THE HONG KONG 2021 CLIMATE EMERGENCY SUMMIT
NESS

CLIMATE EMERGENCY MANUAL

I WANT YOU TO FEEL AS IF THE HOUSE IS ON FIRE. BECAUSE IT IS.

Greta Thunberg, Davos 2019

TABLE OF CONTENTS

TABLE OF CONTENTS

MESSAGE FROM THE ORGANIZERS

Dear Delegates,

This Summit will be unlike any other one you attend. What differs it is that it was created by students, for students. Collectively, we as youth have the right and the responsibility to determine our planet's future, and to ensure our existence on it as a species is healthy and sustainable.

"We wanted to create something that we ourselves would have loved to experience..."

In creating this summit, each of the organizers poured into it countless hours to ensure that it would be of value to you, the delegate. We wanted to create something that we ourselves would have loved to experience and participate in.

The climate emergency is here, now, and it will not go away without a dramatic change in the way humanity collectively operates. Today's youth is not some distant observer. We must create the change, and lead it. We are the change.

17 August, 2021

INTRODUCTION

What is the Climate Emergency Manual?

As you go through the two days of the Summit, this manual will serve as your companion and guide. In it, you will find key information from all the sessions, additional knowledge that will be useful to you, prompts, and questions that will aide your understanding of all the topics being discussed.

How do I benefit from it?

In addition to all the information contained in this manual (which will help you learn so much more about the climate emergency), we've prepared for you questions and prompts that you will attempt to answer after completing each section.

By answering these questions, you will better understand the true complexity-and sometimes simplicity-of the climate emergency. There is often no single correct answer, which is why every perspective is valuable--including yours!

What happens when I'm done?

Once the Summit is over, we will ask you to send us your completed Manual. Based on this, we will assess your participation and award you a signed Certificate of Attendance and/or a Certificate of Distinction.

SUMMIT AGENDA

August 28 / **Day 1**

In total, our two-day event will feature 18 speakers from extremely diverse backgrounds and with an impressive range of experience. Through these speakers, you will learn more about the climate emergency, its history, impacts, solutions, and more.

Time	Session Title	Speaker
09:30 - 10:00	**Opening Ceremony**	
10:00 - 10:20	**Ice Breaker**	
10:20 - 10:35	**Keynote Speech 1 Climate Emergency and Youth Action**	**Ben May** Founder, ThinkOcean
10:35 - 11:05	Climate Emergency and Its Impacts	**Prof. Alexis Lau** Chair Professor, HKUST
11:05 - 11:20	**Break**	
11:20 - 12:05	UN SDGs and International Treaties	**Dr. Jason Lam** Professor, CityU
12:05 - 13:30	**Lunch Break**	
13:30 - 14:15	**Global Climate Action**	**Dr. Shauhrat Chopra** Professor, CityU
14:15 - 14:30	**Break**	
14:30 - 15:15	**Local Climate Action - Business**	**Mr. Henry Ho,** Cathay Pacific **Mr. Scott Reinhart,** Brawn Capital **Mr. Eagle Mo,** Telemax
15:15 - 16:00	**Local Climate Action - NGOs**	**Ms. Lucia Loposova,** Green Hospitality **Mr. Simon Ng,** BEC (Hong Kong)
16:00 - 16:30	**Guided Discussion Session**	

SUMMIT AGENDA

August 29 / **Day 2**

Time	Session Title	Speaker
09:30 - 9:50	Day 1 Recap Session	
9:50 - 10:05	Keynote Speech 2 Climate Justice	**Dr. Paul G. Harris** Chair, GES, EdUHK
10:05 - 10:50	Parallel Session: Climate and Health	**Dr. Janice Ho** Postdoctoral Fellow, CUHK
10:05 - 10:50	Parallel Session: Climate and Oceans	**Serag Heiba** Executive Director, ThinkOcean
10:50 - 11:05	Break	
11:05 - 11:50	Parallel Session: Climate and Finance	**Dharisha Mirando** China Water Risk
11:05 - 11:50	Parallel Session: Climate and Governance	**Dr. Fang Meng Mandy** Professor, CityU
11:50 - 13:30	Lunch Break	
13:30 - 14:15	Youth-led Climate Action	**Nabila Putri**, Indonesia **Mark Cheung**, Hong Kong **Vinson Chan**, Hong Kong **Giulia Belotti**, Italy
14:15 - 14:45	Guided Discussion Session	
14:45 - 15:05	Closing Ceremony	
15:05 - 15:40	Voluntary Networking Session	

MEET THE HKCES SPEAKERS

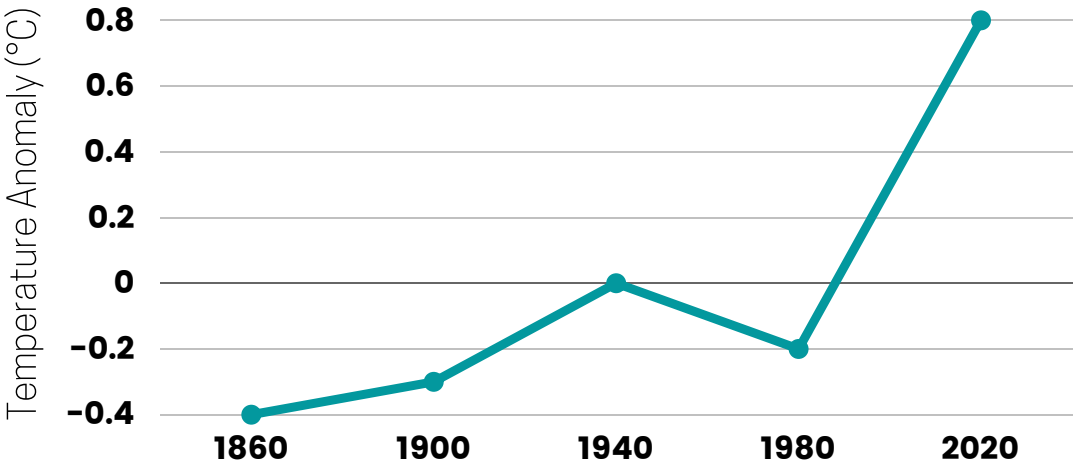
For more information, go to www.nesshk.org/speakers-1

KEYNOTE SPEECH 1:

CLIMATE EMERGENCY AND YOUTH ACTION

Anthropogenic Climate Change

What is it?



Learn more about the rise in global average temperature here

It refers to climate change that is caused by humans. The beginning of the industrial revolution shows a major spike in global average temperature levels. The burning of fossil fuels emits potent greenhouse gases like carbon dioxide and methane, which trap heat in the atmosphere. This causes:

- **Shrinking ice sheets and sea level rise**
- **Ocean acidification and warming**
- **Extreme weather events**
- **Biodiversity loss and mass extinction**
- **Freshwater shortages and droughts**

1.2 °C **increase in mean annual temperatures compared to pre-industrial levels**

INDIRECT EFFECTS

Human society and economy is dependent on the natural world. Any changes to the planet as a result of climate change will also impact us, directly or indirectly. Below are some of the indirect consequences of a warming climate.

01. Political Instability

Climate change affects human activities in all perspectives, from food supply to urbanization. Climate change poses a grave threat to food security and water availability. Conflicts over access to food and water will likely increase as a result. Climate migration impacts economic inequality, housing prices and labor as well as socio-economic dynamics. Internal conflict and displacement will also become more widespread.

02. Economic Development

Climate change is one of the biggest threats to economic development. The World Bank predicted that climate change could push 100 million more people into poverty by 2030. Extreme weather and temperature rise will lower productivity and economic output, pushing millions more to poverty every year and widening inequality.

03. Hunger, Thirst and Sickness

A warming climate will put a tremendous strain on the agricultural output and freshwater resources of the planet. While the global population is expected to reach 10 billion by 2050, food and water shortages as well as an increase in diseases caused by climate change will have a heavy impact, particularly on the world's developing countries

YOUTH ACTION

Climate change is here. As it intensifies over time, it is today's youth who will have to deal with all of its consequences. Therefore, instead of passively being the victim, young people all over the world should unite and fight for change. This is what a 15 year-old Greta Thunberg did when she sparked a global movement of school-age students demanding greater action from the government to fight climate change.

WHAT CAN YOU DO?

01 **Raise awareness**

Use your platform to educate others.

02 **Join an organization or movement**

Combine forces.

03 **Become the change**

Enact on an individual level the systemic change you wish to see.

04 **Drive ambition**

Don't settle for less.

Young people's unprecedented mobilization around the world shows the massive power they possess to hold decision-makers accountable. Therefore, as the pillars of the future society, we need to take responsibility and speak up. Although climate change can hardly be addressed by a single force, if we work together as one, our micro efforts will have a macro effect on our environment and our planet.

BACK TO YOU

What have you done so far to help combat climate change?

Type here...

What more can you do?

What do you wish to gain from this Summit?

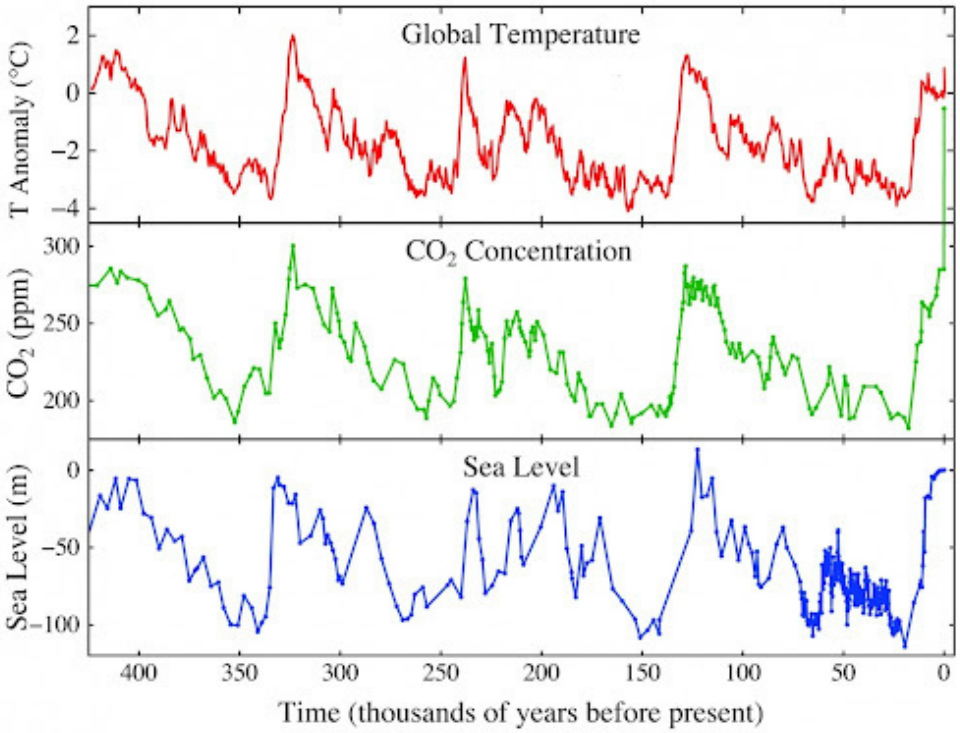
SESSION 2:

CLIMATE EMERGENCY AND ITS IMPACTS

In the last section, we briefly discussed climate change and what we as youth can do about it. In this section, we'll dive more deeply into the history of climate change and its impacts. A good understanding of these two is very important in order for youth today to be able to create the change needed to build a more sustainable and just future for all.

Natural vs Anthropogenic Climate Change?

Climate change can be divided into 2 processes: anthropogenic climate change and natural climate change.
Anthropogenic climate change is caused by human impact on Earth's climate. Natural climate change is the natural climate cycle that has been continuing throughout the Earth's history.
Long before the existence of humans, the temperature of the planet earth has been fluctuating and was much higher than that in the paleolithic era which the earliest human was first found to exist.



As the graph (left) shows, global temperature, CO2 concentration, and sea level all changed in a related and predictable way for thousands of years. This is natural climate change.
Anthropogenic climate change has upset this cycle, and caused much more rapid and unbalanced change.

HUMAN IMPACT ON THE ENVIRONMENT

For the majority of the history of mankind, our impact on the environment has been localized to where our activities were taking place.
However, in the past 200-300 years, the actions of one city or society could have impacts on the entire Planet Earth. This is largely due to the Industrial Revolution, and the emissions of greenhouse gases which impacts the entire atmosphere, the mass extraction of resources (e.g. the deforestation of Europe to supply wood for fuel and clear land for agriculture as the population exploded), and the pollution of air and water (most recently, through plastic pollution).

3.3 million years ago

Paleolithic Era - Foraging

The earliest humans lived in the Paleolithic era.
Humans were foragers during the Paleolithic era, hunting /scavenging for animals and gathering local plants.
Besides, humans were also nomads during this time, moving from place to place over a large area to access these plants and animals

12,000 years ago

Holocene - The Agricultural Revolution

Around 12,000 years ago, homo sapiens stopped solely on hunting and gathering. They cultivated crops and domesticated animals. This is what we call the Agricultural Revolution. Agriculture's biggest advantage was that it was more efficient: on just a small patch of land, farmers could grow a mass of edible plants. This increased the food (energy) supply, which in turn led to rapid expansion of the human population. It increased the size and the complexity of human society.
New systems - writing, money, religion and political empire etc, had to be invented and implemented to deal with the complexity. These systems, in turn, shaped future society.

150–250 years ago

Anthropocene - The Industrial Revolution

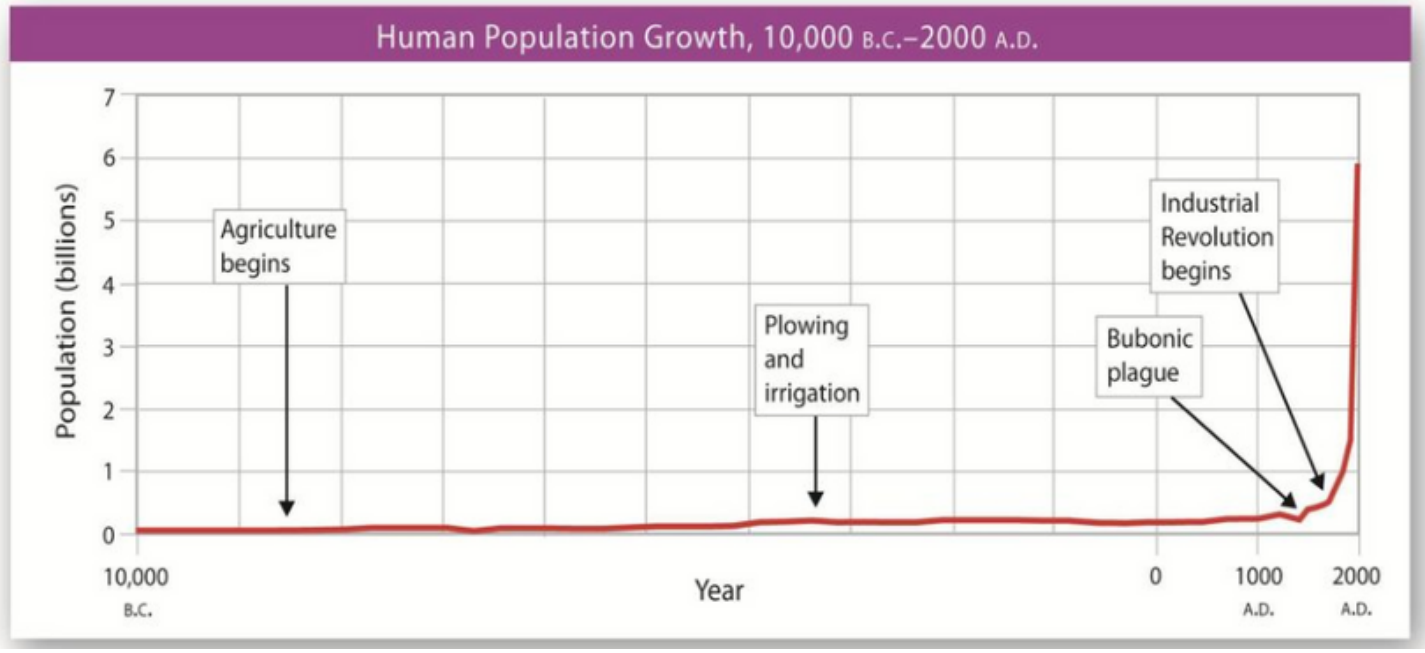
In the mid-18th century in Britain, one of the most momentous transformations in world history began to unfold. The Industrial Revolution saw a rapid development of technology and utilization of natural resources that had not been witnessed since the Agricultural Revolution.

The invention of steam power coupled with the use of assembly lines and the division of labor gave rise to factories and mass production, fueling European economies (and later world economies), improving living standards and food security, and causing a population boom.

In 1800, the world population was around 1 billion people. Today, it is around 7..9 billion.

Historical Population Growth

The size of the global human population is still increasing, but the rate of global population growth is decreasing.

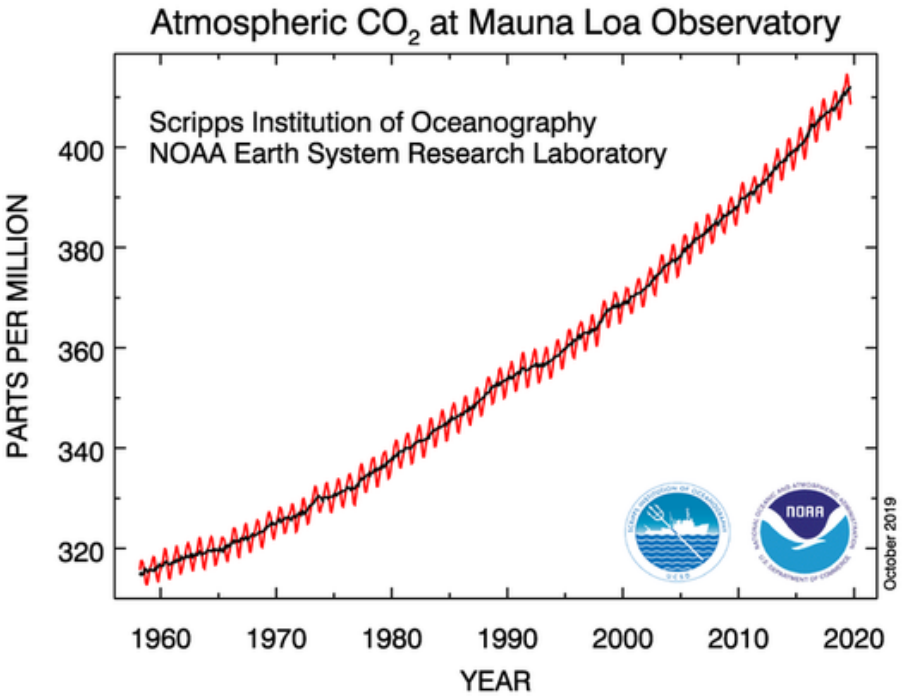


As you can see in the chart above, there was a rapid increase in the global population after the beginning of the Industrial Revolution.

A growing population means **growing demand**, which in turn means the exhaustion of **natural resources**. In addition, the burning of fossil fuels for heat, electricity, and transportation caused greenhouse gas emissions to skyrocket.

GREENHOUSE GAS EMISSIONS

The rapid increase in atmospheric CO2 concentrations



CO2 Concentrations

1000 CE: ~280 PPM

1500 CE: ~285 PPM

1800 CE: ~283 PPM

1900 CE: ~296 PPM

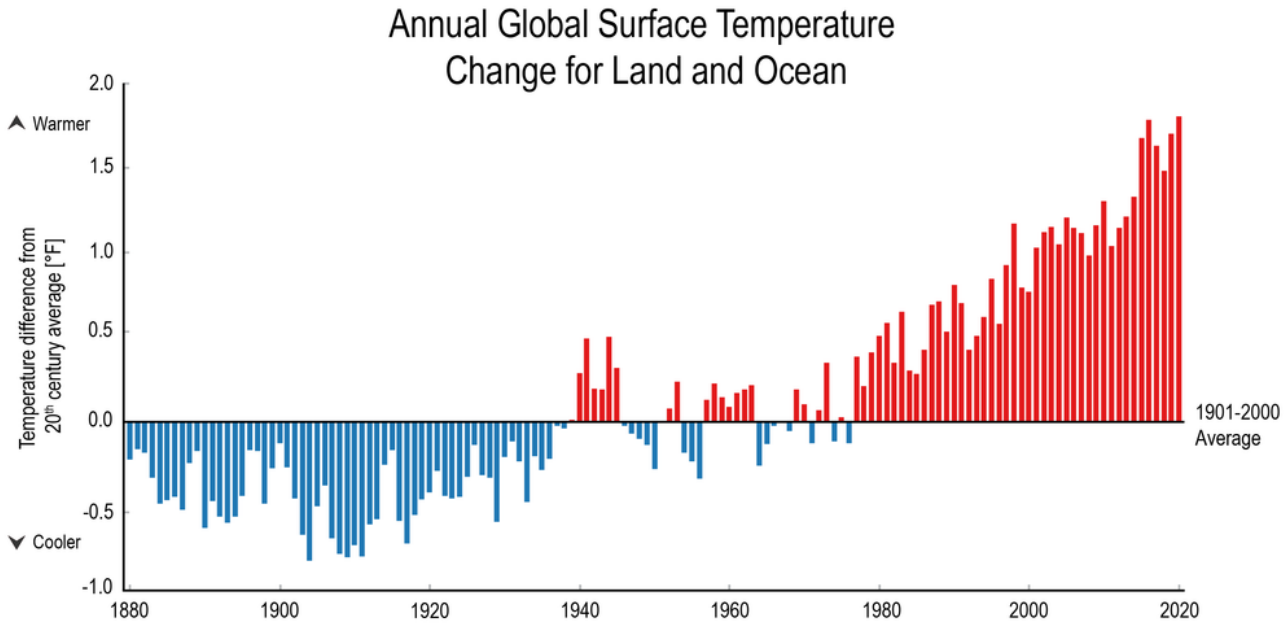
1960 CE: ~316 PPM

1990 CE: ~354 PPM

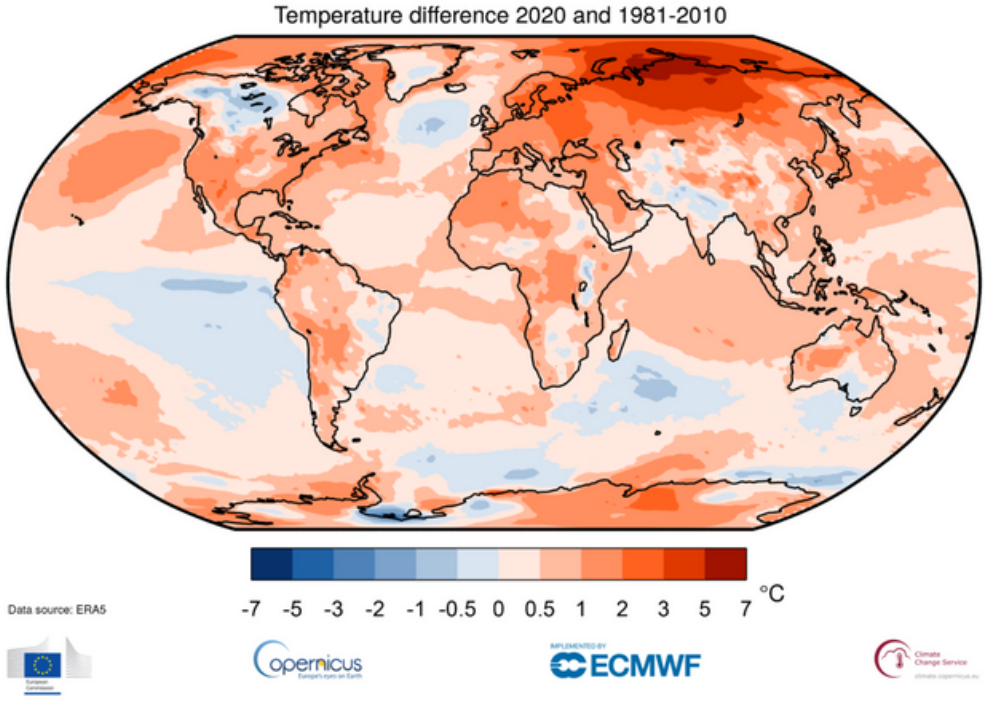
2000 CE: ~370 PPM

August 15, 2021: ~414.73 PPM

And as greenhouse gas concentrations (e.g., CO2 and methane) increase, so does the average global temperature.



Additionally, not everywhere on Earth will experience the same level of warming. Regions closer to the poles experience **more extreme heating**.



Most recent (August 2021) predictions for temperature increase in degrees Celsius compared to pre-industrial levels:

	Near term, 2021–2040		Mid-term, 2041–2060		Long term, 2081–2100	
Scenario	Best estimate (°C)	*Very likely* range (°C)	Best estimate (°C)	*Very likely* range (°C)	Best estimate (°C)	*Very likely* range (°C)
SSP1-1.9	1.5	1.2 to 1.7	1.6	1.2 to 2.0	1.4	1.0 to 1.8
SSP1-2.6	1.5	1.2 to 1.8	1.7	1.3 to 2.2	1.8	1.3 to 2.4
SSP2-4.5	1.5	1.2 to 1.8	2.0	1.6 to 2.5	2.7	2.1 to 3.5
SSP3-7.0	1.5	1.2 to 1.8	2.1	1.7 to 2.6	3.6	2.8 to 4.6
SSP5-8.5	1.6	1.3 to 1.9	2.4	1.9 to 3.0	4.4	3.3 to 5.7

Taken from the IPCC Sixth Assessment Report Summary for Policymaker

CONSEQUENCES OF GLOBAL WARMING I

The consequences of global warming are broad and severe. Almost every single aspect of our lives will be impacted. Around the world, we have already begun to witness extreme weather events like floods and wildfires on an annual basis. These events will only become more frequent and extreme. Below, you'll find a brief overview of the different ways our planet will be impacted by a warming climate:

Sea Level Rise

Global warming increases the melting of icebergs and the thermal expansion of sea water, leading to a rise in sea level. It is estimated that the average sea level will rise by 0.5 meters (low estimate) to 2.5 meters (high estimate) by 2100. If this happens, the following cities would be flooded:

- Jakarta, Indonesia - Population: 10.56 million
- Lagos, Nigeria - Population: 14.86 million
- Dhaka, Bangladesh - Population: 8.90 million
- Bangkok, Thailand - Population: 10.72 million
- Alexandria, Egypt - Population: 5.91 million
- Miami, Florida - Population: 6.16 million

Besides countless human lives and livelihoods, the cities are centers of economy, culture, and history, much of which would be lost upon flooding.

Besides impacting humans, the melting of icecaps reduces the size of the polar habitats, threatening polar bears and other polar species.

CONSEQUENCES OF GLOBAL WARMING II

Extreme Weather

A warmer climate is a less stable climate. The world's weather patterns will become disrupted as ocean and atmospheric currents become more erratic. This will cause more frequent and intense:

- Heat waves
- Droughts
- Hurricanes / Monsoons / Typhoons / Cyclones
- Floods
- Wild fires

From 2000 to 2019, there were 7,348 major natural disasters around the world, killing 1.23 million people and resulting in $2.97 trillion in global economic losses.

By comparison, the previous 20-year period, 1980-1999, had 4,212 natural disasters, claiming 1.19 million lives and causing $1.63 trillion in economic losses.

Much of this increase, the report notes, can be attributed to climate change. Climate-related disasters jumped 83 percent — from 3,656 events during the 1980-1999 period to 6,681 in the past 20 years. Major floods have more than doubled, the number of severe storms has risen 40 percent, and there have been major increases in droughts, wildfires, and heatwaves.

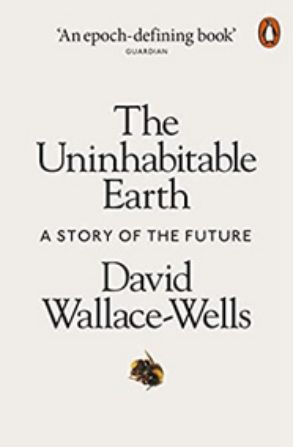
CONSEQUENCES OF GLOBAL WARMING III

Disease and other Health Issues

A warmer climate causes many infectious diseases, such as cholera and malaria, to become more widespread and affect areas that were previously unaffected. This is due to the warming of regions that previously were too cool for disease-carrying insects such as mosquitos and other parasites to live. These insects, which previously live mostly in the tropics, will expand their range as other parts of the world warm.

Heat stress will also become a major concern. Many parts of the world, especially those around the equator, will become "too hot to live in."

- Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year from malnutrition, malaria, diarrhea and heat stress.



Book recommendation:

The Uninhabitable Earth by David Wallace-Wells is a great book to read if you would like to learn more about the impacts climate change will have on our planet. Published in 2019, it gathers very recent scientific research and paints a distressing picture of how life on our planet might look like in the very-near future.

BACK TO YOU

What do you think is the most dangerous & threatening impact of climate change?

Do you think humans are responsible for protecting the planet from climate change?

What is the best solution to stopping global warming in your opinion?

SESSION 3:

UN SDGS & INTERNATIONAL TREATIES

To better understand how we can fight climate change, we need to better understand the existing international systems and agreements in place.

You have probably already heard of the United Nations, but what role do they play in fighting climate change making the world a more sustainable place?

The answer can be split into two complementary components:

(1) The Sustainable Development Goals

(2) The UN Framework on Climate Change

Timeline of International Co-Operation on Climate Action

1949
UN Scientific Conference on the conservation and utilization of resources was the first UN body to address the depletion of natural resources and their use.

1968
The Economic and Social Council was the first to include environmental issues in its agenda as a specific item

1972
The First Earth Summit is held in Stockholm. A declaration was adopted that raised the issue of climate change for the first time.

1987
UNGA adopted the "Environmental Perspective to the Year 2000 and Beyond" where the notion of sustainable development was introduced.

1988
The Intergovernmental Panel on Climate Change (IPCC), a forum for the examination of greenhouse warming and global climate change, was established.

1989
The Montreal Protocol on Substances that Deplete the Ozone Layer entered into force

1992
United Nations Conference on Environment and Development in Rio

1994
The United Nations Framework Convention on Climate Change (UNFCCC) came into force.

1997
The Kyoto Protocol was signed

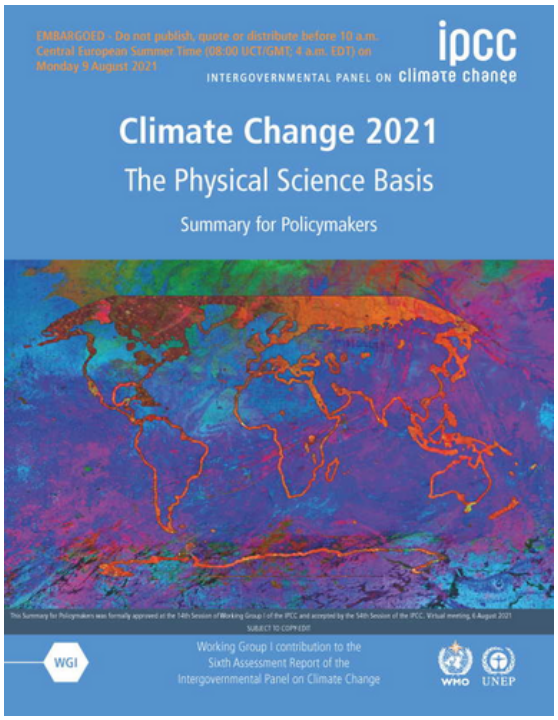
2012
The Doha Amendment to the Kyoto Protocol was adopted. It established a second emission reduction commitment period for 37 countries.

2015
The Paris Agreement was adopted

2021
UNFCCC launched the 'UN Race-to-Zero Emissions Breakthroughs'. The aim of the campaign is to transform 20 sectors of the economy in order to achieve zero greenhouse gas emissions.

THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations, mandated to provide objective scientific information relevant to understanding human-induced climate change, its natural, political, and economic impacts and risks, and possible response options.



The IPCC does not conduct original research nor monitor climate change or related phenomena; rather, it undertakes a systematic review of all relevant published literature to provide a comprehensive update on climate change, its effects, and potential strategies. IPCC reports contain a "Summary for Policymakers" subject to line-by-line approval by delegates from all participating governments; typically, this involves representatives of more than 120 countries meeting every seven years or so.

You may read the latest 2021 IPCC report here- https://www.ipcc.ch/report/ar6/wg1/.

THE UN FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

At the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro from June 3-14, 1992, 154 countries signed the United Nations Framework Convention on Climate Change (UNFCCC). Its aim is to combat "the dangerous human disturbance of the climate system", in part by stabilizing the concentration of greenhouse gases in the atmosphere.
The "Kyoto Protocol" was signed in 1997 and operated from 2005 to 2020, marking the first implementation of measures under the UNFCCC. The Kyoto Protocol was replaced by the Paris Agreement, which entered into force in 2016. As of 2020, the UNFCCC has 197 signatories. Its highest decision-making body, the Conference of the Parties (COP), meets annually to assess progress in the fight against climate change.

Parties to the UNFCCC are classified as:

01. Annex I countries

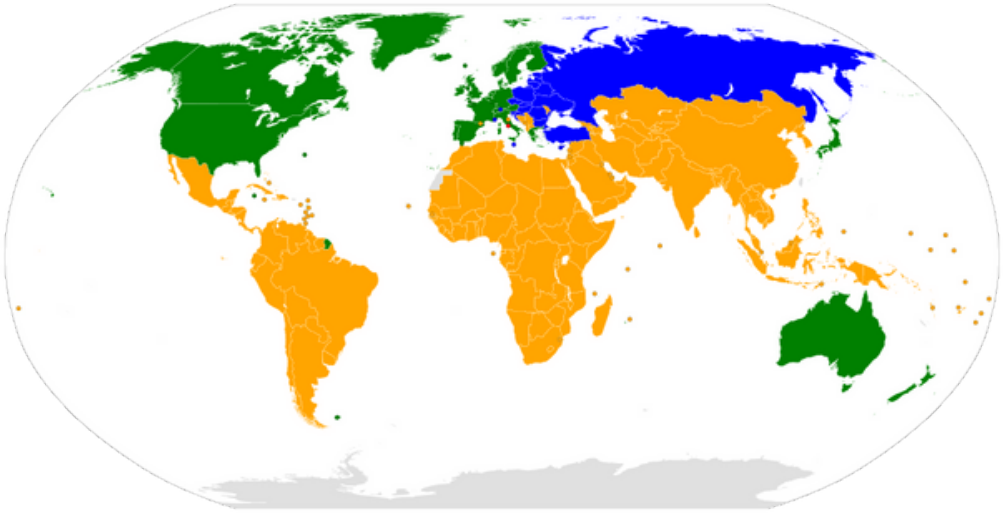
These are the developed countries and Economies-in-Transition (EIT).

02. Annex II countries

These are the countries that are required to provide financial and technical support to the EITs and developing countries.

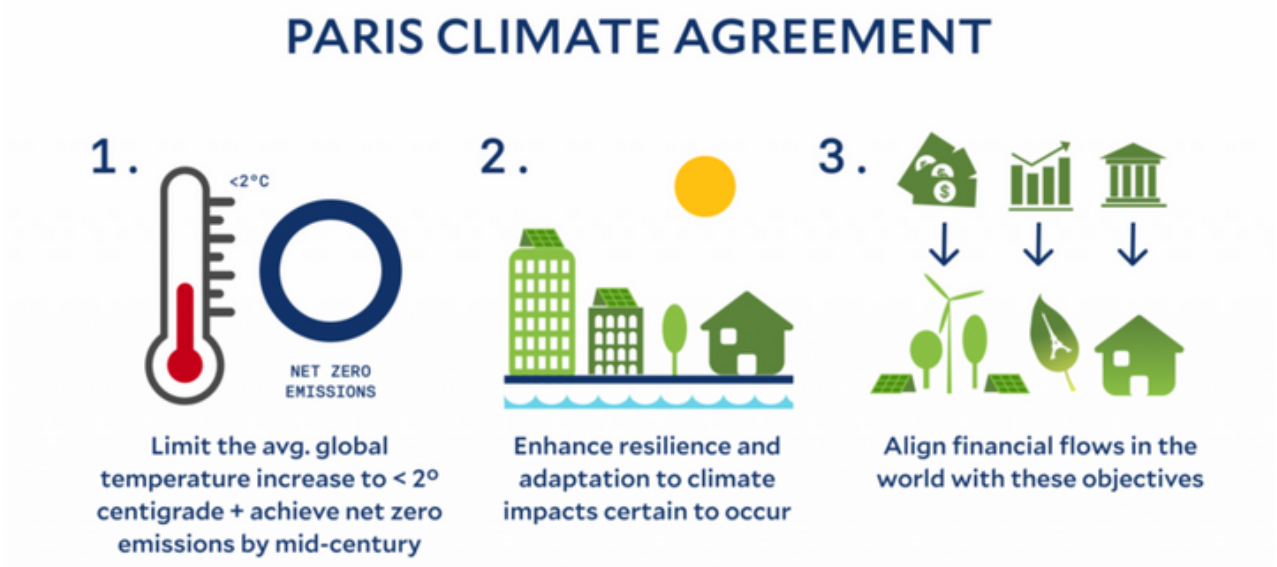
03. Non-Annex I countries

Parties to the UNFCCC not listed in Annex I of the convention (mostly developing countries).



This file was derived from: BlankMap-World6.svg:, Public Domain, https://commons.wikimedia.org/w/index.php?curid=31436070

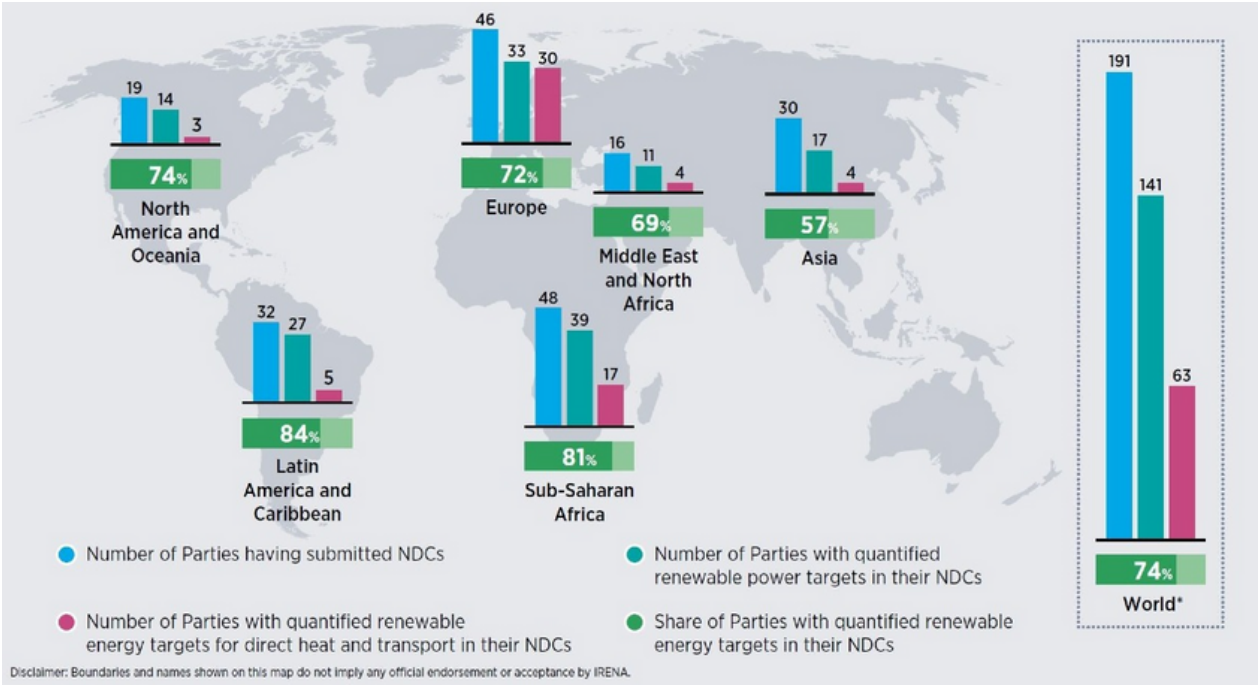
Kyoto Protocol (1997)	Paris Agreement (2016)
Legally-binding	Voluntary and non-legally-binding
Ratified in 2005. Had two commitment periods from 1997 to 2020.	Signed in 2016. New commitments are due every 5 years.
Future global warming should be limited to less than 2 ° C (3.6 ° F) relative to pre-industrial levels.	Control the rise in global mean temperature to within 2 ° C (3.6 ° F) above the pre-industrial level, and it is best to limit the rise to within 1.5 ° C (2.7 ° F),
Only developed countries required to reduce emissions.	The distinction between developed and developing countries is blurred, so the latter must also submit emission reduction plans.



https://sustainability.yale.edu/explainers/yale-experts-explain-paris-climate-agreement

What are Nationally Determined Contributions (NDC)?

The Paris Agreement requests each party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic alleviation measures for climate change, with the aim of achieving the objectives of such contributions.



https://www.irena.org/climatechange/NDCs

CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

Millennium Development Goals (MDG) [2000-2015]	Sustainable Development Goals (SDG) [2015-2030]
8 goals with 21 targets in total.	17 goals with 169 targets.
The goals are focused on social development.	Economic growth, social inclusion & environmental protection are the key objectives.
The goals are focused on developing countries.	All countries, irrespective of development level, are encouraged to participate.
The goals were formulated by experts in their respective fields.	The goals were formulated by 193 UN Member States, the Civil society, and other stakeholders

Millennium Development Goal #7

- Target 7A: Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources.
- Target 7B: Reduce biodiversity loss.
- Target 7C: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation.
- Target 7D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum-dwellers.

Sustainable Development Goal #13

- Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- Target 13.2: Integrate climate change measures into national policies, strategies and planning.
- Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
- Target 13.a: Implement the commitment undertaken by developed country Parties to the UNFCCC to a goal of mobilizing jointly USD100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.
- Target 13.b: Promote mechanisms for raising capacities for effective climate change related planning and management, in LDCs, including focusing on women, youth, local and marginalized communities

ARE WE ON TRACK TO ACCOMPLISH THE GOALS?

The UNFCCC's 2021 Initial NDC Synthesis Report shows that we are not on track to achieve our global goals under the Paris Agreement or under the UN SDGs. The report shows that while the majority of nations represented increased their individual levels of ambition to reduce emissions, their combined impact puts them on a path to achieve a less than 1 per cent reduction by 2030 compared to 2010 levels. The Intergovernmental Panel on Climate Change, by contrast, has indicated that emission reduction ranges to meet the 1.5°C temperature goal should be around 45 per cent lower. COVID-19 posed significant challenges for many nations with respect to completing their submissions in 2020 and working towards the climate emergency in general. According to the Sustainable Development Goals Report 2020, while we were already not on track to achieve the goals on time, COVID-19 has reversed years of progress.

If you would like to learn more about the evolution of the MDGs into the SDGs, and the various conferences and UN processes that gave rise to both, watch this video made by the UN SDG Academy

BACK TO YOU

Do you think we will be able to achieve any of the goals in the aforementioned international agreements on time?

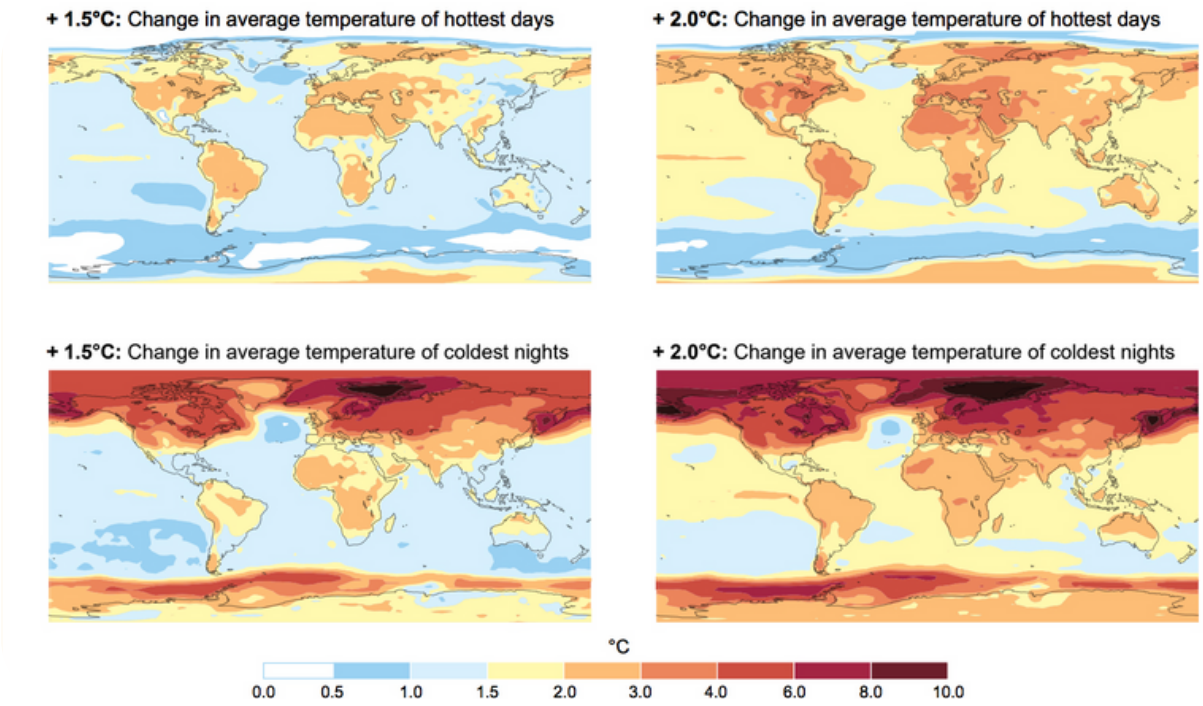
Do you think it is fair for countries, especially developing or underdeveloped countries, to sacrifice national development for collective good?

SESSION 4:

GLOBAL CLIMATE ACTION

IPCC's working group 1 report, "The Physical Science Basis (Assessment Report 6)", released on 9th August is dire in nature and predicts that averaged over the next 20 years, global temperature is expected to reach or exceed the 1.5 degrees celsius mark of warming with the Earth already being warmer than it's been in 125,000 years.

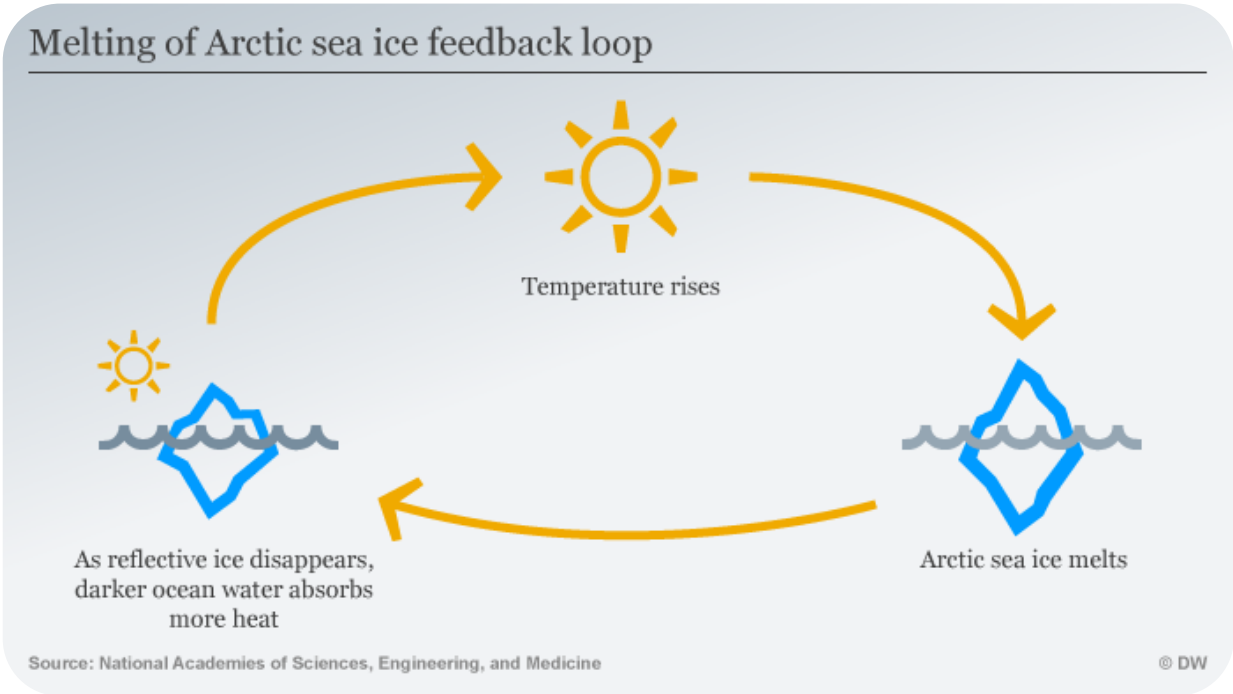
NASA's evaluation on the intensity of change in 1.5 vs 2 degrees celsius rise in temperature



"It is not enough to act. We must act now"

What if we don't act now?

We might face irreversible consequences of global warming, sea level rise, food security, and public health in the form of **feedback loops**.



By taking taking the right steps now, we can prevent millions of premature deaths annually, improve food security by avoiding tens-of-millions of tonnes of annual staple crop losses, protect vital ecosystems and ecosystem services, reduce the risk of dangerous and irreversible climate tipping points, and make significant contributions to achieving the 2030 Agenda for Sustainable Development.

Listen to the award-winning podcast, produced by MIT Environmental Solutions Initiative, to understand climate change, how is it impacting us, and what can we do about it from real scientists and experts

Time for action

Formal action

Taken by international organizations and governments by involving local parties, NGOs and members of the civil society. As an individual, practicing the right to have a say on climate issues and taking part in formal climate negotiations can lead to an efficient system of global climate action.

Various countries have already announced their climate action plans, mainly to go carbon neutral within a few years, with the help of policies and goals specifically in response to the 13th SDG: Climate Action.

Carbon Economics and Climate Governance

In a lot of countries across the globe, carbon plays a significant role in shaping up their economy. Governments are now finding ways to reduce carbon emissions through economic models such as carbon tax and carbon trading.

Carbon Tax

Carbon Tax refers to the fee, set up by the government, levied on the carbon emissions required to produce goods and services. Economists believe that it is the best way to curb climate change.

Carbon Trading

Carbon trading refers to offsetting the right to emit GHGs. For example, a country that relies on activities that emit a lot of GHGs carbon can purchase the right to emit more GHGs from another country that doesn't rely as much on polluting activities.

https://www.youtube.com/watch?v=rg_fP2CZYq4

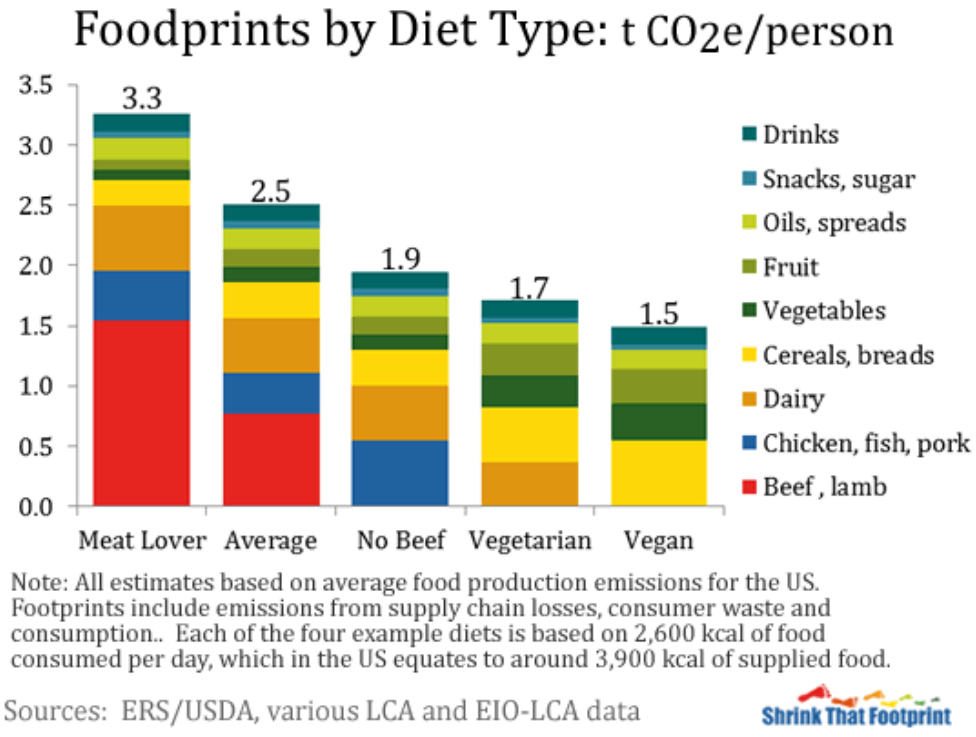
Watch this video to understand carbon pricing and its implications

Time for action

Informal action

- Adopting sources of environmentally-friendly sources of energy that can replace energy from fossil fuels.
- Reduce, Reuse, Recycle
- Vote for the right party and support relevant movements
- Change in lifestyle by preventing unnecessary resource consumption and diet

Can going vegan really help?



Production of non vegetarian food involves a great deal of emissions. Research says that, on average, cutting down red meat alone can reduce individual emissions by one-fourth. In most cases, vegetarians emit only half as much as non-vegetarians.

BACK TO YOU

Do you think individual contributions make significant difference with regards to climate issues?

What impacts do you think climate change will bring in our daily lives about 30 years later, if we don't act now?

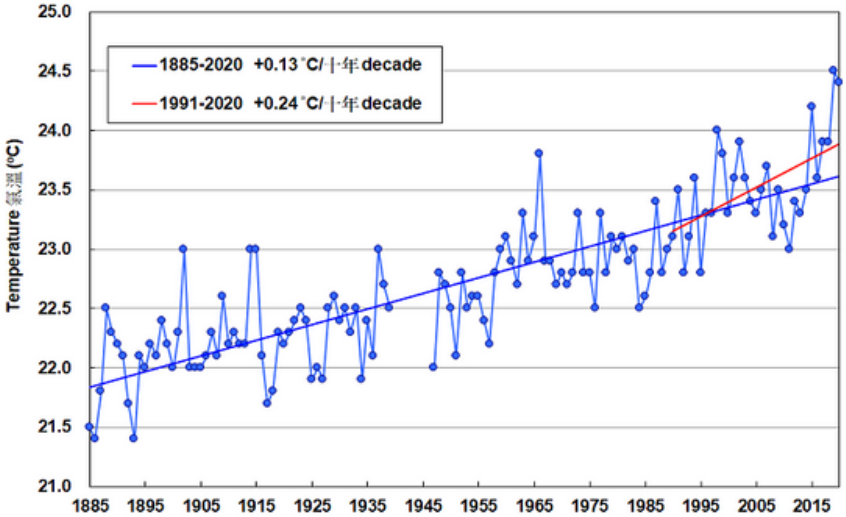
SESSION 5:

LOCAL CLIMATE ACTION- BUSINESSES

THE IMPACT OF CLIMATE CHANGE ON HONG KONG

Hong Kong, like most other places on Earth, has seen increasing effects of climate change in the city. The mean temperature recorded in Hong Kong since 1885 has been rapidly increasing and from 1990 onwards, the temperature of the city increased 0.21°C per decade. The number of days with a minimum temperature of 33°C or above, has increased from 9 in 2005, to a projected 112 by the end of the 21st century.

The mean annual rainfall has seen a rise of 2.3 millimetres per year from 1884 to 2020. The mean sea level, also, has been increasing steadily. On average, the mean sea level in Victoria Harbour rose at a rate of 31 mm per decade during 1954-2020. High tides and flooding of low-lying areas will become more common in the near future. This makes Hong Kong, a region already susceptible to tropical storms and extreme weather events, even more vulnerable.



Annual mean temperature recorded at the Hong Kong Observatory Headquarters (1885-2020)

https://www.hko.gov.hk/en/climate_change/obs_hk_temp.htm

Climate change will eventually threaten Hong Kong's position as a world financial centre. Resources and government funds would have to be allocated for disaster relief instead of economic development. Furthermore, supply chains, logistics, property, and other services are likely to be disrupted due to the increase in extreme weather events. Infrastructure will also be damaged due to flooding and soil erosion. The underground railway system is also in grave danger of being suspended due to unfavourable weather conditions in the future. Similar conditions would be experienced by the Hong Kong international airport.

The government of Hong Kong has identified climate change as a major threat to Hong Kong's position in the world. In its report titled "The Climate Action Plan 2030+", the government stated that it intends to reduce Hong Kong's carbon emissions by around 26-36% by 2030. Achieving carbon neutrality by 2050 is also been a goal of the government. The government aims to achieve these goals through public-private partnerships and market incentives.

You can read the full Hong Kong "Climate Action Plan 2030+" here

HONG KONG AND GREEN FINANCE

What is Green Finance?

Green finance is any financial activity that is designed to ensure an outcome that is beneficial to the environment or significantly reduces the negative impact of other business projects. It involves the granting of several loans and financial mechanisms, including investments, as incentives for green projects. Some examples of such projects are biodiversity conservation, circular economy initiatives, renewable energy, energy efficiency, sustainable use of natural resources, and pollution prevention and control.

https://www.ifec.org.hk/web/en/investment/investment-products/green-finance/about-green.page

Hong Kong, an emerging green finance hub

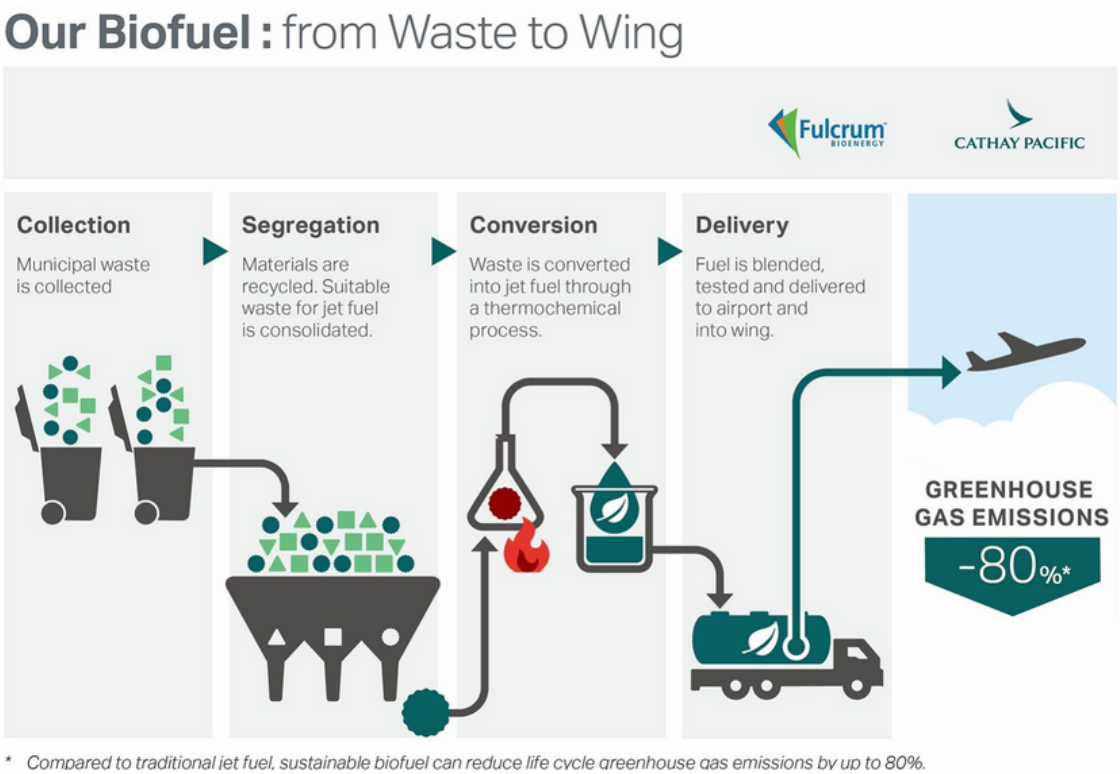
Hong Kong's unique position in the world financial system and its willingness to acknowledge the impacts of climate change has resulted in Hong Kong emerging as a hub for green finance. The government has initiated a number of programmes to promote Hong Kong as a global leader in green finance. In 2018, the Legislative Council approved a green bond insurance programme, with a maximum amount of HK $100 billion which can be lent. The Green Bond Grant Scheme subsidises eligible green bond issuers in obtaining certification under the Hong Kong Quality Assurance Agency's (HKQAA) Green Finance Certification Scheme. A Green Finance Certification Scheme was also introduced by the HKQAA, which encourages issuers to invest in projects related to sustainability. The Cross-Agency Steering Group co-ordinates market development activities and related regulations. The Hong Kong Monetary Authority has also been active in promoting sustainable banking. Sustainable & Green Exchange (STAGE), launched by the Hong Kong Exchanges and Clearing Limited (HKEX), provides greater access and transparency on products and also resources on sustainable finance-related information.

Many more incentives are especially being offered to the private sector for Renewable Energy projects. An example of this is the Feed-in Tariff Scheme, providing stimulus to the private sector to invest in distributed renewable energy. Under the scheme, people who install solar photovoltaic (PV) or wind systems at their premises can sell the RE they generate to the power companies at a rate as high as about five times more than the normal electricity tariff rate.

CASE STUDIES

Cathay Pacific

The Group is increasing its use of Sustainable Aviation Fuel (SAF), with the aim of making it "viable for mainstream adoption". In 2014, Cathay Pacific, as the first airline investor, took an equity stake in Fulcrum BioEnergy, Inc. Fulcrum is a US-based sustainable biofuel developer, which is a world pioneer in the development and commercialisation of converting municipal solid waste into sustainable aviation fuel.
Cathay has committed to purchasing 1.1 million tonnes of SAF over 10 years, making up around 2 per cent of its total fuel requirements from 2023 onwards. When the plant, which completed its construction in July, begins operations, it will be able to convert 175,000 tonnes of waste into more than 10 million gallons of fuel each year.

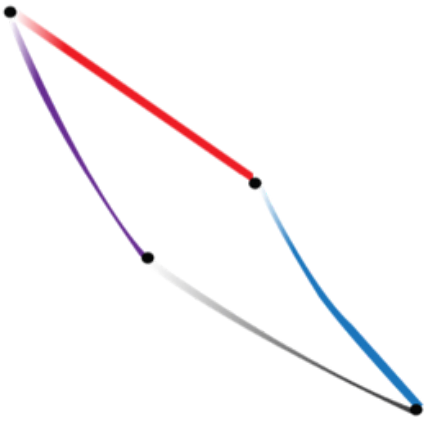


https://www.cathaypacific.com/cx/en_HK/about-us/environment/overview/climate-change.html

CASE STUDIES

Carnot Innovations

This company is a smart building company in Hong Kong. It uses the Internet of Things and automation technology to predict what maintenance buildings require, using sensors to measure warning signs such as vibrations or an increase in temperature. Data analytics is then used to diagnose the problem and suggestions are given on how to fix the problem. This technology has reduced the need for constant preventive maintenance, which, being quite expensive, might lead businesses to avoid having regular maintenance altogether and making the building more susceptible to the effects of climate change. This way, maintenance work can be performed before breakdowns happen when it is actually needed. This significantly reduces both the cost incurred and the energy used.



Carnot Innovations

BACK TO YOU

'Turning green' might require additional resources and investment in new technologies. Why do companies choose to become more sustainable, even if it is harder?

Do you think it would be a more effective strategy to punish businesses causing harm to the environment rather than rewarding businesses trying to address climate change?

Are these green finance initiatives beneficial for the environment in the long run or are they simply a band-aid solution?

SESSION 6:

LOCAL CLIMATE ACTION- NGOs

THE ROLE OF NGOs

In the section above, we looked at the relationship between business and climate change and action, particularly here in Hong Kong. In this section, we will look at non-governmental organizations (NGOs).
An NGO is any non-profit organization that works independently of the government. While most businesses sell products or services, NGOs usually aim to address a social or political issue. In recent years, there has been a rise in the number of environmental NGOs.

Examples of non-environmental NGOs

OXFAM

ASHOKA

MEDECINS SANS FRONTIERES

Examples of environmental NGOs

GREENPEACE

WWF

EARTH ISLAND

With regards to climate action, NGOs can play several important roles. They can be research NGOs, contributing to the growing knowledge-base of climate science worldwide. They can be development or relief NGOs, helping communities on the ground prepare for or recover from environmental disasters. They can be awareness or education focused, and they can also function as representatives for various stakeholders. In this way, essential tasks needed for just and comprehensive climate action are achieved by NGOs around the world, paving the way for other organizations and governments.

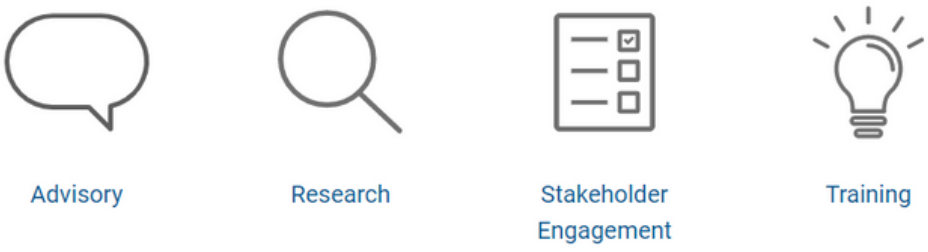
CASE STUDIES

Business Environmental Council

Business Environmental Council (BEC) is a Hong Kong-based NGO which offers sustainable solutions and professional services for government, business, and community-based clients. These services include advisory, research, assessment, and training and award programs. In this way, BEC enhances local and regional environmental protection, and contributes towards the transition to a low carbon economy.

BUSINESS ENVIRONMENT COUNCIL 商界環保協會

Created in 1992, BEC is an independent, charitable membership organization established by the business sector in Hong Kong. Since its inception, BEC has been at the forefront of promoting environmental excellence by advocating the uptake of clean technologies and practices which reduce waste, conserve resources, prevent pollution and improve corporate environmental and social responsibility.



CASE STUDIES

Plastic Free Seas

Plastic Free Seas was founded in 2012 by Tracey Read, an Australian scientist who had recently returned from a scientific expedition to the Great Pacific Garbage Patch. It is registered as an environmental charity in Hong Kong, with the primary aim of offering solution-focused education on plastic marine pollution to Hong Kong schools and students. To date, Plastic Free Seas has served over 70,000 students in more than 180 schools.

"Plastic Free Seas is a Hong Kong based environmental charity focused on changing the way we all view and use plastics in society today, through education and action campaigns."

Plastic Free Seas is led by a small, diverse team of passionate individuals who are committed to reducing the scourge of plastic pollution in Hong Kong. Besides educating students, they have also organized numerous beach cleanups around Hong Kong.

In 2020 alone, despite the COVID-19 pandemic, they have conducted 34 beach cleanups and 19 corporate events.

Click here to learn more about Plastic Free Seas!

BACK TO YOU

Do you think businesses or NGOs are more important in advancing climate action? Why?

If you could start an NGO to tackle one environmental issue in Hong Kong (or your home country), what would it be?

Should NGOs receive financial support from governments and international organizations such as the UN and the World Bank? Why or why not?

KEYNOTE SPEECH 2:

CLIMATE JUSTICE

Compared to the pre-industrial era, the planet has already warmed around 1.2C. People around the world are searching for solutions to tackle all the problems climate change may result in. Apart from the direct effects, indirect effects like social and economic problems may arise. People with adverse backgrounds may have a higher chance suffering from those problems. Therefore, it is vital to advocate and understand climate justice to reduce the disproportionate effects of climate change, and build a harmonious society.

BACKGROUND

- Current Situation

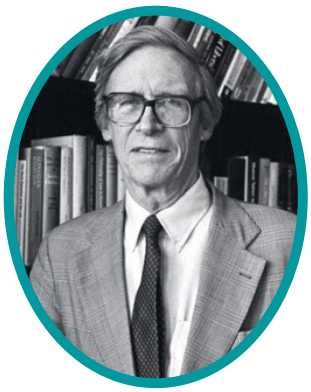
- **Widening the gap of inequality**

Climate change increased the income gap between the richest and poorest countries by at least 25% over the course of the 21st century.

- **Increasing international conflict**

It is predicted that there will be a voluntary or forced movement of 100 to 160 million working-age individuals due to the rising sea level and temperature. Adding dependent children, this means a total of 200 to 300 million climate migrants. The climate-related conflicts over resources will significantly increase future international migration pressure.

CONCEPT - What is Justice?



Before applying the concept of justice into the climate issue, we have to understand the theory behind justice. While justice is defined differently under different perspectives, utilitarians argue that society should pursue the greatest good for the greatest number. On the other hand, John Rawls, an American political philosopher, presented two principles of justice and upheld the idea of justice as fairness .

Rawls' idea on justice is based on 2 hypothetical situations and 2 principles.

Hypothetical situations

1 st
Members of the population can come to a contractual agreement on the distribution of resources without one party being seen to be more advantaged than the other.

+

2 nd **"veil of ignorance"**
The veil was a condition that blinded people to all their personal characteristics such as age, ethnicity, sex and income level, which would otherwise cause bias.

=

Individuals can align the principle to their advantage

Principles

1 st - Principle of equal liberty
All citizens have an equal right to basic liberalities, which entails freedom of conscience, expression, association, and so on.

2 nd - Principle of equality.
1) the least advantaged in society should receive a greater number of benefits,
2) the economic inequalities should be arranged in a way that no individual is blocked from occupying any position or office, regardless of their ethnicity, sex, or social background.

- What is Climate Justice?

Climate Justice is a term or a civil right movement that acknowledges climate change can create different social, economic, public health and other adverse impacts on underprivileged populations. Advocates for climate justice are striving to have these inequities addressed head-on through long-term mitigation and adaptation strategies.

Mitigation: involves either reducing the emission of greenhouse gases or creating greenhouse gas sinks or both.

Adaptation: involves making changes to people's context so that they can cope better with a world undergoing climate changes.

SOLUTION

- Who should take part in climate action?

It is essential to think about who should be responsible for climate change. We need to think about four questions: 1) Who should engage in mitigation and adaptation, and to what extent? 2) Who should bear the cost of mitigation and adaptation?

The society has been heatedly discussing who should take the responsibility on climate action. One might think that the current generation should mitigate climate change aggressively but that they can pass on some of the cost of doing so to future generations. It is linked to the idea of **intergenerational justice**. Children are particularly at risk, being developmentally most vulnerable to many climate impacts, some lasting over their entire lifetime. What moral duty should the current generation bear to ensure that today's children and their descendants will have basic conditions for flourishing?

Intergenerational Justice

It is the idea that concerns the extent and the character of moral relations among different generations.

- Who should bear the economic burden of dealing with climate change?

Burden-sharing problem	
1. Polluter pay principle	It refers to the burdens that should be borne in proportion to how much an agent has emitted. However, it sparked new debate since it is unfair to hold agents responsible for the harms resulting from their emission of greenhouse gases if they are excusably ignorant of the impact of their actions. They argue that many of those who have emitted greenhouse gases in the past were excusably ignorant. Therefore, it is essential to determine whether historical or current emission should be taken accordable.

Burden-sharing problem	
2. Beneficiary pays principle	The agents who have benefited from the activities that involve the emission of greenhouse gases should be responsible for the cost. However, people argue that whether benefiting is always sufficient to render someone liable to pay.
3. Ability to pay principle	It means that the greater an agent's ability to pay the greater the proportion of the cost that they should be expected to pay. Still, people criticize it relies on a controversial moral assumption, namely that the wealthy have a positive duty of assistance. **Example** **- Common But Differentiated Responsibility** The CBDR principle is mentioned in UNFCC article 3 and 4. It acknowledges all states have shared obligation to address environmental destruction but denies equal responsibility of all states with regard to environment protection. There are 3 objectives of contracting differential treatment: • to bring substantive equality in a framework for justice • to foster cooperation among states • to provide incentives for states to implement their obligations

- What approaches should be taken?

Different Approches	
Isolationism	It refers to bracketing other considerations and treating climate change on its own. Advantages: !) It can simplify the issue. Like allocating rights to emit greenhouse gases that treat greenhouse gases in isolation from other issues. 2) It can be more effective in dealing with climate issues. Since it can prevent the deadlock of controversy of what theory of justice is correct.
Interactionism	It refers to treating the ethical issues posed by climate change in light of a general theory of justice and in conjunction with other issues. Rationale: People who favor this approach believe that climate change is interconnected with or mediated through a wide variety of other social or economic phenomena. Therefore, climate change does not present itself as a discrete problem that can be treated separately. Rather it is part and parcel of a larger process.

BACK TO YOU

Who should bear the largest responsibility of fighting against climate change?

Which of the approaches mentioned above is best for climate justice?

Do you think it is important to achieve climate justice? Why or why not?

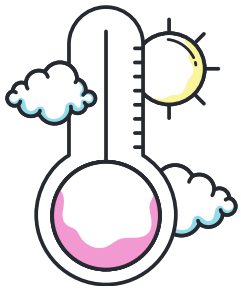
SESSION 8:

CLIMATE AND HEALTH

Climate change poses a fundamental threat to lives and wellbeing. The impacts of climate change are affecting some of the fundamental determinants of human health, such as weather, water, air, and food as well as transmission pattern of different diseases. Climate change is one of the most serious global health issues of the 21st century.

CLIMATE CHANGE AND ITS IMPACTS ON HUMAN HEALTH

01 Temperature and mortality



A study conducted by the CUHK School of Public Health investigated the relationship between temperature and mortality.

It is found that higher daily mean temperatures were associated with increased mortality. In the case of Hong Kong, 28.2°C is the critical threshold for elevated non-accidental mortality during the local warm season. An average 1°C increase in daily mean temperature above 28.2°C was associated with an estimated 1.8% increase in mortality. Non-cancer-related diseases such as cardiovascular and respiratory infection-related deaths were more sensitive to high-temperature effects.

02 Global warming and diseases

Dengue Fever

Dengue fever is a viral and tropical mosquito-borne disease. Recently, transmission has increased drastically 30 times over the past 50 years. Today, an estimated 50 to 100 million infections occur annually. Dengue fever is currently ranked as the most crucial vector-borne viral disease in the world.

The generation time of dengue transmission is highly sensitive to temperature. Scientists have suggested that the severity of dengue epidemics may intensify as the temperature increases because of higher numbers of infections per generation, faster generation, and hatching rates.

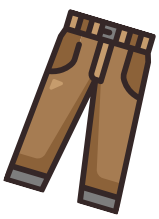
The optimal growth temperature of the dengue fever virus is 33°C. It implies that many dengue-endemic regions will be challenged by increased transmission potential with rising temperatures.

According to the climate change scenario, the places that will have an average monthly temperature exceeding 33°C in 2050 are India and African Sahelian regions.

To prevent dengue fever infections

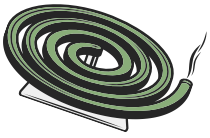
1. Eliminate pockets of stagnant water

2. Wear protective clothing



3. Use mosquito repellent

4. Fumigate where possible



Diseases emerging from melting permafrost in Siberia and the Arctic

"Permafrost is a very good preserver of microbes and viruses, because it is cold, there is no oxygen, and it is dark. Pathogenic viruses that can infect humans or animals might be preserved in old permafrost layers, including some that have caused global epidemics in the past."

- Evolutionary biologist, Jean-Michel Claverie at Aix-Marseille University in France

Anthrax

"Anthrax is a serious infectious disease that is caused by a kind of bacteria called Bacillus Anthracis. It can be found naturally in soil and commonly affects animals around the world.

In August 2016, in the Yamal Peninsula located in the Arctic circle, a 12-year-old boy died and at least 20 people were sent to the hospital because of anthrax infections.

Scientists suggested that a reindeer was infected with anthrax and died over 75 years ago. Its carcass was trapped under a layer of frozen soil that is the permafrost. The bacteria remained dormant down the ground until permafrost thawed during the heatwave in 2016.

This exposed reindeer corpse released anthrax bacteria into nearby water and soil and eventually entered the food chain. It causes over 2000 reindeer grazing close to the area to get infected and led to some human cases.

03 Human health impacts caused by heat waves and rising temperatures

The frequency and intensity of heat waves will rise in the current century as a result of climate change. Cumulative physiological stress on human health is created and exacerbated due to the extended periods of high day and nighttime temperatures.

Heat gain in the human body is caused by the external temperature of the environment and the internal body heat generated by metabolism. When exposing to an environment hotter than average conditions, the rapid increase in heat gain endangers the body's thermoregulatory ability.

People with chronic diseases that are required to take daily medications have a greater risk of complications and death during a heatwave, the same as the elderly and children.

Exposure to heat can cause severe symptoms:

- Heatstroke
- Swelling in lower limbs
- Heat rash on the neck
- Cramps
- Severe dehydration
- Acute cerebrovascular accidents
- Thrombogenesis (blood clots)

Reactions to heat depend on each person's ability to adapt and serious effects can appear suddenly. It is important to pay attention to the alerts and recommendations of local authorities.

HEALTH AND ENVIRONMENTAL CO-BENEFITS

1 Active travel

Choosing to walk a short journey instead of traveling in a car can have significant advantages for the environment over a year.

Environmental benefits of walking:

- 5 trips of 2km per week can decrease the amount of emissions by 86kg a year

Health benefits of walking:

- Motivates people to follow similarly and helps people to move out of their comfort zone.
- Reducing feelings of anxiety in urban areas
- People have been reported to feel safer in environments where a reduction in loud, heavy, and irresponsible traffic is present

Cycling is not only a fun way to stay active and is also great for the environment.

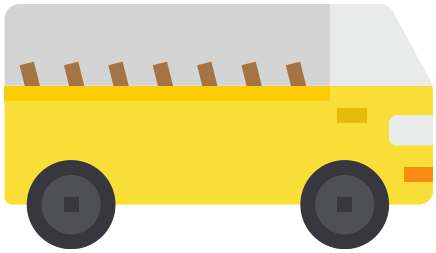
Environmental benefits of cycling:

- If all people in the world who work less than 5 miles from home cycled instead of driving to work one day per week, 5 million tons of greenhouse gas emissions can be reduced per year

Health benefits of cycling:

- Cycling is a kind of low-impact exercise that less pressure is exerted on the bones and joints compared to other aerobic workouts like running or jogging.
- Strengthen your quadriceps, hamstrings, glutes, and lower back

2 Taking public transport



Public transportation enables us to travel from one place to another in an environmental-friendly and affordable manner.

Environmental benefits of using public transport:

- Public transportation can reduce CO2 emissions by 37 million tons annually
- By eliminating one car and taking public transportation, up to 30% of carbon dioxide emissions can be reduced

Health benefits of using public transport:

- Individuals who use public transportation get over 3 times the amount of physical activity per day as those who don't
- Reduce the risk of developing stress, anxiety, depression and loneliness

3 Having plant-based diets

Having plant-based diets does not only help people to lose weight. It can help you to maintain a healthy body and reduce greenhouse gas emissions.

Environmental benefits of having plant-based diets:

- If we all went vegan, the world's food-related emissions would drop 70% by 2050
- Agriculture accounts for about 70 percent of freshwater use. In the U.S., if animal product consumption is cut by half, 37% less water will be required for food production
- Avoid desertification and deforestation due to livestock grazing and the clearance of land for cultivation

Health benefits of having plant-based diets:

- Epidemiological studies have supported the hypothesis that vegetarian diets protect against Type 2 diabetes mellitus
- Decrease the risk of cardiovascular diseases and cancers
- Vegetarian diets tend to be low in saturated fatty acids and rich in n-6 PUFA (dietary n-6 polyunsaturated fatty acid), which exert favourable effects on blood lipid fractions
- Plant-based diets have been associated with longevity in a number of large epidemiological studies

4 Household energy use and waste management

Using less air conditioning can improve indoor air quality (IAQ) and increase indoor air exchange rate, air movement, and ventilation with open windows.

Environmental benefits of improved IAQ:

- Reduce the release of anthropogenic heat
- Reduce the prevalence of urban heat island effects
- Avoid the release of pollutants from refrigerants

Health benefits of improved IAQ:

- Reduce the concentrations of indoor particle pollutants and VOCs
- Reduce the prevalence of sick building syndrome (SBS) and the risk of respiratory allergy

Say no to packaging and disposable shopping bags can reduce plastic waste and the migration of chemicals.

Environmental benefits of reducing the use of packages:

- Lessen the landfill burden, plastics debris in the marine or terrestrial environments
- Reduce GHG emissions from plastic production and combustion

Health benefits of reducing the use of packages:

- Reduce the risks of breast cancer and other disruptions to human reproductive functions potentially related to exposure to chemicals found in plastics

Separating household waste can reduce the amount of waste sent to landfills, particularly household hazardous waste

Environmental benefits of separating household waste:

- Increase the amount of material recovery and reduce the landfill burden
- Reduce GHG emissions from primary material production
- Prevent the leachate/migration of hazardous chemicals

Health benefits of separating household waste:

- Reduce the risks of congenital anomalies, reproductive disorders and the risk of cancer

BACK TO YOU

How can we encourage more people to adapt to a more environmental-friendly (and healthier) lifestyle?

According to one study, climate change would increase the risk of hunger to a level of 64–72% by the 2050s. Do you know how climate change affects our food security?

How is climate change affecting the mental health of an individual?

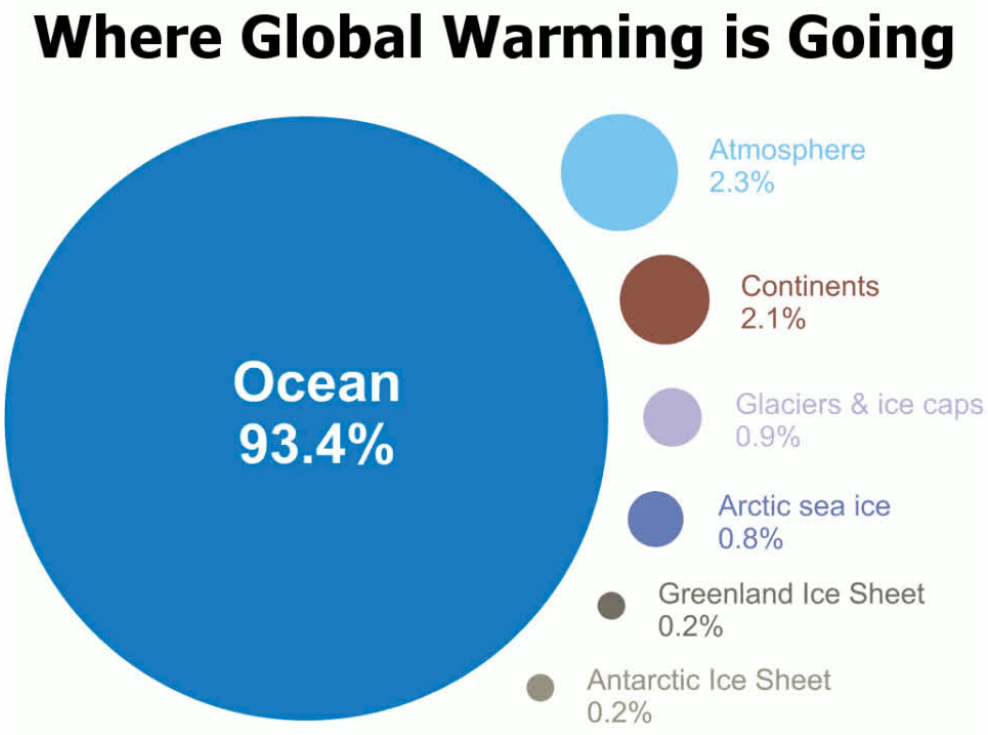
SESSION 9:

CLIMATE AND OCEANS

INTRODUCTION

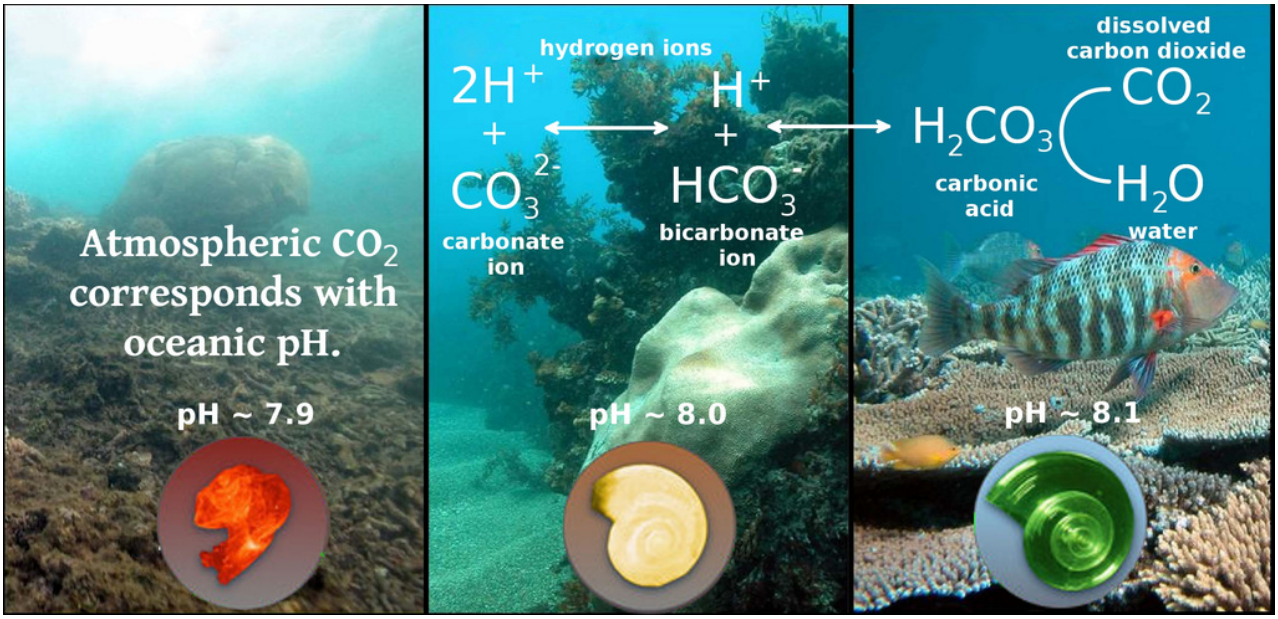
Climate change is a real, scary and extremely pressing issue for us to look into. All the sections thus far have explored the effects of climate change on various aspects of human life. It is important to point out that climate change affects the oceans and the rest of the environment differently from other factors, such as overfishing and plastic pollution. Those can, however, have a chain effect on the ocean ecosystem, indirectly affecting the climate of the world and influencing the regulatory mechanism of oceans on the climate of surrounding areas.

In this session, we will look at some of the ways in which climate change affects oceans.



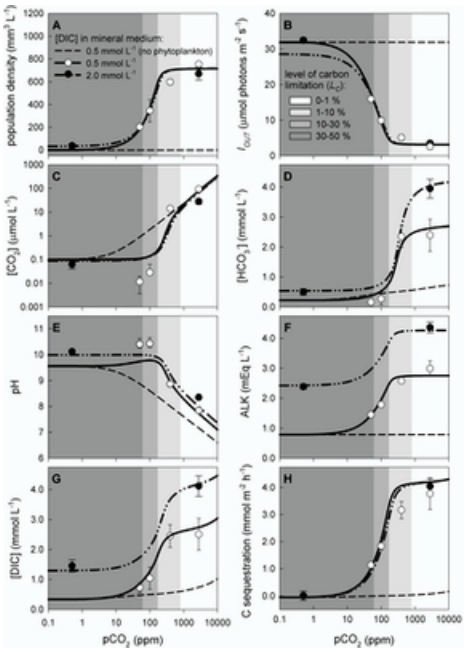
1. Ocean acidification

The carbon cycle is an extremely important regulatory mechanism which allows carbon to be stored in various natural reserves. The ocean is the biggest and most important carbon sink in the world, and when the carbon dioxide levels are normal, the dissolution of CO2 in the oceans is a perfectly normal and necessary process. However, as the level of carbon dioxide keeps increasing in the atmosphere, the oceans take up more CO2 than is healthy for them, disrupting various processes and wreaking havoc in marine ecosystems globally.

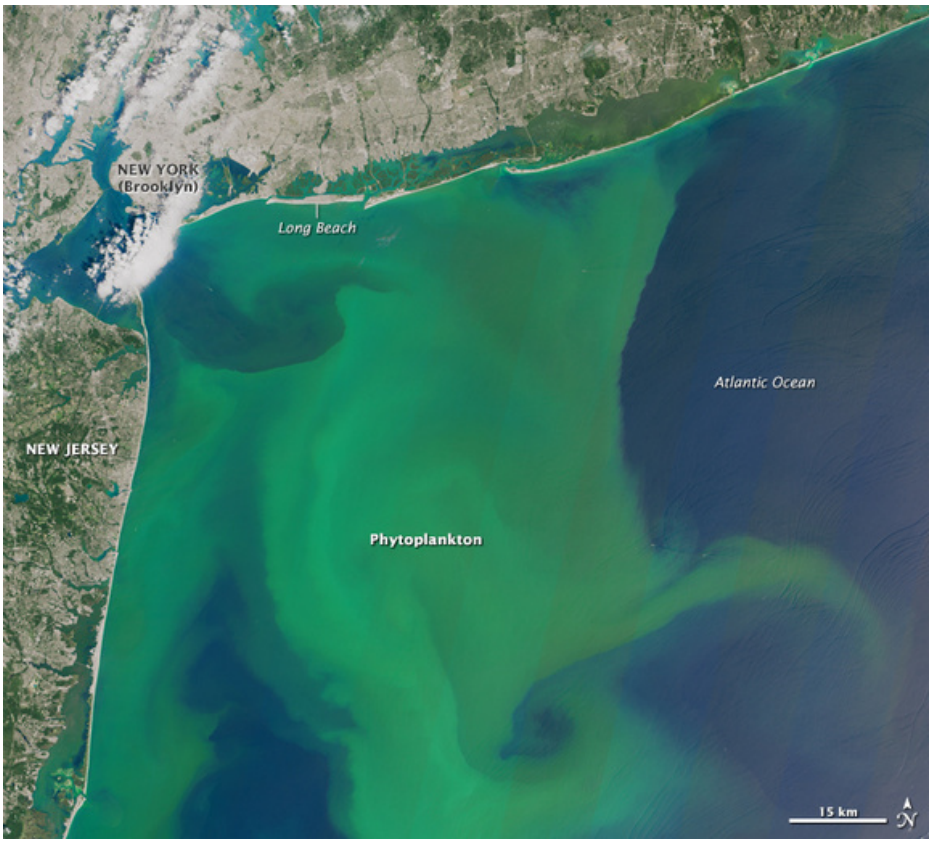


When atmospheric carbon dioxide is dissolved in water, it dissociates into ions, which further transform into carbonic acid. This causes a range of problems, including reduced availability of carbonate for animals like corals and other shelled organisms to build their exoskeletons, resulting in a reduction in their calcification rate. The reduction in pH as ocean water becomes more acidic causes coral bleaching, which is essentially the expulsion of symbiotic zooxanthellae from the coral, removing its colour and leaving it white.

Phytoplankton are the primary producers in our oceans, responsible for producing about 70% of the world's oxygen. They are vital in the functioning of the carbon cycle, as they take up carbon dioxide to perform photosynthesis and start the giant ocean food chain. While some studies suggest that the increased acidity of oceans disrupts the role of these organisms in carbon uptake, causing a decline in their growth, others have been able to demonstrate that increased CO2 concentration enhances the growth of phytoplankton. Either way, this is bad for the oceans, and here is why.



the relationship between carbon dioxide levels and phytoplankton blooms



phytoplankton blooms off the north-eastern coast of the USA

If the phytoplankton population decreases, the carbon cycle is affected, as less carbon dioxide can be taken up from the water to be turned into useful products. However, if there is a phytoplankton bloom, or increased growth, it can lead to eutrophication, which happens when the oxygen in the water is depleted, leaving other organisms to die.

Why is coral bleaching so disastrous?

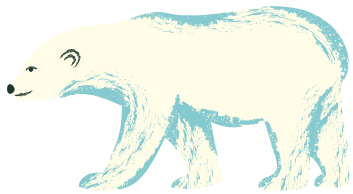
Coral reefs are called the “rainforests of the ocean”. They provide very important resources and perform essential ecosystem services. These reefs are a habitat for a range of marine animals which depend on them for food and shelter. Bleaching renders them unable to perform their usual role, causing problems for all the dependent organisms as well. This greatly imbalances the ecosystem and leaves it in danger or collapse.

the difference between normal and bleached coral communities!

Ocean acidification also causes shells of certain organisms to dissolve due to the splitting of calcium carbonate, the material that the shells are made of. Since such animals need their shells for the protection of their softer endoskeleton and organs, thinning or destruction of the shells can leave them vulnerable to rival attacks, predation or mechanical damage.

Marine animals need to live in certain conditions for their bodily mechanisms to function normally. Increases in pH can disrupt their life cycles at even their larval or egg stages, as eggshells are generally made of calcium carbonate (although most fish eggs do not have eggshells just a thin casing). In general, acidification can cause a range of problems for marine animals.

2. Melting of sea ice



One of the most alarming impacts of climate change on oceans is the rapid rate at which sea ice is melting. Not only does this cause severe habitat loss for animals that live in the frozen polar regions, but also leaves coastal cities and islands in danger of being lost due to sea level rise. Besides displacing millions of residents, it can also have a catastrophic impact on the world's economy. The issue of overpopulation and lack of space is already plaguing our world; such situations will only worsen the plight of the already-struggling human race.

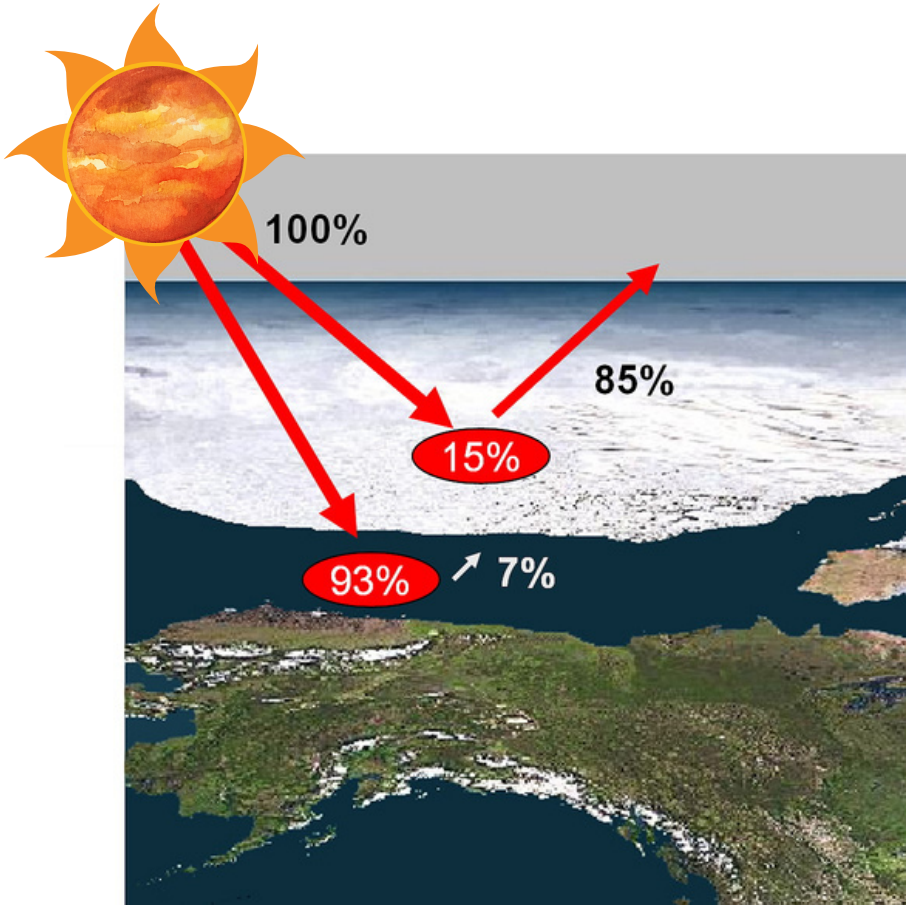
Habitat loss causes animals to venture closer to human-occupied land in search of resources like food and shelter. This further instigates human-animal conflict as there is a competition for survival stemming from lack of living space and resources. Both humans and animals can potentially be harmed as a result of this unexpected and unwarranted proximity. Animals like polar bears could even die after eating garbage that has been abundantly discarded by humans.

climate change causes rising temperature, which fragments ice sheets

this leaves animals like polar bears at risk of habitat loss

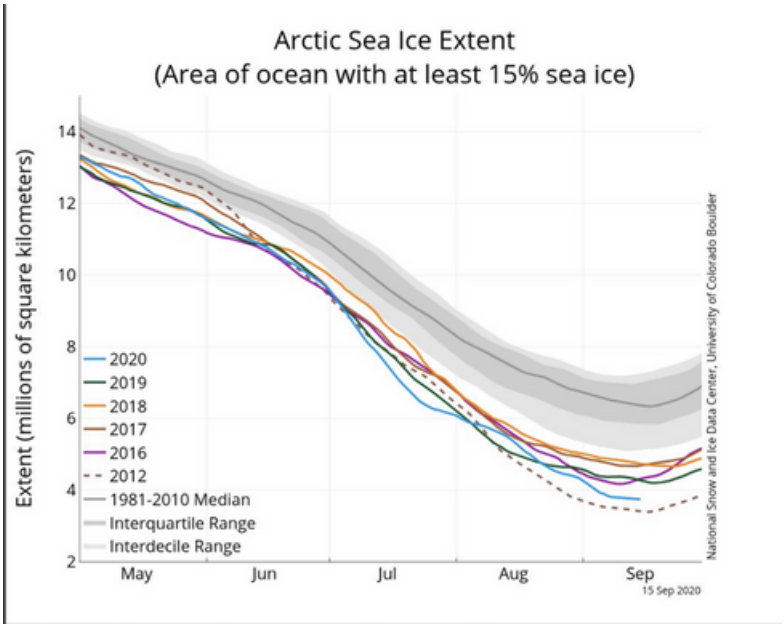
Some other effects of sea level rise include erosion of coastlines and formation of more frequent storm-like events, including hurricanes and typhoons.

Ice, being white in colour, reflects sunlight and prevents excessive warming of the polar regions. This reflective ability is called albedo. However, with increasing loss of sea ice especially from the poles, there is a reduction in the amount of sunlight reflected from these regions. This means that more sunlight is trapped on the earth's surface, leading to warmer temperatures and more ice melting. It is a vicious cycle, one which we have to try our best to break.

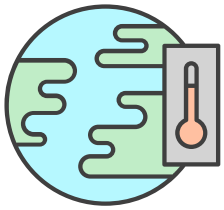


this is the stark difference between the reflective ability of land and ice!

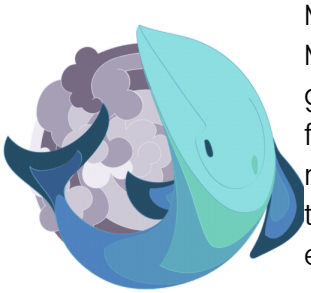
decline of Arctic sea ice over the years



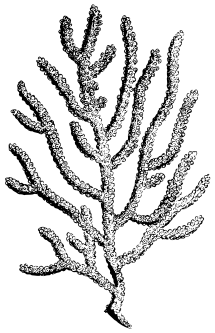
3. Ocean warming



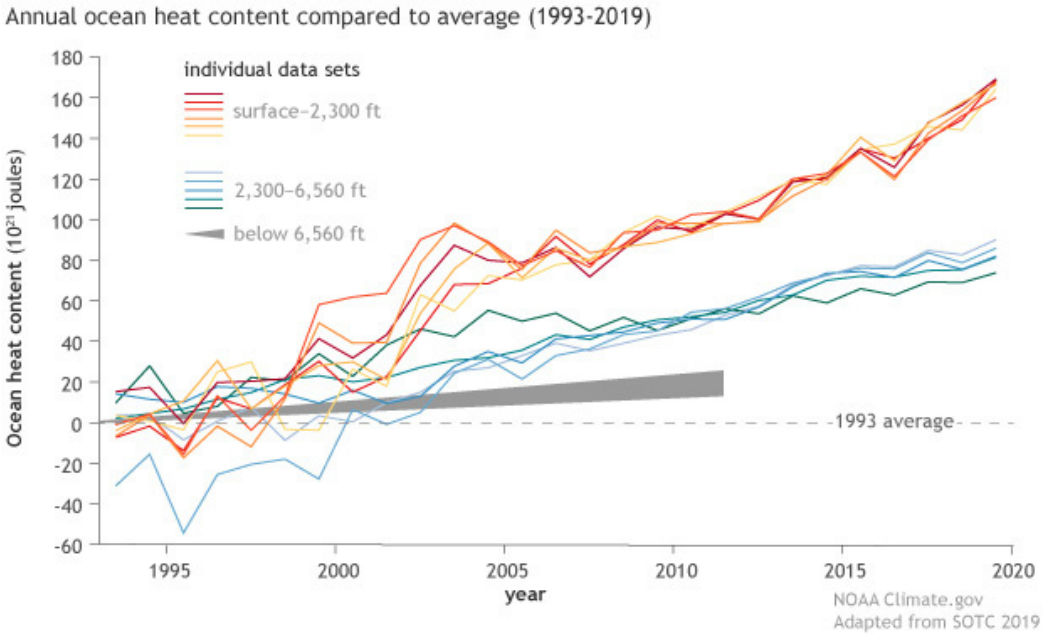
The same explanation that was given for the carbon cycle can be applied here as well. The world's oceans are extremely important in storing excess heat, and until a certain level, this is necessary for the functioning of various ecosystems. However, as the amount of heat in our atmosphere rises at a disturbing rate, the oceans also get much warmer than usual, as they continue to absorb heat. This is extremely problematic and induces several unwanted biotic and abiotic changes in the hydrosphere.



Most marine animals have a range of temperatures within which they can survive. Migratory animals even choose their migration routes based on the temperature gradient between different areas. Certain animals like whales and sea turtles follow similar annual routes, moving to colder regions in summer and warmer regions in winter. With increased ocean warming and higher sea surface temperatures, they will begin to change these routes, leading to potential adverse effects on these animals themselves as well as on the rest of the ecosystem.

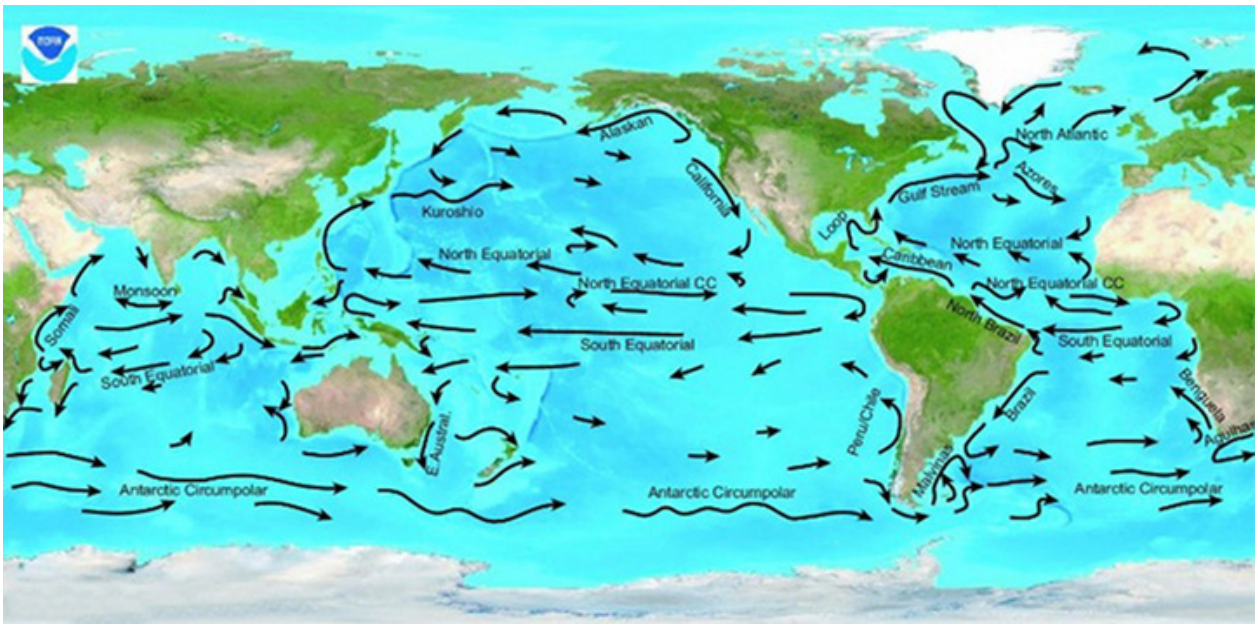


Studies have shown that when all other physical conditions like nutrients and carbon dioxide concentration are kept constant, an increase in temperature can have a potentially fatal effect on marine animals. Corals can be used as an example yet again. They do seem to be the poster species to observe the effects of climate change on ocean systems and animals. This is because they are extremely sensitive to changing conditions and need optimum levels of all abiotic factors in order to function. Heatwaves can cause mass bleaching and death of coral reefs worldwide, triggering a chain reaction in their associated biological systems.



Oceans also play the essential role of heat distribution around the world. Cold and warm ocean currents determine seasonal climatic conditions of various coastal areas and islands. At the equator and in tropical areas, pushed by the atmospheric wind systems and influenced by the rotation of the earth, ocean water heats up and rises to the surface as warm currents and at the poles, cold, dense water sinks to the bottom and moves as cold currents. Besides regulating temperature, this process is crucial for the mixing of nutrients which controls the population of animals and the health of the ecosystems in different areas.

As the NOAA suggests, warming of the sea surface can block the formation of sea ice and prevent the sinking of cold water to the bottom of the ocean. Conversely, large amounts of melting ice can also disrupt the flow and movement of these currents. If nutrient composition changes, it can have a disastrous effect on oceanic food webs, which can affect the global economy as well, considering the fact that fisheries can rake in over 246 billion dollars in annual revenue. Depletion of food sources and decline of marine populations can result in decreasing amounts of available catch for fishermen, bringing down the revenue.



global ocean currents system!

WHAT CAN WE DO?

Reduction of emissions is a key step in preventing ocean warming and acidification. Apart from basic changes like sharing transport and walking instead of using vehicles to make a difference, it is extremely important to raise awareness and call attention to the problem. Climate change is affects the world's systems in several different ways, and the oceans need as much or more attention as land systems. Together, we can make a difference to save them and to protect our world from imminent disaster.

Make conscious changes

Reduce your daily carbon footprint and ensure your actions do not have unwanted effects on the planet's health.

Eat sustainably

Make sure the seafood you eat is sustainably sourced and produced, so as to not make any detrimental changes to the ocean ecosystem.

Create awareness

Spread the word to friends, family, colleagues and strangers. We need all the help we can get if we want to save our blue planet .

BACK TO YOU

What do you think is the most dangerous impact of climate change on the oceans?

How do you think overfishing and pollution can be related to climate change?

Name some daily activities you can change in order to minimise your negative impact on the health of our oceans.

SESSION 10:

CLIMATE AND FINANCE

CURRENT SITUATION

Corporations produce mostly everything we buy, use, and throw away. They play an outsized role in driving global climate change. However, as a profit-driven organization, they did not act prior to the environment.

Emission

71%

of all industrial emission are from the top 100 energy companies

630M

metric tons of greenhouse gases are generated from the top 15 U.S food and beverage companies

Investment

$700B

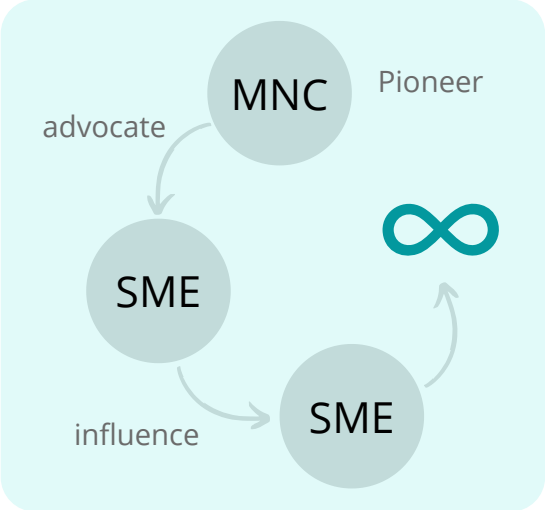
are commited toward fossil fuel financing by six largest Wall Street banks

$528B

in fossil fuel investment is held by the largest insurers

– What role should the business sector take?

Business sector, as one of the biggest stakeholders in climate change, needs to take an active role. Companies can take a stand by reducing carbon emissions, making a climate action plan, and supporting policies that reduce climate change severity. While some international organizations and companies are coming together to form treaties to combat climate change and are setting positive examples. Eventually those MNCs can be advocates and influence SME's decisions and the customer behavior.



MOTIVATION

– Why should the business sector take a role in climate change?

Climate-related business risk can be diminished by taking part in climate action.

	Risks	Opportunities
Physical risks	They are directly related to climate change impacts, such as a hurricane or flood destroying a production planet or climate variability affecting crop production.	Through climate action, they can ensure the operation of the companies by adopting a more sustainable production method, which benefit to both companies and nature.
Reputational risks	The resource they used in production, or the emission will be directly linked to companies' brand image. It may affect the customer's decision on consuming.	By adopting a climate friendly business approach, they can fulfill their corporate social responsibility. And companies with higher environmental, social and governance (ESG) performance are seen to be more promising in financial markets.

Risks		Opportunities
Transition risks	It is linked to expected policy changes in moving towards a low-carbon economy, such as carbon taxes or minimum energy efficiency standards.	Through climate action, they can reduce the cost of climate risk by adopting an environmental-friendly approach.

SOLUTION - Climate Finance

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. All public sector, civil society, private sector and impact investors play a crucial role in climate finance.

Financial mechanism

To facilitate the provision of climate finance, the UNFCCC established a financial mechanism to provide financial resources to developing country parties. The mechanism also serves the Kyoto Protocol and the Paris Agreement. It aimed to progress on the mobilization and scaling up of climate finance of resources originating from a wide variety of sources, public and private, bilateral and multilateral sources.

Since everyone is critical to participate in climate finance, the private sector can reduce using fossil fuel and adopt a greener production approach. Through reducing the use of conventional energy, it can help the global to achieve the target of limiting global warming to an increase of 1.5C above the pre-industrial levels. Through advocating sustainability, companies can eventually affect the customer behavior, and help the society to build an environmentally-friendly habit.

Collective action

UN Climate Change urged developed countries to make good to mobilize USD100 billion annually in climate finance to support the need of developing nations,

WHAT CAN WE DO?

We as a part of the global economy can affect climate action with our actions. From how we shop to how we live, from participating in civil movement to raising friends' awareness, there are so much we can do to financially support climate action.

Case Study - Divestment movement

The Divestment movement is an example showing how powerful and influential the private and civil sectors are on climate change. Divestment refers to getting rid of stocks, bonds, or investment funds that are unethical or morally ambiguous.

The most recent and impactful one will be the fossil fuel divestment campaign in the United State in 2011. It aims to reduce carbon emissions by accelerating the adoption of the renewable energy transition through the stigmatization of fossil fuel companies. Students asked their university to end the investment from fossil fuel companies, which is used to generate income to help institutions run.

Taken from Inside Higher ED

Through ending fossil fuel sponsorship, the companies that cultivate sponsorship relationships will not be able to create “social license to operate”. They no longer have the veneer of legitimacy that enables them to keep expanding operations at the time of climate crisis and to stifle the demands for justice of those communities who live on the frontline of their destructive, polluting operations.

Result

It is reported that this is the fastest growing divestment movement in history.

- a total of 1192 institutions are divesting
- $14 trillion in assets worldwide had begun or committed to a divestment from fossil fuel.

BACK TO YOU

Did you observe any business non-environmental-friendly action in daily life?

How impactful / important do you think climate finance in fighting climate change?

Is it possible for business sector to strive a balance between profit and environment?

SESSION 11:

CLIMATE GOVERNANCE

What is Climate Governance?

Climate governance refers to the “Voluntary mechanisms and measures aimed at directing social systems towards preventing, mitigating or adapting to the risks of climate change”.

To build climate solutions, it is imperative to involve all sections of the society. This can be achieved by Multi-Level Climate Governance.

Youth, NGO's and other social actors play a crucial role in building innovative and effective climate solutions

MULTI-LEVEL CLIMATE GOVERNANCE

Continuous discussions and negotiations involving international, national, and local governmental bodies and organizations along with NGOs, and other social groups is at the basis of multi-level climate governance.

01. Better accountability and representation

Every member of society can directly or indirectly take part in discussions and negotiations.

02. Efficient medium of collaboration between different sectors in society

All sectors of society can collaborate with each other in a convenient and efficient manner by sharing ideas, opinions and solutions.

03. Promotes integration of ideas and formation of goals with a holistic approach

By welcoming ideas from all sectors of society, better solutions can be established.

WHO IS INVOLVED IN FORMING GOALS AND SOLUTIONS?

Public sector

Includes government bodies, institutions, and publicly funded enterprises. This sector sits at the top of the hierarchy, and is responsible for making most regulations and decisions. While it is important for public sector organizations to take responsibility for climate goals and solutions, it is also important for all the other sectors to collaborate with this sector to ultimately form the best policies and regulations.

Private sector

Includes various businesses, corporations, and non-government agencies, that generate the most GHG emissions but at the same time, have tremendous potential to create large scale positive impacts with regards to climate solutions. This can be done by changing business/supply chain models, incorporating concepts such as circular economy, and creating resilient mitigation and adaptation technologies.

Local governmental bodies

This sector plays a very important role in the climate action seen as it arguably sits closest to the citizens. Local governments are responsible for taking actions according to international and national policies and negotiations such as the Paris Agreement, and take inputs from the citizens.

Academia

This sector provides relevant knowledge backed by scientific research that is essential for establishing well informed policies and regulations. Promoting high quality education supervised by this sector is the need of the hour.

Civil society

Includes civil members of the society and the organizations that represent these people. Members of this sector have the responsibility of rightfully utilizing their right to participate in the climate decision making processes by sharing solutions, opinions and ideas.

.

GOVERNANCE PROGRESS

Forming policies for issues like climate change is a fairly process. Hence, it is important to ensure that these policies are sustainable and resilient.

At the UNFCCC, the decision-making process incorporates international, national and local bodies to ensure that all the voices are heard. The ideas presented at the discussion space are further analyzed and finally used to establish relevant policies and agreements that are signed by the parties involved in the decision-making process. The parties that do not wish to sign the agreements are given the status of observers as they lose their power to vote or object to proceedings.

Formation of policies/decisions that relate to the international climate governance processes of the UNFCCC.

Create space for participation and action.

Collectively assess progress at the UN climate change conference of UNFCCC parties (COPs) every year

Update Nationally Determined Contributions (NDCs) every five years to keep track of goals and progress.

All countries that sign the UNFCCC are called parties, and meet once every year the Conference of Parties (COPs), the largest UN conference. The 26th UN Climate Change Conference (COP26) will be held in Glasgow this year.

WHAT ARE GOOD CLIMATE POLICIES?

Good climate policies are backed by scientific knowledge, and take into account the economic, social, and environmental consequences.

01

Backed by science

Rely on scientific information on climate change

02

Sustainable

Best policies can be sustained until the goals are achieved

03

Resilient

Have the tendency to effectively respond to miscalculations

04

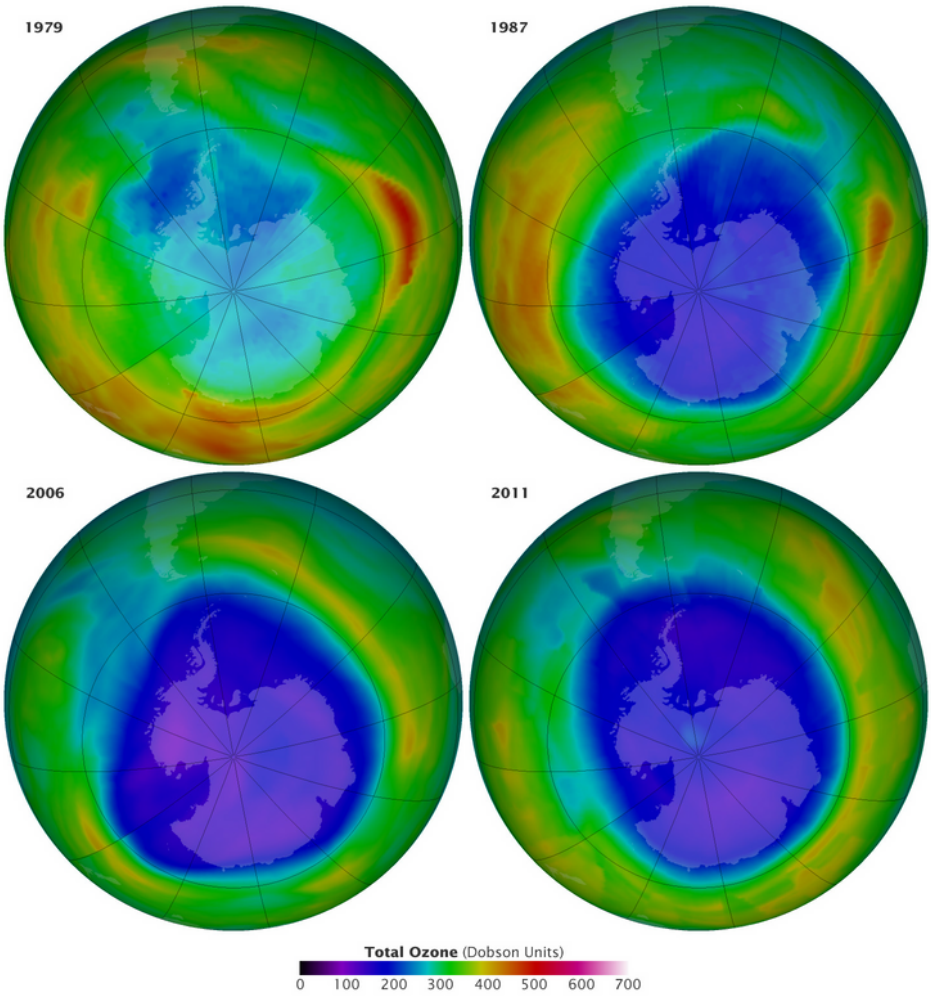
Practical and achievable

Realistic goals

It is unfortunate that most climate solutions in the form of policies and agreements such as the Kyoto protocol haven't shown overall positive impacts. The global temperature and greenhouse gas emissions continue to rise in spite of all the initiatives taken by . However, there are a few great examples worth taking note of.

MONTREAL PROTOCOL

The **Montreal Protocol** is an international agreement signed to protect the Earth's ozone layer by phasing out harmful chemicals. Although it is still in effect, the **Montreal protocol** has been successful in reducing ozone-depleting substances from the stratosphere, showing positive signs of recovery.

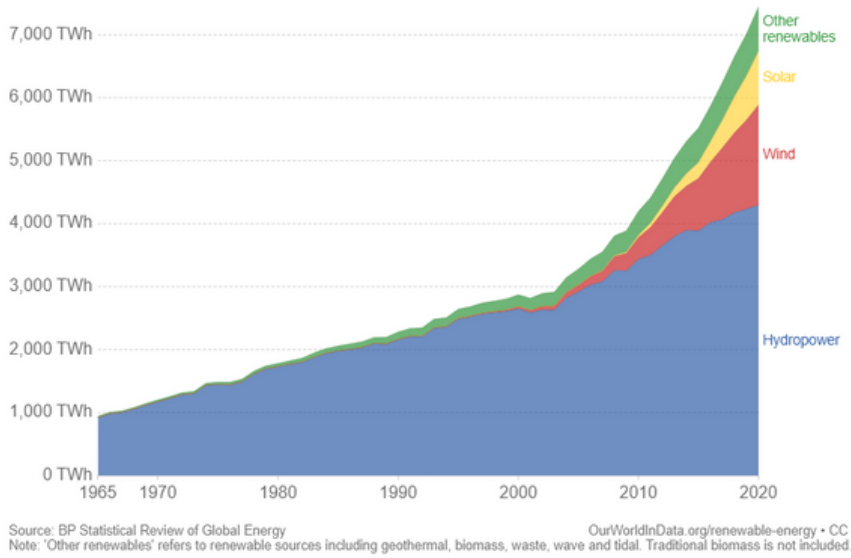


"The Montreal Protocol has helped both to reduce global warming and to protect the ozone layer."

Climate Governance in the 21st Century: Transitioning to Clean Energy

What is green energy?

Green energy is the type of energy that comes from natural sources, mostly renewables, that can can replace energy produced from fossil fuels as an environmentally-friendly alternative. Examples include solar, wind, hydropower etc.



Green Energy is on the rise, and is expected to bring great benefits to the environment, economy, and the society

Green energy indeed has exceptional potential, but implementation requires government support in the form of assistance in the following:

- Initial investment
- Subsidize green energy instead of fossil fuels
- Accelerate decarbonization process

BACK TO YOU

Which sector according to you plays the most important role in the decision-making process?

There are more than 1200 climate laws in the world. Yet, we always fall short. Why?

What do you think can be done to establish more agreements like the Montreal Protocol?

SESSION 12:

YOUTH-LED CLIMATE ACTION

WHY IS THIS IMPORTANT?

This is OUR planet. We are the ones who will have to spend our adult lives here. It is in our hands to decide whether we want it to be a happy, clean, safe future, or no future at all. It is up to us to take the reigns and make the necessary changes. It is our duty to educate those who are not aware of this ever-growing problem, to tackle it using our bright and capable minds, to snatch our future world from the throes of disaster. It is completely up to US.

One of the most inspiring young leaders we see today is Greta Thunberg, who makes sure her voice is heard loud and clear when it comes to matters concerning the environment and the future of our world. She has even taken on world leaders, fearlessly calling them out for any ill-informed or irresponsible decisions they make.

Some important global youth-led movements

Fridays for future is led by Greta Thunberg and began when she first skipped school to protest for more climate action from political authorities. On certain pre-decided Fridays, students stay out of their classrooms and flood the streets with slogans and signboards, hoping to convince global leaders to make the required changes.

ThinkOcean is a global youth-led organisation for ocean conservation. A global network connects student ocean enthusiasts and environmentalists, enabling them to come together for a common purpose, to achieve a shared goal. The founder and executive director were speakers at different sessions in this conference.

Earth Guardians is yet another global organisation that aims to spread awareness about various issue that plague our world in creative and impactful ways. Their methods range from leadership trainings to campaigns to even lawsuits.

BACK TO YOU

If you could lead a youth climate organisation, what would be the purpose and the goal?

How do you think youth can effectively convince adult political leaders and people in positions of power to make significant changes?

What are your opinions on the effectiveness of the Fridays for Future protests?

Youth have more of a responsibility towards the future of this world than adults do. Yes or no?

NOTES...

NOTES...

NOTES...

DEAR DELEGATE,

As the Summit draws to and end, we hope that your experience as a participant in the first Hong Kong Climate Emergency Summit has been a fruitful one.

Throughout both days, you've had the chance to hear from 17 different speakers, each an expert in their own way. You've also had the chance to connect with other delegates from Hong Kong and around the world, and build your network of connections as you embark on your journey as a youth climate activist. You've learned so much about climate change and the various peripheries which intersect it.

But if there's one thing we hope you've gained from these past two days, it is this: hope. Our generation is the first to live fully in the midst of the climate emergency. We did not cause it, but we must face it. Our world is rapidly changing, but if there is one thing we know for certain, it is that we, as youth, are the future.

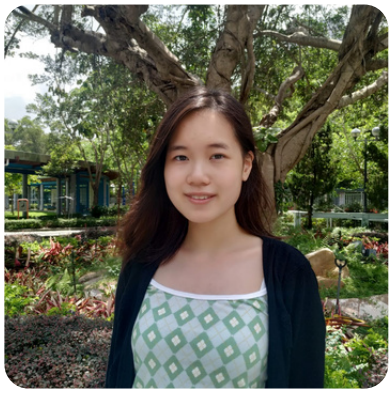
The climate emergency is here, now—but so are we.

#HKCES2021

ACKNOWLEDGEMENTS

This Climate Emergency Manual was the creation of a creative and hardworking team of young students, from various universities around Hong Kong. It could not have been made without the tireless efforts of them all.

Animesh Singh,
CityU



Janine Cheng,
HKUST

Nidhi Menon,
HKU

Nikhita Nainwal,
CityU

Cheryl Shum,
CityU

ACKNOWLEDGEMENTS

HKCES (NESS) Core Team


Hermia Chan, CUHK


Serag Heiba, CUHK


Alice Chan, HKUST


Morgan Cheung, CityU

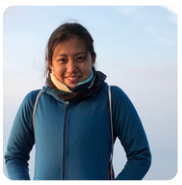

Shruthe Kirupakaran, CItyU


Mark Cheung, HKU


Mindy Park, CityU

Partnership & Outreach Team


Kenneth Fung, CityU


Christie Lai, HKU


Annie Chau, CUHK


Kitty Wang, CityU

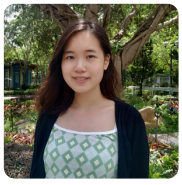
Communication and Marketing Team


Kriti Gandhi, HKU


Hannah Tsang, CityU


Nicolas Lo, CUHK

Education Team



nesshk.org