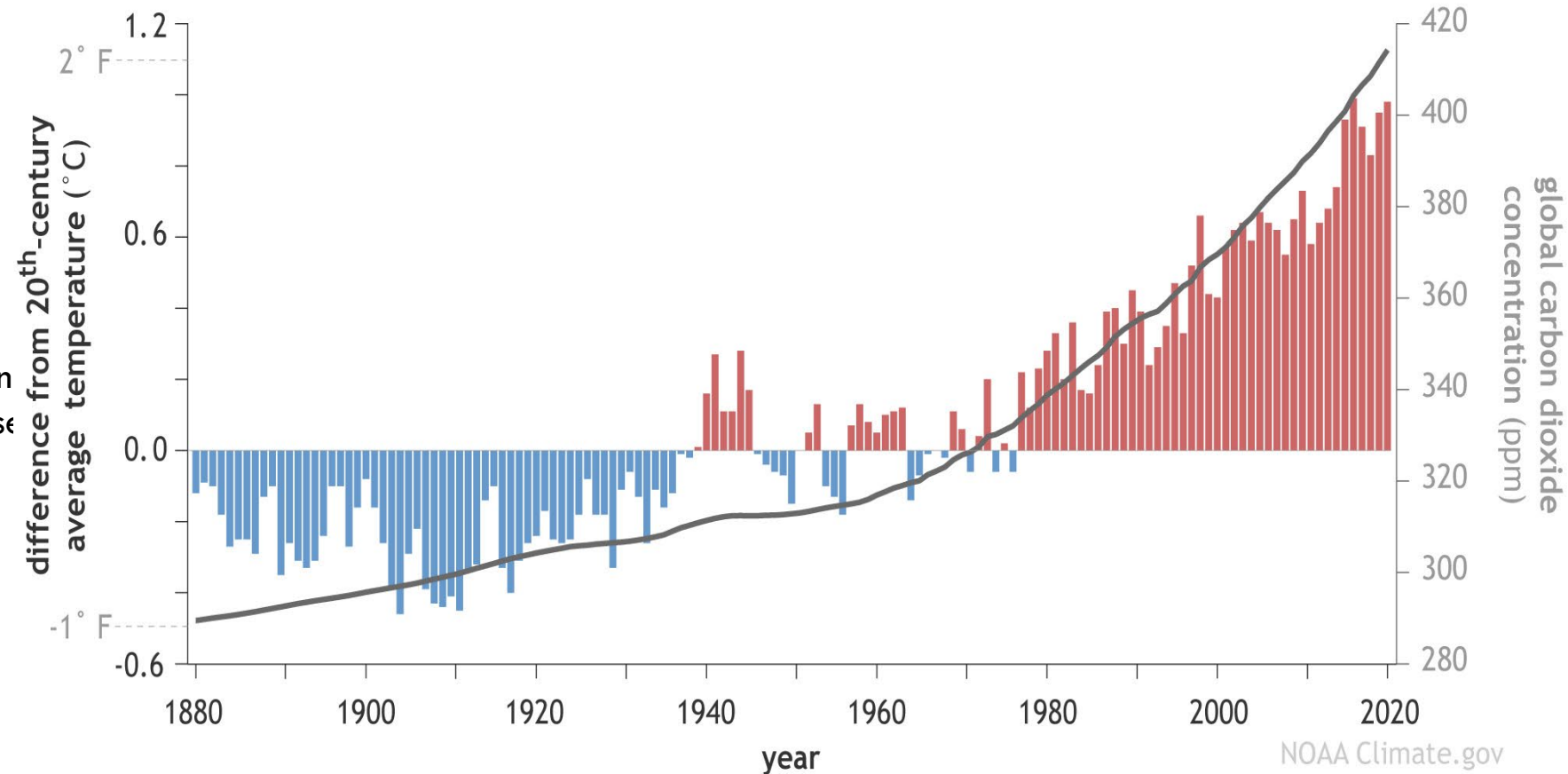
Temperature Rise

Globally, March 2022 has been the fifth warmest March since records began in 1850. This March is notably cooler than March 2016, 2017, 2019 and 2020, though it is warmer than in March 2021 and all other previous years.



The Scientific Context: Correlation between CO₂ and temperature rise

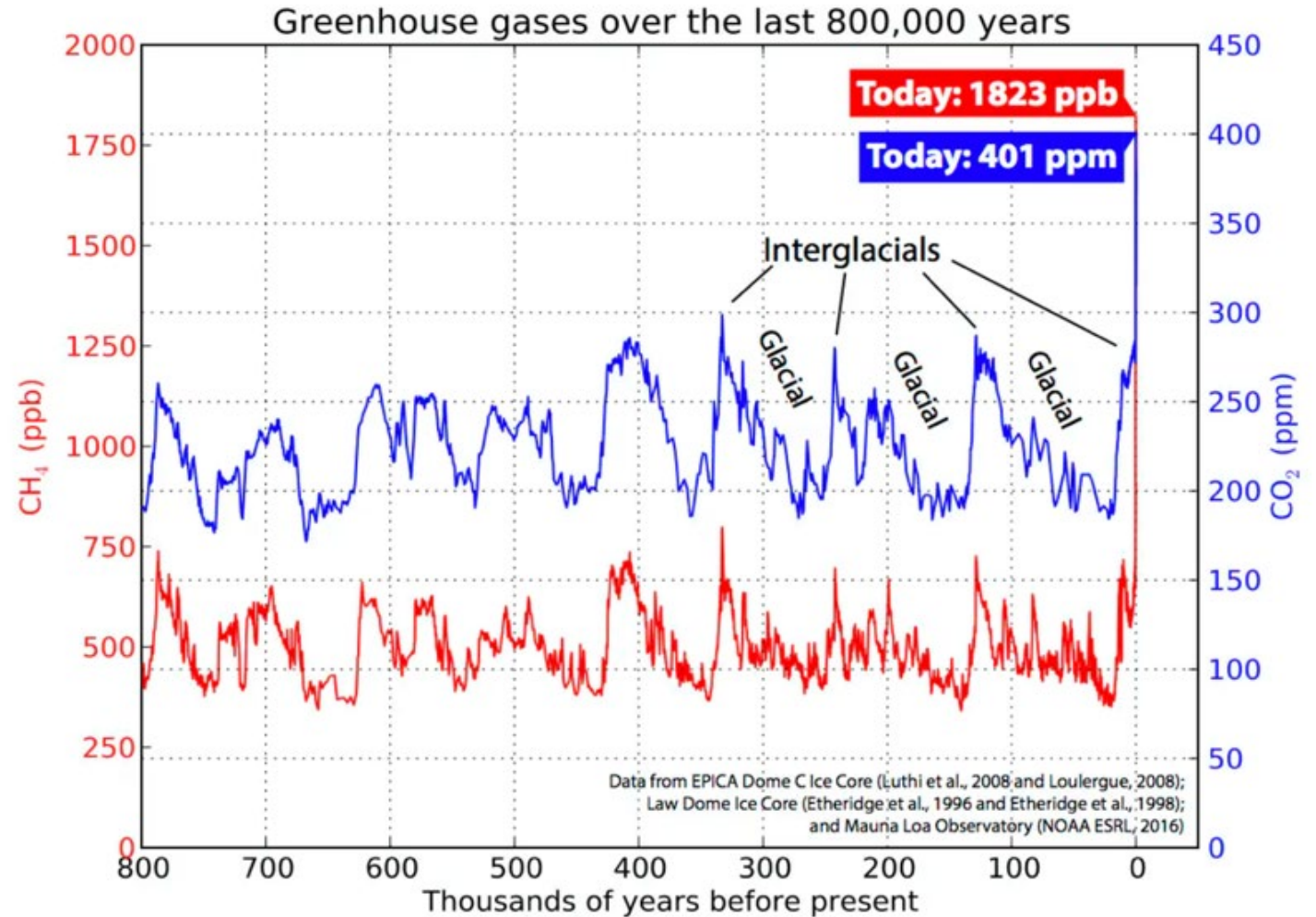
Global atmospheric carbon dioxide and surface temperature (1880-2020)



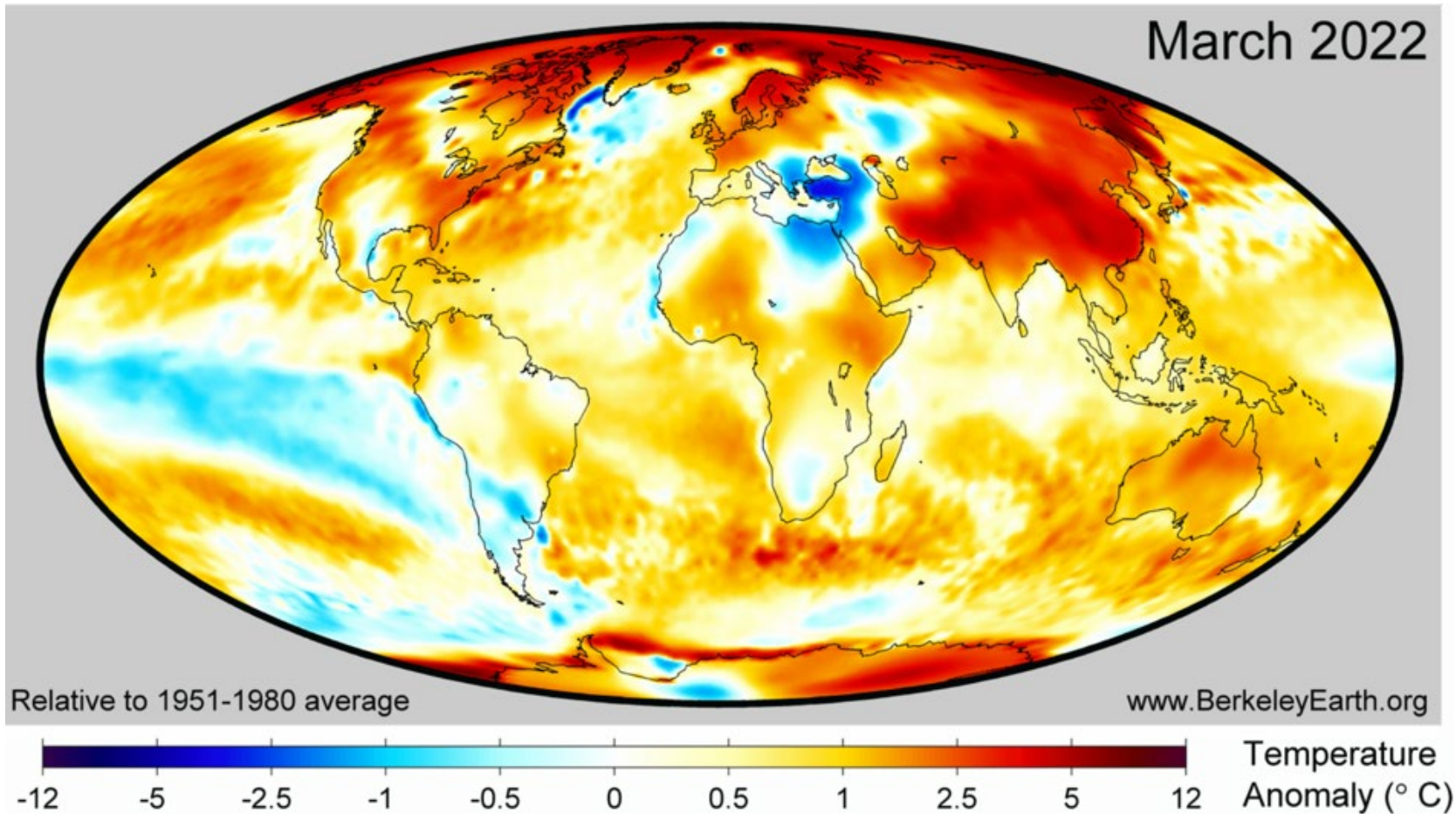
There is an algorithmic relation between CO₂ concentrations and temperature rise

The Scientific Context:

A look into paleo-climate to see the link between CO₂ rise in interglacial years



The Scientific Context: Anomalies (Global)



From the *Berkeley Earth* global temperature report – we see the global distribution of temperature changes 2022 relative to the period 1951 – 1980.

Global mean average rise so far: 1.3 degree C (°C)

(berkeleyearth.org)

The Scientific Context: Armenia

Armenia		
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Already	+2.5°C	In 2020
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Heading For	+4.5°C	In 2100
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- Projections suggest Armenia could experience warming at levels significantly above the global average, with potential warming of **4.5°C** by the 2090s (middle of the range scenario); up to 7 most pessimistic scenarios);
- Expected rise in maximum and minimum temperatures are even more significant and represent major threats to human health, livelihoods, and ecosystems.
- Warming is projected to be strongly biased towards the summer months of July, August, and September.



Agreed aspirational limit of 1.5 degrees Celsius of warming by the Intergovernmental Panel on Climate Change (IPCC) in order to limit the effects of climate change on our ecosystems and existence.

What are the effects of 2 degrees versus 1.5 degrees?

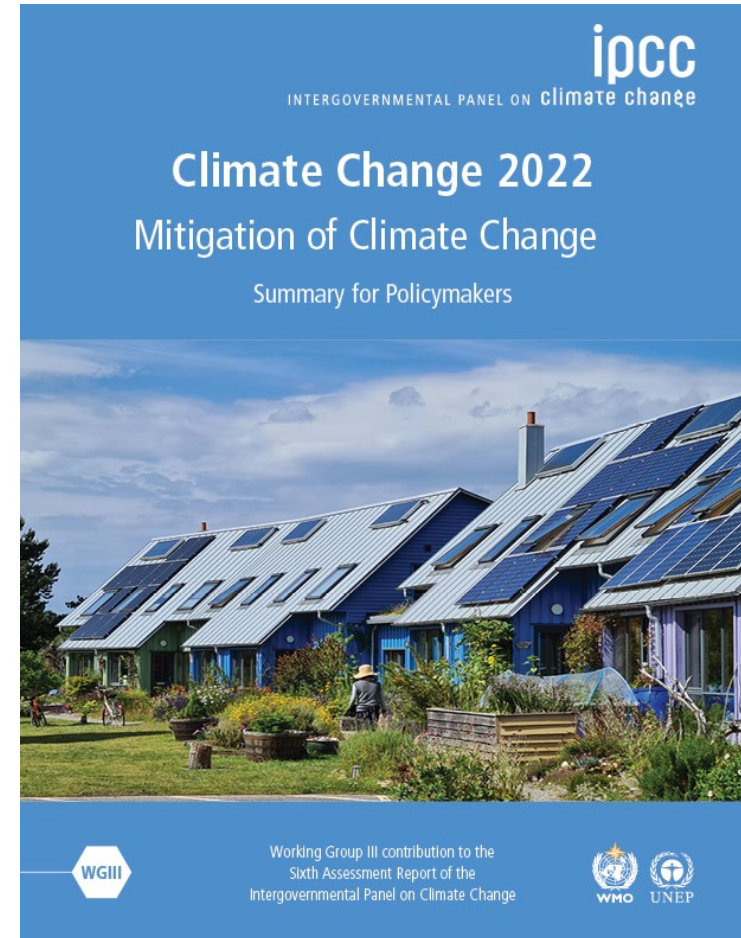
- At 2°C, extreme heat will be 2.6x worse, the world will experience 10x more ice-free summers, there will be 2x more species loss, ecosystem shifts will be 1.86x worse, there will be a 2.3x reduction in crop yields, a 29% further decline in coral reefs, and double the decline in marine fisheries.

Can we still achieve 1.5 degrees – how difficult is it?

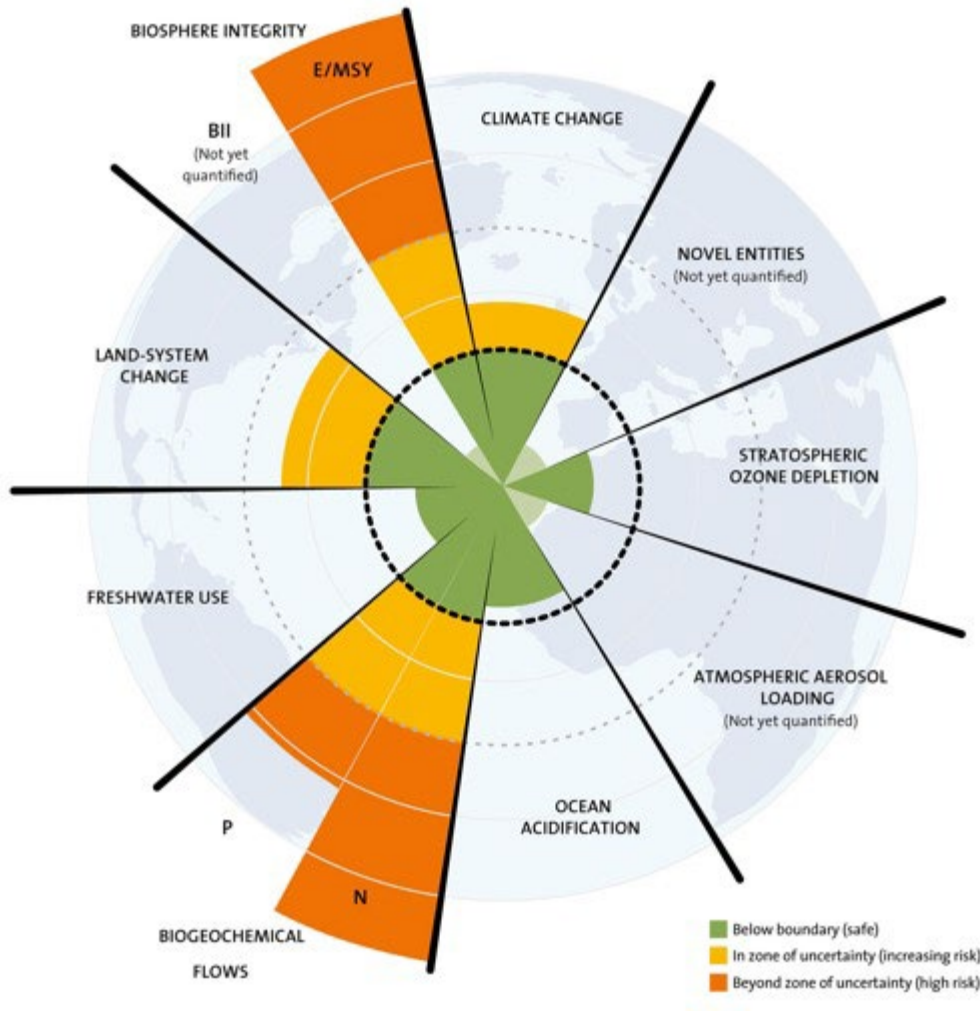
- Currently, the world is not on track to limit warming to 1.5 degrees, as emissions will need to reach net-zero by mid century.
- The WRI finds that to meet the 1.5 degree goal, investments in low-carbon energy technology and energy efficiency will need increase by roughly a factor of five by 2050 compared to 2015 levels.

Last IPCC report

- Climate science cannot be disputed any longer
- It has now become imperative that the inflection point on greenhouses gas emissions has to happen as soon as possible
- Achieving low carbon development and economic growth, as well as climate resilient investments are indeed possible.
- We need to support those countries and clients that may not have the necessary resources to invest in the green and sustainable transition to help them bridge the gap between what is needed and their ability to finance these solutions.
- More financial and human resources, capacity and time should be dedicated to integrating actions in climate change and other environmental and social objectives, such as biodiversity preservation and sustainable development.



The Scientific Context: Planetary boundaries



- Paris Agreement (Climate Change)
- Montreal Protocol (CFC)
- Kigali Amendment (rev. CFC)
- Convention on Biological diversity (CBD)
- UN Convention to Combat Desertification (UNCCD)

Quiz 1

What is the global mean temperature rise from the pre-industrial baseline up to 2022?

1) 2.1 °C

2) 1.2 °C

3) 1.3 °C

Quiz 2

What is the global mean temperature rise in Armenia (from baseline to 2020)?

1) 2.5 °C

2) 1.9 °C

3) 1.0 °C

Training Day 1

The regulatory context



Three Key Conventions

Originating from the Rio Convention of 1992, based upon numerous multilateral exchanges and the Stockholm Declaration (1972) - Declaration of the United Nations Conference on the Human Environment

United Nations Convention on Climate Change (**UNFCCC**)



United Nations Convention on Biological Diversity (**UNCBD**)



United Nations Convention to Combat Desertification (**UNCCD**)



Three Key Conventions



United Nations Convention on Climate Change (**UNFCCC**)

The United Nations Framework Convention on Climate Change (UNFCCC) established an international environmental treaty to combat "dangerous human interference with the climate system", in part by stabilizing greenhouse gas concentrations in the atmosphere.



Convention on
Biological Diversity

United Nations Convention on Biological Diversity (**UNCBD**)

The Convention on Biological Diversity, known informally as the Biodiversity Convention, is a multilateral treaty. The convention has three main goals: the conservation of biological diversity; the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources.



United Nations
Convention to Combat
Desertification

United Nations Convention to Combat Desertification (**UNCCD**)

The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) is a Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.

Context Of Change - NDCs

- 2015 was a historic year in which 196 Parties came together under the **Paris Agreement** to transform their development trajectories so that they set the world on a course towards sustainable development, aiming at **limiting warming to 1.5 to 2 degrees C above pre-industrial levels**.
- Through the Paris Agreement, Parties also agreed to a **long-term goal for adaptation** – to increase 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.
- Additionally, they agreed to **work towards making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development**.
- **Nationally determined contributions (NDCs)** are at the heart of the Paris Agreement and the achievement of these long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.
- The Paris Agreement (Article 4, paragraph 2) requires each Party to **prepare, communicate and maintain** successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

The Shared Socioeconomic Pathways (SSPs), projections of global socioeconomic developments up to 2100, are used to derive greenhouse gas emission scenarios under different climate policies. The analysis gathers the outputs of 16 models to simulate IPCC climate scenarios over several periods (short, medium, and long term) and in accordance with the (SSPs) that were introduced for the IPCC Sixth Assessment Report on climate change (2021). The SSPs are:

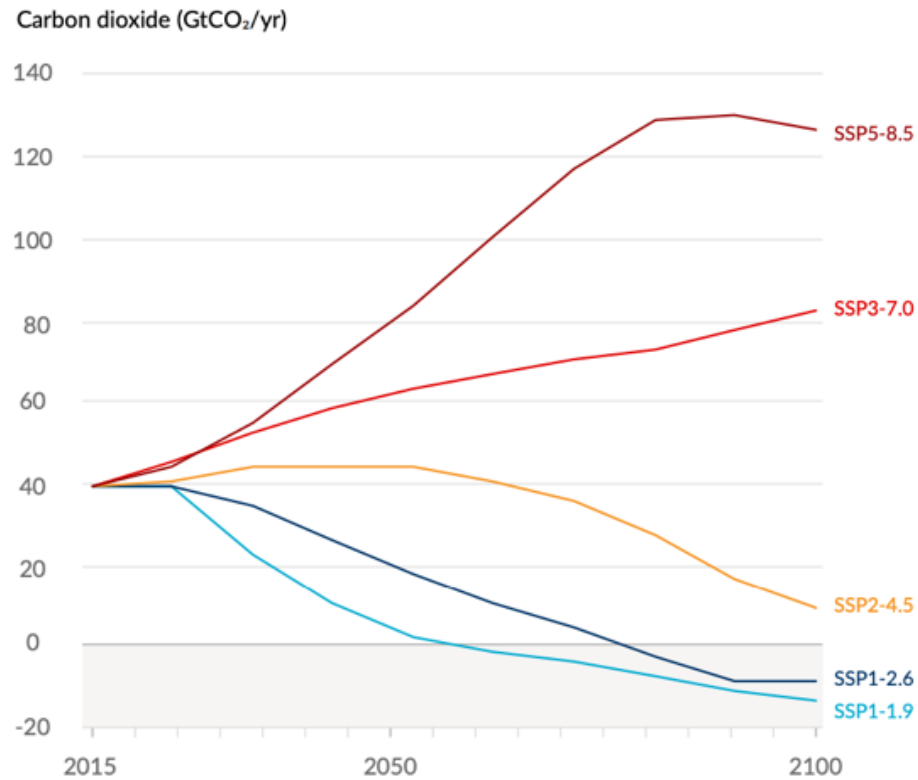
- SSP1: Sustainability (Taking the Green Road).
- SSP2: Middle of the Road.
- SSP3: Regional Rivalry (A Rocky Road).
- SSP4: Inequality (A Road Divided).
- SSP5: Fossil-fueled Development (Taking the Highway).

Other scenarios apply the Representative Concentration Pathways (RCPs) that were previously used:

- RCP 2.6: Very stringent scenario (emissions start declining in 2020, reaching zero by 2100).
- RCP 4.5: Intermediate scenario (emissions peak in 2040, then decline).
- RCP 6.5: Limited emission reduction scenario, with emissions peaking in 2080, then declining.
- RCP 8.5: Continued rise in emissions into 2100.

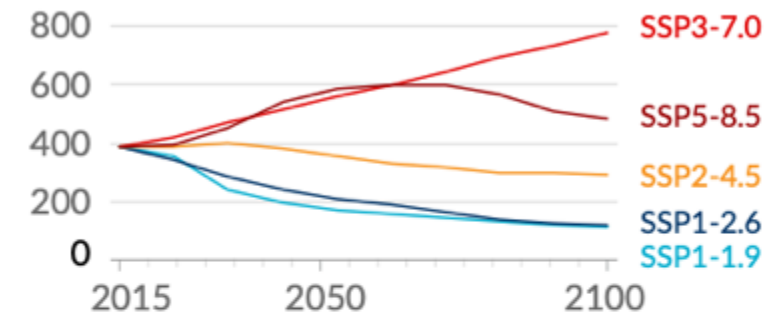
The Scientific Context

Carbon and other GHG trajectories

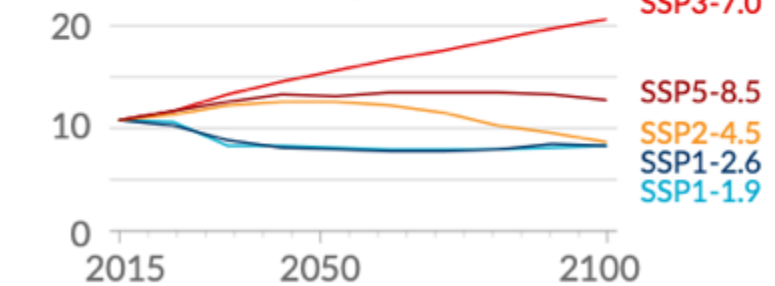


Selected contributors to non-CO₂ GHGs

Methane (MtCH₄/yr)



Nitrous oxide (MtN₂O/yr)



Context Of Change – COP 26

- COP26 (Glasgow, 2021), discussions on:
 - the ***Global Methane Pledge***. Participants joining the Pledge agreed to take voluntary actions to contribute to efforts to reduce global methane emissions by 30% from 2020 levels by 2030, which could eliminate over 0.2°C warming by 2050.
 - the ***Glasgow Leaders' Declaration on Forests and Land Use***. During COP26, 141 countries pledged to “work collectively to halt and reverse forest loss and land degradation by 2030 while delivering sustainable development and promoting an inclusive rural transformation.”
 - Regular (annual) updates on NDCs.
 - Further on net zero pathways.

Quiz 3

Open questions... please answer orally or in chat room)

1) Which are the three Rio Conventions?

2) What are the key elements of the Paris Agreement?

3) What are the key decisions from the last Conference of the Parties (COP) 26, in Glasgow?

Training Day 1

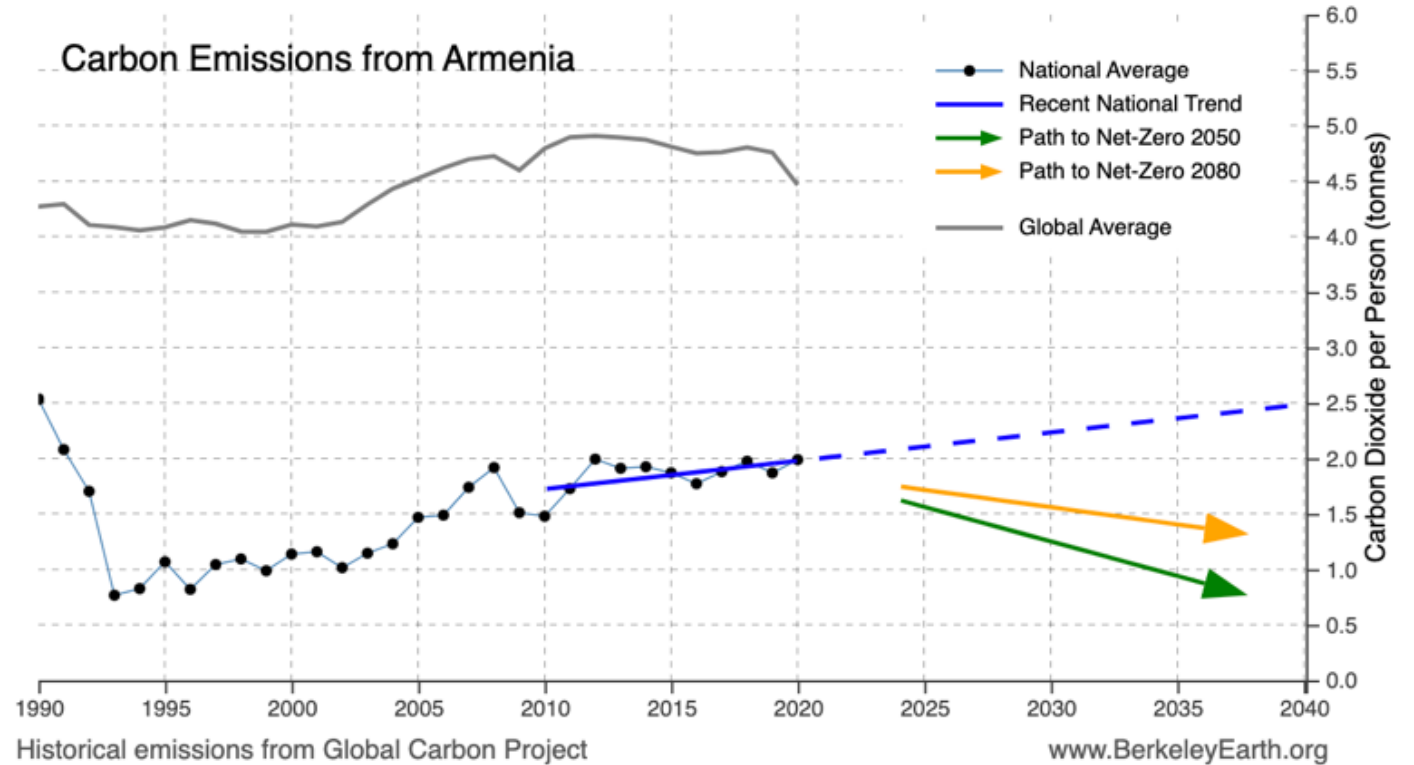
Climatology and projections for Armenia



Armenia: GHG emissions

Carbon dioxide from Armenia

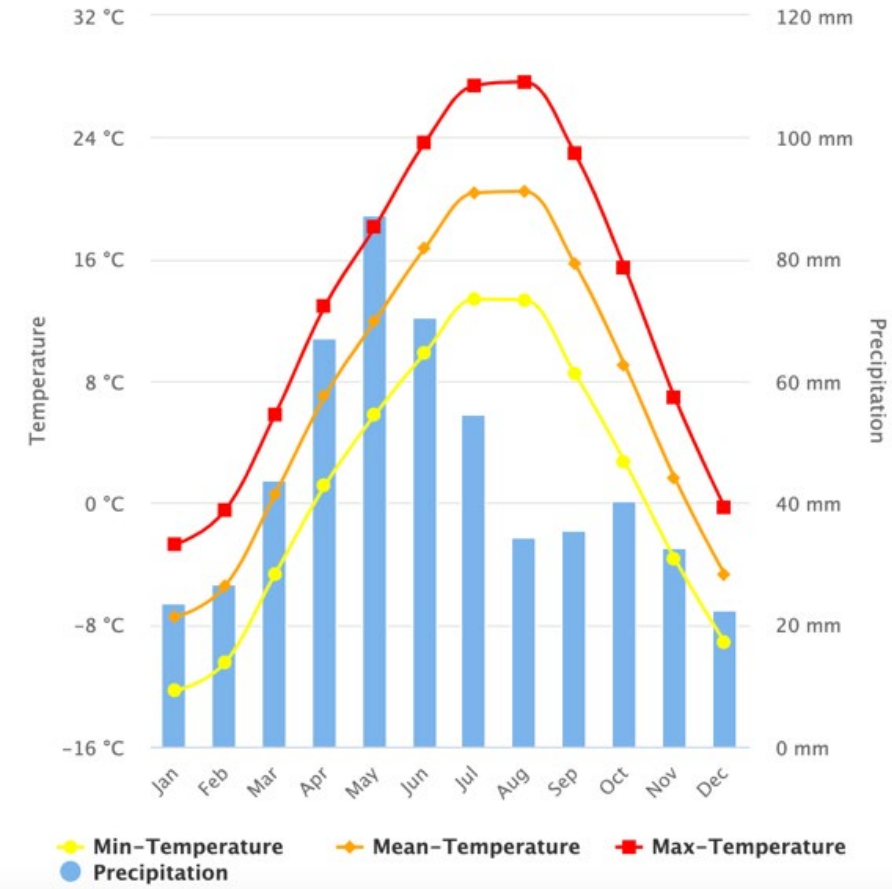
Annual carbon dioxide emissions	2.0 tonnes per person	123rd highest, 0.4x world average
Trend in emissions (2010-2019)	+0.3 tonnes per person per decade, +13% per decade	55th fastest increase
Net-zero with current trend	Not Declining	Not Applicable
Cumulative emissions (1850-2020)	383 million tonnes	105th highest



Armenia: climate context

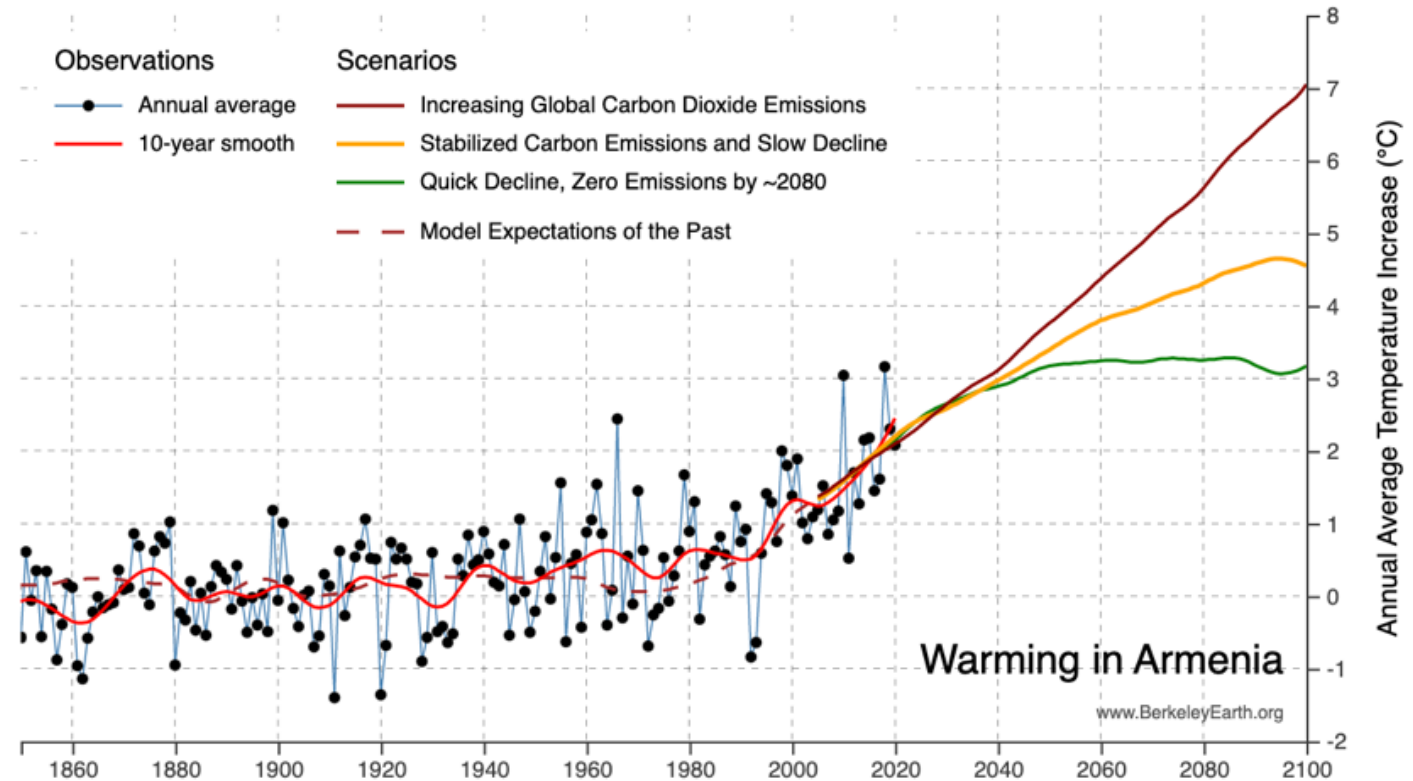
This page presents Armenia's climate context for the current climatology, 1991-2020, derived from observed, historical data. Information should be used to build a strong understanding of current climate conditions in order to appreciate future climate scenarios and projected change. (World Bank Climate Knowledge Portal)

Monthly Climatology of Min-Temperature, Mean-Temperature, Max-Temperature & Precipitation 1991-2020
Armenia



Armenia: Warming

The model ensemble projects that the annual probability of a heatwave could increase to 5% under RCP2.6 and, more significantly, to 18% under RCP8.5 by the end of the century. The country is also projected to experience a significant increase in the number of very hot days ($T_{max} > 35^{\circ}\text{C}$)

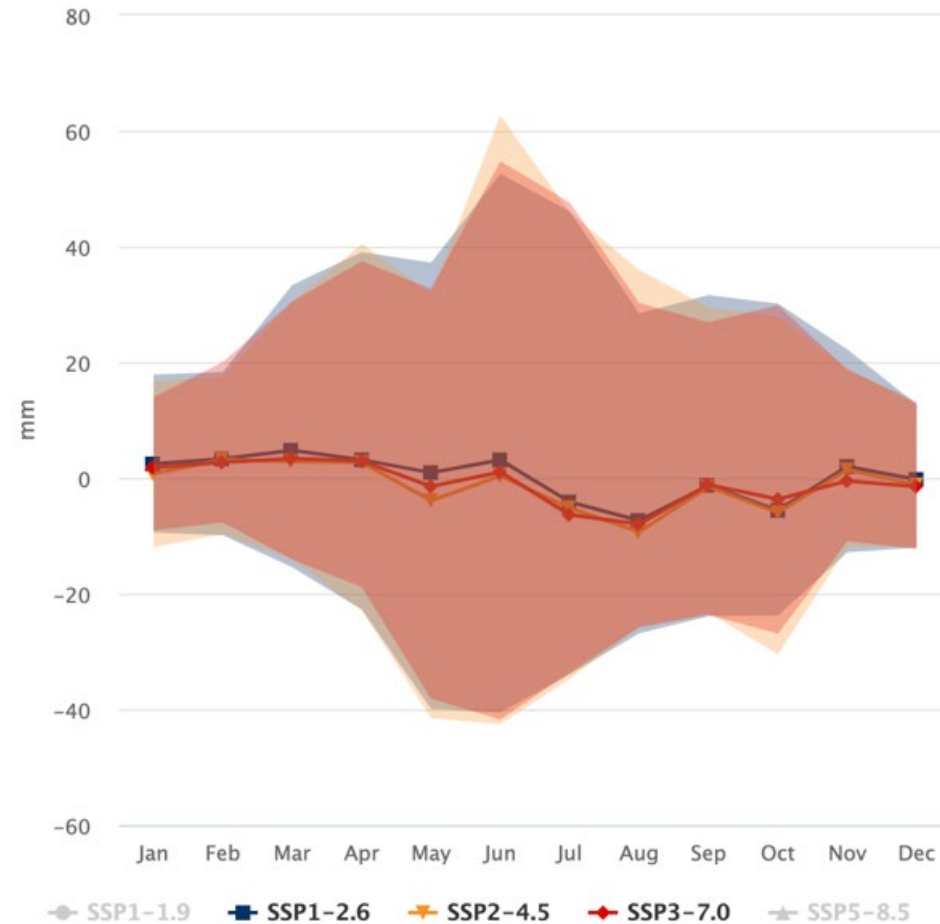


Armenia: Precipitations

Most climate models project a small increase in the intensity of extreme precipitation events, yet uncertainty remains in precipitation projections and model ensemble estimates.

The general shift in the seasonality of precipitation away from the summer months will likely intensify extreme events (floods, landslides) and highlight a need for disaster risk reduction measures

Projected Precipitation Anomaly for 2020-2039
Armenia; (Reference Period: 1995-2014), SSP1-2.6,
SSP2-4.5 & SSP3-7.0, Multi-Model Ensemble



Quiz 4

According to Berkley Earth, what would be the temperature rise in the most pessimistic scenario for Armenia?

1) 4 °C

2) 7 °C

3) 5.5 °C

Training Day 1

Vulnerabilities and challenges for Armenia



Armenia – key climate challenges

- Increased drought risk is a particular threat to poorer rural communities dependent on subsistence agriculture;
- As the Caucasus Glaciers will largely disappear over the 21st century, the pressure and dependence on water management infrastructure is expected to also grow significantly.
- A warmer and more drought prone environment is likely to drive significant changes in ecosystems composition, notably driving dry land expansion, forest loss, and species range shifts.
- The increased risk of both flood and landslide hazards demand attention on disaster risk reduction, particularly in Armenia's poorer rural communities.
- A reduction in both the total arable land and the yield of staple crops threaten food production and efforts to eradicate undernourishment in Armenia.
- Without adaptation and disaster risk reduction, changes will exacerbate income and wealth inequalities and hinder attempts to reduce poverty rates.

Main Sector of Mitigation Contribution

- Energy (including renewable energy and energy efficiency);
- Transport (including development of electrical transport);
- Urban development (including buildings and construction);
- Industrial processes (construction materials and chemical production);
- Waste management (solid waste, wastewater, agricultural waste);
- Land use and Forestry (afforestation, forest protection, carbon storage in soil).

Prioritized Adaptation activities

- Natural ecosystems (aquatic and terrestrial, including forest ecosystems, biodiversity and land cover);
- Human health;
- Water resource management;
- Agriculture, including fishery and forests;
- Energy;
- Human settlements and infrastructures;
- Tourism.

Quiz 5

(Open answers)

1) What are the key climate-related vulnerabilities for Armenia?

2) Can you mention three mitigation interventions?

3) Can you mention three adaptation interventions?

Training Day 1

Moving from science and policy to interventions



Multiple dimensions for reporting

- 1) Descriptive: Measuring / reporting on alignment with green standards (e.g. taxonomy, own corporate inclusion and exclusion lists)
- 2) Qualitative outcomes that are impact related: ESG, SDG
- 3) Risk-related: Taskforce on climate related financial disclosure (TCFD) and Adaptation and Resilience (A&R): measuring risk

Climate Finance (Mitigation and Adaptation)

UNFCCC Definitions: 'Climate finance refers to local, national or transnational financing drawn from **public, private and alternative sources of financing** — that seeks to support mitigation and adaptation actions that will address climate change. It is needed for **adaptation and mitigation.**' UNFCCC 2020



Mitigation: avoids or reduces GHG emissions or enhance GHG sequestration; and contributes to the stabilisation of atmospheric GHG, in alignment with the Paris Agreement.

Adaptation: builds the long-term resilience of people, livelihoods and places (natural and physical infrastructure) to demonstrable climate-related vulnerabilities.

Green, Climate and Sustainable Finance

Sustainable finance typically refers to the process of taking due account of environmental, social and governance (ESG) considerations in investment decisions. It refers to climate change mitigation and adaptation, as well as the environment (preservation of biodiversity, pollution prevention and circular economy).

Green finance is an umbrella term to define the financing of investments that provide environmental benefits in the broader context of environmentally sustainable development. Subsets of green finance include climate finance, environmental finance and conservation finance.

Sustainable

Green

Climate

Low-carbon

Climate change mitigation (clean energy; energy efficiency; e-connectivity; low-carbon agriculture)

Climate change adaptation (increased resilience; regeneration; livelihoods; health)

Other environmental issues:

- Water resources
- Resources efficiency
- Circular economy
- Pollution abatement
- Biodiversity & land restoration

Social outcomes:

- Health, Education
- Gender empowerment
- Inclusion programs
- Human rights
- Supply / Value chain integrity
- ESS

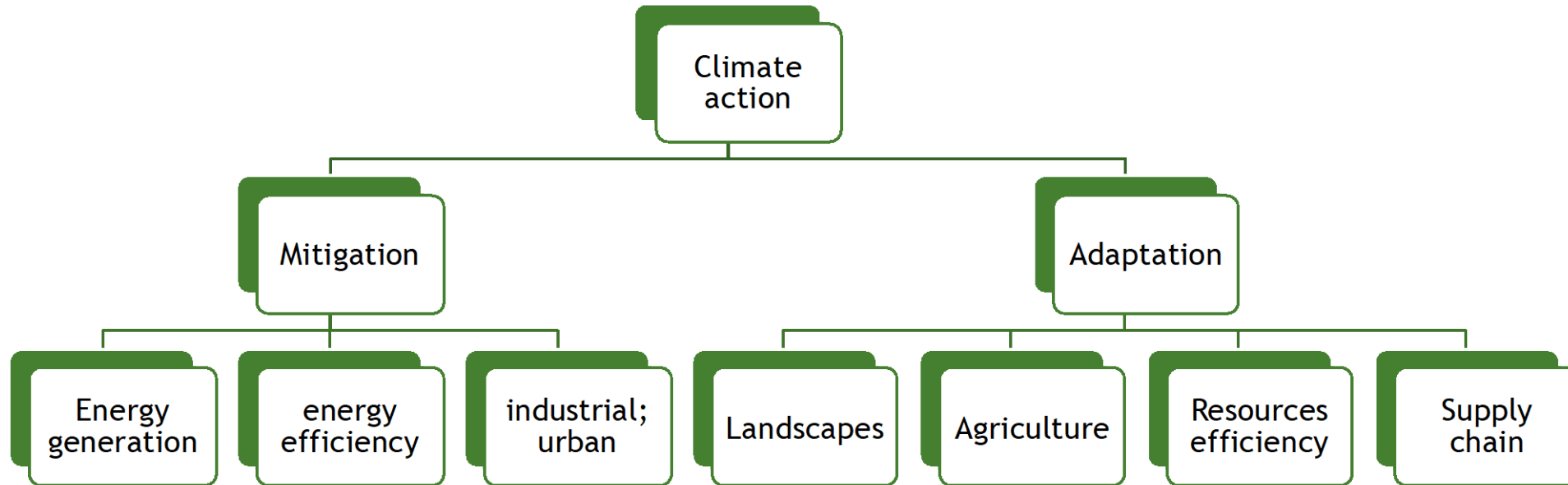
Socio-economics outcomes:

- Reduced poverty
- Green recovery
- Green jobs

Others SDG's

Cross-cutting and nature-based solutions; environmental certifications; offsetting activities

Benchmarking: What is green? What is environmental?



- Think about a continuum, with the extremes being brown = oil and coal; natural gas;
- Somewhere in the middle (arguable): nuclear;
- Towards green: battery storage, gravitational storage;
- Very green: energy efficiency; clean energy generation

What do different 'sustainable' investment terms mean?

- Several global indices have been designed to measure and report ***sustainability performance***.

Sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organisational performance towards the goal of sustainable development

- ***ESG investing takes into account how a company's policies and practices impact profits and future returns.***

• ***SRI (Socially Responsible Investing)*** is more closely focused on whether an investment is in line with the investor's individual values.

• ***Impact Investing*** is made with the intention of generating positive, measurable social and environmental impact alongside a financial return. With impact investing, investors are looking to put money into market segments or businesses dedicated to solving pressing global issues such as renewable energy and healthcare access.



Focus on the green slice: is ESG here to stay?

- Direct climate benefits
- Indirect / co-benefits

What climate risk is your financial system most exposed to?

- Extreme weather events
- Asset impairment
- Stranded asset risk
- What are the implications to think about here?

Impacts on financial flows, direction, liability risks, displacement / replacement

www.youtube.com/watch?v=4RQv9VDgQq0

Climate risk: What Are The Impacts On Business

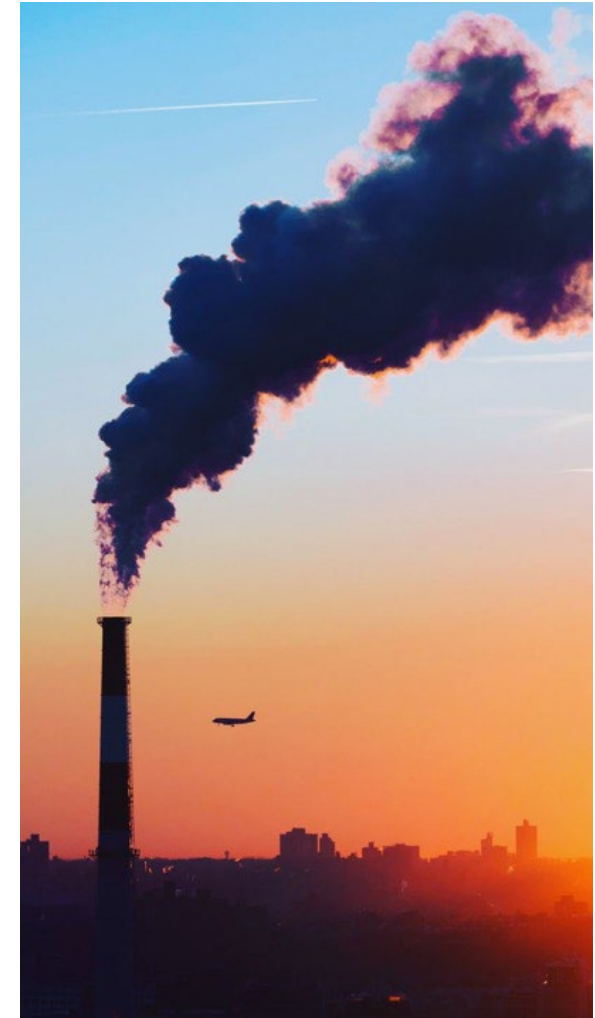
Climate change related risks...

Transition risks: the risks associated with the transition to a lower carbon economy, the most common of which relates to changes in the regulatory framework, legislation and international agreements. For example, compliance with agreements e.g. the Paris Agreement may lead to risk of stranded assets; however weight current cost versus future savings. *Rethinking of the paradigm

Physical risks: those are the very tangible risks arising from acute events that have been rendered 'extreme' by climate change, such as storms, floods, fires. They can also be chronic, as they relate to longer term shifts in weather patterns (changing rains patterns, longer periods droughts) and gradual changes in physical conditions (sea level rise; loss of certain habitats).

Liability risk: from parties who have suffered loss or damage from the effects of climate change and seek compensation; legal claims.

- The **Taskforce on climate related financial disclosure (TCFD)** recommendations are designed to solicit consistent, decision-useful, forward-looking information on the material financial impacts of climate-related risks and opportunities, including those related to the global transition to a lower-carbon economy. They are adoptable by all organizations with public debt or equity in G20 jurisdictions for use in mainstream financial filings.
- **Four elements:**
 - Governance
 - Strategy
 - Risk management
 - Metrics
- **Strategy:** The actual and potential impacts of climate-related risks and opportunities on the organization's business strategy, and financial planning



Core Elements of Recommended Climate-Related Financial Disclosures



Governance

The organization's governance around climate-related risks and opportunities

Strategy

The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Risk Management

The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities

Quiz 5

(Open answers)

1) What are the three main areas of reporting?

2) Why is impact reporting important? What does it do?

3) What are the three key risk types derived from climate change?

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References

Name	Date	Link
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<i>Climate Risk Country Profile: Armenia</i> (WB, ADB)	2021	https://climateknowledgeportal.worldbank.org/sites/default/files/2021-06/15765-WB_Armenia%20Country%20Profile-WEB_0.pdf
Globalfields: <i>Insights on the IPCC Report</i>	2022	https://www.globalfields.co.uk/insights/insights-from-the-latest-ipcc-report
Globalfields: <i>All we need to know about Climate Change</i>	2020	https://www.globalfields.co.uk/insights/all-we-need-to-know-about-climate-change
IPCC Reports	2022	https://www.ipcc.ch/assessment-report/ar6/#:~:text=The%20IPCC%20is%20now%20in,to%20its%20latest%20Methodology%20Report.
Philippe Sands, Jacqueline Peel, <i>International Environmental Law</i> , 2012	2012	Print (Cambridge University Press)