Melting Hot

A ride through the history,
institutions, economy, and
culture of sustainable living

course by **Zuza Nazaruk**

ZUZA
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(...)
when we get stuck in the depths of history
and even horses will not take another step
no matter how hard we rush them
with whips made of our dreams

do not curse at the sky or the ground
do not damn the world or the fate

look
a bird flies
a forest hums
a beetle and a ladybird walk

life continues
we exist

R. Kapuściński, translated from Polish

A POPULAR ACTIVIST STATEMENT GOES, "IF YOU ARE NOT ANGRY, YOU ARE NOT PAYING ATTENTION." WITH SUSTAINABILITY, IT IS VERY POSSIBLE THAT YOU ARE PAYING ATTENTION AND YOU ARE ANGRY, YET REALITY DOES NOT MATCH YOUR EFFORTS.

Carbon dioxide (Co2) emissions are on the rise. Demand for plastic **rose** in 2019 by 3.5% globally. Species are **going extinct** every day in what scientists have deemed the sixth mass extinction. All despite your efforts to eat vegan, never buy a single-use plastic cup, take the stairs, not the elevator, or reduce travelling by plane. All the while, the powerful of the world advocate their support for sustainability, and more and more brands offer sustainable solutions.

What is going on here?

The series of articles you are about to read aim at equipping you with theoretical tools to help you answer this question. The four modules will guide you through the historical, political, economic, and cultural aspects of what we call 'sustainability' today. You will learn how the scientists realized that we need to protect our environment and spread this need to the general public; how international institutions responded to this growing awareness with commissions and treaties; how big businesses, supported by the changing economic and political tides, have tried to interfere with environmental efforts; and, finally, what you can do with all this knowledge. Hyperlinks in bold support all the evidence I present so you can fact-check and read more on the topic that interests you. If you prefer, you can also listen to the course - the audio tracks are available here.

The course includes several "Consider this..." boxes apart from the main, chronological and thematic storyline. The stories from this section highlight some controversial or misunderstood aspects related to sustainability, allowing you to reflect on the presented notions critically.

This course will not answer all your questions on sustainability, neither will it claim to do so. I hope, however, that you will finish it with theoretical tools and critical skills to find your own way through the flood of information. If you feel like you disagree with something or want to chat, please contact me. I have created **this** (private) Facebook group where you can engage in scientific discussions and share constructive feedback. There will also be some assignments to share with the community on the way.

Living sustainably is ultimately to strive towards being a better human. We tend to excuse our lack of action with the notion of 'human nature': humans are greedy, humans want power, humans will always be like this. This approach is a disgrace to our species and all that we achieved over millennia of collective effort. Nature is in constant change, and so are we, and we can strive every day to be more empathetic, more rational humans.

The actions we take in this decade will be crucial in either sealing humanity's fate or allowing for our survival. It is also the decade in which we will enter the global workforce. It has become a truism to say that the future belongs to younger generations, but our stakes are higher than that of any previous generation. We could blame the ones before us, or… we can start changing the world.

Enjoy reading.

Zuza Nazaruk

Created by

A freelance journalist with an eye for systemic ties between politics, culture, and economy. Seeking journalistic processes that live up to the challenges of the 21st century, she creates writings that encompass journalism, academic research, and creative writing.

Her focus on sustainability comes from the hope that the sustainable transition will help redefine neoliberal norms ruling our society for the past half-century. Driven by the need to build a more just and inclusive society, she likes to assist individual transitions but, above all, keep the big players in check.

You can see more of her work at her portfolio website: **www.zuzanazaruk.com/**

MODULE 1:
a brief history of the environmental awakening

THE "FOUR LAWS OF ECOLOGY" ARE ALMOST 50 YEARS OLD. A CELLULAR BIOLOGIST BARRY COMMONER FIRST STATED THEM IN 1971 IN HIS BOOK "THE CLOSING CIRCLE". HIS WAS ONE OF THE FIRST TITLES TO POPULARIZE SUSTAINABILITY TO A MASS AUDIENCE. LET US EXAMINE HIS LAWS BY LOOKING AT CONTEMPORARY NEWS HEADLINES.

Rule number one: everything connects to everything else. What affects one person or species affects all of them.


Climate change

This article is more than 3 years old

Climate change 'will create world's biggest refugee crisis'

Experts warn refugees could number tens of millions in the next decade, and call for a new legal framework to protect the most vulnerable

Matthew Taylor

Thu 2 Nov 2017 06.01 GMT

4,988 249

source: *the Guardian*

Rule number two: everything must go somewhere. Nature knows no waste, and things cannot be thrown away. There is no "away".


Malaysia sends back trash, says won't be world's waste bin

January 20, 2020

source: *AP news*

Rule number three: nature knows best. Technological improvements to natural systems may have a negative outcome for those systems.


Pesticides

This article is more than 1 year old

Firms making billions from 'highly hazardous' pesticides, analysis finds

Use of harmful chemicals is higher in poorer nations, according to data analysed by Unearthed

Damian Carrington
Environment editor

@dpcarrington

Thu 20 Feb 2020 07.00 GMT

3,963

source: *the Guardian*

Rule number four: there is no such thing as a free lunch. Everything has a cost in a world with finite resources, and with increasing exploitation, more and more valuable resources will turn useless.


Fossil Fuels

Oil Sands Mining Uses Up Almost as Much Energy as It Produces

Thanks to high global oil prices, industry can afford the large amount of energy needed to extract the oil and turn it into a usable fuel.

By Rachel Nuwer
February 19, 2013

source: *InsideClimate News*

Fifty years ago, the green wave was just beginning to emerge. From our current perspective, the story you are about to read may seem obvious. Yet, the discoveries of environmental science that date back to the 1960s or 1970s are increasing in urgency today. Back then, scientists only started to discover humanity's impact on the planet. Environmental awareness was waking up slowly, in opposition to many anthropocentric viewpoints. Few scientific discoveries in the history of humankind had such profound implications for the planet's very survival. Yet environmental science continues to be hushed and discredited in a fierce machine of climate denial. *We need to understand how ecological awareness started to make sense of the current increase in 'green' movements.* This module presents you with a series of short stories about crucial discoveries on the way towards environmental protection.

THE FAIRYTALE OF THE POST-WAR

It is hard to pinpoint a precise moment when the green movement started. The establishment of national parks could be the oldest modern pro-environment activity, although the reserves were initially created **for** human pleasure rather than wildlife conservation. Nature reserves started popping up about the same time as national parks - which is at the end of the 19th century - due to private individuals who wanted to protect a particular plant or animal species out of (monetary or scientific) personal interest. At that time, care for nature was limited to care for what humans could get from it.

People always wondered about their impact on the planet - but not too much. There were more important things to do, so environmental discoveries were left in the hands of a few scientists. Interest in the human-planet relationship usually spiked after an ecological catastrophe. *Scientists that addressed environmental issues risked being discredited as "critical", "pessimistic", or even "inhuman" if they dared to point out that humans may cause smog, toxic waste, or nature destruction.*

The end of the Second World War brought about massive economic and population growth, accelerated by the increased mechanisation of industry and agriculture. People were eager to rebuild and repopulate, and the war-related advancements - chemicals, high-yield factories, planes, trains, plastics, antibiotics - were there to help them. For the first decade or so, nothing stood in the way towards a better life. I am, of course, talking about the 'West', or as it was **called** back then, the 'First World' countries. Quality of life in Africa, Latin America, and many parts of Asia grew much slower, to a large extent because of 'First World' countries' **interferences**.

In the 'First World' countries, life seemed good. Child mortality dropped, and families grew bigger and richer. Anaesthesia, chemotherapy, antibiotics, or blood transfusion **entered** mainstream medicine. There was enough food for everybody - even in some 'Third World' countries thanks to **the Green Revolution**. Labour, coming from both machines and humans, was abundant, making the productivity rate grow exponentially. More and more people owned cars; they moved to the suburbs, got higher education and better jobs.

source: *Paresh*

Technological and medicinal advances had two profound, intertwined impacts on the Earth's environmental equilibrium. The population **boomed** from 1.6 billion in 1900 to 6 billion in 2000. Not only were there significantly more people, but a fraction of them started to consume so much that, in total, humanity was **using up** resources worth 1.5 planets.

CONSIDER THIS...
INTERSECTIONAL ENVIRONMENTALISM

The story of the environmental movement I am telling is predominantly American, European, and white. There are various reasons for that uncomfortable state.

Environmentalism, as most of us know it, necessarily comes from the 'West' because it is this group of people that put our planet on a collision course. Economically developed countries are responsible for the majority of the world's pollution. They use the most resources, so they make the greatest mess. They are also the ones with the means, such as finance or infrastructure, to clean that mess up. Note that the cleaning-up efforts only occur once these countries have been affected. This is why the history of the environmental movement is primarily the history of ecological disasters in economically developed countries.

This very development that led to planetary degradation was built on centuries of the indigenous and people of colour's suffering. It is a two-edged sword with both edges directed-against the poor and the vulnerable. Now that the effects of the reckless treatment of our planet are visible, it is once again the world's vulnerable that are disproportionately affected by the environmental crisis.

Environmental justice is inherently intertwined with social justice. *Environmental crises do not discriminate, but policies do.* Intersectional environmentalism advocates for care about the planet and the people, realizing that communities need resilience to face the challenges the environmental crisis is posing. As defined by the Intergovernmental Panel on Climate Change (see Module 2 for further information on IPCC), resilience is "the ability of a system and its parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner". This definition includes preserving, restoring, and improving basic infrastructure. Hazardous events deepen existing vulnerabilities; therefore, environmental resilience comes with empowerment to every group that faces systemic discrimination: people of colour, women, the LGBTQ+ community. These groups are likely to face **lower** mobility, lower economic resources, and **higher** potential for harassment, in addition to a **worse** livelihood location to start with.

Every aspect of social inequality needs to be improved simultaneously for the environmental movement to succeed. The environmental struggle, just as the social equality struggle, is a fight for respect.

source: *Falco*

EVERYONE ELSE BUT NOT US

Somehow humans forgot their deadly potential. Mass murder, nuclear bombs, and chemical weapons seemed to belong to the distant atrocities of the Second World War, at least - and only - on the west side of the Iron Curtain. What was important was to maximize abundant resources and let the economy grow. The sky was the limit - until it fell.

Scientists quickly discovered that rapid development could prove deadly. Both on its own, if resources shrink, and through the tools needed to achieve it. Yet even today, during the most significant surge of environmental awareness since the 1970s, many choose to cherry-pick which parts of environmental science they believe in. The denial machine does not spare environmental activists: I once had a chat with a nature conservationist who told me he does not believe that humans cause global warming. Getting to clear conclusions on the connection between human activity and the planet's climate is no easy task, if only due to the number of variables and their changeability. Yet *some conclusions that were arrived at 50 or 60 years ago are still discussed or denied today, impending urgent action.*

In March 2020, the COVID-19 pandemic was just starting. I was travelling back then, and people from all over the world would tell me that “it would spare them”, “it would spare their country”, “it is not as serious as the media portray”, or they would come up with a thousand conspiracy theories. They insisted on denying the existence of a viral risk the scientists have long been **warning against**. When countries worldwide started closing borders, everyone was unprepared, and the shock quickly turned into panic. I could not help but draw a parallel between COVID-19 and the global environmental crisis in how little seriousness people put to both despite scientists' warnings.

THE BURNING BIKINI

Nuclear bombs are, to date, the most potent showcase of humanity's destructive power and were one of the first environmental alarm bells. From the time that two of them hit Hiroshima and Nagasaki, The Bulletin of Atomic Scientists has been releasing **Doomsday Clock** every year in January. The clock is a metaphorical depiction of the dangers humanity's advances pose to our very existence, from nuclear weapons through climate change to cyberwars. The Bulletin also takes into consideration the political situation and policymaking.

Maybe the Nobel Peace Prize **should have gone** to Oppenheimer and his team for constructing a weapon so lethal that it rendered the concept of war obsolete. Maybe. Instead, the world's superpowers continued testing the limits of their destructive abilities. The tiny Pacific Ocean archipelago of the Marshall Islands became **a testing ground** for nuclear weapons. Between 1946 and 1958, American military scientists deployed 67 atomic bombs - the equivalent of 7,100 **Hiroshima-sized bombs** - destroying whole atolls and releasing radiation levels **comparable** to those in Chernobyl.

source: *AP*

A few things happened in 1954 on the Marshall Islands that fostered the creation of the environmental movement. The world's first hydrogen bomb was detonated, which dissolved a whole island and created a crater in a lagoon. It was an ever-more-powerful expression of humanity's destructive capabilities.

The nuclear testing programs of the US and the USSR caused the arms of the Doomsday Clock to move from two minutes to midnight. For a long while, two minutes remained the closest humanity ever came to self-imposed doom.

That same year, the public in the US and Japan started to worry about the impact of the nuclear testing program. The program was not as remotely located as the crowd was told: nuclear fallout from one test followed a different route than expected. The fallout contaminated parts of the ocean and impacted some 228 people, mostly the inhabitants of the islands but also military personnel and Japanese fishermen.

The fallout's route changed because of the wind. Nature's unpredictability showed vast amounts of people that everything in the world is interconnected, just like Commoner stated in his first law of ecology. Pollutants can travel and affect populations in areas far away.

The US continued nuclear tests in the Bikini Atoll until 1958. The growing concern about the effects of radioactive fallout pushed the key players - the US, the UK, Canada, France, and the USSR - to begin negotiations on an international agreement to end nuclear tests. **The Limited Ban Treaty** came into force in 1963, banning atomic testing "in the atmosphere, in outer space, and underwater". It took the UN Disarmament Commission eight years. The world seemed a safer place, and the Doomsday clock showed 12 minutes to midnight.

A MIND BOMB

The Limited Ban Treaty did not ban underground nuclear tests. In 1964, the US started conducting underground nuclear tests in the Alaskan peninsula of Amchitka. The public was only informed about the onset of testing a year later.

The greatest American underground nuclear test was planned in 1971. The load was so big that the trial had to be moved from the Nevada testing site to a more remote Amchitka. 'Cannikin' was planned to be a five megaton explosion - 400 times more potent than Hiroshima with **a yield** comprising 14% of the total output of all 730 American underground nuclear tests.

More and more people were becoming aware of the dangers of nuclear testing, and public outrage was growing. Canadians and Americans were worried about the earthquakes and tsunamis that underground testing could induce, on top of the already well-known worry about nuclear radiation. Besides, the American public was increasingly **tired** of wars that were not their own.

Some decided to plant a 'mind-bomb' to oppose a nuclear bomb. A few environmentalists, now esteemed as the pioneers of the environmental movement, formed the crew of Phyllis Cormack. In 1971, the crew **sailed** to the Amchitka peninsula, the bomb detonation site, to stop the operation. Although stopping 'Cannikin' from detonation failed, the Phyllis Cormack crew's international recognition was a cornerstone for the modern environmental movement.

source: *"How to Change the World" documentary*

During the preparatory meetings, one of the crew members would always say goodbye with 'Peace'. Once another one replied, "Make it green peace". This is how Greenpeace, one of the biggest environmental organizations to date, came to life.

CONSIDER THIS...
THE LOST STRATEGIC POTENTIAL OF GREENPEACE

With the hindsight of 49 years, linking pacifism and environmentalism was a brilliant strategic idea for popularizing the environmental movement. Unfortunately, the story shows a missed PR chance.

Linking peace with care for the environment should be a crucial axis of the environmental movement. World peace depends on the environment. Any species' survival depends on the availability of resources. Forget luxurious oil: some parts of the world are already scarce in water. The UN **predicts** that 50% of the world's population will have trouble accessing water by 2030. That is, in less than a decade.

If humans are so willing to kill for oil, imagine what will happen when access to water is restricted. Even though you and I live in one of the wealthiest countries in the world, we will be affected too - at least by the political upheaval.

Water is just one, albeit the most important, natural resource. Think about soil, sand, food. Or about technologies such as nuclear and chemical weapons or the arms race. *War budgets are not spent on nature protection. Without peace, there is no green.*Talking about peace would attract more people to the environmental cause than Greenpeace'sGreenpeace's turn. People tend to care more about their immediate surroundings and personal benefits from social causes.

After initial success with protesting nuclear tests, Greenpeace turned to animal protection. Noble and vital cause as it is, the shift contributed to a widespread view of environmentalists as freaks that endanger people's sources of income - and so in a crucial time, when the environmental movement was on the rise, it staggered.

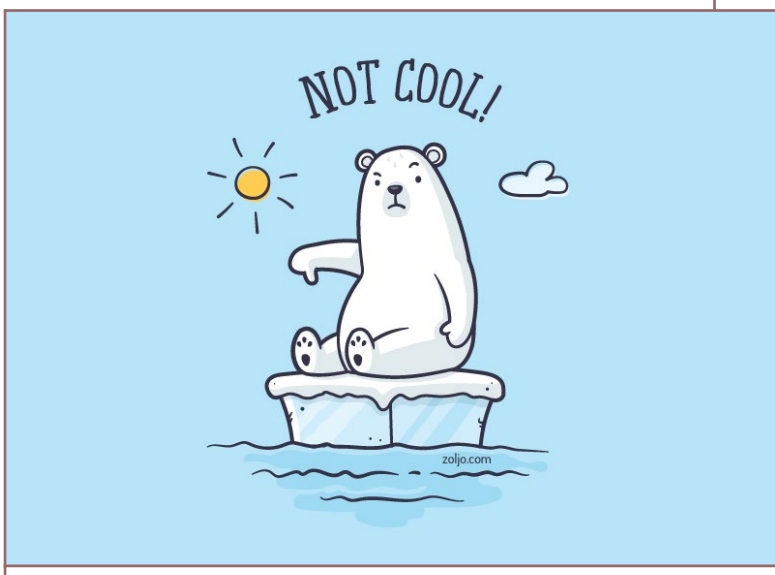
Nature conservation is not an effective building block for mainstream support. Concern for wildlife will not mobilize groups big enough, or for long enough, to make a change. It will eventually get lost in the ordinary unfolding of life because most people will not feel like it impacts them personally. The environmental crisis threatens almost every form of life on this planet, yet human action alone can change the destructive path. Every environmental organization needs to appeal to human well-being in the first place to have its postulates heard.

CALCULATING THE WARMTH

Air pollution is one of the most visible consequences of human industrial activity. Acid rains close to coal plants were observed as early as the 1850s. Big cities have struggled with smog since the Middle Ages. The Great Smog of London in 1952 contributed to the deaths of an estimated 6,000 people. Both in Europe and the US, air pollution regulations were among the first environmental laws to be passed. Immediately visible and felt, air pollution was a real issue to deal with.

Global warming was not so straightforward. The notion that human-made industrial activity is warming the planet **started** gaining prominence in the 1960s. Scientists created mathematical models that turned up with surprisingly high variability. It seemed that the climate was so delicately balanced that any change could impact it. The options were countless: sun or volcanic activity, changes in the planet's orbit, ocean currents. Significant occurrences unrelated to human activity could bring an occasional ice age. It was hard to believe that something as meagre as some tons of carbon dioxide released into the atmosphere could profoundly impact the planet's life. Everyone agreed that the issue is hugely complex and requires more research. Mass media were confusing, heralding the start of a new ice age in one week only to raise the alarm about melting ice caps in another. That is if they covered the issue at all.

By 1988, scientists managed to agree on a calculation. Doubling the level of carbon dioxide in the atmosphere would raise the temperature of the surface by one Celsius degree. Humanity would emit double levels of Co2 in the late 21st century. The scientists also agreed that planet-warming is a chain reaction - an atmosphere warmer by one Celsius degree would hold more vapour, which would cause the temperature to go up by approximately another degree. Beyond this calculation, the science got complicated. Humans were emitting increasingly more gases in addition to Co2, such as methane. The gases impacted the atmospheric warmth and added to the complexity of calculations.

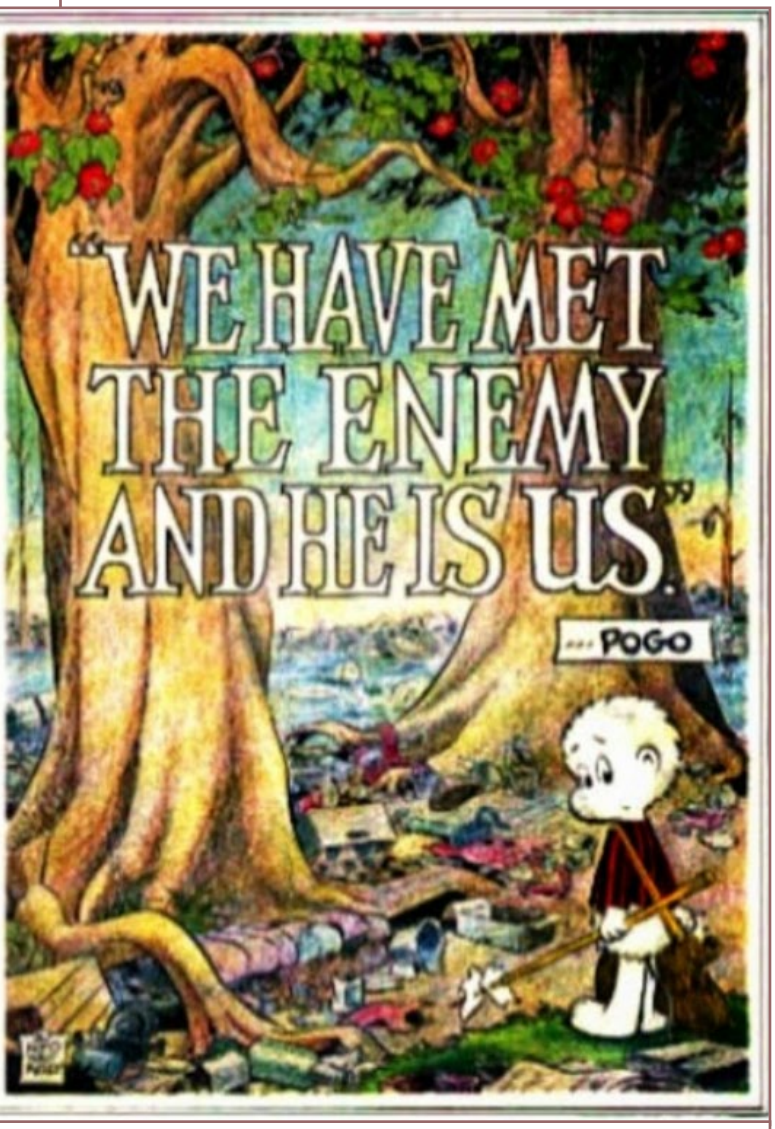


source: *Zoran Milic*

The year of the findings, the Doomsday Clock moved to 6 minutes to midnight due to increased regulation on inter ballistic missiles between the US and the USSR.

The Intergovernmental Panel on Climate Change, a UN advisory scientific body, released an **assessment** in 1990. The Panel's projections predicted that global temperature would rise by 1 degree Celsius between 2025 and 2050, depending on whether governments will take action. The assessment included a wide range of possible consequences of global warming, such as sea-level rise, changes in agricultural patterns, or biodiversity loss, each with corresponding socio-economic implications.

Since then, computer modelling improved significantly, and scientists could discover more about the interconnected trends within the climate. Despite the arduous work of

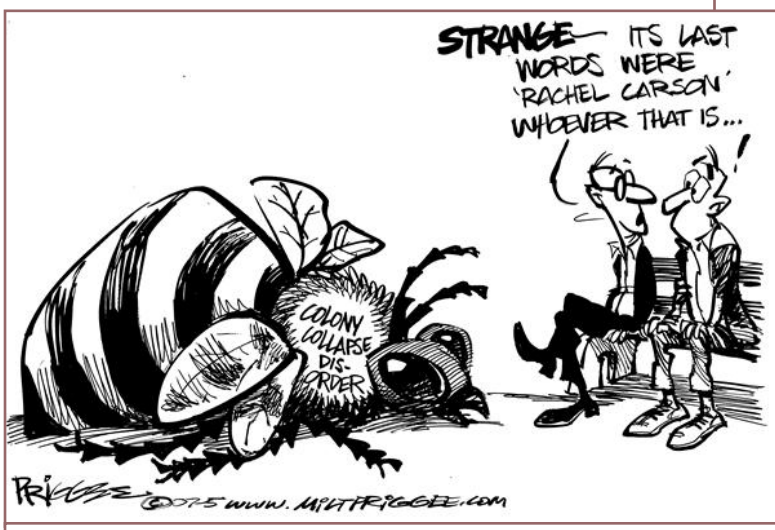


source: *Walt Kelly*

thousands of scientists, many people deny the link between human activity and global warming to this day. The powerful machine of denial is fuelled by the very oil that makes the Earth heat up. Module 3 explains why so little action has so far been taken to protect humans from humans.

I FEEL THE CHEMISTRY

The notion of using synthetic chemicals to bend nature to humans' wish became widespread, but by the 1960s, more and more people realized that maybe synthetic was not the solution. Heartbroken mothers found out that the price for not suffering morning sickness was **an unhealthy baby**. **Lead poisoning** in the Japanese village of Minamata made people aware of the dangers of living close to chemical plants. The two tragedies had different causes - lack of thorough research versus dumping of chemical waste - but they shared the destruction of human fates instead of promised improvements.



source: *Milt Priggee*

The scientific community recognized the impacts of industrial chemical exposure on the human body - deemed **'occupational cancer'** - as early as the 1940s. Yet it was not until 1962 that Rachel Carson, a marine biologist, explained the sudden and mysterious appearance of epidemics diseases that had been ravaging the United States for some years by then. She identified the root of the problem in DDT, a group of pesticides that became popular after the war.

"Although we are warned that some of these will dissolve varnish, paint, and synthetic fabrics, we are presumably to infer that the human skin is impervious to chemicals." Carson described how toxic substances stay in organic matter and saturate soil or water to travel to different, initially non-affected life forms.

The author also revealed the absurdity of widespread DDT use, pointing out that insects can quickly adjust to a new environment - a fundamental evolutionary law. Such evolutionary ability is why highly toxic pesticides are harmful to humans and non-pest species and ineffective. The biologist openly blamed the intertwined financial interests of the chemical industry and the American government for the destruction of the biosphere.

"We train ecologists in our universities and even employ them in our governmental agencies, but we seldom take their advice". Carson's statement sounds disturbingly familiar to Greta Thunberg's repeated **calls** on politicians to start listening to scientists. Except, Carson's call is 58 years old.

"Silent Spring", now an environmental classic, met with incessant criticism from the chemical industry. The chemical industry tried to discredit the book with bitter attacks on Carson. The author **was called** "too emotional", "a communist", and accused of **generating** "a culture of fear" that would "deprive people of life-saving chemicals".

These exemplary attacks were directed against Rachel Carson - not her claims. The practice of discrediting researchers whose findings are inconvenient became so commonplace it even earned a name. **The Serengeti strategy** refers to attacking researchers rather than debating the conclusions. Targeting individual scientists instead of a scientific field resembles lions hunting vulnerable zebras at the edge of a herd.

POLITICAL, DIRTY, FINITE

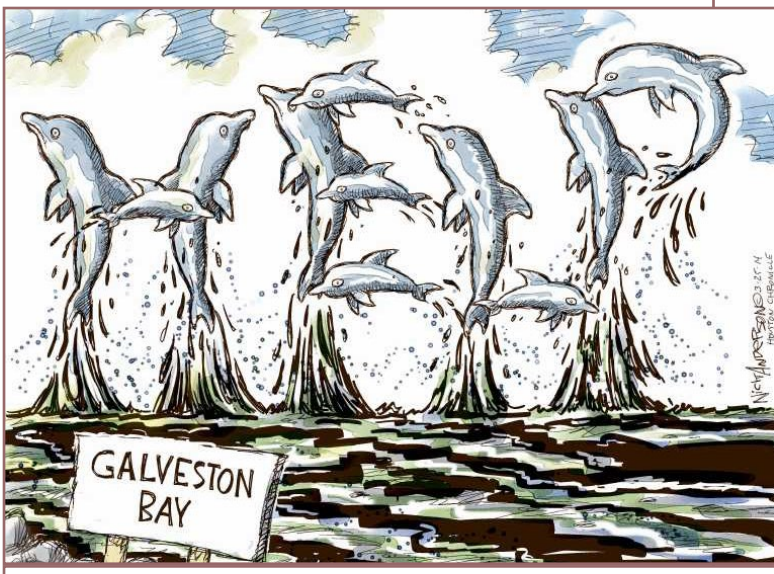
The liquid gold that allowed for a developmental boom also proved problematic. In the 1960s and 1970s, the world started realising problems inherent to the oil-based economy.

As early as 1956, scientists made forecasts on oil running out. M. King Hubbert wrote a **paper** predicting an oil production peak and decline. Although renewable, fossil fuels' rate of renewal was painfully slow to satisfy the growing demands of humankind. Based on Hubbert's assumptions, a recent model predicts that oil demand will overshoot its supply in 2070.

The 'Western' public could feel the direness coming already in 1973 when the Organization of Arab Petroleum Exporting Countries proclaimed an oil embargo on nations supporting Israel during the October War. The embargo extended to Canada, Japan, the Netherlands, the US, Portugal, Rhodesia (currently Zimbabwe), and South Africa. During four months, oil prices soared by 400%. *Deemed "the first oil shock", the embargo made the 'West' realise that over-dependency on a single energy source has political implications.*

Black gold, liquid productivity, the most efficient energy source that revolutionised every industry from cosmetics to automobile, turned out to be a foul business, and not just politically so. The first oil spills demonstrated devastating effects on wildlife and revealed a complete government lack of preparedness. The Mississippi and Minnesota Rivers became polluted, respectively, in 1962 and 1963, by industrial spills, one from a plant and one from a tanker. Long parts of the river habitat became unlivable for animal and plant species for months. The UK experienced a similar ecological shock in 1967. **Torrey Canyon**, a supertanker, wrecked between Cornwall and the Islands of Scilly, releasing 117,000 tons of oil into the sea in what remains the biggest British oil spill in history. Oiled birds continued to die until 2012. It was the biggest spill of its time, and the government's inadequate response worsened the crisis.

Although the safety of maritime fleets carrying oil improved in the wake of the spills, oil spills continue until today, destroying marine and coastal wildlife and irreversibly transforming the natural landscape. The Exxon Valdez in 1987, Deepwater Horizon in 2010, **Ogoniland** continuously through the 1970s and beyond are just a few better-known examples. Wikipedia **lists** 227 oil spills between 1903 and 2020, emphasising that the list is incomplete.



source: *Nick Anderson*

Oil spills did not have an immediate, electrifying effect on the public comparable to the first oil shock. The public widely **perceived** the problem as nature conservation which did not touch them personally. It took the efforts of environmental activists over decades, and many more disasters, to provoke public outrage over the spills. *Scientists informed policymakers on the impacts of oil spills, and natural devastation became included in oil transporting as a calculable risk.*

A small group of environmentalists was outraged about the spills. They started a worldwide movement that lasts until today. An oil spill in Santa Barbara in 1969 was a direct motivation to organise the first Earth Day on April 22 1970. The day marked its 50th anniversary this year. It is a yearly occasion to push for policy action and educate on environmental issues, directed at both policymakers and the public.

Throughout the 1970s, the Doomsday Clock did not go below 9 minutes. By then, the clock's creators still focused mostly on nuclear testing. Climate issues came long after the Cold War finished: the 2007 Doomsday Clock statement points out that "the dangers posed by climate change are nearly as dire as those posed by nuclear weapons."

Update from the 21st century

The world stopped worrying about oil running out about 15 years ago with the **fracking** boom. Despite oil technologies becoming more and more environmentally destructive - **tar sands** in Canada are among the most well-known examples - the problem shifted from oil running out to oil being too abundant. We had a taste of the oversupply during the COVID-19 pandemic when oil prices in the US **dropped** to -37.63$ a barrel. The negative value means that the cost of storing the barrels was higher than the profit. Low oil prices are the leading market factor for delaying the development of electric cars.

EVERYBODY PEAKS

The notion of finite resources gained momentum in the late 1960s and early 1970s. The Club of Rome's electrifying **publication** from 1972, titled "Limits to Growth", provided a comprehensive analysis of resource overexploitation.

A computer simulation included five variables: population, food production, industrialisation, pollution, and consumption of non-renewable natural resources. The model assumed that those variables would increase exponentially, in contrast to a linear increase of technological abilities to enhance resources. The research concluded that without changes in current growth trends, the limits to Earth's growth would be evident by 2072. *Reaching the limits would result in a "sudden and uncontrollable decline in both population and industrial capacity".*

The "exponential variables versus linear technology" assumption was a take on two contrasting theories on resource use. The Thomas Malthus school predicts population decline following a population boom due to insufficient resources to sustain everyone. The Ester Boserup school rejects Malthusian claims on the grounds of the potential of human ingenuity. Boserup claims that humans will always find a new technological development that will allow the agricultural output to increase, and hence the population to grow.

After Club of Rome's publication, protests erupted, which repeated and extended Boserup's claims. The protesters disagreed with what they perceived as a lack of 'human' element in the variable analysis. They believed not only, as Boserup claimed, that humankind's pool of creativity will result in new technological adaptations. The protesters also put faith in humans' ability to change their lifestyle values, not to overexploit the Earth's resources.
How ironic, from the perspective of almost 50 years. The early environmental publications were criticised as "too pessimistic". For decades, politicians, corporate actors, and media **engaged** in a ruthless process of discrediting, among others, "Limits to growth". The scientists, guilty only of doing a computer analysis, were presented as either too right- or too left-wing, depending on the political option in power.

CONSIDER THIS...
THE ANTI-POPULATION GROWTH MOVEMENT AND EUGENICS

Paul and Anne Ehrlich **wrote** "The Population Bomb" in 1968. The controversial book warned of widespread famines as uncontrolled population growth devours the world's resources. Such an approach to shrinking resources has been criticised as an easy road towards eugenics: a belief in improving the quality of human life by managing groups deemed superior or inferior to others. Accepting the link between uncontrolled population growth and deteriorating quality of life leaves one with uncomfortable questions: Who should decide which populations are not allowed to reproduce? How to choose a population that should be restricted? What should be the limit on reproduction? In the case of the Ehrlichs specifically, their solutions were so radical they could be directly linked to eugenics. The authors proposed, for example, starving nations that would not undergo population control.

Today, the notion of population growth as the culprit for environmental degradation is echoed in arguments that the biggest threat to the planet's survival is developing newly industrialised nations, especially India and China. Increasing wealth in those countries will result in their citizens consuming more, putting a more significant strain on the world's resources. While the logic behind the argument is correct, it is crucial to see the context of overconsumption. It is the "West": Europe, North America, and Australia, that consume most of the world's resources. 'Western', consumption-based lifestyle has become the definition of development and an ideal for countries to achieve. The planet cannot sustain such a lifestyle already, so it should be a priority for the 'West' to lower their environmental footprint before calling for less developed countries to curb their development.

SCIENTISTS WARN HUMANITY

Many other events happened in the late 1970s and throughout the 1980s. Describing them all would take a book, not an online course. There were more oil spills and even a nuclear disaster in Chernobyl in the USSR in 1986. The scientists that warned against overexploitation of resources were losing their impetus. Plastic started ruling the planet. A hole in the ozone layer was discovered and attributed to the widespread use of freons, back then a popular coolant. In short, the early discoveries of environmental science went widely unnoticed, so much that scientists decided it is time to take dramatic measures.

In 1992, a group of scientists issued **a document** titled "World Scientists Warning to Humanity". They warned that "human beings and the natural world are on a collision course". The paper listed endangered aspects of the planetary ecosystem, creating an apocalyptic vision of the world in line with the Club of Rome's conclusions.

The atmosphere was in danger through ozone depletion and air pollution. Water resources were becoming scarce and polluted with endangered food production due to marine fisheries collapsing. The soil was becoming less fertile due to industrial farming and fertilisers. Critical forests have been disappearing, with predictions that tropical forests would be gone by the end of the 21st century. Biodiversity loss was so rapid it would impact one-third of all living species, which would result in a collapse of medical systems and genetic diversity. On top of it all, the scientists warned that increasing levels of gases released into the atmosphere "may alter climate on a global scale". *The authors of the warning urged for fundamental changes in lifestyle and policymaking to avoid altering the world to the extent that would make it unlivable.*

That was 28 years ago. You may be wondering how much has changed since.

Let me fast-forward to 2017. A freshly released **scientific paper** marks a record. With over 15,000 signatory scientists, the paper becomes the most extensive scientific consensus in history. Titled "World Scientists' Warning to Humanity: Second Notice," it states that since 1992, humanity failed to address all the environmental issues outlined in the "first warning" apart from reducing the hole in the ozone layer. The environmental challenges are getting far worse, the scientists warn: greenhouse gases, deforestation, and agricultural production are among the biggest culprits of global warming and the sixth mass extinction that mark our reality.

source: *Bulletin of Atomic Scientists*

The 2021 Doomsday Clock is the closest to midnight than ever: we have 100 seconds left for a second year in a row. The Bulletin of Atomic Scientists explains their decision by pointing out that nuclear and climate threats persist while the international institutions that could manage them have eroded.

How did we get from a wave of environmental enthusiasm and scientific discoveries to an it-is-almost-too-late state?

MODULE REFLECTIONS

This section aims to put your newly acquired knowledge into practice by engaging in some reflective questions. You can write as little or as much as you want, or just reflect on the questions on your own. I would also be delighted if you decided to share your answers with the learning community **here**.

1. The environmental awakening happened mainly due to natural catastrophes that development brought. Which of the accidents - nuclear fallout, chemical pollution, oil spills, (the discovery of) global warming, (the discovery of) resource scarcity - do you find the most impactful and why?

2. If you could go back to the 1980s and change one aspect of our way of living - it can be anything from economic, political, cultural, to lifestyle - what would it be and why?

3. What should we do today to move the arms of the Doomsday Clock away from 100 seconds to midnight?

MODULE 2:
an institutional snooze over climate

IN THE **PRESS RELEASE** JUSTIFYING THE DECISION TO KEEP THE DOOMSDAY CLOCK'S ARMS "CLOSER THAN EVER" FOR THE SECOND YEAR IN A ROW, THE BULLETIN OF ATOMIC SCIENTISTS CONDEMNED THE INACTION AND COUNTERACTION OF WORLD LEADERS. "THE PANDEMIC REVEALED JUST HOW UNPREPARED AND UNWILLING COUNTRIES AND THE INTERNATIONAL SYSTEM ARE TO HANDLE GLOBAL EMERGENCIES PROPERLY. "THE CLOCK'S JURY POINTS OUT THE FAILURE OF THE WORLD'S GOVERNMENTS TO TAKE SCIENTIFIC ADVICE AND COOPERATE EFFICIENTLY. THIS IS A CONTINUATION OF LAST YEAR'S NOTICE THAT WORLD POLITICIANS' EFFORTS DO NOT CORRESPOND TO THE GROWING CLIMATE THREAT AND THAT MISINFORMATION IS A CRUCIAL WEAPON FOR SCIENCE DENIALISTS.

The UN Secretary-General called on the world leaders to come to the long-anticipated UN Climate Action Summit in September 2019 with "concrete plans not beautiful speeches". His urging words and their aftermath, or rather the lack of it, illustrate the long-lasting reality of climate change policies: too little, too late, too complex, too costly, too political, too neutral, too short term, too long term, too… unnecessary against a myriad of short-term economic, social, and political issues.

source: *Banksy, Politicians discussing global warming*

In Module 1, you witnessed the birth of scientific and social-environmental awareness. The cornerstones of the resurging movement in recent years were laid more than fifty years ago. Yet, most international agreements have remained mired in the form of beautiful speeches since the 1970s. Although such a situation is undeniably outraging, it also stems from a hard-to-change reality of policymaking and international relations.

THEORETICAL TOOLS TO UNDERSTAND CLIMATE INACTION

Three main **theories explain** climate inaction on both international and national levels. The theory of collective action argues that countries are prone to break international agreements while keeping everybody else in check (known as 'freeriding'). Freeriding allows countries to enjoy the benefits of a stable climate without bearing the costs of transitioning towards sustainability. The theory of cognitive or psychological bias looks at the issue from a more individual perspective. According to this theory, policymakers cannot comprehend the seriousness of the climate change crisis due to its scale, so they delay or reject climate-focused proposals. Finally, comparative politics theory explains the inaction through "distributive conflict". Climate policies create a new class of economic winners and losers, cross-cutting existing political divisions (known as 'cleavages'). As a result, representatives of opposing political parties may block climate proposals.

You should regard the theories as a tool to understand climate inaction, not as a definite explanation. Each of the theories is true in some aspects, and their suitability depends on the culture, history, and tradition of policymaking in a given country.

I want to give you a taste of the complexities of international climate policymaking. Trying to unite 195 (as of 2020) countries on a world policy despite their various historical, economic, and political disputes is something world leaders would only do if an imminent catastrophe approached the globe.

CONSIDER THIS...
THE TERM "SUSTAINABILITY"

The UN General Assembly recognized the increasing damage to the world's resources and the environment in 1983. That same year, the UN created the Brundtland Commission or the World Commission on Environment and Development. The Commission's mission was to "unite countries to pursue sustainable development together". The extraordinary institutional effort brought scientists and public health experts from every side of the Iron Curtain together. **The Brundtland Report** released in 1987 includes the most common definition of sustainable development up to date: *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".* The three pillars of sustainable development defined in the Report are economic growth, social equality, and environmental protection.

Although it remains the most popular one in policymaking, there are several problems with the Brundtland definition. The primary issue is that it focuses on outcomes rather than processes. It states an end goal without offering any indication of how to get there. Besides, future generations do not have a voice, making them rather abstract creature. The level of abstraction can impact the engagement in climate action. These issues have been visible - while the Report served as an essential basis for the talks during the 1992 Earth Summit (see below), countries tend to focus on economic growth, leaving the other two pillars behind.

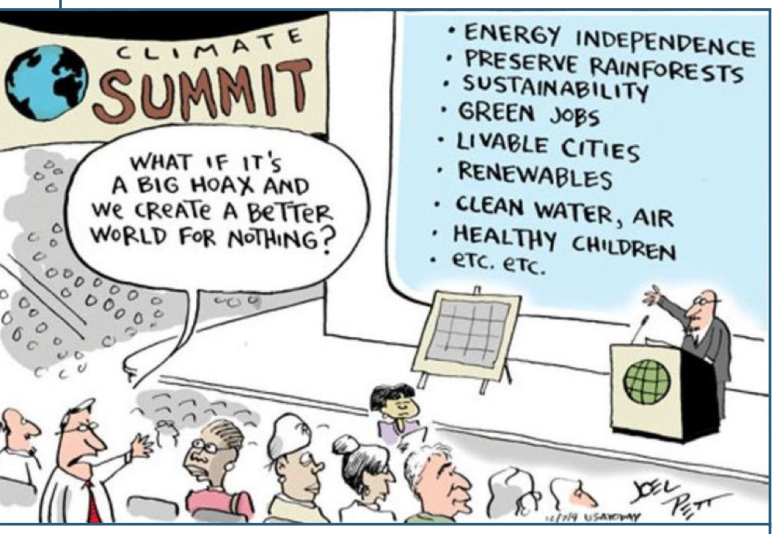
THE WORLD'S PROJECTION MAKER: IPCC

The world's biggest and most prominent advisor on climate change is the Intergovernmental Panel on Climate Change (IPCC). A scientific body created in 1988 by the UN Environment Programme and the World Meteorological Organization, the IPCC assesses the state of knowledge on climate change. IPCC does not conduct its research, but it identifies areas of scientific agreement and controversial issues that require further investigation. IPCC is responsible for crucial projections, such as the impact of future global temperature rise.

THE EARTH SUMMIT AND THE CLIMATE CHANGE CONVENTION

As long as the world had been divided into three camps during the Cold War, any international climate agreement was impossible to achieve. The first international conference on climate action happened in Rio de Janeiro in 1992, a year after the Soviet Union officially dissolved.

The Earth Summit was the first official acknowledgement that climate change is too big for member states to deal with separately. The negotiations laid the groundwork for ratification of the Kyoto Protocol and its successor, the Paris Agreement. Most importantly, the member countries adopted the Climate Change Convention (UNFCCC). Its objective was to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". Although non-binding, the UNFCCC continues to play a vital role in international climate action. The Convention assigned the signatory parties to create inventories of their greenhouse gases, which later allowed for defining caps on further emissions in the Kyoto Protocol. The Convention also required signatory parties to meet annually during Conferences of Parties (COP) to assess the collective effort in tackling climate change. COP-26 was supposed to happen in 2020 in Glasgow, the UK, but it was moved to 2021 due to the outbreak of COVID-19.



source: *Joel Pett*

The first international climate action event happened two decades after the Club of Rome released their "Limits to Growth" report. Two decades after, environmental awareness started to be taken seriously by world citizens. For two decades, paranoid arms and space races were more important than mounting evidence of the destructive impact humans have on the only habitable planet in the universe known to date. Once the Summit finally happened, many activists took the chance to address world leaders - among them, Severn Cullis-Suzuki. Cullis-Suzuki was 12 when she made her **speech**, which now, 28 years later, sounds disturbingly familiar.

"All this is happening in front of our eyes, and yet we act as if we had all the time we want and all possible solutions. [...] I challenge you: please make your actions reflect your words."

Cullis-Suzuki was Greta Thunberg's predecessor, yet her words passed almost unheard. Is it because we were not ready for a youth leader back then? Or because we believed that we have the time and the solutions? Or maybe because the effects of climate change that Cullis-Suzuki and many others warned against are becoming deadly visible only about now? Maybe there were more urgent issues for world leaders to take care of back then?

CONSIDER THIS...

WHY ARE "NATURAL" DISCOURSES POLITICALLY DANGEROUS?

"Natural" is a very dangerous adjective in political discourse. Many politicians, philosophers, or activists equate "natural" with "unchangeable", an entity that does not transform. "It is natural for humans to seek domination", "Our brains are programmed to be greedy", "We are born like this"... Not only are these assumptions empirically incorrect, as nature is in constant change, but also their determinism proves dangerous. People used to **believe** (and some, sadly, still do) that the Black, or the Latino, or the Indigenous, or the Jewish people were "naturally" inferior to the white people. Or that a woman's "nature-prescribed" place is in the kitchen, or that the existence of gay people "is against nature", or that it is "natural" to own slaves. *"Nature" used in such a context is nothing but a rhetorical tool used to push somebody's agenda.*

PLANET VERSUS PROFIT

Environmental laws do not always align with economic growth, and it is the latter that has been, and still is, the primary focus of policy-makers. This truism became acutely evident with **the Kyoto Protocol**. Adopted in December 1997, the protocol entered into force in February 2005 after a long and complex ratification process. Its first commitment period started in 2008. The main objective of the protocol was to reduce emissions of six greenhouse gases in the atmosphere to "a level that would prevent dangerous anthropogenic interference with the climate system". Broad as it sounds, the Kyoto Protocol was the only international climate agreement including targets that were binding under international law. That is, as long as the countries ratified the protocol. The second commitment period never entered into force because too many countries withdrew.

The protocol's **principle** of common but differentiated responsibilities and respective capabilities proved to be a major clash of interests. The protocol shifted responsibility to reduce current emissions to 37 most developed countries. The decision stated that the developed countries drove the emissions to their current level. Moreover, developed countries have a greater ability to combat climate change due to their economic situation.

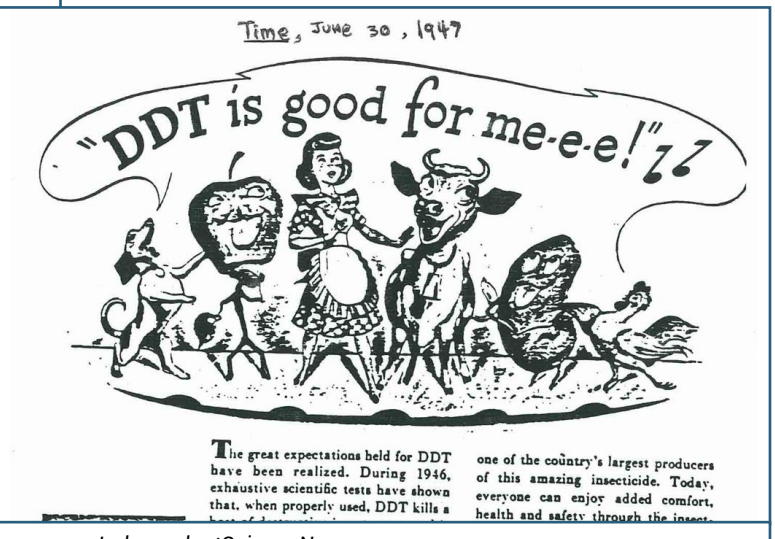
*The US **never ratified** the protocol, denouncing what it perceived as unfair competition with emerging economies that faced no obligations, such as China or India.* In 1990, the US accounted for 36% of global emissions. Canada, Japan and New Zealand withdrew in the 2010s. Although 36 developed countries reduced their emissions due to a lack of obligations for emerging economies and major economic players, global emissions **increased** by 32% between 1990 and 2010. Today, China **accounts for** some 27% of the world's greenhouse gas emissions despite **ratifying** the Kyoto Protocol in 2002.

HIDDEN GE(R)MS IN "SUCCESS STORIES"

The DDT and freon bans are often cited as the "success stories" of the environmental movement. It takes one click in Google search to find out that the success is not quite what one could imagine it to be, and the story is… lengthy, at best.

You may remember DDT from "Silent Spring", Rachel Carson's environmental classic from 1962. The author condemned the use of DDT as pesticides. Their use since the 1950s damaged the natural world. The US ordered the cancellation of DDT use in 1972, but the international ban for "persistent organic pollutants" (POPs), known as the Stockholm Convention on POPs, came into force in… 2001. That is 39 years after "Silent Spring".

This is not the end of the 'success story'. The World Health Organization (WHO), a UN international health agency, **declared** in 2006 that DDT could be used indoors in malaria-plagued African countries. According to the agency, DDT's effects in curing malaria outweigh the risks the pesticides pose to the environment and human health. I recommend reading "Silent Spring" to understand the absurdity of this decision entirely.



source: *IndependentScienceNews*

Moving on to another "success story": the abandonment of freons, a popular name of a group of **chlorofluorocarbons** (CFCs) popularly used as cooling compounds in fridges or air conditioners. Can you guess which year they were entirely banned? The harm freons were causing to the ozone layer had been discovered as early as 1974. The Montreal Protocol ordered their phase-out in 1987. The phase-out proved painfully lengthy since the freons became entirely banned in 2020.

Meanwhile, the ozone layer **is not "fixed"**, as we like to believe. 'Fixing' parts of the environment that underwent even partial destruction takes years, decades, maybe centuries. It is way easier to trigger a negative environmental pattern than reverse it. In 2019, the ozone hole was the smallest since 1982, yet NASA scientists **attribute** such an occurrence to… "warmer stratospheric temperatures". Also known as global warming.

The Kyoto Protocol had its issues, too. Even if all countries complied with the Protocol and reduced their greenhouse gas emissions, the impact would still likely be insufficient. *The Protocol **did not put** any obligation on greenhouse gases from aviation, shipping, and land use, including forests and farming. Together, these activities account for almost 35% of overall greenhouse gas emissions.*

source: *Plantu, "The situation is serious but we are doing as little as possible!"*

Without including key emitting countries and key industry sectors, the Kyoto Protocol was set to remain as a beautifully worded representation of international wishes rather than an effective policy instrument.

CONSIDER THIS...
CLIMATE REFUGEES

According to the 1951 UN Refugee Convention, a person is considered a refugee if she or he "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country". The seventy-year-old definition does not include climate threats, and today, the phrase 'climate refugee' does not exist under international law.

Climate plays a vital role in society's well-being. Water scarcities have been **listed** among the reasons for the outbreak of the civil war in Syria. Climate disasters, such as droughts, hurricanes, locust plagues of enormous size, or floods, force people to relocate. Yet the event does not need to be as dramatic as a climate disaster - the Pacific islands are under a growing threat of disappearing, with Kiribati **possibly** becoming uninhabitable in 15 years. Rising sea levels, soil deterioration, and increased difficulty accessing freshwater are all significant reasons for climate-related migration.

source: *Gatto*

The UN Refugee Agency, UNHCR, **recognizes** the possibility of defining a displaced person as a refugee only in case a natural disaster triggered an armed conflict. *An absence in international law means that climate refugees cannot receive shelter under the Refugee Convention.* Instead, they are subject to procedures for immigrants (those who enter a country without a push factor of persecution or violence), which may include entry fees or skills-based entry rights.

In January 2020, the UN human rights committee **ruled** that it is unlawful for governments to return people to countries where the climate crisis might threaten their lives. Although regarded as a "legal tipping point" for the future protection claims related to global warming, the committee's verdict stood against the plaintiff. The plaintiff, a citizen of Kiribati, an island on the Pacific Ocean, sought refuge in New Zealand because his island does not have enough potable water and fertile land. The resource strain became increasingly acute due to an influx from other islands that became uninhabitable due to climate changes. The committee rejected his case, arguing that there are enough resources on his home island. A committee member disagreed with the verdict, arguing, among other issues, that "potable water" is not equal to "safe drinking water", especially for children. The case illustrates the difficulties in establishing whether somebody qualifies as a climate refugee.

Estimations for the number of climate refugees worldwide **vary** between 25 million and 1 billion. Without an internationally agreed definition, people fleeing their homes due to their living space shrinking are left with no state protection.

THE PARIS AGREEMENT

Kyoto's successor, the Paris Agreement, was drafted carefully to avoid mistakes from the past. As a result, the Agreement is non-binding, with a "naming and shaming" system as the compliance mechanism. There are no compliance mechanisms that would oblige a country to set specific targets by specific dates, except for the expectation that each target would surpass the previous one under the principle of "progression". *The planning and reporting of the mitigation efforts are entrusted to individual countries' to execute under the nationally determined contributions scheme.*

Deemed the "world's first comprehensive climate agreement", the Agreement aims to increase the UNFCCC's implementation by reaching the so-called 20/20/20 targets. Reducing carbon dioxide emissions by 20%, increasing renewable energy's market share to 20%, and increasing energy efficiency by 20% will perform a collective effort of halting the global temperature increase "well below" 2°C compared to pre-industrial times. Besides, the Agreement strives towards increasing climate resilience and low greenhouse gas development and adjusting finance flows to the path of low emissions and climate resilience. The Agreement has been seen as a driver of fossil fuel divestment as the leaders called on reaching a global peak of greenhouse gas emissions as soon as possible.

source: *Hachfeld*

Most of you probably heard that Trump decided to withdraw from the Paris Agreement in 2017. I will not spare many words on this decision for a simple reason: it did not matter that much. Upon withdrawal, a country **needs** to go through a transition period that only finished in November 2020. Joe Biden took office in January 2021, and one of his very first orders was to come back to the Agreement. Subsequently, the US was only a 'non-signatory' for less than two months. The symbolic value of the rough-and-tumble was perhaps more important than the process itself. Yet, although it is vital to have the greatest historic polluter joining the global climate agreement, what matters is whether actions follow words. That is, simply put, not happening.

*In its **report** from September 2019, **Climate Action Tracker** (CAT) concluded that we are currently on route to a 3.2°C warming by the end of the century.* With the current levels of climate (in)action, we will reach 1.5°C warming by 2035 and 2°C by 2050. CAT rated the US and Russia as 'critically insufficient', with their current track of progress leading the world to an above 4°C warming. China got a 'highly insufficient' rating, just above the US and Russia. The EU and Australia were ranked 'insufficient', and, somewhat surprisingly, India was rated compatible with 2°C warming – yet still requiring more work for the 1.5°C target. The only two countries on the development track that would fit into the 1.5°C cap are Morocco and The Gambia, whose emissions are slim, to begin with.

One can argue that due to its non-binding nature, the Paris Agreement is not a sufficient measure to enforce climate action. Yet, a glimpse of hope comes from the efforts of civil society and the environmental NGO. Remarkably, their lawsuits.

*In February 2021, a French court **found** the French state guilty of not keeping up to its climate promises.* The government pledged to reduce the country's greenhouse gas emissions by 40% until 2030 and reach carbon neutrality by 2050. The annual reductions to fulfil this pledge require 1.5% until 2025 and 3.2% afterwards. Meanwhile, French emissions only fell by 0.9% in 2018 and 2019, prompting the lawsuit. Four environmental organisations, including Oxfam and Greenpeace France, created a petition that 2.3 million people signed. The petition accused the state of exceeding its carbon budget and, as a result, worsening the daily quality of life and health of the French people. The court found the state guilty of failing to rise to its promises to address the climate crisis. This is a landmark case as it shows that whole countries can be held responsible for keeping their climate promises.

HOT OR HOTTER?

During the COPs that preceded the Paris Agreement, a widespread agreement emerged that the world's efforts to curb global warming below 2°C were insufficient. During the negotiation rounds, some parties noted that the target of no more than 2°C was not enough to save humanity from an imminent climate catastrophe. Alongside creating the Paris Agreement, the negotiating parties also invited the IPCC to report the consequences of global warming reaching either 1.5°C or 2°C by the end of the century.

The IPCC accepted the invitation in April 2016 and published **the Special Report on Global Warming of 1.5°C (SR15)** two years later, in 2018. Ninety-one authors from 40 countries worked on comparing the impacts of a rise by 1.5°C with the warming of 2°C. The scientists state that human activities have caused the Earth to warm up by approximately 1.0°C since pre-industrial times and that we increase warming by about 0.2°C every decade. They warn that "Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate", simultaneously highlighting that the mitigation ambitions under the Paris Agreement "would not limit global warming to 1.5°C, even if supplemented by very challenging increases in the scale and ambition of emissions reductions after 2030".

The report reflects on temperature-induced changes for various ecosystems, stressing that for every climate change-triggered occurrence, the consequences will be less severe and more easily mitigated if global warming does not exceed 1.5°C. Yet, the report also acknowledges losses, such as ecosystems collapsing, to be 'irreversible' under either of the temperature scenarios.

The Arctic experiences annual average warming two to three times higher than in other regions. Ice sheet loss in the polar regions, triggered by a temperature rise of 1.5°C or 2°C, "could result in a multi-meter rise in sea level over hundreds to thousands of years". By 2100, the global mean sea level rise is expected to reach 0.26 to 0.77 m for a 1.5°C temperature rise. For 2°C, the sea level rise would increase by an additional 0.1 m.

The report's authors predict the geographic range of species to change as global warming proceeds. 9.6% of insects, 8% of plants and 4% of vertebrates will lose half of their climatically defined geographic range if the warming of 1.5°C occurs, with the values doubling in case of a 2°C warming. Infectious diseases, such as malaria, will, on the other hand, increase their climatically determined geographic reach with the global temperature rising.

The changing of the world's ecosystems will harm our "health, livelihoods, food security, water supply, human security, and economic growth". Although adaptation and mitigation are already in place, the risks need to be reduced by "multilevel and cross-sectoral climate mitigation". The stakes are high - the difference between a 1.5°C and a 2°C warming could mean as much as up to 10 million fewer people exposed to risks of rising sea levels. Extreme weather events or large-scale singular events will occur with a strikingly higher frequency with a 2°C warming. Complete melting of the Arctic ice sheet is predicted to happen once per century in case of a 1.5°C warming. At 2°C, the frequency stands at once per decade.

The scientists urge governments to stay within the total carbon budget from the pre-industrial level. Carbon budget *refers to* the cumulative amount of carbon dioxide emissions within a

specific period to stay within a temperature threshold. The report acknowledges that in order not to overshoot the 1.5°C point, the world needs "rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems" that would lead to "deep emissions reductions in all sectors".

The report concludes that for the warming not to overshoot the 1.5°C threshold, global carbon dioxide emissions need to decline by 45% by 2030 (with 2010 as the base year) and reach zero net emissions by 2050. Limiting the warming to 2°C would require a 25% emissions decline by 2030 and reaching zero net emissions by 2070.

The report has been widely acclaimed. Antonio Guterres referred to it as "an ear-splitting wake-up call to the world". Scientists and activists **called** on the world leaders to increase their efforts in providing clean energy, and many energy ministers responded with pledges. However, the Australian and American governments did not take the report seriously, questioning the legitimacy of the IPCC and, in the case of Donald Trump, humans' impact on global warming. The EU, on the contrary, indicated a will to add more ambitious goals to reduce the block's greenhouse gas emissions.

CONSIDER THIS...
IS GEOENGINEERING GOING TO SAVE US?

The broad definition of geoengineering assumes any large-scale, human-made changes to the planet's equilibrium, such as increasing the concentration of greenhouse gases in the atmosphere. However, in the light of climate changes, geoengineering has started to be seen as a possible solution. Also called "climate invention", geoengineering in this sense refers to large-scale projects that aim to mitigate the effects of climate change through technology. Although the world has seen some positive impacts of geoengineering, the concerns against it are widespread. Two main lines of argument emerge. For one, we cannot predict with complete certainty just how large-scale changes will affect the Earth's complex climate. Besides, trusting geoengineering to save humanity means allowing "business as usual" to continue.

A team in Italy is trying to **prevent** Alpine glaciers from melting by covering them with large geotextiles of up to 100,000 square meters in total. The textile reflects the sun, keeping the temperature underneath lower than outside the textile, therefore maintaining the glaciers cold. That way, the scientists try to halt a positive feedback loop from occurring. Positive feedback loops **happen** when an event triggered by global warming amplifies the effect of warming. In this particular case, melting glaciers transform into water, which has a lower albedo (ability to reflect the sunlight). Therefore it absorbs more heat, contributing to an increased heating up of the Earth's surface. Covering the glaciers with a geotextile keeps the albedo high and prevents them from melting.

In Switzerland, the first carbon-sucking **fans** were installed in 2017. The technology pumps carbon dioxide out of the atmosphere and feeds it to plants. Carbon capture technologies are criticised for being extremely expensive and not efficient enough. The Swiss project has so far only operated in a small municipality. *Despite its current costliness, geoengineering is sometimes regarded as the fastest and cheapest way to "solve the climate problem".* In 2017, scientists from Harvard University **started** conducting tests on solar geoengineering. They aimed to simulate a short-term cooling of the atmosphere by aerosol injections, claiming that solar engineering could complement decarbonisation efforts. Backed by the current US administration's approach to climate change, their project met with fierce backlash from the scientific community.

One of the main **concerns** of the critics was the high possibility of solar geoengineering bringing about a disaster. Short-term planet coolings that happen after volcanic eruptions can have dire consequences for humanity. Droughts, crop failures, and famines could be the side effects of a temporary artificial cooling of our planet.

Cooling the planet is not the only concern regarding the climate crisis, critics argue further. Think about ocean acidification, biodiversity loss, or plastic soup boiling in our oceans. These issues have corresponding geoengineering projects: **iron dumping** to prevent ocean acidification or plastic-devouring **enzymes**. Yet geoengineering essentially means altering the climate further to serve a consumption-centred lifestyle. How does an iron-stuffed marine ecosystem function? What happens to the enzyme once it eats all the plastic? How to restore biodiversity or merely prevent it from disappearing? Scientists need to put an effort to foresee the potential consequences of their work for their research to be legitimate. Nevertheless, another miracle anthropocentric technology diverts funds and attention from climate mitigation and a necessary lifestyle change.

THE EU'S CLIMATE POLICY

The EU's position as a world leader in a fight against global warming has recently been discredited. The bloc passed the world's first climate law in March 2020, making it legally binding for member states to reduce their net emissions to zero by 2050. The lack of commitment to reducing emissions by 2030 per the Paris Agreement met with criticism from youth climate activists. **ClimateEmergencyEU** is an open letter to EU leaders urging them to increase their climate action. The letter was sent to EU leaders on July 16, and as of July 23, 108.965 people have signed it.

source: *Paresh*

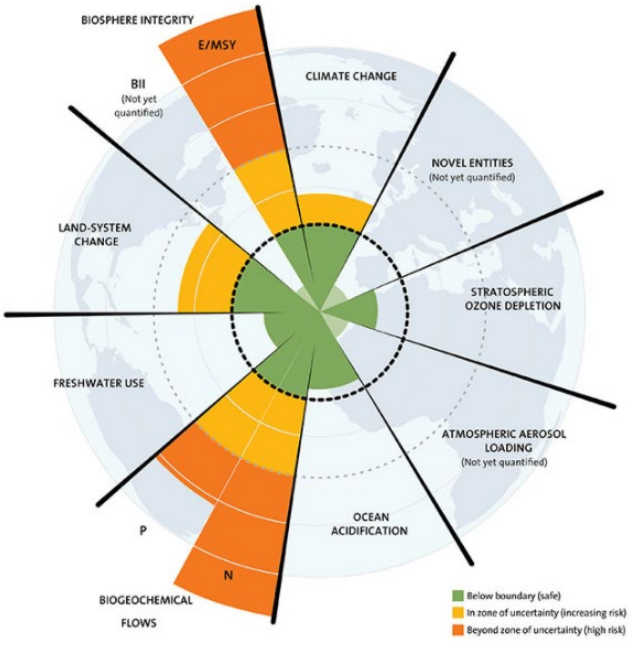
The EU launched the world's first greenhouse gas emissions trading scheme in 2005. It remains the biggest to date. The 'cap-and-trade' system is based on a pool of allowances. A company or plant is only allowed to emit a certain amount - the top limit being the 'cap' - after which it is obliged to buy 'allowances' from the actors that did not reach their 'cap'. Although intended to work as an incentive to lower greenhouse gas emissions, the scheme has been **criticised** for its inefficiency against its high costs.

Despite criticisms, the EU remains one of the 'greenest' clusters of developed countries. **A European Green Deal**, presented in 2020, includes a comprehensive framework for many aspects of a green transition, such as food production, biodiversity, or circular economy. The EU has historically been more strict with its regulations than, for example, the US, and today, many chemicals, pesticides, or food and cosmetics ingredients that were proven toxic are banned in the EU.

If the 'greenest' block in the world gets criticised for not acting fast enough, that only shows how difficult the necessary transition will be. The clock is ticking, and I do not mean the Doomsday Clock this time. The **Climate Clock** counts how much time we have left before overshooting the 1.5°C threshold. The calculation is updated every year based on the emission rates from the previous one. As of 2021, we are 11 years away from reaching a 1.5°C temperature rise. With the current rate of 'green' transition, we will overrun the limit in 2032.

CONSIDER THIS...
IS CLIMATE CHANGE OUR BIGGEST PROBLEM?

International agreements primarily focus on greenhouse gas emissions. Emission reduction involves many changes to industry and ways of doing business that are positive for the environment, such as diversifying energy sources, reforestation, or climate mitigation. Yet focusing excessively on one aspect of the current environmental crisis does not account for the complex interconnectedness of the Earth's ecosystems. Climate change is just one of the nine planetary boundaries, a **concept** that maps out Earth's system processes developed by scientists from the Stockholm Resilience Centre and Australian National University.



source: *Stockholm Resilience Centre*

Among the nine, you can see, for example, ocean acidification, freshwater use, biogeochemical flows, or biosphere integrity. At the moment, we reached high-risk levels in biosphere integrity and biogeochemical flows (marked in red on the diagram). The former describes the ongoing sixth mass species extinction. The latter outlines how nitrogen and phosphate, minerals essential for food production, are transformed into unusable forms. As you can see in the diagram, these two are the most endangered areas - more at risk than climate change. Some sites, such as novel entities - meaning toxic chemical pollution or microplastics - are not calculated yet but considered crucial enough to be included in the nine planetary boundaries.

None of the remaining eight issues is represented enough on the climate change-dominated international agenda. Amid a sixth global species extinction, international agreements aimed at protecting biodiversity are **ineffective** and barely known to the public. Countries **adopted** a UN resolution on sustainable nitrogen management in 2019, but this was as far as any action on the topic went. The UN **warns** that half of the world's population will face difficulty accessing freshwater by 2030. Besides the warning cries, no effective mechanism has yet been put in place to secure freshwater supplies. On the contrary, **investments** in water rights and infrastructure are on the rise, threatening to privatise a vital life resource. Maybe most importantly, plastic floods our houses while international agreements stay stubbornly silent on the plastic problem - perhaps because most of 'Western' waste is currently **shipped** to less-developed nations.

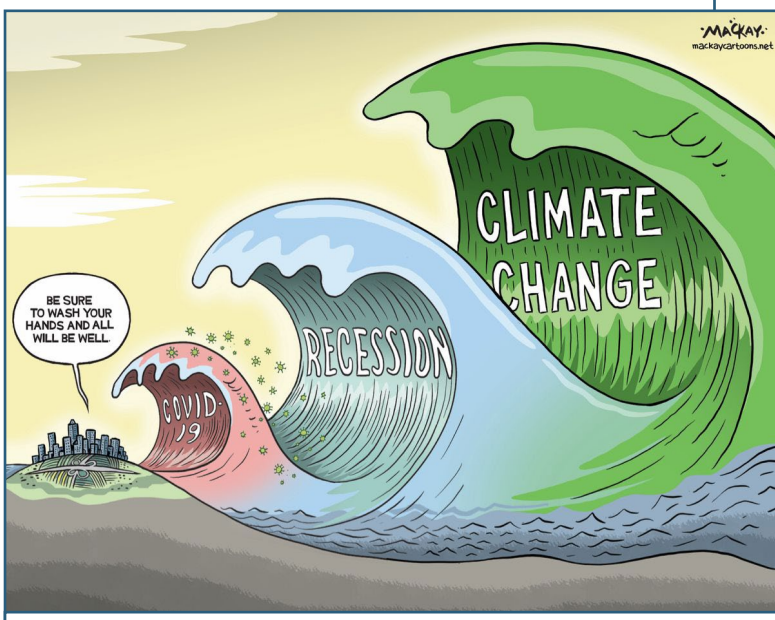
The environment is a complex system, and for our actions to yield the desired effects, or at least not bring about unexpected results, we need to tackle it holistically. **Systems thinking** is instrumental in designing comprehensive solutions, and I believe policymakers should embrace it more.

You may have noticed that the vocabulary of this mini-course varies between 'environmental' (action, issues, mitigation, etc.) and 'climate'. This is no accident. I want to focus your attention on the fact that the issue is more extensive than climate and highlight the specific uses of the terms. For example, in Module 2, you mostly encountered 'climate' (action, etc.) because international agreements focus on it. When I am not talking about a specific deal, I use 'environmental' (...).

COVID-19 AS A POLICY WINDOW

Apart from accounting for a temporary drop in greenhouse gas emissions, economic crises also create an opportunity for reform towards a greener financial system. Scientists that issued **the Hartwell Paper**, an influential scientific paper calling on re-thinking the existing climate policies, openly talk about the 2008 economic crash as a chance for reform. They call the economic crisis " an immense opportunity to set climate policy free to fly at last", arguing that climate policies have been misunderstood since 1985.

The reform that the Hartwell Paper scientists envisioned did not happen. Yet, the unprecedented crisis of 2020 brings new hopes for the planet's future. Although economists anticipate the most significant recession since the end of the Second World War, it is not the economic aspect of the COVID-19 pandemic that strikes policymakers. Destruction of **natural habitats** and **mass food production** have played a role in developing the global health crisis. Besides, the environment starts to speak for itself, with catastrophic consequences for its polluters. COVID-19 broke out just weeks after the Australians turned down ravaging **wildfires**. East African, South Asian and Middle Eastern countries have been dealing with an enormous, crop-devouring **locust plague** while simultaneously fighting the pandemic. The sizes of both wildfires and the locust plague have been linked to humans' degradation of the planet. The youth climate movement is loud in demanding reforms to secure young generations' future. The increasing pressures from civil society and the frightening evidence on climate change create an urgency for reform. The pandemic-induced breakdown of the world as we know it opens possibilities to re-think and re-shape global industries, businesses, and our relationship with nature.



source: *MacKay*

Some cities have already responded with planet-friendly pledges. Not to look far, the City Hall of Amsterdam **decided** to implement a doughnut economic model to run the city in balance with the planet. **'Doughnut economics'** is an alternative growth model which places human needs in 'the dough'. The inner circle of the doughnut symbolises the minimum we require to lead a good life, following UN Sustainable Development Goals. The outer ring is the environmental threshold that includes freshwater, biodiversity, or fertile soils. Staying between the two circles ensures balanced growth. Other countries worldwide are **investing** in enlarging bike lanes and pedestrian spots to curb air pollution and allow for "socially responsible recreation".

At the same time, the EU's post-COVID recovery deal **does not contain** any obligations to curb emissions. Pan-continental efforts are crucial in tackling the climate crisis since cities alone are just a drop in the quickly acidifying ocean.

RUNNING A COUNTRY: A PROFITABLE BUSINESS

In recent years, international policymaking on climate change has faced increased difficulties. The rise of populist parties worldwide threatens efforts to achieve a coherent climate policy. In Poland, the ruling Law & Justice party is responsible for blocking the EU from linking its post-COVID recovery fund to fighting global warming. Brazil's president Jair Bolsonaro **thwarts** efforts to protect the Amazon rainforest in nationalistic advocacy for "boosting the economy" regardless of the environmental costs. Bolsonaro, just like the world's most influential climate denialist Donald Trump, waged war against science, firing scientists that present uncomfortable facts. Apart from blinding nationalism, the two presidents have something else in common: their business-like approach to running a country. Business, especially big business, poses the most significant single threat to the environment.

Join me in Module 3 to hear what is usually hushed: the marriage between climate denial and big businesses.

MODULE REFLECTIONS

This section aims to put your newly acquired knowledge into practice by engaging in some reflective questions. You can write as little or as much as you want, or just reflect on the questions on your own. I would also be delighted if you decided to share your answers with the learning community **here**.

1. The Dutch grade system is from 1 to 10. The pass is at 5.5, and 7 is an average grade (10 is rarely issued, 9 means the student highly exceeds the average academic level). Knowing this, what grade would you give to:
    a. The Kyoto Protocol
    b. The Paris Agreement?
   Please provide a short explanation of the grade you chose.

2. Choose any of the three theories on climate policymaking: collective action, cognitive bias, or comparative politics. Shortly explain the ineffectiveness of the Paris Agreement through the lens of your chosen theory.

3. Imagine you possess superpowers that make the world's leaders listen to you. What is the one solution you would order them to implement and why?

MODULE 3:
the hands that turn off the alarm

JUST LIKE THE EARTH'S VARIOUS SYSTEMS EXIST IN RELATION TO ONE ANOTHER, SOCIAL STRUCTURES ARE ALSO INTERCONNECTED AND CAN INFLUENCE EACH OTHER. ECONOMY, POLITICS, CULTURE, AND SOCIAL NORMS, ARE IN A CONTINUOUS EXCHANGE. IDEAS THAT PREVAIL IN CULTURE ARE LIKELY TO BE TRANSLATED INTO AN ECONOMIC POLICY, A POLITICAL ENDEAVOUR BY NATURE. WITH TIME, THE ECONOMIC POLICIES WILL IMPACT HOW MEMBERS OF SOCIETY PERCEIVE THEIR CULTURE.

The current economic and cultural doctrine originating from the 'West' is the engine for innovation and socio-environmental degradation. It is also the main obstacle in creating economic, political, cultural, or social structures that could effectively respond to the mounting environmental crisis.

ENVIRONMENT? NOT WORTH IT

Given the current economic and political trends, it is in no business's interest to account for its environmental impact. The costs of cleaning up, preventing degradation, taxing emissions are redundant in an economic system that focuses on economic growth, a political system that enables such growth, and a consumption-centred culture that sees its commodified comfort as an inalienable right.

But wait, what about CSR?

Corporate social responsibility is a business model that allows companies to be accountable for their actions. As rosy as it sounds, due to a lack of standardisation or an accounting body, it is not an efficient measure of a company's socio-environmental performance. Thanks to the growing awareness among consumers, seeming socially or environmentally friendly **gives** companies a competitive advantage over those that do not create such an impression. Yet whether they are doing something good for the people or the planet is a matter of debate (some, undeniably, are. But to find them, we need to evaluate their actions critically). Now, let me go back to the main story.

The second half of the twentieth century saw the rise of capitalism into the prevailing socio-economic doctrine. When Francis Fukuyama **proclaimed** the "end of history" in his 1989 essay, he meant that liberal democracy and the free market have prevailed as the ideologically superior economic and political systems. Economists, such as Milton Friedman, fuelled Fukuyama's belief and advocated for capitalism as the most efficient and just financial system. Resource allocation under capitalism, they **argued**, is the most efficient because it is rooted in objective laws of supply and demand, steered by rational and profit-maximising individuals. Self-regulating markets, in their view, were the drivers of innovation and the great social equalisers. The public and the policymakers alike believed that economic growth had spillover effects for the whole society and, therefore, contributed to overall social prosperity. Economic growth was **believed** to be the means to various societal ends, whether gender equality or poverty alleviation.

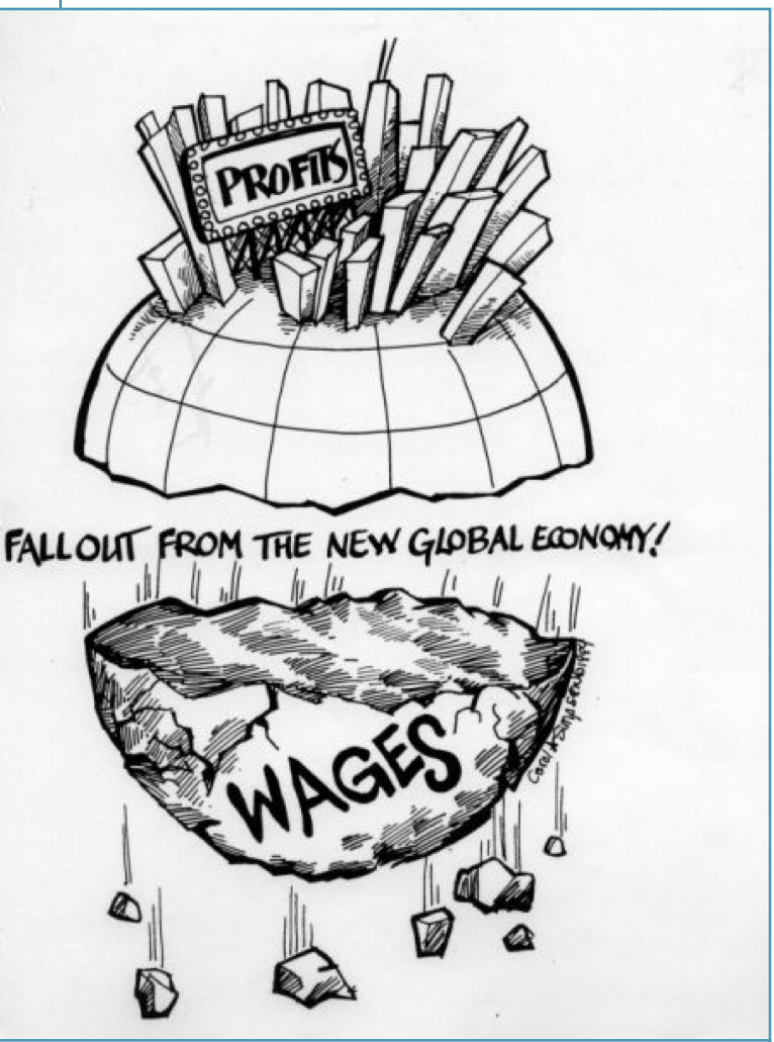
source: *Brendan O'Connell*

The decades following the Second World War saw the coexistence of capitalism and democracy in so-called state capitalism. In such a system, the state was responsible for protecting its citizens through welfare programmes. It also had regulatory power over businesses. State capitalism suffered severe blows in the wave of reforms sweeping the world in the 1980s, known under the collective name of neoliberalism. The reforms mainly **included** market deregulation, privatization, and welfare withdrawal, with an accompanying social campaign advocating individual rights and freedoms. Subsequently, labour and capital were easier to move around the globe as the state's importance shrank. Such an economic shift had profound consequences for the world's politics, society, and culture. Somewhere along the way, economic growth became the end instead of the means, which

is best illustrated by GDP emerging as a **vital indicator** of a country's performance. Today's ongoing environmental destruction of countries outside of the 'global West', the deepening distrust in traditional institutions such as the state or the media, or our apathy to everyday terrors of human rights abuses or ecocide stem directly from neoliberalism.

POVERTY AS A RESOURCE

A company that can keep costs low while profits high is a successful one. Yet, just like there is no free lunch, there is no way to make expenses disappear. However, what is possible is to outsource them to third parties, a practice that deregulation and freeing of capital flows made possible. Such outsourcing results in



source: *Cartoon Movement*

'comparative advantage' of production in countries of the global South, a neat term that hides extreme deregulation in terms of environment and workers' rights.

The wealth of giant corporations, often **exceeding** the budgets of developing countries, gives corporations the bargaining power to force those countries to play by their rules. Their leverage point is the ability to move to another place, one that is willing to subsidize cheap production costs with the health of its citizens and environment. Poverty becomes a resource where states are desperate enough to engage in a "race to the bottom" to keep the foreign business in. Corporations, with headquarters in proudly democratic countries, welcome practices such as 14-hour working days, child labour, and unsafe factory buildings. Through such squeezing of far-away populations, the companies can get to their fortunes. The producing countries usually do not benefit more than the as-low-as-possible employee wages since the corporations they work for are foreign-owned. Therefore, there are no taxes that the government could re-invest in public infrastructure to improve people's livelihoods and career opportunities. This circle of poverty is a contemporary form of colonialism, dangerous not only for the lives of individuals but also for their environment. Consider the case of the Niger Delta.

THE NIGERIA TALE OF SHELL

Nigeria is Africa's largest crude oil producer, yet most petroleum products are unavailable to ordinary Nigerians. The country has only four oil refineries, which forces it to export most of its crude oil and import refined products. The delta, located in the country's south, has been an oil extraction site **since** the 1950s. The whole region is severely polluted by oil, resulting from spills that **started** in 1976 and continue until today. At the time of use, the pipelines were poorly maintained. Now that the site is abandoned, the pipelines still cross the landscape and continue spilling.

Shell, the company responsible for the spills, managed to avoid responsibility for the clean-ups despite the engagement of multiple international organizations such as Friends of the Earth, Amnesty International, or UN Environment Programme (UNEP). Several law-suits against Shell have been filed. According to Shell's Nigerian subsidiary, the Shell Petroleum Development Company of Nigeria (SPDC), some were dismissed as the spills came from sabotage. Others were won by en-vironmental groups and followed by an almost complete lack of action from Shell. A 2020 joint report by Friends of the Earth, Amnesty International, UNEP, and Milieudefensie **showed** that Shell started its clean-up work on only 11% of the identified sites and that 11 out of 16 contractors in these spills had no expertise in oil clean-ups. Nor has there been any public accounting of how the money provided in funding has been spent.

Given Shell's long history of responsibility avoidance, the recent **ruling** by the Court of Appeal in The Hague, stating that SPDC is re-sponsible for environmental degradation in the Niger Delta, has been welcomed with cautious optimism. Throughout the whole legal rough-and-tumble, the local population continues to suffer. Their crops are destroyed or inedible, they note higher rates of cancer and infant mortality, and they are subsequently pushed deeper into poverty.

source: *The Guardian*

Note that in this story, the environmental organizations are not focused on punishing Shell for its actions but only on pushing the company to take responsibility for the clean-ups. This shows that companies' illegal actions against the environment are not restricted by law but by enough public outrage. Where economic growth is the end, not the means, creating gains comes before making value. Corporations, often in concert with politicians, destroy our natural environment for one simple reason: because it is profitable.

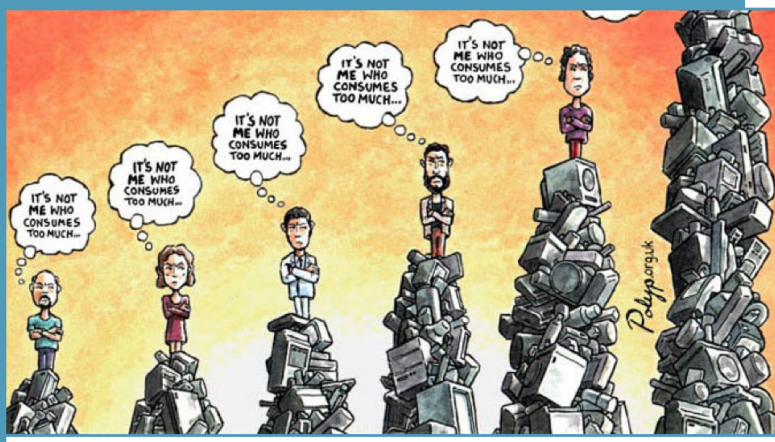
Let us bring this story closer to home. Although the suffering of the Nigerian people may touch you, you also realize that you do not have much to do with the oil industry. Even if you had a car, your oil consumption is marginal compared to the industrial one. What about clothes? We all wear them, and I do not know anybody who would not love to refresh their wardrobe now and then.

The stories of garment worker abuses have become well-known in the past years. There is a fair chance that you have heard of at least one of the following: **'True Cost'** documentary, the **Rana Plaza** tragedy, hidden **notes** from Chinese prisoners, or the ongoing **#PayUp** campaign. The working conditions that these stories reflect are vulnerable, dangerous, exploitative, and precarious. More and more people are talking about the abuses - for example, Instagram influencers drove the #PayUp campaign. Yet, in reality, not that much has changed despite all this public knowledge. Why is that so?

CONSIDER THIS...
AND EDWARD BERNAYS SAID, LET THERE BE DEMAND

My grandma is 70 years old. She grew up in a village in Eastern Poland. Street lights only appeared in the village when she was a child, and she recalls going to a community centre to watch TV as a teen. For most of her adult life, her groceries would come in paper and glass. She would take good care of her clothes and non-wearable textiles, repairing and repurposing them. Personal-use electronic devices came later in her life, first TVs, then cell phones, finally the internet and smartphones. Today, I send her pictures on WhatsApp, and she has to stop my cousins from spending all their time playing video games. She once told me that she saw more technological developments throughout her life than any other generation. I could not agree more. Yet, there is another phenomenon that took off during her life that I find more crucial for the fate of humanity and our planet, one that is so purposefully ubiquitous that she never mentioned it: the rise of consumerist culture.

Younger generations like ours often do not realize that fast fashion, omnipresent plastic, and planned obsolescence are not how things have always been. Consumerist culture ensures that economic growth never ends because the demand is insatiable. The very basis of consumerism is that products do not satisfy our needs but rather our, sometimes unrecognized, desires. Edward Bernays, the 'father of public relations' and advertising, was the first to **coin** this notion. A nephew of Sigmund Freud, Bernays got influenced by his uncle's ideas about the subliminal desires ruling people's behaviour. Bernays revolutionized advertising by appealing to the subliminal rather than to the rational. Instead of selling, for example, a piece of functional furniture, he would sell the promise to a better life that the buyers would surely reach upon their purchase. His work, originating in the US, would slowly spread to the rest of the world, reaching even my beloved grandma. Growing up in consumerism, we take it for granted - we find it normal that clothing expresses our identity, 'shopping is cheaper than a psychologist', and our phones' software becomes incompatible with the very phone it was installed on after a couple of years of use.



source: *Polyp*

The psychological consequences of consumerism could provide material for a whole separate book, so I will mention only one: apathy to the revelations about human and environmental suffering that such a status quo brings about. Indeed we feel bad for the garment workers who cannot go pee during their 14-hour shifts, but they are far away. Our peers who will judge our newest fashion choice are much more real. Naturally, we sigh hearing about **cutting down** the pristine Indian forest to establish an illegal

mica mine with child labour. Still, then again, our lipstick or bronzer will run out very soon. Convenience guides our choices more than a somewhat dystopian, incomprehensible idea of a whole planet on a collision course. This is not an accusation but an acknowledgement of a genuine psychological phenomenon trained by decades of consumerism.

Ethical brands are and always will be more expensive than those employing exploitative labour, for the very reason of paying a fair wage to their workers and respecting the environment. Having grown used to our ability to buy pretty much whatever we want, we frown at the idea of restricting our material richness. Besides, are we even sure these products help the planet?

THE POLITICS OF KNOWLEDGE

Neoliberalism marries economic and political power. The person with money is the one with a voice. As we have already seen, corporations have immense cultural and economic power. They use both, but especially the latter, to dominate the political sphere. They do so in two ways: influencing the information flow and direct albeit hidden political action.

To understand and react to events, we obviously need to know they are happening. Therefore, a well-functioning civic society requires access to information and an agreement over what the data means. In democratic countries, access to information is easier than in non-democratic ones. Yet, there are several ways an actor can, if not deny the information, then make it ambiguous.

An internal **memo** assembled by the American Petroleum Institute (API) in 1998 outlines a "Global Climate Science Communications" strategy. The document states that victory will be achieved when "average citizens <<understand>> uncertainties in climate science; [...] media coverage reflects balance on climate science [...], and those promoting the Kyoto treaty based on science appear to be out of touch with reality". API clearly articulates the goal of making climate science a "non-issue". Among the tactics to achieve this goal, API envisions generating media coverage on scientific uncertainties, involving previously unknown "experts" that will question the validity of climate science, or reaching out to authors and writers. In short, API aims at sowing doubt - the same technique used by tobacco companies to **convince** people to keep on smoking despite damning public health research. Making consensus crumble requires only the questioning of essential claims.

JOURNALISTIC COVERAGE AND ENVIRONMENTAL AWARENESS

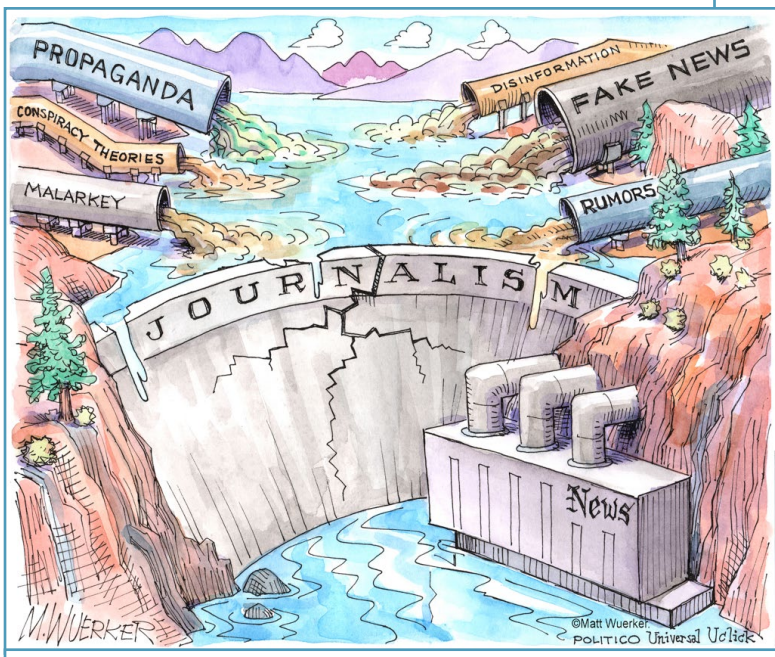
It is impossible not to notice the tremendous importance of the mainstream media - understood as the journalistic coverage - in disseminating information on environmental science. The API memo focuses almost exclusively on reaching out to journalists, writers, and thinkers. Throughout the years of the fight for environmental action, the media gained a somewhat unfavourable opinion supporting the cause.

In the beginning, when environmental awareness was just being shaped, media coverage **appeared** fragmented, unsure. Therefore it lacked the power of convincing the general public about the urgency of the situation. As it was becoming increasingly clear that human-made climate change will have irreversible effects on the planet and, therefore, humanity, the media's objective of "appearing unbiased" played into the hands of climate denialists. Showing two sides of an event may be beneficial in public discussions, but it does not reflect reality in the case of a fact-based occurrence such as climate change. As a result, the media contributed to sowing doubt on the event's size, severity, and speed. Later on, when it became clear (to most) that climate change is both human-made and impending, media coverage was over-referring to it in **catastrophic** terms. Such an approach has helped foster inaction as people feel disempowered and overwhelmed. Finally, the journalistic coverage of critical transnational media outlets has been focused on developed countries, which are the least affected by the consequences of any environmental damage. While it comes as no surprise since those media outlets are located in and financed by actors from developed countries, such coverage distorts the reality of the problem and impedes finding practical solutions.

THE IMPACTS OF THE NEOLIBERAL COUP ON THE MEDIA

Journalistic coverage underwent crucial changes in the past half a century, which impacted the debate about environmental issues. Firstly, technological transformation - starting with the emergence and popularisation of TV, later the spread of the internet - changed the epistemological nature of the news. The canonical thesis by media theorist Marshall McLuhan states that "the medium is the message", meaning that where we see the news impacts how we read it. The shift from reading to watching to scrolling had **consequences** on absorbing the news. The focus on appearance and dramatisation, combined with the shortening of programme lengths corresponding to shrinking attention spans, deteriorated the quality of the coverage we receive. Secondly, neoliberalism did not leave the media industry untouched. A for-profit orientation **changed** the media's perception from the public good to 'news factories'. What started to matter was readership rates versus coverage production costs rather than the reliability of the information.

The focus on money-making had several implications for journalistic coverage. Employment cuts in news agencies and outlets mean that the remaining journalists have less time to check their stories. While there are fewer journalists, the PR branch has proliferated. Often, journalists rely on PR for their stories, not because they are less attached to finding the truth but because they have no time to conduct their investigations. For the same reason, many media outlets share the official governmental line. These two factors weigh into the journalistic coverage on environmental issues, often echoing the PR needs of big businesses through covering up stories or outright silence. Another consequence of for-profit media orientation is creating stories that attract large readerships, which are often not those stories that are essential for the public good. According to such media logic, large-scale catastrophic events sell better than small, positive stories about efforts for climate adaptation.



source: *Matt Wuerkel*

Conspiracy theorists often use the arguments I outlined above to deny the legitimacy of established media. Such a denial is misplaced. While it can be true that the coverage such media present is not always fully representative of the whole story, it reflects an industry in crisis rather than some plot created by the authorities to control the masses. Journalists undergo ongoing training in essential journalistic standards such as objectivity, source analysis, or impartiality. These values remain crucial to their profession. If you are unsure whether the media outlet you are reading or watching is a reliable one, I have prepared a brief media guide for you.

CONSIDER THIS...
THE QUICK GUIDE TO EVALUATING THE NEWS

1. Find another source. Is any other media outlet talking about this news item? Can you confirm it anywhere else?
2. Read about the author. Can you identify her/him in the first place? Can you find other pieces that she/he wrote?
3. Check the media outlet. Can you find information about their values, staff, history? What is the outlet's political line (for this, you can take a look at **MediaFactCheck**)? Is this a reputable outlet, so quoted by other outlets or journalists? Is the outlet's goal to promote a specific worldview?
4. Check the funding of the media outlet. Is the funding information disclosed openly? If not, that could be an alarm bell. If yes, can you identify whether any funders could wish for a particular line in the news coverage?
5. Confront your bias. Do you want what you are currently reading to be true? Do you agree with the presented worldview, and so you do not wish to question it? Are there other possibilities?

Now take one news item that you recently read and evaluate it according to the questions above. Do you still find the item trustworthy afterwards?

CREATING CLIMATE DENIAL

Busy sowing doubt on the reality of climate change, fossil fuel companies did not do anything to prevent a crisis they were well aware is coming. For at least 50 years, the companies have **known** about the environmental impact of their products. They were also aware of the existence of carbon capture and storage technologies. Therefore, it has been their conscious decision not to incorporate neither the knowledge nor the solutions into their business plan. Instead, they focused on shifting the narrative.

source: *Adam Zyglis*

And it has worked. Due to the complexity of the topic, environmental and climate science is filled with uncertainties. Yet, these include rather 'when' than 'whether'. For example, no scientist is certain when we will reach the point of no return when emissions lead to irreversible temperature increase. Yet, there is an agreement among the scientific body that this will happen. Climate science denial continues to reach millions of people, including key global leaders. The very enterprise of adjusting institutions, norms, and ways of living worldwide to accommodate the challenge is tremendous. The discussion cannot get far if we still debate the basic facts.

HOW TO TALK TO CLIMATE SCEPTICS?

Suppose you meet a person who does not believe in climate change. How do you react? Do you react at all? Correcting individual scepticism plays an essential cumulative role in fighting climate scepticism. However, such conversations are very tricky. You may feel like there is not much point in talking to somebody who outright denies science. Yet often, such denial **comes** from a place of deception, distrust, or self-delusion. Before you get into the conversation about facts, consider these **points**:

What is your goal with this conversation?

Do you want to convince the person about scientific evidence, or maybe to get them to vote or support a local government's policy? Understanding your aim helps you focus on the conversation.

Who are you talking to?

Does your conversation partner belong to a specific group, for example, religious, employment, ethnic, or social? Does that help you understand anything about the values they care about? It is easier to hold a meaningful conversation when you empathise with the person.

What values do you share with your conversation partner?

Once you understand what you want to achieve and the possible values of the climate sceptic, you can frame the conversation around things you both care for. Instead of talking about planetary destruction and rising sea levels, try to show the person that green solutions create jobs or new kinds of national independence. Or that by protecting the planet, we can improve the livelihoods of those around us. Coming from a place of empathy rather than confrontation allows you to prevent the climate sceptics from getting defensive, resulting in deepening their convictions.

After establishing grounds for the conversation, let us take a closer look at some **rebuttals** of the most common climate scepticism claims.

"One record year does not prove anything" - Yes, one record year does not show anything in the long-term. Long-term trends, however, do. The ten hottest years on record occurred in the past 15. Two reputable temperature trend analyses, **NASA** and **CRU**, show a steady increase in the world's temperatures.

"Climate is always changing" - Sure, but not at this rate. Human Co2 emissions exceed natural ones by 100 times. Besides, the matter is not simply the climate warming up, but also mass species extinction, poor air quality, valuable resources running out, and many others that cannot be attributed to anything but human activity.

"Scientists are not sure" - 97% of them are sure about the anthropogenic existence of global warming. This argument shows that the misinformation machine of the big corporations worked, just like the API memo designed. Ask your conversation partner where they get their information and try to nudge them into checking media reliability.

"But it is cold today" - Human-made global warming does not mean that every place on Earth will become a desert overnight. Regional variations according to climatic zones are a regular occurrence. Warming the oceans means that some underwater currents will reverse or stop existing. This can affect some regions that depend on warm currents for their warm climate. Europe is one of such regions: the Atlantic Meridional Overturning Circulation, a 'conveyor belt' for warm water, has been **recorded** weakening. Therefore, we may experience colder temperatures as a result of global warming.

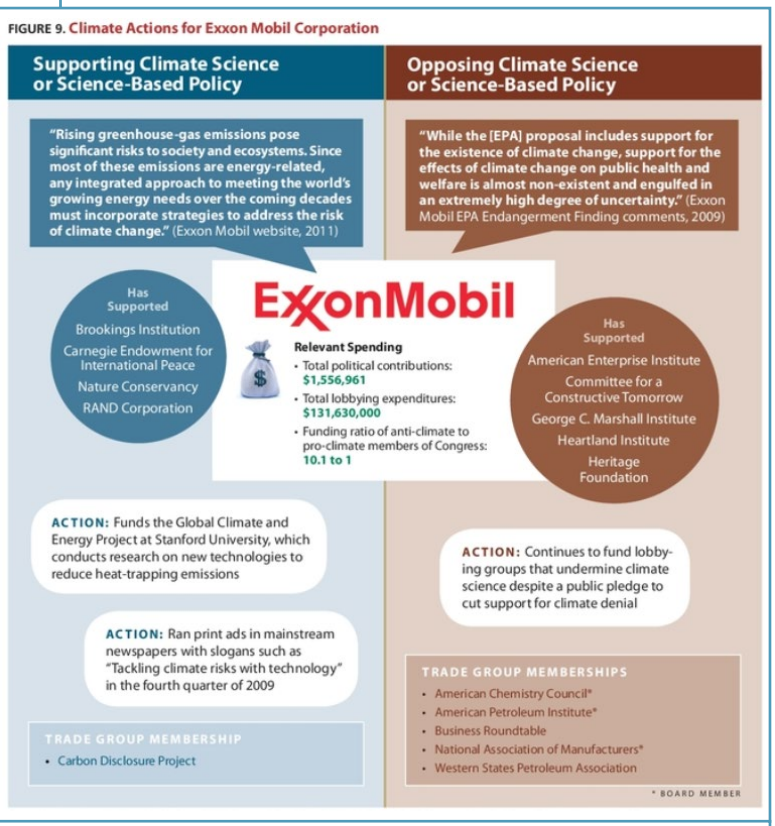
source: *Branco*

"Global warming is a hoax" - Here, you could give a list of all the organizations that confirm the existence of global warming, among them, the world's most prominent, such as NASA or IPCC. If your conversation partner's scepticism comes from ignorance, this may well convince them. Yet, it is also possible that the climate sceptic rejects those organizations as illegitimate, riding on the wave of worldwide rejection of scientific and institutional authority. That is a deeper problem that one conversation is unlikely to tackle. In this case, try to get back to the shared values and talk about a different aspect of a green transition, such as national security or energy independence.

… so that you know, I based this section on Grist's brilliant "How to talk to a Climate Skeptic" **guide**. It was released in 2007. Spooky, isn't it?

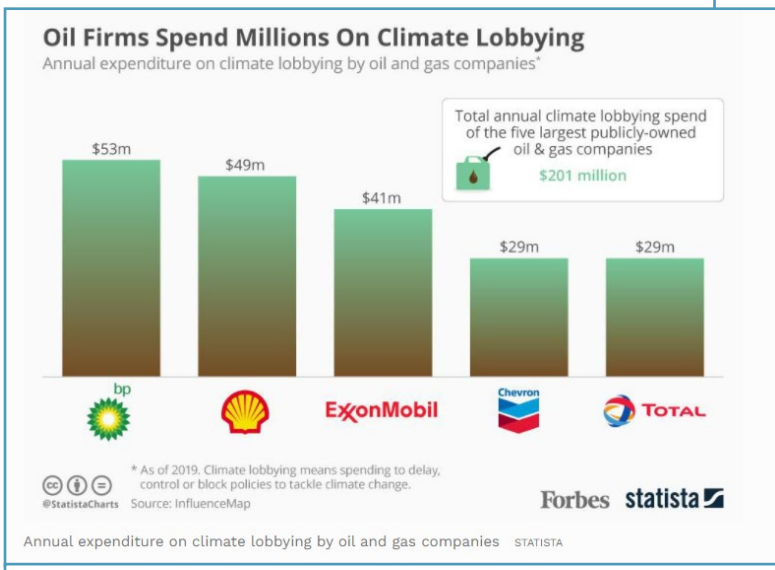
ALL THE OIL'S MEN

While debunking climate-related myths is a valuable and essential activity, is it equally crucial to dig deeper and look at what the public figures 'forget' to mention. Silence is as powerful of a tool as misinformation. Companies tend to acknowledge climate change as an issue and promise to commit to policies that reduce their environmental footprint on their corporate websites. These same companies then fund anti-climate science think-tanks or even politicians. Exxon Mobil expressed great concern over climate change, which did not prevent the company from **founding** Heartland Institute, America's centre for climate misinformation.



source: *Union of Concerned Scientists*

Lobbying is a rather silent activity and a highly effective one. Five of the largest fossil fuel companies: BP, Shell, ExxonMobil, Chevron, and Total, **spend** approximately $200 mln per year on lobbying. In comparison, the European Environmental Agency, an EU body responsible for environmental issues, had a **budget** of approximately 54.5 mln euros in 2019.



source: *Niall McCarthy for Forbes*

What exactly constitutes lobbying? The term refers to any activity by private groups or individuals to influence the decisions of the state. As such, lobbying can be anything from investing in a politician's private company, direct money transfers, promises to fund a politician's electoral campaign, all the way to **social media ads** (which, as we **know** by now, are a scarily effective political communications tool). In a world where the value of data has surpassed the value of oil, internet misinformation techniques are valuable means of controlling the information flow.

While the most overt and abusive lobbying practices occur in the US, where the fossil fuel industry "**keeps** the Republican party pretty much by the throat", the consequences of this state impact the whole world. The US remains the largest historical emitter of fossil fuels, and for that reason, its lead on environmental issues is crucial.

Most lobbying efforts concentrated on slowing down or blocking climate legislation in the

past. Today, when major oil companies cannot pretend to ignore the mounting evidence on human-made climate change and its consequences, lobbying turns toward supporting moderate policies. Most fossil fuel giants now advocate for introducing carbon capture technology. Such 'eco-modernization' goals could have been applicable 50 years ago when the companies just discovered their environmental impact. Today, they are 'too little, too late'. The point is, carbon capture technologies do not threaten the core of fossil fuel businesses. A policy that requires carbon-capturing leaves the extraction and burning almost unaltered while ensuring that fossil fuel companies receive restructuring subsidies.

CONSIDER THIS...

WHY IS INCREASING ENERGY EFFICIENCY CONTROVERSIAL?

Many countries and organizations put increasing energy efficiency as one of their strategies for emissions reduction. The logic of such action explains that a more efficient energy source is cleaner because burning a smaller amount of the source will achieve the exact energy yield. Yet such an approach misses what is commonly known as the **Jevons Paradox**: price decrease driven by higher efficiency stimulates consumption, resulting in higher emissions. You should not consider the Paradox with individuals because people tend not to care enough to, for example, switch to higher energy efficiency in their household. Think big tech companies, resource extraction, transportation - higher energy efficiency, if unaccompanied by additional measures, such as an ecological footprint tax, may result in more space travel rather than lowering emissions.

BUYING A BETTER PLANET

Consumerism has swallowed the sustainable movement: from reusable products to renewable energy, consumers got convinced that buying more but different will solve the environmental crisis while making them trendy. Greenwashing - any activity that claims to be 'green' (sustainable, healthy, organic, natural, planet-friendly, you name it…) when it is not - is primarily a corporate practice, yet it has been culturally conditioned. The consumerist culture that directly contributes to the current environmental crisis also shields the system from social changes. We buy to fix the world. What matters is that we still buy in overly large quantities, and companies find ways to sell us products that are equally bad for the environment (and cheap to produce) under a 'green' label.

In a world where "there is **no such thing** as society", everyone is responsible for their actions. That is the neoliberal mantra. The **dilution** of structural responsibility onto individuals has severe consequences for our mental state and how we approach the environmental movement. Remember, earlier in this module, I laid out that where economic growth is the end in itself, creating profit always comes before creating value. We still live in such a world, despite the growing environmental awareness. It is, therefore, in the interest of big business to carry on its activities as usual. Such companies deploy a myriad of greenwashing actions to convince us to continue buying as usual. All of which aim at covering up the root issue with interim, ineffective solutions. Shifting responsibility on consumers is one of the critical methods. If only we bought more green, if only we cleaned up our plastic trash, if only we refused to fly, we would save the planet. As I will outline in Module 4, such actions are by no means meaningless. Yet, they are missing the root issue. To get the planet off the destruction course, we need systemic changes in the way we produce, consume, advertise, dispose of trash, even what we perceive 'trash' as. These changes are far-reaching and more profound than switching from one product to another. Consider these examples of greenwashing to understand better how persistent it is.

A BIT HELPFUL, A CHUNK NOT

Companies plant trees to balance their environmental footprint. This form of carbon offsetting is one of the hippest (and easiest) ways for companies to seem environmentally friendly. For some, a tree for every purchase is even the way to **get into** 'eco' magazines. Sadly, the connection between planting trees and being eco-friendly is small to the point of non-existent. Carbon offsetting should be the last stage after companies have done everything in their power to lower their carbon emissions. Such lowering can be done in various ways: switching to renewable energy, cutting transportation by moving production closer to the market, and improving machinery efficiency. Planting trees is not one of the ways. It became an environmental fallacy to compensate for any planetary wrongdoing with trees. It seems logical to the general public: trees are pleasant, we like to be around them, and they turn carbon dioxide into oxygen. While this is all true, newly planted, small trees (in relatively small quantities, too) cannot compensate for the environmental losses, which are usually not just about the air quality.

source: *Cartoon Movement*

Cosmetics use organic ingredients. Or so they claim on their labels. Lack of appropriate label and standard regulations is a primary driver of greenwashing. Cosmetics is one of the least regulated industries in that aspect, although it is still far better in Europe than in the US. It could also be that the products are using some organic ingredients, right next to hormone-blockers such as parabens. **Here** is a little guide on how to navigate the world of green cosmetics.

Shops are introducing optional cotton bags. Albert Heijn made me laugh when I saw a cotton baguette bag offered in its bakery section. What a shame all its baguettes already come in plastic packaging. While replacing single-use products with more durable ones seems noble, common sense guides me into thinking that buying more stuff to tackle a problem that stems from (among others) overconsumption is misguided. Indeed, cotton bags only improve an individual's environmental footprint if reused several **thousand** times. Meanwhile, I found at least seven freebies in my wardrobe.

A fast-fashion brand introduces an organic cotton collection. At the same time, the brand continues to overproduce and throw away clothes. It also did not do much to improve the livelihoods of its workers. Finally, organic cotton requires more water and land than non-organic, making it more environmentally costly to produce. Organic cotton is a great solution, but only once the roots of the problem are addressed. The origins are not the materials with which the clothes, or any other consumer products, are made, but rather overconsumption and overproduction. Improving one aspect of a company's supply chain often does not significantly affect, apart from distracting consumers from demanding environmental action.

Greenwashing goes beyond just consumer products. In 2015, Shell **funded** the Energy Transition Commission. One of the first

research questions that the Commission was set to answer was: "How to take zero-carbon energy sources to scale in the power sector? What would it take for these sources to achieve 50% by 2050?" It looks good at first glance. An oil giant researching how to limit its climate impacts? Yet, such an effort is inadequate to the world's climate needs. Halving our use of fossil fuels by 2050 sets the temperature rise on the 4˚C track. To limit global warming to 2˚C, fossil fuels need to make up no more than 20% of global energy needs by 2050. Shell's effort is therefore insufficient and, given Shell's track record in cover-ups and diverting attention, rather untrustworthy.

RECOGNIZE DISTRACTIONS

As this module has shown you, environmental action is a complicated enterprise. There are plenty of factors to consider so that we do not get lost in the sea of half-truths or falsehoods. This holds when we read the news, buy consumer products, or talk to our friends. I hope you are not overwhelmed by all this information. Our distracted selves are the best we can be for those who wish to continue business as usual. This is why we need to stay focused on what is going on. Now that you have a historical, political, economic, and cultural background to evaluate environmental claims and actions, let me move on to initiatives that you can take to make the impact. See you in Module Hope.

MODULE REFLECTIONS

This section aims to put your newly acquired knowledge into practice by engaging in some reflective questions. You can write as little or as much as you want, or just reflect on the questions on your own. I would also be delighted if you decided to share your answers with the learning community **here**.

1. Can you recognize the political bias in this module? Describe it shortly. Do you agree with such a framing of the world?

2. What, in your opinion, would be an effective solution against corporate lobbying?

3. Do you know of any other examples of greenwashing than presented in the module? Describe it/them shortly.

MODULE 4 OR HOPE:
how to stop oversleeping

CONGRATULATIONS ON MAKING IT THIS FAR! IN THIS MINI-COURSE, WE HAVE COVERED THE HISTORY OF ENVIRONMENTAL AWAKENING BY SCIENTISTS AND THE GENERAL PUBLIC; THE INSTITUTIONAL RESPONSES TO THIS AWAKENING; AND SOME OF THE REASONS WHY ENVIRONMENTAL AND CLIMATE ACTION IS NOT AS ROBUST AND DECISIVE AS IT SHOULD BE. BY NOW, YOU HAVE A FAIR UNDERSTANDING OF SOME CRITICAL PROCESSES THAT RULE ECOLOGICAL ACTION AND KNOW SOME IMPORTANT MILESTONES IN THE MOVEMENT. I CAN IMAGINE THAT IT MAY FEEL A BIT OVERWHELMING. IN LIGHT OF POWERFUL SYSTEMIC FORCES THAT DRIVE US TOWARDS THE BRINK OF A CLIMATE DISASTER, CAN OUR ACTIONS HAVE MEANINGFUL RESULTS? THEY CAN, AND THEY DO. REMEMBER THAT 'SYSTEMS' ARE JUST A THEORETICAL TOOL TO EASE OUR UNDERSTANDING OF COMPLEX SOCIETAL PROCESSES. IN REALITY, 'SYSTEMS' ARE MADE UP OF PEOPLE LIKE YOU AND ME, PEOPLE THAT HAVE THE POWER TO CHANGE THE VALUES BY WHICH WE SHOP, VOTE, OR COMMUNICATE.

In this module, we will dive into what we, individually or in groups and communities, can do to have a genuine, long-lasting, spot-on impact on the environmental state of our planet. I will give examples centred around Rotterdam and the Netherlands because I did my research here, but similar initiatives, or even branches of the same ones, exist anywhere. Most of the tips come from **Choiceful Rotterdam**, a blog and solutions database for sustainable living that I run with two unique humans. Hyperlinks will direct you to specific posts to dive deeper into the issues I touch upon here.

CONSUMER CHOICES VS CONSUMER VOICES

But first, a quick recap. You do not bear the responsibility for fixing the planet, nor for planetary destruction. We as consumers are only the end of a system of extraction, production, transportation, retail, advertising, and more. It is those systems that perform and perpetuate the actions that are most harmful to our planet. When I say a 'system', I mean not only corporations that are directly performing these actions but also the legal systems that allow them and economic and cultural doctrines that find the actions acceptable, as we saw in Module 3. Not until the systems transform will we see genuine improvement in environmental care. Changing a whole system feels like a tremendous task - and, to be fair, it is. Yet it is not impossible and, even, already in motion, as I will shortly demonstrate. However, it is also fought against by the very people who will lose their privileged spots if the system changed. One of the most common practices by the biggest of corporations is to try to shift responsibility for the negative consequences of their actions on consumers. For example, Coca-Cola would "surely get rid of plastic bottles" if it was not for "the consumer that demands them". This is the other side of the "buying to fix the world" coin: convincing consumers to change their habits instead of changing the ways of business-making.

source: *Rob Rogers*

This means that you should not torture yourself with your sustainable lifestyle, nor should you substitute environmental action with sustainable purchases. Living sustainably should take collective action to pressure those with more significant direct impact. Consumer choices matter as a collaborative task of sending a message to corporations. It **takes** about 3.5% of a given group (population, audience, target consumers) to change practice (of a government, brand, corporation). 3.5% of a population gathered in a collective singular pro-environment demonstration will impact more significantly than 3.5% of consumers switching to thousands of different sustainable brands.

So if you buy a bottle of water after a climate march, you are not a hypocrite (I mean, try to bring your bottle, of course, but emergencies understandably happen). It is a well-established method to discredit environmental activists for some petty everyday actions, such as buying the 'wrong' product or travelling the 'wrong' way (primarily, by plane). Such criticism is misplaced - activists are still part of the same world as non-activists and need to obey the rules of what is available and not. Singular 'unsustainable' behaviours do not discredit a long-term striving for a better world. Yet, for businesses, this goes the other way round - if a company tells you they are sustainable because they use **Ecosia** and reusable cups, you can suspect something is not quite right (hint: it starts with 'green' and ends with 'washing').

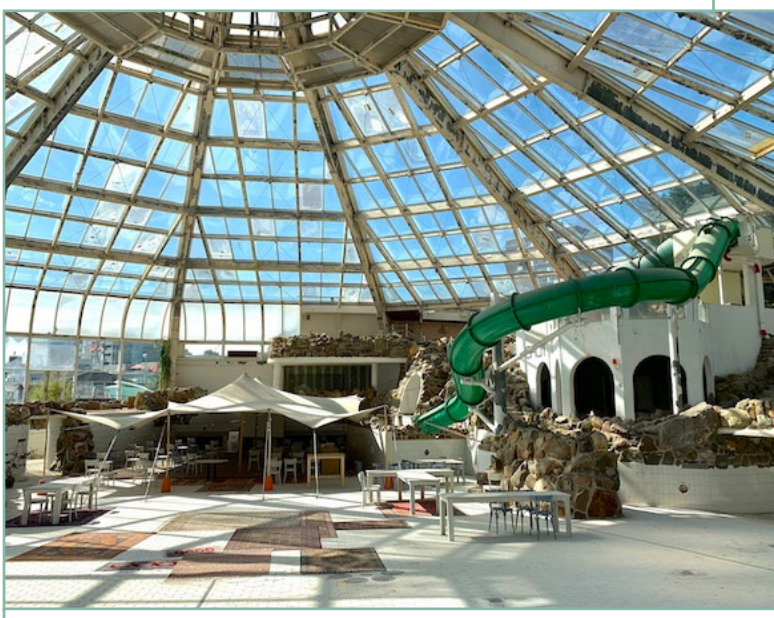
However, a focus on a sustainable lifestyle can prove crucial in one aspect: to help you deal with climate anxiety. If you feel overwhelmed by all the bad news around you, keeping your house sustainable can make you feel better. If it does, go for it. If not, that is okay, too. The point is: sustainable lifestyle choices are not crucial in the long run and will only work if combined with diverse, collective actions.

START LOCAL

For a start, let us go local. Meeting the sustainable community in your city allows you to learn about hands-on approaches, share and deepen your knowledge, and meet like-minded people. This, in turn, can get you inspired to come up with your sustainability initiatives (if you need support with these, check **Impacton** out). Besides, it makes you feel less alone in the sustainability struggle and can help you meet lifelong friends. Finally, exploring your local, sustainable options is a great way to get to know the city, especially if you only recently moved. Rotterdam, for example, is filled with talks, swaps, workshops that allow you to master a variety of skills and deepen your knowledge on different topics (that is, when a nasty virus is not going around).

Not to look far, **Erasmus Sustainability Hub** organizes events that touch upon social and environmental sustainability in areas such as food production, fashion, social inclusion, or gender issues. The cool thing about ESH is that they foster dialogue between very different groups, for example, mixing an Extinction Rebellion member with an employee of a big corporation in a discussion on green transformations. Besides, they are an umbrella organization for all sustainable initiatives at Erasmus University.

If you are looking for hands-on experience on how to do things differently, **BlueCity** by the Maas river is an exciting spot to visit. An old swimming pool **turned** a centre for circularity, BlueCity is home to around 30 social enterprises as well as a dry and a wet lab and, most recently, a food lab. The hub's collective goal is to re-define waste as a yet unused resource. Their talks and events touch upon the bio-based and circular economy.



source: *Zuza Nazaruk*

Events are a great place to meet people, so what about an event dedicated solely to that purpose? **Cambridge Innovation Centre** by Rotterdam's Central Station organizes Thursday gatherings weekly in collaboration with Venture Cafe. There, you can meet various social entrepreneurs, not only in the field of sustainability, as well as join interesting talks and workshops. CIC is a worldwide brand with offices in Warsaw, Tokyo, Cambridge, and various American cities.

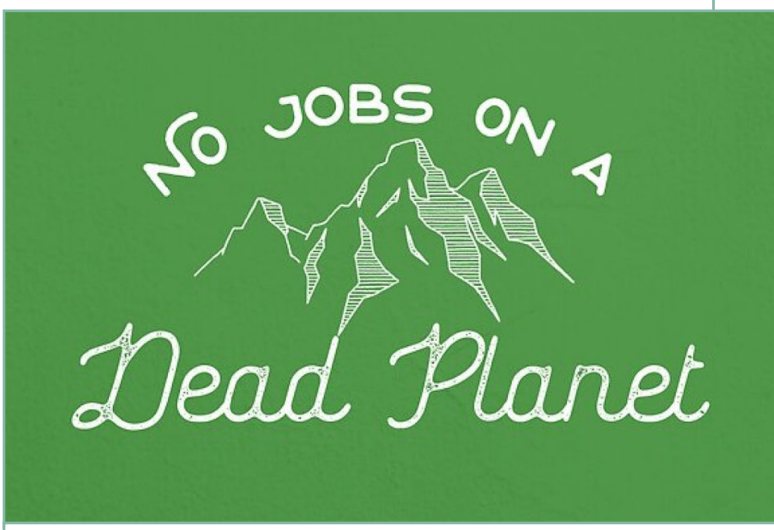
Were you looking for something smaller-scale and more directly impactful? Reach out to **Groenten Zonder Grenzen**, a local group dedicated to saving food. In pre-Covid times, GZG used to collect leftovers from the marketplaces and cook a collective dinner. Initially, during the pandemic, they set up a scheme to pick up leftovers from marketplaces and supermarkets and deliver them to those in need. In spring 2021, they slowly come back to their weekly cooking activities.

DEMAND ACTION

Whenever you see anyone whose impact can be more significant than yours alone, demand action. Ask about sustainability in your workplace. Is it taken into consideration? What changes can be made to accommodate a more sustainable way of working? You will be riding a wave of environmental awareness, so it may well be that your managers only need a little push. Some summers ago, I worked in a pop-up restaurant by the Maas river. Water for the staff came in half-litre plastic bottles lying around just about everywhere in the staff area. I asked the manager generally whether he cares for sustainability, and he immediately pointed at the bottles. The next time I worked there, he proudly showed me that he switched staff bottles from plastic to large, returnable glass ones. In the context of a few summer months and several dozens of employees, this change mattered.

If you are a student, take a look at your curriculum. Does your university pay enough attention to educate its students about the greatest challenge of our time? Demand more focus on environmental issues if you answered negatively. Ask your tutor, your dean, your course coordinator what can be done to talk about the environment more. With such an all-encompassing issue, the possibilities are endless: incorporating the environment in economics classes, policy-making courses, arts and culture… there is room for every profession in the environmental struggle (but there will not be on a dead planet).

You can also demand action by working with or volunteering for an environmental organization. The lines between advocacy and activism are blurry here, so I have decided not to make a particular distinction between the two. Environmental movements tend to be supra-political, meaning they call for coming



source: *progprints*

together regardless of one's political ideas. With the recent proliferation of engagement and activism, perhaps most notably among the youth, environmental movements have risen in prominence. Politicians take notice of their demands and sometimes incorporate them into their policies. For example, the new small plastic **bottles** and **cans** deposits that will be introduced in the Netherlands in, respectively, June 2021 and January 2023, were driven by a collaboration of NGOs. **Recycling Netwerk Benelux**, advocating for a re-thinking of our waste streams, was among them.

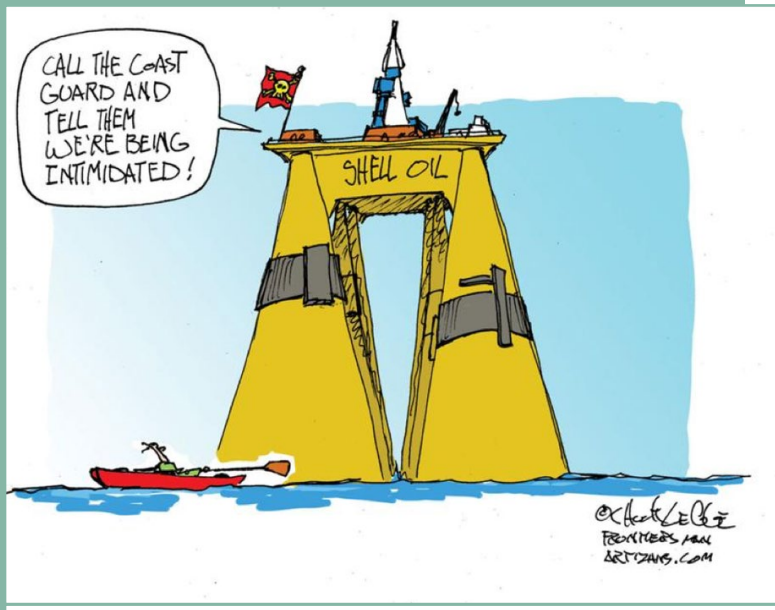
In Europe, **Extinction Rebellion** is one of the most prominent environmental activist organizations. XR demands that politicians act quickly to reverse biodiversity loss and bring greenhouse gas emissions to zero by 2025. Progressive ideas also accompany their political program, such as creating a Citizen's Assembly. XR is organized in various groups, some of which focus solely on well-being and arts. Their actions range from organizing demonstrations and lobbying to carrying out information campaigns. **Sunrise Movement** focuses on similar goals and with similar methods across the ocean.

If you are looking for something close to home, consider getting involved with **Changerism** - a Rotterdam-based interdisciplinary think-tank focused on finding solutions to pressing environmental issues. Or take a look at **Plastic Soup Foundation**, a Dutch NGO focused on fighting plastic pollution in the oceans.

Finally - vote green. Demanding action in a voter ballot is key to bring about change on national and supranational levels. Green political parties entered the political mainstream in almost every European country. Environmental issues also reach the proposals of other parties. The political Green made significant **gains** during the 2019 EU parliamentary elections, reflecting that more and more people treat environmental issues as necessary in their voting choices. Interestingly, the Green parties often offer a sharp **turn** from the old-school, established ones, bringing about progressive ideas on global equality or economic growth. So, for the well-being of the planet - vote green.

CONSIDER THIS...
SHELL'S LOVE AFFAIR WITH ERASMUS UNIVERSITY

What would an oil giant like Shell do at Erasmus University? It turns out that it influenced the curriculum. A 2017 **report** by Changerism showed the ties between fossil fuel giants and Rotterdam School of Management. The study revealed that Shell and BP have been on RSM's advisory board and helped formulate its strategy. A 2012 partnership contract between RSM and Shell outlines that the oil company will be allowed to influence the design of the curriculum and the profile of students admitted to the Bachelor and Master programmes. According to the agreement, Shell will shape the students' understanding of the company by inviting speakers and guests for various courses. Individual professors are also involved with Shell. For example, in 2008, RSM professor Henk Volberda led a research project that advised the government to reduce tax for multinational companies. The research, which later served as the basis for government tax reforms, **received** 300,000 euro from Shell. Another professor, Cees Van Riel, has supported Shell with 'reputation management' tasks through his private firm. The professor's journal also featured articles by Shell. Besides, several fossil fuel companies, such as Shell, ExxonMobil, GasTerra, and GDF Suez, all paid RSM for advice on fostering public acceptance of gas drills, which drive public controversy due to their damaging socio-environmental impact.



source: *Frontiersman*

Multinationals' involvement with a publicly-funded educational institution is a pretty damning finding. Primarily, it raises questions about the institution's academic integrity. The report met with an intense backlash from RSM's management and contributed to Erasmus University's re-thinking of their institutional ties.

Findings like these show precisely why we need to demand action.

KEEP ON LEARNING

Environmental science is filled with myths and half-truths, amplified by the rise of social media, so it is ever more critical that you know what is going on and distinguish the truth from the noise. This matters for you and those close to you that you share your knowledge with. A sound understanding of environmental matters can go a long way.

If you are looking for a structured approach to learning, look at the **SDG Academy**. An open-source educational program for the United Nations, the SDG Academy offers various self-paced courses ranging from general knowledge on the science of climate change to specific lessons about, for example, water management or climate ethics. All courses are free of charge. Online education platforms such as Coursera, FutureLearn, or EdX also offer various environmental courses from universities and think tanks for a reasonable price.

Staying in touch with the latest environmental developments is a part of learning. Indeed there is much to keep up with, considering that ecological issues encompass politics, economy, technology, culture, and just about any other aspect of our societies. If you do not have it yet, you will develop an interest in a specific part of environmentalism with time. Hopefully, my list of environmentally-related news outlets will help you find your sweet, sustainable news spot.

For general news on the environment, check out *The Guardian*. Its **Environment** section includes various sub-sections such as 'The Age of Extinction' that focuses on biodiversity and conservation, or 'Animals Farmed' that outlines eponymous issues. Although it often focuses on its native Great Britain, I find The Guardian a reliable source of well-researched environmental news. I particularly like the fact that they always search for good news. *Al Jazeera's* **Climate News** is also valuable, although you need to keep in mind that AJ is at least in part sponsored by the oil industry.

For scientific discoveries and research, you may want to turn to **Nature**. This sciences giant publishes several journals, articles, features, and analyses. You can browse by subject or by region. It is an excellent source for sound fact-diving. **Scientific American** is another great science journal/publisher, although, as the name suggests, it has a particular focus.

If you are set to learn about the natural world, conservation- and biodiversity-focused global news outlet, **Mongabay** will be of your interest. They deliver news in several languages and focus on forests, wildlife, oceans, and the conversation sector at large.

"Less freaking out, more figuring out" is the mantra of **Grist**. They cover topics like clean energy or environmental justice in in-depth features. **Treehugger** brings you the freshest of sustainable lifestyle news. Their goal is to drive sustainability mainstream.

For fans of all things printed, check out **It's Freezing in LA!**, a slow journalism magazine on sustainability in culture and society. On a cultural side of things, **The Earth Issue** gathers artists and writers to speak up about environmental and intersectional activism issues.

There is an ever-growing interest in environmental issues. You can learn a great deal from a medium of your liking. I compiled a little (growing) resource list with books, podcasts, and movies. You can view it **here**.

CONSIDER THIS...
THE OCEAN CLEANUP

With a better understanding of environmental science, you can critically evaluate sustainability initiatives. It is accessible in the case of more-or-less straightforward corporate greenwashing. What about initiatives that not only seem sustainably all right but are close to top-stars? The Ocean Cleanup, an initiative that originated at Delft University and swept the world, is a good example. The organization's premise is to clean up water basins - first oceans, now rivers - from plastic pollution. What can be **wrong** with that? Primarily, the fact that millions of euros flow into developing a technology that does not address the root cause of pollution in any way. Clean-up initiatives allow for continuing 'business-as-usual' while leaving the general public feeling that something is being done. Besides, machine cleaning is likely to harm wildlife, either directly by catching it in the net or using not-so-bio-friendly boat conservation materials for which there is no alternative. As oceanologists and wildlife conservationists point out, it is far better to keep the plastic out of the water in the first place by reducing its production and use.

REDUCE, REUSE, RECYCLE

Lastly, let us talk about our consumer habits. The one-word solution to living more sustainably is: reduce. Buy less, waste less. The zero-waste mantra goes: reduce, reuse, recycle, precisely in this order. Get less in the first place, try to repurpose the goods that you will not use anymore, then, very lastly, recycle. Do not throw away anything to make space for sustainable counterparts; such behaviour is as opposite of 'sustainable' as it can get. Remember: the most sustainable is what you already have. Below you can find ways to live sustainably (and thrifty).

source: *Choiceful Rotterdam*

Food

The current food production system is broken in several ways. According to the UN Food and Agriculture Organization, **FAO**, one-third of all the food produced globally goes to waste. That amounts to 1.3 billion tonnes per year. The number includes 'lost' food – during harvest, transportation or production – and 'wasted', a term that describes food that is fit for consumption yet ends up in a trash bin. Now let me zoom in on those terms for a second. Food primarily gets 'lost' in distribution centres or supermarkets, where it does not fulfil certain 'beauty' or 'freshness' standards. There are very particular rules to what size, colour, and stage of growth a vegetable or fruit needs to reach a supermarket (I interviewed a distribution centre worker a while ago, you can read it **here**). Once it reaches a store, the fact that production is so distanced from consumption means that consumers do not feel the effort to grow a single vegetable (let alone breed an animal), so we are more inclined to throw away food. Our convenience to get fresh food in every season and almost at any time comes at a high-waste price. Then, of course, there is the plastic packaging question.

Fortunately, more and more places try to face the challenges of the food supply chain. Greengrocers **offer** products bought on a special auction for supermarket rejects. **Oogst Market** and **Rechtstreex** allow consumers to buy directly from a local farmer, the former every other Saturday in Rotterdam Noord, the latter online and not only in Rotterdam. Organically grown food can be found in organic supermarkets **EkoPlaza** and **Gimsel**. All these shops also offer organic meat. Remember, you do not have to torture yourself for the planet - reducing meat and sourcing local and organic is just as noble as going vegetarian or vegan.

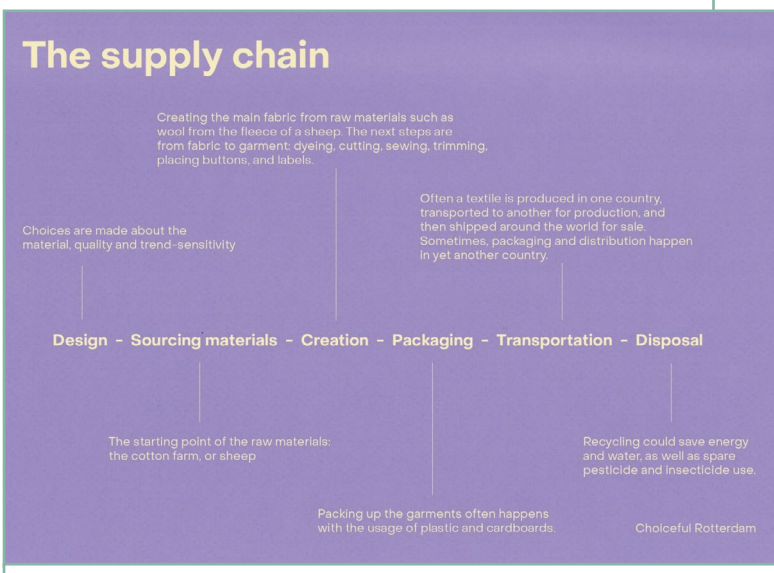
Some social enterprises find creative, unconventional solutions to food waste while promoting the circular economy. **RotterZwam**, located in the BlueCity, grows oyster mushrooms from coffee grounds. Another BlueCity-based enterprise, **Vet & Lazy**, is a circular beer brewery that releases seasonal beers with often hilarious names. A phone app **Too Good To Go** is a marketplace where you can buy a 'Magic Box' from various restaurants and supermarkets. The box contains surprise goodies that venues cannot sell anymore for a reduced price.

To reduce your plastic use, shop 'naked' or bring your bags. You may inspire other shoppers if they see you with your stock. Oh, and for that, there is no need to buy special cotton bags - we all have just about tons of plastic bags in the house; these will do well. Remember, reduce and reuse! Rotterdam-based webshop **Pieter Pot** found an innovative solution to plastic packaging - the orders from their shop come in glass jars that the employees pick up with the following order.

Once you got your groceries, it is time to think about ensuring there is no spillage. Try to spend some time observing your eating habits to understand how much food you need per week, then shop accordingly. Ensure you store your food correctly; for example, do not put onions or tomatoes in the fridge. You can find tips on storage **here**. Learning the difference between 'best before' and 'use by' is also crucial for preventing food waste. By taking a less rigid approach to labels and relying on your senses instead, you can save a lot of still perfectly edible food.

Clothes

Only the oil industry pollutes more than the clothing one. Clothes' supply chains are long and often transcend various countries, making garment production account for 10% of global greenhouse gas emissions. Growing textile materials also requires enormous amounts of water and usually involves harmful pesticides. Although this statistic does not count for synthetic materials such as polyester, these textiles, on the other hand, release microplastics in the wash. Worst of all, as much as 20% of produced clothing - so the energy, human effort, and pollution - goes to waste. Most are never recycled.



source: *Choiceful Rotterdam*

Reducing the number of new clothes you buy can help reduce this waste. The primary way to do this is to prolong the life-cycle of the clothes you already own by taking good care of them. To do so, it is a good idea to know what **material** they were made of and how to gently **clean** them and learn how to sew and repair the clothes.

There are plenty of ways to refresh your wardrobe without buying new clothes. Second-hand stores (or apps like Vinted or websites like **Marktplaats**) are the most popular option, but the recent hit is the swap shops. In Rotterdam, there is one in **De Wasserij** and the city centre. Erasmus Sustainability Hub sometimes organises clothing swaps as well. Due to the participating demographic, swaps often include more contemporary clothing styles than thrift shops. Sustainable fashion brands are on the rise as well - you can find a list of some I found, as well as a selection of second-hand stores and apps, **here**.

Discarding your old clothes appropriately is an integral part of moving towards sustainable fashion. The best option is to bring them to a swap shop, sell them online, or give them away

CONSIDER THIS...
HOW MUCH DO CHEAP PRODUCTS REALLY COST?

True-cost accounting **means** adding social and environmental costs into seemingly cheap products. By putting a monetary value on non-immediate costs, economists can assess the impact of cheap products. Lower prices usually mean higher socio-environmental costs that were omitted through exploitation. Let us take a closer look at a few cheap products.

A beef burger

- a single burger may need **up to** 2,500 litres of water for production
- feeding the cows contributes to deforestation, which in turn leads to higher greenhouse gas emissions as well as biodiversity loss
- cows are one of the biggest single **contributors** to methane emissions
- cattle farming takes up extensive amounts of land and contributes to soil degradation and water pollutions
- cows are fed **antibiotics** which increase antibiotic resistance
- the International Agency classifies processed meat for Research on Cancer, a WHO subbody, as equally carcinogenic as tobacco, asbestos, or arsenic
- small family farms disappear, unable to compete with big corporations

More on the health costs of cheap groceries: **"What the Health"**

A T-shirt

- it takes 2,720 **litres** of water to produce a single T-shirt
- although cultivating cotton takes up only 3% of the world's arable land, the industry is responsible for 24% of **pesticide** use
- cheap fashion relies on outsourcing labour to developing countries, where **employees** are paid starvation wages, often child labour occurs, and there are barely any safety regulations in place
- as a result, fast fashion deepens social inequalities

More on the social costs of T-shirt production: **"The True Cost"**

A bottle of soda

- it contains half of the Mendeleev table, all kinds of colourants and additives
- it **increases** consumers' chances for diabetes, cancer, obesity, and dental issues
- plastic producers do not need to clean up after themselves, so the trash often ends up in the oceans
- Coca Cola, Nestle, and others overexploit local water resources in southern countries, causing shortages for the people living there

More on plastic trash: **"Plastic China"**

If we consider these hidden costs, the price of our food may even double. Dramatic as it may be, maybe the world's wealthiest countries would stop wasting consumer products in the amounts we currently do.

to your friends. However, some textiles may be too used or destroyed to give them a second life. In that case, you can repurpose them - for example, turn T-shirts into cleaning cloths - or bring them to an appropriate recycling point. For example, the sustainable fashion store **Studio JUX** takes in old jeans. Finally, you can leave your textiles in the designated clothes container - you can find the rules of textile disposal **here**.

Electronics

The wastefulness of electronic devices comes from every part of their life cycle. A vast majority of laptops on the market are produced in China. The growing geopolitical giant has eliminated most obstacles to making quickly and cheaply, which means that the country's environmental and social regulations are lax. As a result, the business of extracting minerals and transforming them into usable device remains extremely dirty, especially as electronic devices require very polluting **rare Earth** metals. Once on a "Western" market, electronics usually reach a short lifespan due to so-called 'planned obsolescence'. The speed of innovation combined with relatively low prices of new devices and the difficulty of fixing broken ones drive consumers to replace their electronics quickly. The average time in which one laptop is in use is four years. This is a meagre time for the amount of carbon dioxide emitted (between 882.2 kg and 925.2 kg) and water used in its production (6,500 litres per laptop, added to the carbon footprint). Besides, today, the amount of e-waste rises three times faster than the world's population, with 90% of this waste dumped illegally. Electronic waste intoxicates the environment and is dangerous for those who engage in semi-recycling, primarily women and children from developing countries. If you want to read more about these issues or check my numbers, **I wrote an article** that compares reading digital and paper copies.

By now, you can probably guess the magic action that you can take to lower the socio-environmental burden from electronic appliances. Reduce! Keep your devices for longer, repair them when needed. The most sustainable is what you already have. Sell those you do not use or give them away. Only recycle in the last instance, and so in an appropriately marked recycling spot. Try to buy devices second-hand - several post-leasing shops offer high-quality refurbished gear. If buying new is your only option, consider **Fairphone** or look for sustainable laptop brands.

CONSIDER THIS...
DOES GOING PAPERLESS SAVE TREES?

The short answer to this question is, "It depends". Although the buzz goes that digitally read documents are more sustainable than paper ones, the statement gets fuzzy in light of meticulous calculations. The carbon footprint of laptop production is the most significant culprit for why digital is not necessarily all so sustainable. While emissions from using a device or internet activity are slim (unless you are streaming videos), those released in production cast a shadow over the sustainability of digital reading (as you saw above, it's nearly a ton per laptop). On the other hand, paper copies are primarily 'guilty' of printer production. Yet, the printers are used by various consumers and for longer, so the emissions fall with time. Then, the paper is with humans for so long that we have learned to not only produce it sustainably but also recycle it properly, which, as you saw in the previous article, is still far away in the case of electronic devices. In the end, the context of your document reading matters. After all, a printed document only needs printing once, while a digital one constantly uses energy for display and power. So, if you only read a document for yourself, it is better to do so on a screen. Suppose the paper copy will circulate to several people, the multiple-use balances out the emissions. These calculations are all rather complex as they involve making several assumptions. The analysis I **did** is called a "life-cycle assessment" and is a fascinating, although time-consuming, way to understand the environmental footprint of any product.

YOU MADE IT!

Congratulations! You should be very proud of yourself for (almost) finishing the whole Melting Hot course. I hope you found this information useful and that your newly acquired knowledge will motivate and encourage you to get engaged with environmental action.

It is a life mission; the most crucial challenge humanity has faced, and, ultimately, a test to our collective values. We have the knowledge and innovation to make the green transition happen. You have the skills and the heart to join in. Good luck - I am rooting for you.

MODULE REFLECTIONS

This section aims to put your newly acquired knowledge into practice by engaging in some reflective questions. You can write as little or as much as you want, or just reflect on the questions on your own. I would also be delighted if you decided to share your answers with the learning community **here**.

1. Of all the solutions presented in this Module, which one do you find the most effective and why?

2. What criteria would you use to evaluate whether a business is truly sustainable?

3. Research one product you use daily. Considering its social and environmental impact, how much does it really cost?

Before you sign off and change the world, let me recap the most important terms and points of the course to refresh your memory.

MODULE 1

- The environmental crisis we are dealing with today is, to some extent, a consequence of the population growth and the wealth growth of a small part of this population that took place post-World War Two.
- It is important to remember, however, that in that time, life got better for large parts of the global population, with the advancement in medicine and poverty reduction.
- Several events happened in the 1960s until the 1980s that opened the world's eyes to the dangers of innovation. Nuclear testing was one of them, increasing the concern about nuclear fallout and subsequently giving birth to one of the world's largest environmental organisations, Greenpeace.
- Another environmental milestone was the scientific agreement on calculating global warming. By 1988, scientists discovered that doubling the carbon dioxide in the atmosphere results in atmospheric temperature rise by 1°C.
- That same year, the world's climate prediction maker, the IPCC, was established.
- Chemical disasters helped to increase environmental awareness as well. One of the most prominent environmental books until today, Rachel Carson's "The Silent Spring", dealt with the issue of chemical pollution brought by DDT, which proved deadly for biodiversity.
- Although oil spills have been happening since 1903, with some very prominent ones in the 1960s and 1970s, an oil embargo during the 1973 October War made the West realise its over-reliance on fossil fuel.
- In 1972, a group of scientists known as the Club of Rome published a report titled "Limits to Growth" that showed that Earth's resources are finite. The report was discredited both by the politicians and parts of the public.
- Scientists warned humanity in 1992 in an eponymous article. They urged the world to take action to prevent damage that would make our planet unlivable, highlighting several areas for change. In 2017, the second notice of Scientists' Warning to Humanity highlighted that the world has failed in addressing all the issues from the first notice apart from the ozone layer.

MODULE 2

- International agreements over climate are highly complex and so not particularly successful.
- The term "sustainability", or rather "sustainable development", first appeared in the Brundtland Commission's report from 1987. It remains a benchmark definition for many climate policies.
- The first global climate conference took place in Rio de Janeiro in 1992.
- During the conference, the UN Framework Convention on Climate Change was adopted, laying grounds for future climate agreements.
- In 1997, the world leaders adopted the Kyoto Protocol. It came into effect in 2005, with the first commitment period in 2008.
- Based on the principle of common but differentiated responsibilities and respective capabilities, the Kyoto Protocol obliged 37 industrialised countries to limit their emissions.
- The Kyoto Protocol was the only international climate agreement to date with binding targets.
- The US never ratified the protocol, denouncing unfair competition against countries that faced no obligations. Other industrialised countries withdrew, so the second commitment period never occurred.
- Global emissions rose by 32% between 1990 and 2010.
- The Paris Agreement was adopted in 2015. It requires countries to perform a collective effort to keep the global temperature "well below" 2°C, but it has no binding compliance mechanisms in place.
- Subsequently and despite ambitious targets set by the Paris Agreement signatories, the world is currently moving towards a 3.2°C increase by 2100.
- The consequences of 1.5°C and 2°C warming differ significantly, with respective implications for our livelihoods.
- The EU's climate policies are among the earliest and most ambitious globally, yet the EU has been widely criticised for not acting fast enough.
- Greenhouse gas emissions and global warming are not the only, or even the key, issue in the environmental struggle.
- COVID-19 can act as a policy window for introducing greener options on a city- and country-level.

MODULE 3

- The neoliberal reforms in the 1980s gave corporations more power and reduced governments' power.
- Today, most of the world's production is outsourced to the global South, where environmental and social regulations allow for cheap production costs at the expense of the workers and the environment.
- Shell's actions in the Niger Delta are a grim demonstration of what happens when so much power is given to corporate actors. Despite destroying the natural landscape and, subsequently, people's livelihoods and health, the fossil fuel giant has so far managed to avoid responsibility.
- The rise of consumerist culture means that convenience guides our choices more than awareness about wrongdoings somewhere far away from us.
- Fossil fuel giants have engaged in a systematic disinformation campaign to sow doubt on the scientific evidence that their actions warm up the planet.
- The media played their part in climate denial by appearing "unbiased" when climate awareness was rising and then presenting overly catastrophic coverage.
- The neoliberal turn made money-making, not public interest, the key objective for many journalistic outlets, further decreasing the quality of coverage.
- Despite the two points above, the media remains an essential source of information - you just need to know how to evaluate what you are reading.
- Climate scepticism is partly a result of the 'doubt campaign' by fossil fuel companies. Yet even climate denialists can be convinced if you approach them with the right attitude.
- Lobbying is largely responsible for climate inaction on a national level. Fossil fuel companies invest enormous amounts into lobbying while making environmentally-friendly claims.
- Greenwashing and the belief that we can "buy a better planet" are a real danger to practical environmental action on an individual level.

MODULE 4

- The most effective environmental action that an individual can undertake is engaging in diverse, collective activities.
- Getting in touch with local initiatives is an excellent place to start. It allows you to meet like-minded people and learn about the environmental actions in your area.
- We have to demand action, everywhere and always: at our work, university, from our governments. There are various ways to do so: direct talks, petitions, voting.
- In 2017, a Rotterdam-based think tank, Changerism, revealed that Shell and other fossil fuel companies were financing the Rotterdam School of Management and had a say in the school's curriculum. This is why we need to demand action.
- Keep on learning - through online courses or staying up to date with environmental news. Expanding your knowledge allows you to critically evaluate organisations and claims and spread this knowledge in your circles.
- Clean-up initiatives are not necessarily good for the environment. You learn this by keeping on learning.
- The best you can do in your everyday life is to use less.
- Cheap products are subsidised with our and our environment's health.
- You are a rockstar for finishing this course

Thanks for reading.

If you liked the course,
make sure to
join its learning group.

You can also email Zuza at
zuzanazaruk@gmail.com.

See you on the journey
to fix the world.

design by **Laurens Borsboom**