

# The Limits to Growth: Sustainability and the Circular Economy

## Lecture 4: Sustainability and Political (In-)Action

Prof. Dr. Benjamin Leiding  
M.A. Theresa Sommer

## License

- This work is licensed under a **Creative Commons Attribution-ShareAlike 4.0 International License**. To view a copy of this license, please refer to <https://creativecommons.org/licenses/by-sa/4.0/> .
- Updated versions of these slides will be available in our [Github](#) repository.

# Oral Exam

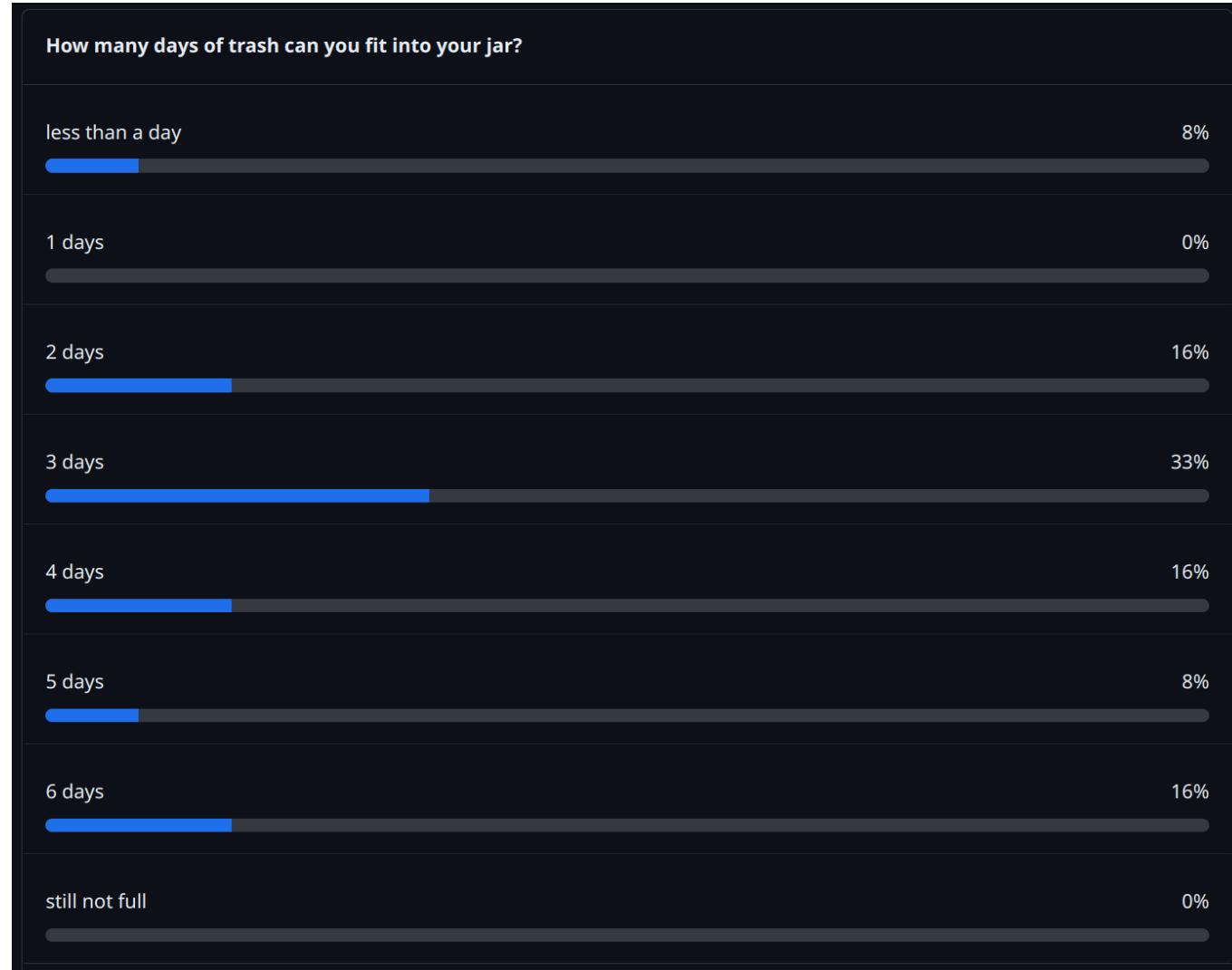
## Important Update

- **Examination date: 09.08.2023**
- The oral exam will be held **online** via BigBlueButton



## E03 – A JAR OF WASTE

# E03 - Household Waste Results



## E03 - Household Waste Results

- “*Tips for Zero Waste Living – How a Family of 5 Makes Almost No Waste! | Life With Less Waste*” by Happen Films – [Link](#)

## E03 - Household Waste Results

- “*Tips for Zero Waste Living – How a Family of 5 Makes Almost No Waste! | Life With Less Waste*” by Happen Films – [Link](#)
- How long did the family of 5 (all of them together) manage to squeeze all their trash into a jar?

# INTRODUCTION

## E01 - Defining Sustainability

### Results

“Sustainability means having a **balance** of what we have and what we intend to have in the **future**. The resources and the usage of these resources so that it can sustain for a **long period of time**.”

“To me, sustainability means living in a way that does not worsen the conditions for **those after us** compared to the conditions we live in. It is often associated with using only as many **resources as can be regenerated**, as well as keeping the climate as stable as possible.”

“At first, sustainability for me is preserving the ability to live on the Earth for us and the **next generations for a long time**. (...) It is our duty to preserve our planet for our children not in **worse condition** that we have obtained it. Natural environment is very complex and cohesive. Unfortunately, the today's humanity often acts very shortsighted regarding of material goods.”

# Introduction

## Sustainability

*„Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.“*

# Introduction

## Sustainability - Origins

„Wie eine sothane [solche] Conservation und Anbau des Holzes anzustellen / daß es eine continuirliche beständige und **nachhaltende** Nutzung gebe / weiln es eine unentbehrliche Sache ist / ohne welche das Land in seinem Esse nicht bleiben mag“ - Hans Carl von Carlowitz (1713)

# Introduction

## Sustainability - Origins

„Wie eine sothane [solche] Conservation und Anbau des Holzes anzustellen / daß es eine continuirliche beständige und **nachhaltende** Nutzung gebe / weiln es eine unentbehrliche Sache ist / ohne welche das Land in seinem Esse nicht bleiben mag“ - Hans Carl von Carlowitz (1713)

→ “continuously enduring and sustainable use”

# Introduction

## Sustainability - Origins

*„Sowing and planting of trees had to be regarded as a national duty of every landowner, in order to stop the destructive over-exploitation of natural resources“ - John Evelyn (1662)*

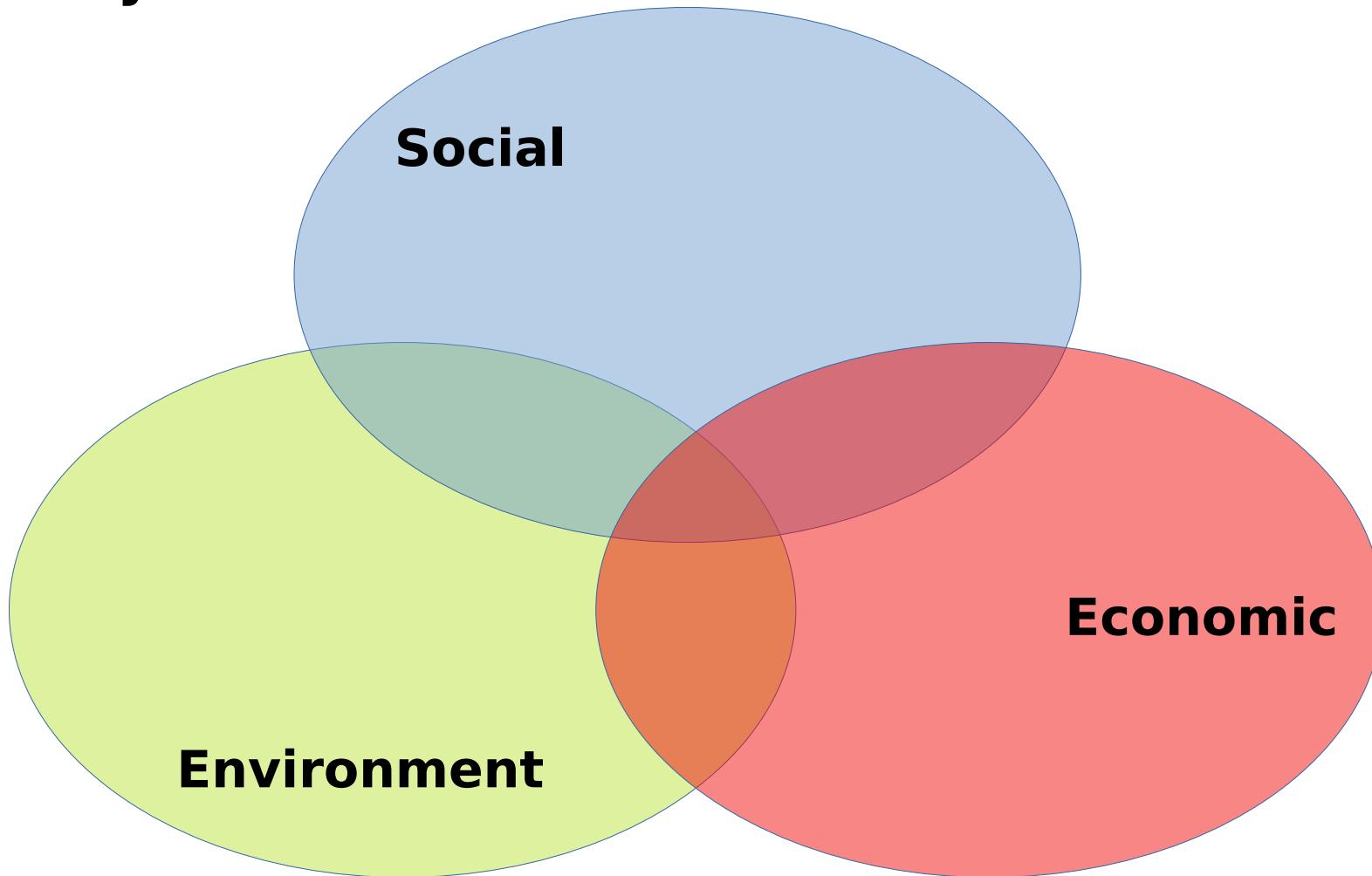
# Introduction

## Sustainability - Origins

- Carl von Carlowitz and *Sustainability*
  - Coined the term at a time when Europe was in need of vast quantities of wood (mining, ore-smelting, ship building, etc.)  
→ Fear of timber scarcity
- Growing population → Fear of food-shortage if food production cannot keep up with reproduction
  - World population in 1700 → ca. 0.6 billion people
  - World population in 1800 → ca. 1.0 billion people
- Industrial revolution (ca. 1760 – 1840) fostered environmental degradation → society chose prosperity rather than sustainability

# Sustainability

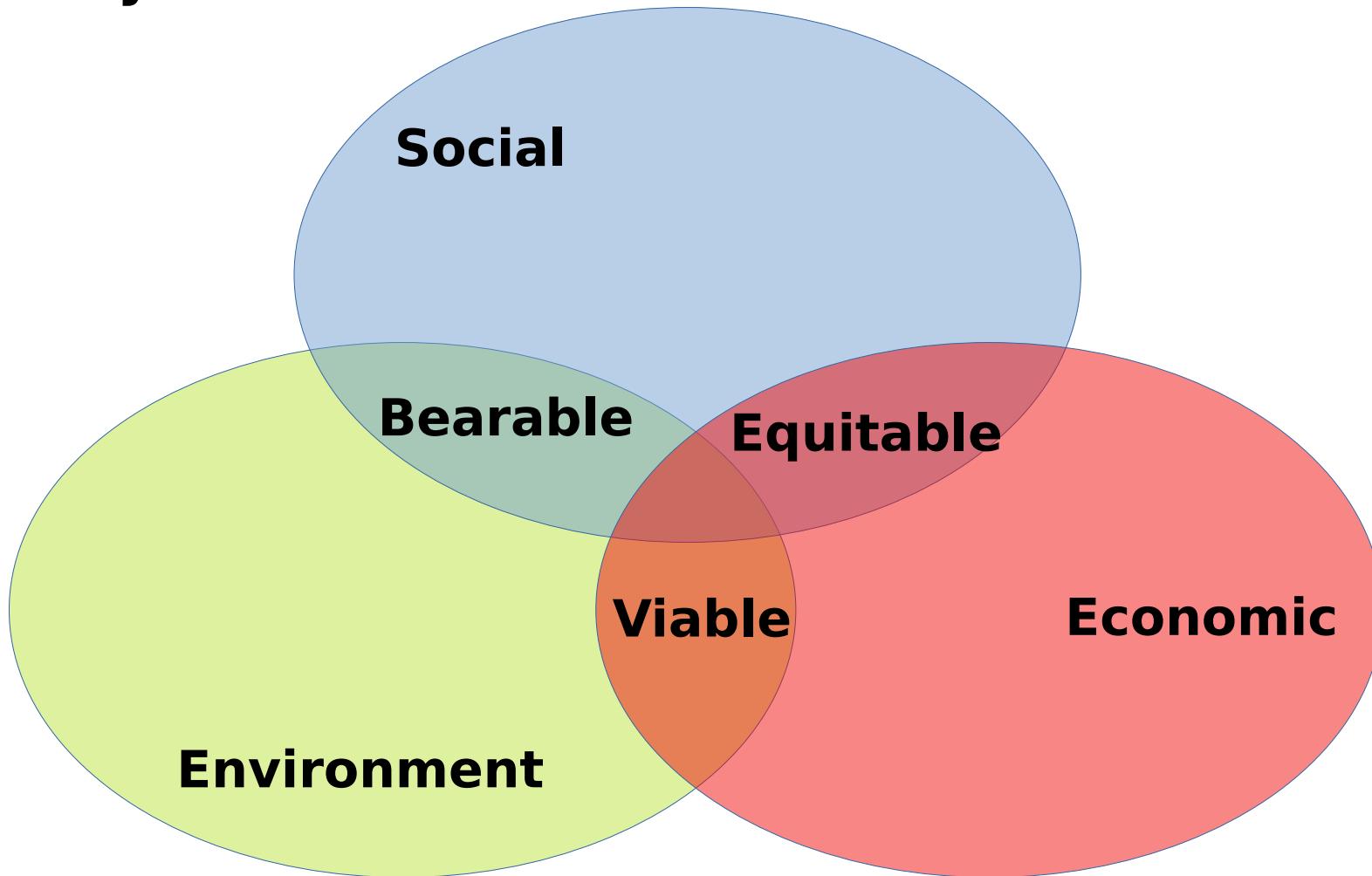
## Definition



Based on: Thomsen C. (2013) Sustainability (World Commission on Environment and Development Definition). In: Idowu S.O., Capaldi N., Zu L., Gupta A.D. (eds) Encyclopedia of Corporate Social Responsibility. Springer, Berlin, Heidelberg. [https://doi.org/10.1007/978-3-642-28036-8\\_531](https://doi.org/10.1007/978-3-642-28036-8_531)

# Sustainability

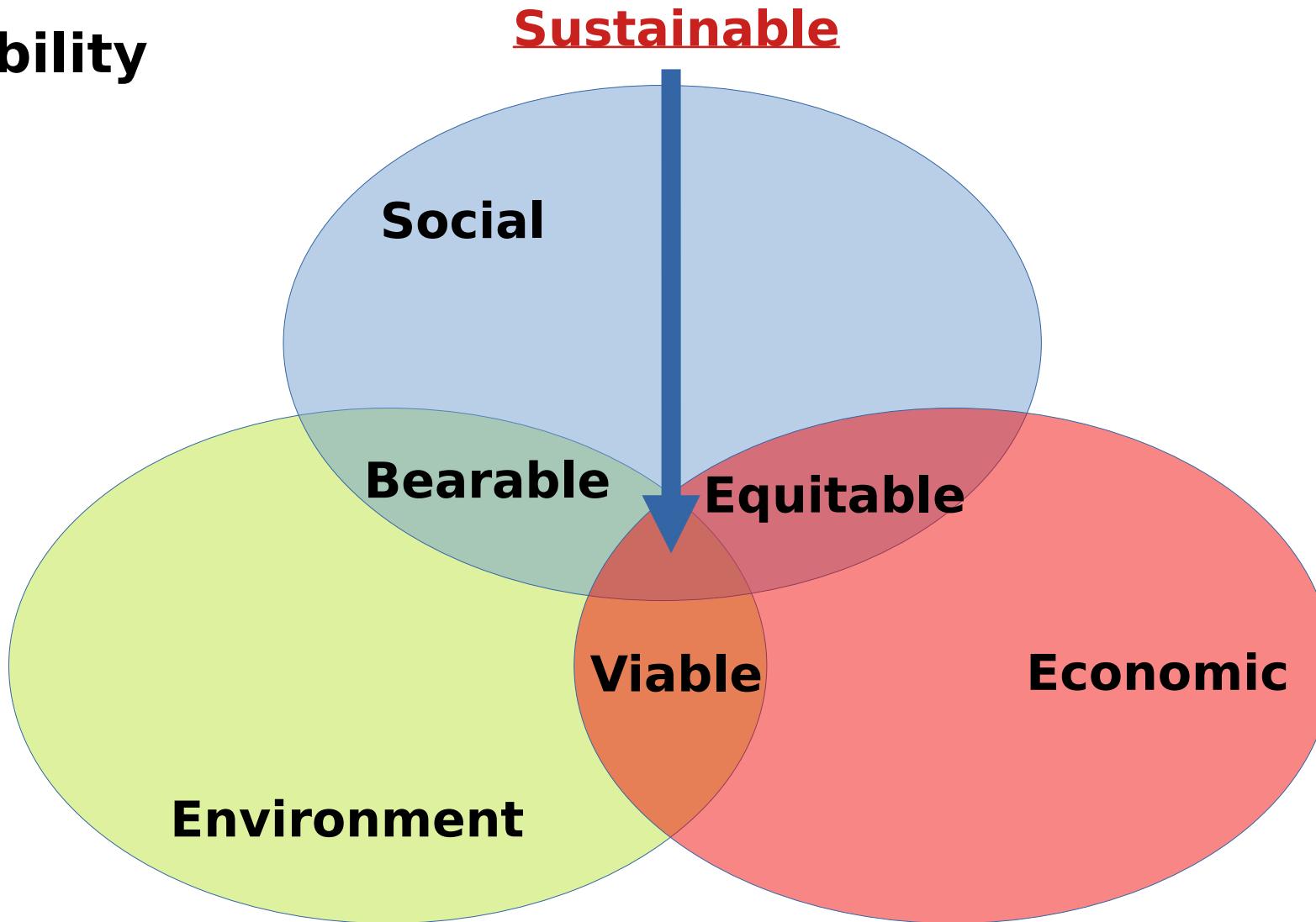
## Definition



Based on: Thomsen C. (2013) Sustainability (World Commission on Environment and Development Definition). In: Idowu S.O., Capaldi N., Zu L., Gupta A.D. (eds) Encyclopedia of Corporate Social Responsibility. Springer, Berlin, Heidelberg. [https://doi.org/10.1007/978-3-642-28036-8\\_531](https://doi.org/10.1007/978-3-642-28036-8_531)

# Sustainability

## Definition



Based on: Thomsen C. (2013) Sustainability (World Commission on Environment and Development Definition). In: Idowu S.O., Capaldi N., Zu L., Gupta A.D. (eds) Encyclopedia of Corporate Social Responsibility. Springer, Berlin, Heidelberg. [https://doi.org/10.1007/978-3-642-28036-8\\_531](https://doi.org/10.1007/978-3-642-28036-8_531)

# Biocapacity

## Definition

*Is „the locally available carrying capacity of the ecosystem for generating resources and absorbing wastes“*

# Ecological Footprint

## Definition

*„The ecological footprint for a particular population is defined as the total area of productive land and water ecosystems required to produce sufficient resources and assimilate wastes“*

- 1.) W.E. Rees (1992) – Ecological footprint and appropriated carrying capacity: what urban economics leaves out. Environmental Urbanization.
- 2.) W.E. Rees, M. Wackernagel (1994) – Ecological footprints and appropriated carrying capacity: measuring the natural capital requirements of the human economy.
- 3.) D. Yue, J. Guo, C. Hui (2013) – Scale dependency of biocapacity and the fallacy of unsustainable development – <https://doi.org/10.1016/j.jenvman.2013.04.022>

# Sustainability Implications

**Sustainability → Consume less**

# SUSTAINABLE DEVELOPMENT GOALS



# Sustainable Development Goals

## Important Actors

- United Nations
  - Largest intergovernmental organization in the world
  - 193 members
  - Established in 1945
  - Main aims: maintaining international peace, international cooperation
  - Organized in six principal bodies and autonomous specialized agencies



e.g. General Assembly,  
Security Council, UN  
Secretariat



e.g. World Health Organization (WHO),  
World Bank Group (WBG), Food and  
Agriculture Organization (FAO)

# Sustainable Development Goals

## Overview

- Sustainable Development Goals → SDGs
- 17 interlinked goals
- Proposed in 2015 by the United Nations General Assembly
- To be achieved by 2030 by all UN member states
- Each goal typically has 8-12 targets, and each target has between 1-4 indicators used to measure progress toward reaching the targets.

*“A blueprint to achieve a better and more sustainable future for all people and the world by 2030” – United Nations General Assembly*

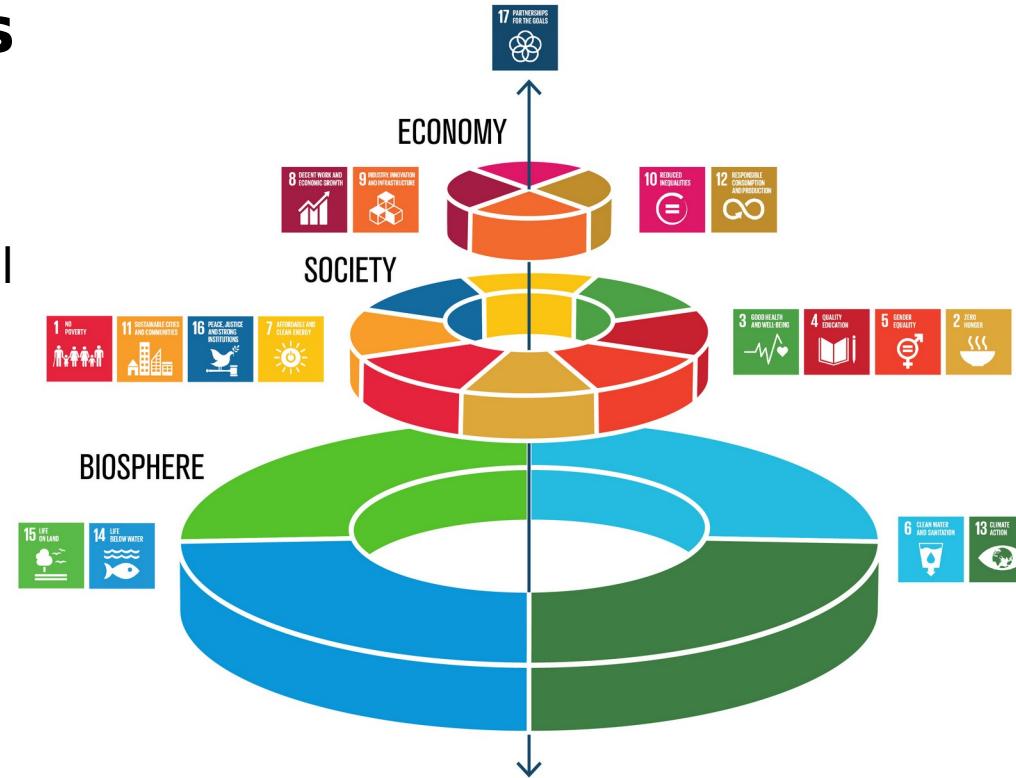
# Sustainable Development Goals



# Sustainable Development Goals

## Challenges

- The SDGs cover all three dimensions of sustainability: economic, ecological and social
- Many of the goals focus on society
- No prioritization between different goals



*"The means of implementation targets under each Sustainable Development Goal and Goal 17, which are referred to above, are key to realizing our Agenda and are of **equal importance** with the other Goals and targets. We shall accord them **equal priority** in our implementation efforts and in the global indicator framework for monitoring our progress."*

# Sustainable Development Goals

## Challenges

- Water, food and energy are vital prerequisites for any human life → other goals cannot be achieved without them

# Sustainable Development Goals

## Challenges

- Water, food and energy are vital prerequisites for any human life → other goals cannot be achieved without them
- Each goal by itself does not guarantee sustainability

# Sustainable Development Goals

## Challenges

- Water, food and energy are vital prerequisites for any human life → other goals cannot be achieved without them
- Each goal by itself does not guarantee sustainability
- Achieving all goals is quite challenging → Stakeholders focus on particular goals which risks to achieve all goals (no sustainability if we just achieve 8 out of 17 goals)

# Sustainable Development Goals

## Challenges

- Water, food and energy are vital prerequisites for any human life → other goals cannot be achieved without them
- Each goal by itself does not guarantee sustainability
- Achieving all goals is quite challenging → Stakeholders focus on particular goals which risks to achieve all goals (no sustainability if we just achieve 8 out of 17 goals)
- Potential trade-offs and incompatibility between different goals
  - Zero Hunger vs. Environmental Stability (Life Below Water, Life On Land)
  - Economic Growth vs. Decent Work

# Sustainable Development Goals

## Challenges

- Water, food and energy are vital prerequisites for any human life → other goals cannot be achieved without them
- Each goal by itself does not guarantee sustainability
- Achieving all goals is quite challenging → Stakeholders focus on particular goals which risks to achieve all goals (no sustainability if we just achieve 8 out of 17 goals)
- Potential trade-offs and incompatibility between different goals
  - Zero Hunger vs. Environmental Stability (Life Below Water, Life On Land)
  - Economic Growth vs. Decent Work
- Potential/risk for/of greenwashing

# A SHORT HISTORY OF ACTIONS ON CLIMATE CHANGE

# A Short History of Actions on Climate Change

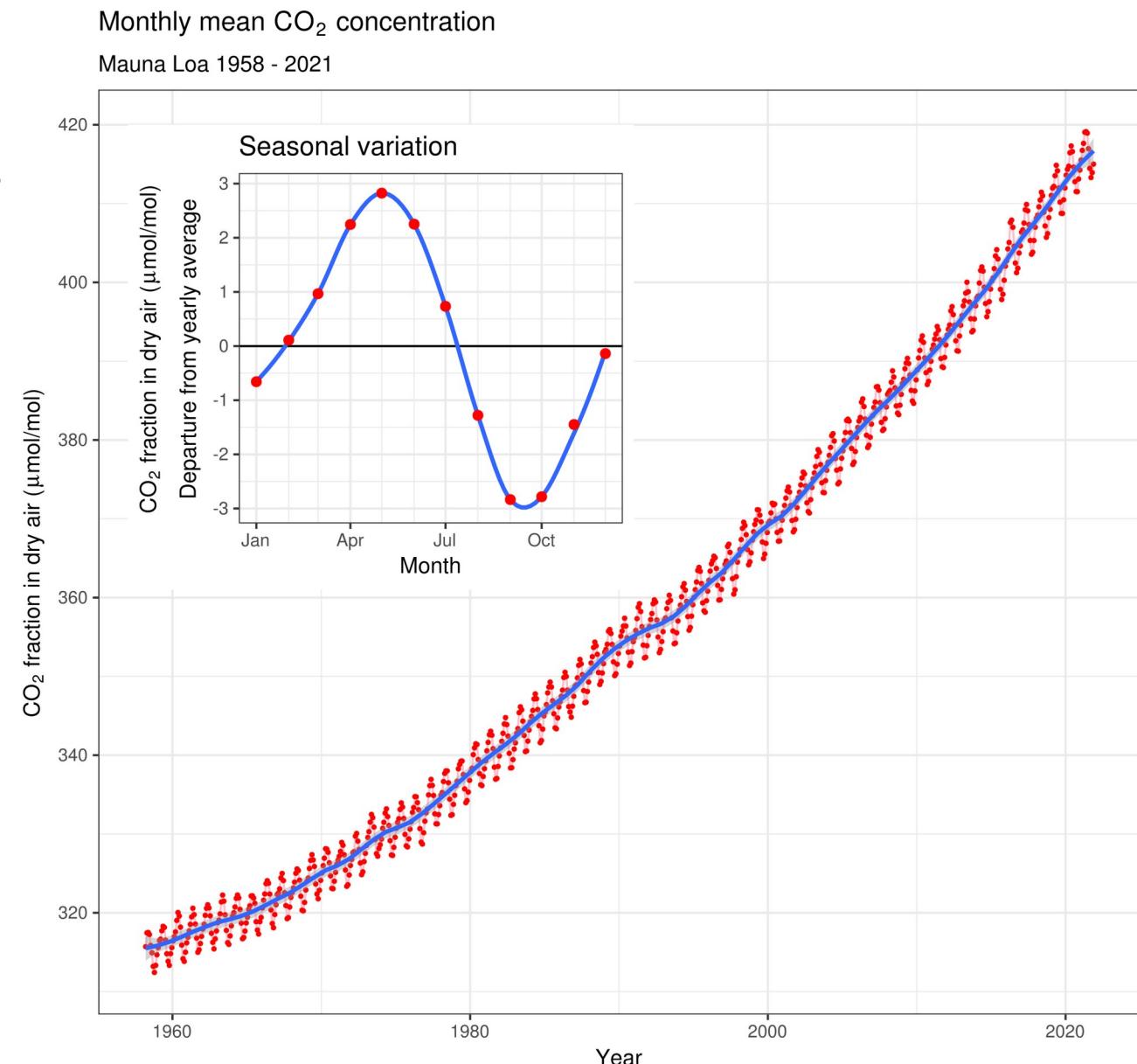
## (Incomplete) Timeline

- 1957 - First climate change warnings issued by Roger Revelle and Hans Suess
- 1958 - Start of systematic measurements of atmospheric CO<sub>2</sub> by Dave Keeling
- 1972 - United Nations Conference on the Human Environment (Stockholm)
- 1979 - First World Climate Conference (Geneva)
- 1988 - IPCC (Intergovernmental Panel on Climate Change) founded
- 1992 - Earth Summit (Rio)
- 1997 - Kyoto Protocol
- 2009 - Copenhagen Accord
- 2015 - Paris Agreement
- 2021 - Glasgow Climate Pact

# A Short History of Actions

## Detour - Keeling Curve

- Named after Charles David Keeling
- Graph representation of the accumulation of CO<sub>2</sub> in the atmosphere based on continuous measurements (Mauna Loa Observatory - Hawaii) from 1958 to the present day



Data : Dr. Pieter Tans, NOAA/ESRL (<https://gml.noaa.gov/ccgg/trends/>) and  
Dr. Ralph Keeling, Scripps Institution of Oceanography (<https://scrippsc02.ucsd.edu/>). Accessed 2021-12-16  
<https://w.wiki/4ZWn>

## A Short History of Actions on Climate Change

### 1979 - First World Climate Conference (Geneva)

- First major meeting on climate change
- Initiated by the World Meteorological Organization (WMO)
- Scientific gathering explored how climate change might affect human activities
- Led to the creation of the Intergovernmental Panel on Climate Change (IPCC)
  
- Urged governments “*to foresee and prevent potential man-made changes in climate that might be adverse to the well-being of humanity*”

## A Short History of Actions on Climate Change

### 1988 - IPCC (Intergovernmental Panel on Climate Change)

- Intergovernmental body of the United Nations
- Task: *“Provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation”*

## A Short History of Actions on Climate Change

### 1988 - IPCC (Intergovernmental Panel on Climate Change)

- Intergovernmental body of the United Nations
- Task: “*Provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation*”
- IPCC assessments:
  - *provide a scientific basis for governments to develop climate related policies*
  - *are policy-relevant but not policy prescriptive: they may present projections of future climate change based on different scenarios and the risks that climate change poses and discuss the implications of response options, but they do not tell policymakers what actions to take.*
  - *are written by hundreds of leading scientists who volunteer their time and expertise as Coordinating Lead Authors and Lead Authors of the reports. They enlist hundreds of other experts as Contributing Authors to provide complementary expertise in specific areas*

# A Short History of Actions on Climate Change

## 1997 – Kyoto Protocol

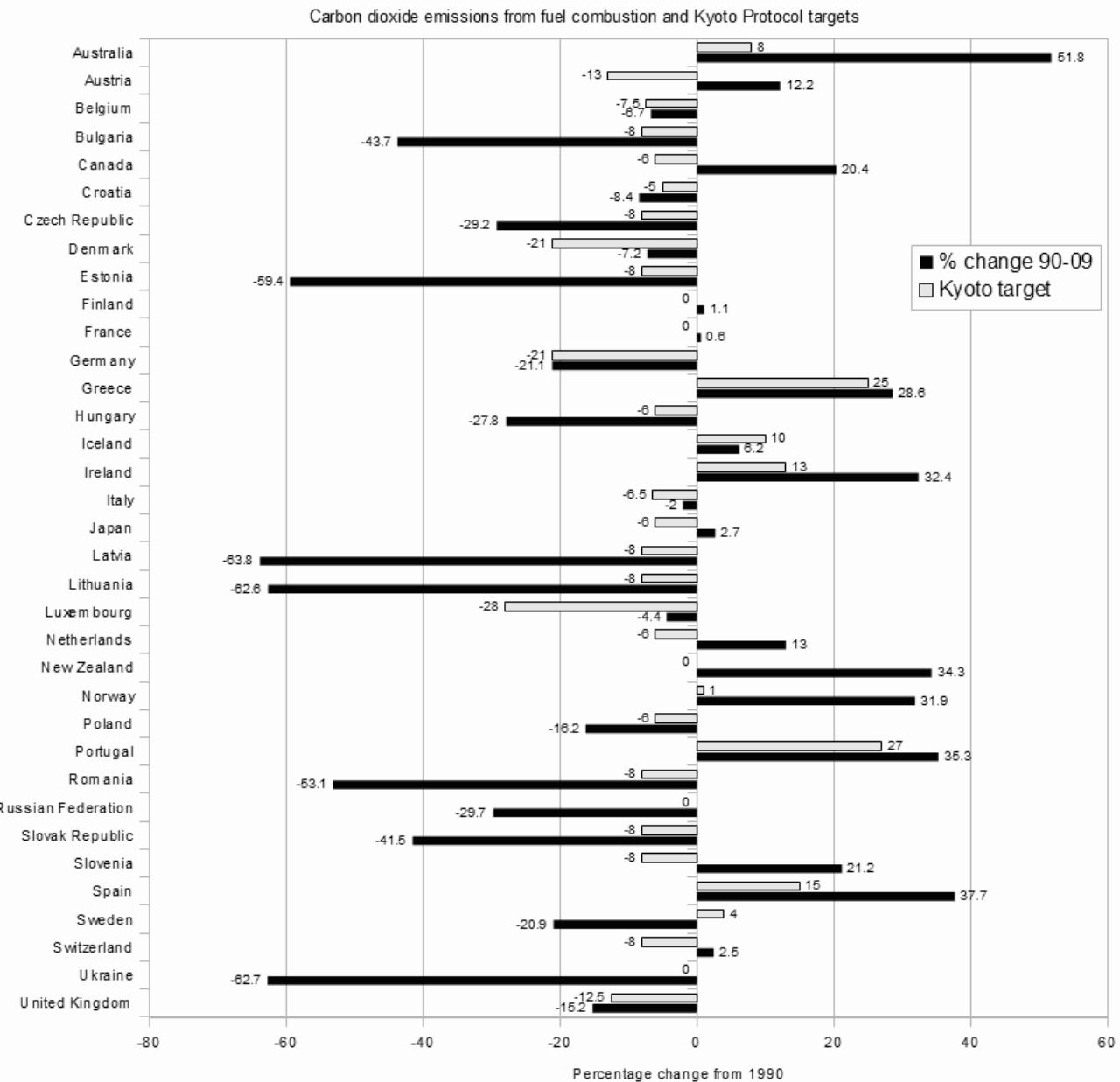
- Commitment to reduce GHG emissions and concentration in the atmosphere to “*a level that would prevent dangerous anthropogenic interference with the climate system*”
- Recognizing that global warming occurs and that human-made GHG emissions are driving it
- Developed nations pledge to reduce “overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012”.
- Entered into force on 16 February 2005

# A Short History of Actions on Climate Change

## 1997 – Kyoto Protocol

- Commitment to reduce GHG emissions and concentration in the atmosphere to “*a level that would prevent dangerous anthropogenic interference with the climate system*”
- Recognizing that global warming occurs and that human-made GHG emissions are driving it
- Developed nations pledge to reduce “overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012”.
- Entered into force on 16 February 2005
- However
  - USA, Australia and other countries refused to ratify the agreement
  - Canada withdrew from the Kyoto Protocol in 2012

# A Short History of Actions 1997 – Kyoto Protocol



Enescot – [https://commons.wikimedia.org/wiki/File:Kyoto\\_Parties\\_with\\_first\\_period\\_\(2008-2012\)\\_greenhouse\\_gas\\_emissions\\_limitations\\_targets\\_and\\_the\\_percentage\\_change\\_in\\_their\\_carbon\\_dioxide\\_emissions\\_from\\_fuel\\_combustion\\_between\\_1990\\_and\\_2009.png](https://commons.wikimedia.org/wiki/File:Kyoto_Parties_with_first_period_(2008-2012)_greenhouse_gas_emissions_limitations_targets_and_the_percentage_change_in_their_carbon_dioxide_emissions_from_fuel_combustion_between_1990_and_2009.png) – CC BY-SA 3.0.

# A Short History of Actions on Climate Change

## 2009 – Copenhagen Accord

- Drafted by only 5 countries
- Not legally binding
- No real targets

# A Short History of Actions on Climate Change

## 2009 – Copenhagen Accord

- Drafted by only 5 countries
- Not legally binding
- No real targets
- Content:
  - **Endorses** the continuation of the Kyoto Protocol

# A Short History of Actions on Climate Change

## 2009 – Copenhagen Accord

- Drafted by only 5 countries
- Not legally binding
- No real targets
- Content:
  - **Endorses** the continuation of the Kyoto Protocol
  - “**We emphasise our strong political will** to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities”

# A Short History of Actions on Climate Change

## 2009 – Copenhagen Accord

- Drafted by only 5 countries
- Not legally binding
- No real targets
- Content:
  - **Endorses** the continuation of the Kyoto Protocol
  - “**We emphasise our strong political will** to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities”
  - “**We shall, recognizing** the scientific view that the increase in global temperature should be below 2 degrees Celsius”

# A Short History of Actions on Climate Change

## 2015 – Paris Agreement

- *Reach global peaking of greenhouse gas emissions **as soon as possible***

# A Short History of Actions on Climate Change

## 2015 – Paris Agreement

- *Reach global peaking of greenhouse gas emissions **as soon as possible***
- *Holding the increase in the global average temperature **to well below 2°C** above pre-industrial levels*

# A Short History of Actions on Climate Change

## 2015 – Paris Agreement

- Reach global peaking of greenhouse gas emissions **as soon as possible**
- 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;

# A Short History of Actions on Climate Change

## 2015 – Paris Agreement

- Reach global peaking of greenhouse gas emissions **as soon as possible**
- 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;
- 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; and

# A Short History of Actions on Climate Change

## 2015 – Paris Agreement

- Reach global peaking of greenhouse gas emissions **as soon as possible**
- 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;
- 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; and
- Making **finance flows** consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

# A Short History of Actions on Climate Change

## 2021 - Glasgow Climate Pact

- **Reaffirms** the Paris Agreement temperature goal of holding the increase in the global average **temperature to well below 2 °C** above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels

# A Short History of Actions on Climate Change

## 2021 - Glasgow Climate Pact

- **Reaffirms** the Paris Agreement temperature goal of holding the increase in the global average **temperature to well below 2 °C** above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels
- Including accelerating efforts **towards the phase-out of unabated coal** power and inefficient fossil fuel subsidies

# A Short History of Actions on Climate Change

## 2021 - Glasgow Climate Pact

- **Reaffirms** the Paris Agreement temperature goal of holding the increase in the global average **temperature to well below 2 °C** above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels
- Including accelerating efforts **towards the phase-out of unabated coal** power and inefficient fossil fuel subsidies
- **Urges developed country** Parties to provide enhanced **support, including through financial resources**, technology transfer and capacity-building, to assist developing country

# A Short History of Actions on Climate Change

## 2021 - Glasgow Climate Pact

- 140 countries pledged to reach net-zero emissions
- 100+ countries pledged to reverse deforestation by 2030
- 40+ countries pledged to move away from coal

## A Short History of Actions on Climate Change

### 2022/23 – COP27/28 (United Nations Climate Change Conference)

- COP27 in Sharm el-Sheikh, Egypt
  - No relevant results
  - But, more than 600 fossil fuels lobbyists registered to attend

# A Short History of Actions on Climate Change

## 2022/23 – COP27/28 (United Nations Climate Change Conference)

- COP27 in Sharm el-Sheikh, Egypt
  - No relevant results
  - But, more than 600 fossil fuels lobbyists registered to attend
- COP28 in Dubai
  - Designated president for COP28: Sultan Al Jaber → CEO of Abu Dhabi National Oil Company

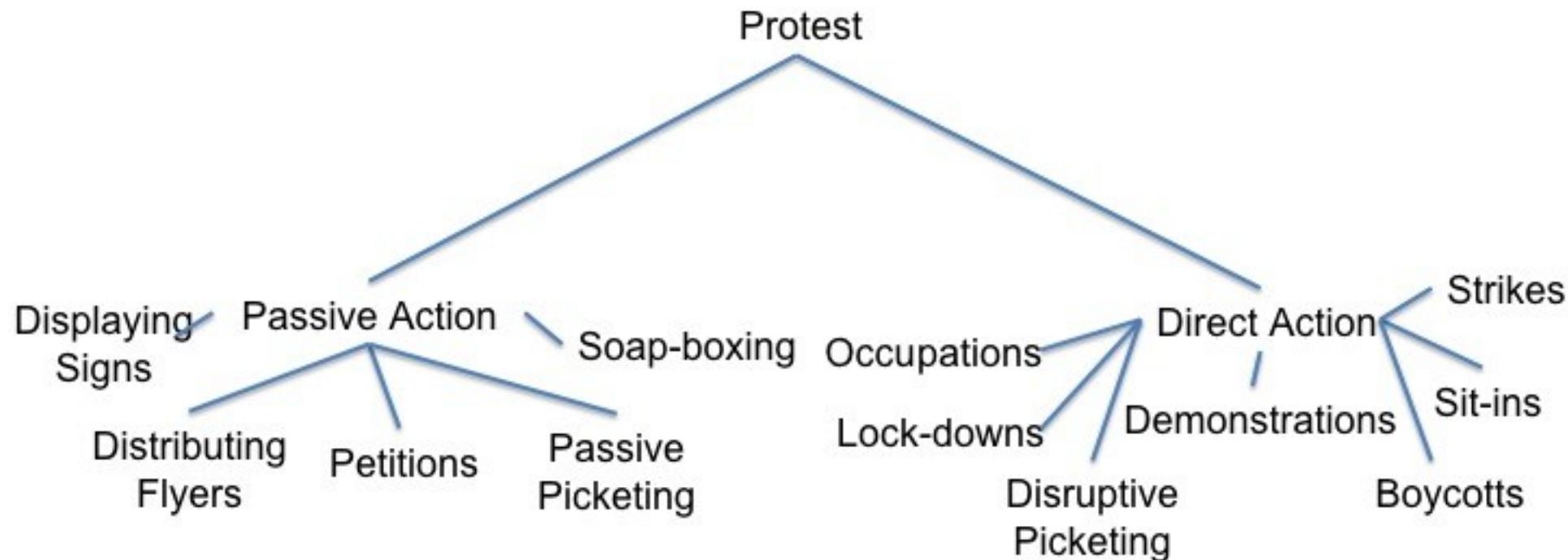
## What to expect of COP28?

- Bla, bla bla - [Link](#)

# ACTIVISM

# Activism

## Types of Political Protest



\* All can be violent or non-violent

# Activism

## Fridays for Future



Frankie Fouganthin (2019) – [https://commons.wikimedia.org/wiki/File:Greta\\_Thunberg\\_in\\_School\\_strike\\_for\\_the\\_climate.jpg](https://commons.wikimedia.org/wiki/File:Greta_Thunberg_in_School_strike_for_the_climate.jpg) – CC BY-SA 4.0.

The Limits to Growth – TU Clausthal

## Activism

### Extinction Rebellion (XR)



*"I am afraid of losing my child  
to a resource war because of a  
climate collapse"*

# Activism

## Extinction Rebellion (XR)



Vladimir Morozov (2019) – <https://xrbristol.org.uk/2020/04/17/blog-xr-has-sticking-power/> – CC BY-SA 4.0.

## Activism

*“Climate activists are sometimes depicted as dangerous radicals, but the truly dangerous radicals are the countries that are increasing the production of fossil fuels.”*

## Activism

*"Climate activists are sometimes depicted as dangerous radicals, but the truly dangerous radicals are the countries that are increasing the production of fossil fuels."*

**United Nations Secretary General Antonio Guterres**

## Activism

### Extinction Rebellion (XR)

- Beyond just protesting (Lars Werner): [Link](#)

## Activism

### Last Generation (Letzte Generation)

- 2021 → before the elections in Germany
- 27 days hunger strike (picture day 25) → afterwards Intensive Care Unit
- Together with other climate activists, Jeschke wanted to use this drastic means to draw attention to the climate crisis and achieve a discussion with the candidates for chancellor.
- Olaf Scholz (Chancellor Germany) and Last Generation → [Video](#)



# Activism

## Neubauer, et al. vs. Germany

## Activism

### Neubauer, et al. vs. Germany

- Nine young people from Germany sued Germany
- They argue: *“that the goals and measures of the Federal Climate Protection Act are not sufficient to effectively protect their fundamental rights from the consequences of the climate crisis as well as to fulfill the government’s obligations under the Paris Agreement.”*

## Activism

### Neubauer, et al. vs. Germany

- Nine young people from Germany sued Germany
- They argue: *“that the goals and measures of the Federal Climate Protection Act are not sufficient to effectively protect their fundamental rights from the consequences of the climate crisis as well as to fulfill the government’s obligations under the Paris Agreement.”*

**They won!** → *“Freedoms and fundamental rights are already being violated today by insufficient climate protection. The legislator must adapt the Federal Climate Protection Act by the end of 2022”*

*“Climate protection is not nice-to-have, fair climate protection is a fundamental right, that is now official. A huge success - for everyone and especially for us young people who have been on climate strike for their future for over two years. We will now continue to fight for a 1.5 degree policy that is fair to all generations.” – Luisa Neubauer*

# CONCLUSION

## Conclusion

- Definition of Sustainability
- Sustainable Development Goals → SDGs
- Short history of actions on climate change
  - Geneva, Kyoto, Copenhagen, Paris, Glasgow, etc.
  - Problem
    - → A lot of bla, bla, bla
    - → Lack of progress
    - → Policies favor business as usual instead of acting in accordance with science because they are afraid to make unpopular decisions
- Individual activism as a response / counter movement to inactive governments who ignore urgent issues (i.e., the three key challenges of the 21<sup>st</sup> century)

## EXERCISE E04

## Exercise E04

### How is Sustainability Discussed in Different Countries?

1. Choose a country you are familiar with (ideally a country you have live in for a prolonged period of time) and find a current newspaper article from this country discussing sustainability.
  2. Shortly summarize the main discussion points of the article.
  3. Afterwards, explain in detail how sustainability is discussed in the country you chose. Answer the following questions:
    - Is sustainability a political priority? How are politicians talking about sustainability? Do they see it as an important national issue or not?
    - Do you know of any activist groups that are active in your country? What are their goals and how do they try to achieve them?
- Submit your result according to the submission guidelines posted in the exercise sheet → [E04](#).

## Additional Resources

- Podcast Episode: How to Save a Planet (2021) - *We Go Inside the COP26 Climate Talks* - [Link](#)
- Greta Thunberg mocks world leaders in 'blah, blah, blah' speech | BBC News (2021) - [Link](#)
- Rutger Bregman tells Davos to talk about tax: 'This is not rocket science' | Guardian News (2019) - [Link](#)
- IPCC (2022) - *About the IPCC* - [Link](#)
- Richard Black, BBC (2013) - *A brief history of climate change* - [Link](#)

# Questions?