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We4 Change
Girls and Women Connecting for Environmental Change

We4Change: Girls and Women Connecting for Environmental Change

We4Change Changemakers Event Curriculum

Presenting: Girls and Women for Sustainable Consumption

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Girls and Women Connecting for Environmental Change

We4Change *"Girls and Women Connecting for Environmental Change" is a project funded under the Erasmus Plus programme of the European Union that aims to contribute to the EU Youth Strategy by engaging, connecting and empowering young girls and women with digital and innovation skills, increase civic engagement and unlock their changemaking potential to engage in society and have an active role in addressing the challenges posed by climate change. More information and educational resources can be found at http://we4change.eu/*

Table of Contents

What is climate change, and what is driving it? 3
Global greenhouse gas sources 6
What are the consequences of climate change? 7
What can be done to reduce emissions? 10
Individual actions to reduce consumption 13

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What is climate change, and what is driving it?

First and foremost, we need to understand what is changing exactly when we speak of climate change. No better way to do it than to first know what exactly is the climate. A good way to exemplify it is to differentiate weather and climate. Weather is the day-to-day state of the atmosphere and its short-term variation that ranges from minutes to weeks. Simply put, it is the information that the weather people provide us every morning - humidity, wind, temperature and so on... The climate, however, is a long-term account of the weather patterns, usually on a longer period of a minimum of 30 years. In other words, it is the information on weather patterns that allow you to know what to expect from seasonal weather throughout the year, and know which type of clothes to keep in your closet to face the weather in each season.

Now, to focus our attention on where all of this takes place: the atmosphere. The atmosphere is a complex and layered space that revolves around planet earth, composed of several gases that are fundamental to guarantee a liveable planet and where, amongst other, meteorological phenomenon takes place.

The greenhouse effect

A lot happens in the atmosphere, and the most important regarding climate change is the greenhouse effect. The greenhouse effect is a natural process that prevents us from freezing here on the planet. Without it the temperature on the surface of the earth would be -18C°.

This effect is like the workings of a greenhouse, hence the name. Solar radiation passes through the atmosphere and is absorbed by the earth's surface, which re-emits the radiation at a lower wavelength in the form of infrared (IR) radiation. This IR radiation is thermal radiation, that is, it causes an increase in temperature. This radiation is emitted by the Earth's surface into space but is captured by certain gases present in the atmosphere, which have the ability to absorb and re-emit it in all directions, including back to Earth. Thus, a layer with constant thermal radiation is formed, which does not immediately escape from the Earth, heating its atmosphere. This is exactly what happens in a greenhouse, where light passes through the glass, hits the ground, which heats up and radiates back from the IR radiation, which is retained by the glass, heating the interior of the greenhouse.

Greenhouse gases (GHG) are responsible for heating the atmosphere and the surface of the earth. Carbon Dioxide (CO2) is probably the most familiar since it is the more well-known, however, it is not the only GHG. The Kyoto Protocol groups the following gases in the category of the GHG:

- Natural - and by natural we mean that they exist naturally in the atmosphere and come from natural/anthropogenic environments: Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (NH2);
- Synthetic - created by us: HFCS - Hydrofluorocarbons, PFCS - Perfluorocarbons, SF6 - Sulfur Hexafluoride.

GHG come from a wide array of sources. Carbon Dioxide is the most abundant in the atmosphere and comes mostly from the burning of fossil fuels in transportation and industrial processes, as well as from forests and other land uses (such as agriculture, for example). Methane is generated by waste but mostly from agriculture and livestock activities, as is the case of nitrous oxide which mostly comes from the use of fertilizers. Fluorinated gases are mostly generated in industrial processes and refrigeration, our air conditioners and fridges as examples.

We learned these gases are responsible for heating the atmosphere and the surface of the earth. But each of these has different chemical properties and thus has different “warming” potential - meaning, some “trap” more heat than others. To simplify, the warming potential of each gas is determined in relation to CO2, the baseline of this measure. So, when we say that methane has a global warming potential of 28, it means that one kg of methane warms the atmosphere as much as 28 kg of carbon dioxide, and so on. On this scale, we can understand that sulfur hexafluoride, the last gas on the table has a warming potential as the same as 23500 kg of carbon dioxide, so if we think about the distribution of quantities, it is best to have the least amount of these gases with a greater global warming potential.

Another baseline measure concerns emissions comparison. For this, the metric utilized is the CO2 equivalent. A carbon dioxide equivalent or CO2 equivalent, abbreviated as CO2-eq is a metric measure used to compare the emissions from various greenhouse gases based on their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming. So, make it easier on our understanding, when you hear or read in media, or other information sources about carbon dioxide emissions, it actually comprises of a lot more gases than just carbon dioxide.

Now we've learned how the temperature of the earth is maintained at a global average of 18°C that prevents us from freezing. And how does it relate to climate change? There can be too much of a good thing. And that is true for the concentration of GHG in the atmosphere.

Since the industrial revolution in the 19th century, and as the global economies progressed and developed, so did the GHG emissions, and today CO2 is being released into the atmosphere faster than ever before, at least for the last 66 million years. Today, carbon dioxide is being released into the atmosphere faster than ever before, at least for the last 66 million years.

The carbon dioxide emitted to the atmosphere does not stay in full there. There is a balance of absorption and emission of carbon dioxide... This balance is maintained by what it is called "Natural sinks". The natural sinks in the earth are the forest and the oceans, that abosrv the CO2 in the atmosphere via photosynthesis. However, we have surpassed the absorption capacity of these sinks, so a lot of the CO2 emitted is being accumulated in the atmosphere.

Variations on the concentration of CO2 in the atmosphere is a cyclical occurrence and are expected, as it has happened throughout the millennia. These variations coincide with the earth's glacial periods and warmer periods. But what we registered today is an unprecedented record-breaking concentration of CO2 in the atmosphere.

And the concentration is increasing at an exponential rate. 417 parts per million may not look like a lot, but if we bring average temperature differences from the previous century, we can see a correlation between it and the increase in CO2 in the atmosphere.

If we take the whole globe into account, as some NASA graphics illustrated in the presentation, we can clearly see a tendency of the temperature to increase since the 19th century.

Today, in the 21st century we are reaching record-shattering temperatures, with these records all concentrating in this century alone, which supports this temperature increase tendency.

When the matter of climate change started emerging, some doubts were cast. First over the certainty of this since, as we've seen before it is common to have cycles of warmer and colder periods. And the second, over the human influence on said warming of the globe. This has been cast mainly by large economic groups that are vested in keeping things as they are, also known as a business-as-usual approach. But there is unanimous consensus amongst

scientists on these two questions raised before. The IPCC – The Intergovernmental Panel on Climate change is comprised of top experts on climate science that release every 4-5 years reports that are considered the most important documents on the matter, and they are unanimous on the human influence on climate change, and the necessity to act on the climate crisis. António Guterres, the United Nations Secretary-General classified the latest IPCC report as a "code red for humanity".

Not all emissions are evenly distributed through the countries. In fact, nowadays more than 60% of global emissions come from only 10 countries. The economic disparities between countries are reflected on countries' individual emissions since emissions are intrinsically connected with economic development. The current emissions panorama encompasses the richest countries and countries with emerging economies, such as China and India, as the top contributors to global carbon emissions..

However, on the debate of emission reduction the question arises on how to distribute the reduction in an equitable and fair manner – since developed countries had the chance to grow their economies, shouldn't developing countries have the same opportunity? This is the case because if we look at the historical panorama on cumulative emissions, the ranking of the top emitters shifts.

Although the biggest part of global GHG emissions belongs to only 10 countries, the vulnerability to and risk to climate change is not proportionally distributed between the biggest contributors to emissions. We can look at the case of Mozambique or the countries in Central America, that has a residual contribution to carbon emissions but are some of the most vulnerable to climate change. Brings light to disparities and inequality between the biggest drivers of the climate crisis, and the ones that have contributed the least but nonetheless suffer the consequences and often have the less economic capacity to react to the extreme weather events.

Global greenhouse gas sources

Let's narrow the scope and look at the emissions by source. [You can ask the audience to reflect on the main sources, and even ask someone to share their thoughts.]

One thing to be aware of is that the source data may vary. Some analyses focus on different categorizations of the sources – for instance in the case of energy, which can be considered a broader category that includes electricity production, buildings, and transportation. The characterization of emission sources in the chart was devised by the Fifth assessment report produced by the IPCC in 2014. It may be subject to change when the 5th report is released during this year and throughout 2022.

Energy for the production of electricity and transports is responsible for almost 40% of global emissions, mainly due to the burning of fossil fuels that produce GHG. Land uses, which include deforestation and represent a fifth of global emissions. cutting down forests not only deprives the storage and sequestration capacity of the cutdown biomass, but to add insult to injury, the process also releases the CO2 stored in the soil and on the plants.

Electricity is mainly generated by burning coal and Fossil gas. The basic principle is heating to generate steam – this, in turn, generates kinetic energy (energy generated by movement), by rotating turbines, stimulating the electromagnetic field, and finally generating energy into the power grid.

What are the consequences of climate change?

Now that we understand a bit better what climate change is, and what it is driving it, you should be wondering what are the practical effects of all of this in our daily lives. Let us focus on the consequences of climate change.

Extreme weather events

As the global climate patterns are disrupted it contributes to the increase of extreme weather events such as heatwaves, changes in precipitation, floods, droughts, wildfires, and more intense storms and hurricanes. There is a tendency for an increasing number of extreme events, which will worsen in number and intensity in the future.

[Go through several examples included in the slides, of extreme weather events that have occurred in the last years]

Defrost

An increase in the temperature causes ice to melt, both glaciers (ice overland) , like Greenland and Antarctica and on the mountains all over the world, and icebergs (ice floating in the sea) such as the big ones in the Arctic Ocean. There is a clear tendency of ice cover decrease in both glaciers and icebergs. Loss of glaciers causes sea level rise and affects coastal and island populations. Loss of ice on mountain glaciers causes a decrease in water resources for populations living in those areas. Iceberg melt, however, doesn't cause sea level rise. Think of an ice cube on a glass of water, however, it can cause changes in ocean currents, and furthermore, it decreases reflection from sunlight, which in turn increases the temperature.

Sea level rise

There are two main drivers for sea-level rise: the melting of the glaciers and thermal expansion which is caused when seawater expands because of the higher temperature of the water. Since the oceans absorb heat from the atmosphere, when the atmosphere becomes warmer so will the oceans. ... The increased volume will cause the level of the water in the oceans to rise.

Currently, there is a tendency of rising sea level, in 2020 that variation was about 1 cm. Coastal areas are the most vulnerable to sea-level rise, which threatens the coastal communities. Amsterdam is one of the particular areas that are threatened by this since the city is 4 meters below sea level.

Tuvalu Island, located in the Pacific Ocean is facing the risk of being submerged if the sea level continues to rise. Island states and coastal areas are the most vulnerable places that face the threat of sea levels rising

Ocean acidification

The oceans are also a natural sink of absorption of CO2. As the CO2 concentration in the atmosphere increases, so does the absorption in the ocean, and the consequential acidification of the water. This has dire consequences on marine life, which are particularly sensitive to these types of variations. As an example, more acidic waters deteriorate the shells of marine organisms that are made of calcium carbonate – caused by chemical reactions between carbon and the chemicals of the shells.

Effects on ecosystems

Rising temperatures have catastrophic consequences on ecosystems. One example is coral reefs, which are fundamental to entire marine ecosystems, and are considered biodiversity hotspots. They are also incredibly sensitive to temperature and pH variations. Temperature increase and acidification of the oceans contribute to the phenomena called coral bleaching that results in the

death of the reef – entire organisms perish in these conditions, which means that the marine life that coexists in this ecosystem vanishes completely.

Effects on human health

Warmer temperatures, and changing climate patterns in countries, creates conditions for pathogens and diseases common to warmer weather to emerge in regions of the world that have never seen them before. This is the case of Malaria, which is transmitted by a mosquito that is common in warmer/tropical climates, but it is predicted to emerge in northern regions of the world.

Climate refugees

Madagascar, one of the region's most vulnerable and at risk of climate change, is already facing the consequences of it, where 1 million people are currently facing famine linked to climate change. Climate change is changing weather patterns in the country, which deeply depends on agriculture, disrupting seasonal weather that allows for this economic and subsistence activity to persist in the area. Again, the countries that least contributed to climate change are the ones that are already facing the consequences.

More and more populations in the world will face grave consequences caused by climate change in their regions. Today, many people in developing countries are suffering from droughts and windstorms on a scale never seen before, depriving them of daily food and basic needs. It is still fresh in our memories that last November many people from the Central American countries of Honduras, Guatemala, and El Salvador, which were hit by two massive hurricanes, poured across the border into Mexico and headed toward the US border.

The term "climate refugee" was first coined to describe the increasing large-scale migration and cross-border mass movements of people that were partly caused by such weather-related disasters. As the weather events worsen, so dies the need for these populations to migrate to other countries to seek refuge.

Tipping points

Think about tipping point as a game of Jenga, you remove pieces one by one, and then comes a point where the tower comes down and there is no stopping gravity. This is an analogy for the climate tipping points, which once surpassed will lead to irreversible changes. A specific example, melting of the glaciers and icebergs is a dangerous positive feedback loop on the climate, which means that the effect of temperature increase, ice melt, increases its

cause, the temperature itself, keeping a circle of ever-increasing temperature which can lead to the disappearance of the glacier.

What can be done to reduce emissions?

Moving on from the doom and gloom of the climate crisis, what can then we do to try and resolve this pressing issue?

On a global large scale level, we need to focus on reducing our global carbon emissions, plain and simple. There are two main ways to seek to balance our emissions and absorption, which is through preserving and restoring our natural sinks and fundamentally change our energy system

Preserve and restore our land sinks

As we have seen previously, natural sinks are essential to maintaining a balance of carbon dioxide in the atmosphere, and we have long surpassed the absorption capacity. Carbon dioxide concentrations have been increasing, for one, because of the ever-increasing emission rate, but also because we are tearing down one of our natural sinks: Forests.

Brazil has one of the worst rates of deforestation in the world, and it shows no signs of slowing down. The countries in the Indian-pacific also experience a high rate of deforestation, mainly driven by industry exploration. Brazil is an alarming case for example, a country that hosts one of the largest areas of forest cover.

Increasing pressure of human activity - population rise, economic and technological development, and other pressures and driving deforestation. The economic value lies in the biomass of the forest, and the land in which they are located. The direct drivers of deforestation range from extractive industries, buildings and infrastructure construction, and agriculture – including livestock. These cause major deforestation fronts, that are indirectly driven by anthropogenic causes such as population growth, political and economic factors, technological advancements – mainly in agricultural contexts, and environmental factors. By cutting down this natural sink, the concentration of carbon dioxide in the atmosphere is amplified because we are reducing the absorption capacity.

Does this mean that we can just plant more trees and solve the issue? Not quite. Research shows that preserving our current natural sinks brings more benefits than restoring, in terms of “emissions gains”, because as we mentioned before, cutting down forests not only generates emissions but also reflects in CO2 absorption losses.

As trees regrow, the absorption capacity also rises, but it always starts at a smaller level, so it may take up years to actually start to have a meaningful impact on balancing emissions. The time that we currently do not have to address the climate crisis. Research shows that preserving our current natural sinks brings more benefits than restoring, in terms of "emissions gains", because as we mentioned before, cutting down forests not only generates emissions but also reflects in co2 absorption losses. So in terms of reducing our emissions, preserving the standing forest is preferable to restoration and reforestation practices. But this is not to say that regeneration shouldn't be an option altogether to the damage already done to our forest areas.

Reshaping our energy system

There are several ways we can look at the breakdown of emissions. By sector, by economic activity, and so on. If we account for energy emissions as a whole, it accounts for a staggering 75% of total global emissions. This means that 75% of total emissions come from generating energy. Why is this?

Reshaping our energy system means changing how we produce electricity and how we generate energy to move around in our transportation system, which are the largest consumers of energy production currently and the biggest slice of emissions. There are two main sources from where we produce our energy and electricity. Fossil fuels: Oil, gas, and coal. And renewable energy.

Energy production takes up that much of global carbon emissions because it is still mostly reliant on fossil fuels. Almost 85% comes from burning fossil fuels, which are very carbon-intensive. Changing the source of energy and transitioning from fossil fuels to renewable energy is fundamental to cutting down emissions.

Renewable energy

Renewable energy sources include:

- Solar: Photovoltaic panels, concentrating solar thermal energy through mirrors
- Hydroelectric: Water reservoirs, or water strands
- Biomass is the burning of wood, agricultural waste, and other organic material, to generate electricity and heat. Although the burning of biomass does release carbon dioxide to the atmosphere, the organic material during its growth phase absorbs a considerable amount of carbon dioxide, so it balances it with emissions.
- Wind: located onshore or offshore
- Oceans: waves and tides

- Geothermal energy uses the heat of the earth to generate electricity

The distribution of renewable energy sources varies between countries that source them – it depends on various economic and environmental factors (wind, yearly sunlight) and the infrastructure investment of each country. However, globally speaking, the overall renewable energy consumption remains at about 11%. The energy mix is a group of different primary energy sources from which secondary energy for direct use - such as electricity, transports, and heating - is produced.

Projections on the installed capacity by renewable sources show an increase in these energies, particularly on solar energy, which does harness a lot of energy potential for our demands.

There is a lot of potentials for renewables to source our energy demands, nowadays there are some positive examples of almost all the grid relying on renewables. However, a challenge that has an energy system fully reliant on renewable energy is that it relies on an inconstant factor: the weather. So future challenges ahead rely on this inconsistency, on power storage, and more reliable and constant alternatives that provide a stable flow of clean energy

Our energy demands increase year after year, and it shows no signs of slowing down. As economies grow and develop, so does the energy demand to accompany this process. It is necessary to invest in energy efficiency and our individual and collective consumption of energy.

The carbon footprint of the internet

An increase in energy use does have a correlation with the growth of the technology sector. Internet users are rapidly increasing around the world, and today we are reliant on the services on the web, for both our work and personal daily lives. From servers powering the internet and technology information, to the actual devices we use. The pandemic actually highlighted the importance of staying connected whilst physically apart.

All the energy consumed for our technology and internet needs does carry a carbon footprint, in other words, sending an email does produce carbon emissions. And websurfing also has its footprint, because of the servers needed to host most web services. You can check a website's carbon footprint at www.websitecarbon.com! Data centers and web service providers can opt for renewable energy to source their power needs.

But the technology sector does rely on energy use, and it is troublesome because as we mentioned, our energy sector is still mostly dependent on fossil fuels. Energy-intensive activities of the technology sector are actually

surpassing the energy consumption of whole countries, as is the case of the emerging technology of the blockchain, and more mediatic bitcoin. Bitcoin mining consumes more energy than some countries, and it will continue to rise.

All in all, reducing energy consumption is necessary to address global carbon emissions, not only because our energy system is still dependent of fossil fuels, but also as a means to reduce the pressure and strain we put on the energy system to better control demand and supply of energy.

Shifting away from the larger scale and systemic changes required to cut down emissions, lets now speak of what we can do to act upon our individual consumption of energy, at a smaller scale.

Individual actions to reduce consumption

Let's narrow the scope, and look at the emissions by source. You can ask the audience to reflect on the main sources, and even ask someone to share their thoughts.

Environmental and Carbon footprint

Our daily actions carry an environmental cost. Consuming resources, in turn, does result in GHG emissions also known as the carbon footprint. You may stumble across more than one type of footprint. There is the environmental footprint, which may also be named the ecological footprint, which compares the total resources people consume with the land and water area that is needed to replace those resources. And the carbon footprint focus strictly on the greenhouse footprint also deals with resource usage but focuses strictly on the greenhouse gases released due to the burning of fossil fuels. Greenhouse gas calculations make up a portion of an ecological footprint but are not used in the same way as those in a carbon footprint. However, both calculations illustrate the impact of human activity on the environment.

The world's ecological footprint is ever-increasing, just like global greenhouse emissions. This coincides with population growth and other factors that come from our ever-increasing number and consumption. This puts a lot of pressure on earth's ecosystems, and everything is rising!

However, consumption is not equal throughout the world. Just like in the emissions panorama, which is intrinsically connected with economic development. Currently, it would take about 1,7 earths - in terms of resources, to support the world's population. But even between countries, this varies. If the whole world population had the same lifestyle as the inhabitants of the united states, it would require 5 earths to support that lifestyle. If we al had the

consumption levels as someone that lives in India, it would require 0,7, well below the earth's full capacity.

This brings us up to the earth overshoot day. Earth Overshoot Day marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year. We are reaching it sooner as the years pass by because global consumption is on the rise.

Reduce energy consumption

Our energy system is still mostly reliant on fossil fuel sources, which is responsible for around 75% of global emissions as we've seen previously. On a large scale, it is required that we Shift these sources to renewable energy sources to cut down the emissions on.

What can you do?

- Opt for energy-efficient devices
- Wash clothes in a full load and using cold water, and dry your clothes outside;
- Unplug devices that you are not using, when in stand-by they still consume energy
- Make use of natural light, and switch off your lamps
- Switch your lightbulbs for LED lights
- Lower your thermostat - use an extra layer of clothes and make use of sunny days to open the blinds and letting light enter

Change your email habits. Avoid unnecessary emails by avoiding replying to all, and sending simple one-line "thank you" or other types of emails. You can also unsubscribe from newsletters and another email list you are not interested in. Avoiding going through search engines and directly to a website helps avoid an extra server to get to the site. There are some cloud services and server providers that are committed to running fully on green energy that better options to reduce emissions. Dimming your monitor not only helps reduce the energy your computer or laptop consumes, but it is also better for your eyes. The same goes for choosing to use your device in dark mode! Finally, opting for a laptop instead of a desktop computer helps with energy consumption, since the latter is more energy-intensive, and often is left plugged in when not in use.

Transportation

On transportation, there are choices we can partake in every day, such as opting for public transportation, walking, and cycling, all whilst avoiding using an individual mode of transportation, which has more emissions per person and per km. Sharing rides is a way to cut some emissions because the bill is

taken up by two people rather than just one. Air transportation has the biggest impact per person and km, and it is the most inefficient way to travel, taking only emissions into account. So avoiding air travel whenever possible it is a way to cut down emissions.

Food

Our diets and daily choices in terms of food have a big impact on our daily footprint. There are three main approaches we can take in this regard to cut down emissions. Opting for plant-based meals, avoiding letting your food go to waste, and opting for products with less transport – sourcing locally!

Meat consumption

Plant-based diets

Plant-based diets have a smaller carbon footprint than meat-based ones. It brings benefits to your wallet and your health! You do not have to fully rely on vegetarian diets, but opting for vegetarian options has a great impact on your individual carbon footprint.

Where do you source your food?

Where our food comes from does have a great impact on our carbon footprint. Some food travels great distances to reach our plates, and the closer you get your food, the smaller the carbon footprint in transporting the food. Seasonality also plays a big role in this. Out-of-season food probably had to be transported by another country or means an increase in the resources spent to grow it.

So how can you act on this exactly? Opt for seasonal food and produce by local farmers in farmers' markets or buy directly from the producers. Community gardens are also a good option to grow your own food. If you live in an apartment you can also opt for vertical gardens that are easily maintained in small spaces.

Food waste

Food waste is a massive issue that is responsible for one of the biggest slices of emissions. ⅓ of food produced in the world goes to waste, which is a deeply perverse environmental and social problem.

It is not only the food at home that we let go to waste that is a problem. A lot of food that is unsold at the end of the day in supermarkets, ends up in the trash. Some people even partake in a movement called dumpster diving, in

which they literally dive in dumpsters near restaurants or supermarkets and salvage food that is thrown out and it is still perfectly good to be consumed.

Going to the store without a plan or on an empty stomach can lead to buying more than we need. To keep your kitchen on track, try to eat leftovers, think of meals you might eat out, and avoid unnecessary purchases by planning your grocery list ahead of time.

While there are plenty of benefits to eating fresh food, frozen foods can be just as nutritious. They also stay edible for much longer. A lot of seafood, for example, is frozen before it reaches your supermarket and then thawed and put on display. That means it will only stay fresh for a few days. By buying frozen seafood, you can extend the shelf life of the product considerably. Cooking and freezing food—especially produce—before it goes bad is a great way to avoid having to toss it.

Before you shop, use the food you already have. Websites like Big Oven, Supercook, and MyFridgeFood allow you to search for recipes based on ingredients already in your kitchen. You can also use apps like Epicurious and Allrecipes to make the most of what's in your fridge and pantry.

Fruits and vegetables that are beyond ripe may not look pretty, but that doesn't mean they can't still taste delicious in recipes. Try using your wilting, browning, or imperfect produce to make sweet smoothies, bread, jams, sauces, or soup stocks.

Preventing food waste is the most effective way to shrink its impact on the planet. If we avoid producing food that we don't eat, we can save the land, water, and energy that would have been used to make it. And awareness is a good first step; according to ReFED, educating consumers about food waste could prevent 7.41 million tons of greenhouse gas emissions.

Other creative ways to avoid food waste:

To face this massive challenge of food waste, here are some creative and meaningful ways to avoid it.

- Refood - Reefod is an organization that supports families in need with meals. The food comes from restaurants and other establishments that have a lot of food leftovers. It functions on a volunteering basis, and the volunteers are responsible for collecting the food and distributing the meals to the families. They are spread in a lot of locations around Portugal.
- Too good to go - is an app that restaurants, cafés, and other food establishments can sell the leftovers for the day at a reduced price. They are limited offers and they are only up for a limited period of time

(usually after meal hours) and you never know exactly what you end up buying, but this avoids a lot of meals and food simply going to waste.

- Good after - It is a sort of supermarket that sells expired food, in essence. Often expired food is still good to be consumed since the expiration date is merely a bureaucracy that results in a lot of food waste.
- Fruta feia- The literal translation of this is called “Ugly fruit”. This movement started to salvage fruits and vegetables that are considered under the standard to be sold to the public. Facing this, producers mostly had no choice but to throw this food out because there were no buyers. Fruta feia buys these products directly to local farmers, and then they are sold in baskets to people that subscribe to the service. This not only avoids food going to waste, but also contributes economically to the producers.

Consumption

Consuming in a sustainable matter means making sufficient and efficient use of resources to minimize our environmental impact on the planet. This ranges from the food we consume to other goods and products, such as clothes technological devices, and so on.

All these choices usually contribute to the waste problem. As consumption increases, materials and other resources are used to supply our habits, and most of it ends up filling up landfills everywhere around the world.

Waste

For waste we cannot avoid producing, recycling is still our best option to reduce material waste and extract more resources from the earth. Another thing that is beneficial for both emissions and the environment is to compost food waste and scraps. For one, this contributes to returning organic matter back to earth and it is good for our soils.

Reducing consumption is essential to avoid waste being created. Opting for a more minimal lifestyle, or other options to buy clothes and other products. Buying secondhand clothing or swapping clothes you do no longer use in swapping events is an option to avoid purchasing new clothes, and contributing to the fashion industry that has a big carbon footprint. You can also opt to repurpose or repair your old clothes and devices!

Planned obsolescence and right to repair

Ever wonder why your phone gets slow after a few updates on the software? Or how difficult the devices are to repair once a component malfunction, and

often you end up needing to replace the whole device? This is all by design, called planned obsolescence. Planned obsolescence is a business strategy in which the obsolescence (the process of becoming obsolete, that is, unfashionable or no longer usable) of a product is planned and built into it from its conception, by the manufacturer.

This is a problem because of the e-waste it generates, The right to repair electronics refers to proposed legislation that would provide the practical means for equipment owners to repair their devices and not a new legal right. Advocates observe that while the repair is legal under copyright law and patent law, owners are often prohibited from making their own repairs or hiring technicians they trust to help by manufacturer limitations on access to repair materials such as parts, tools, diagnostics, documentation, and firmware

Are there any other alternatives for technological devices? Yes, modular devices! They have a better rate of repairability, if a component malfunction you can easily replace it with another modular piece of that component, instead of having to buy a new one altogether. There are some options currently available for phones, the fair phone, and recently for laptops to with the framework laptop

Circular economy

Currently, our economic system works more in a line, in which a lot of resources you extracted from earth end up in waste. The circular economy is a new paradigm that aims to close the cycle, and avoid new resource extraction, essentially making use of what we already have by recycling it, repurposing it, repair and reducing.

Degrowing the economy

Degrowth essentially means to reduce the global production and consumption in society, to “slow down”, and shift the paradigm of economic growth to an economy that focuses on social and environmental wellbeing, rather than growth and more consumption