

Research Report

COMMITTEE : WMO

ISSUE : How to transition to a carbon-neutral economy ?

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HOW TO TRANSITION TO A CARBON NEUTRAL ECONOMY?

INTRODUCTION

Committee



**World
Meteorological
Organization**

Weather • Climate • Water

The World Meteorological Organization (WMO) is the specialised agency of the United Nations (UN) for weather, climate and water resources. It is also the UN scientific voice on the state and behaviour of the Earth's atmosphere and climate.

This organization focuses on the international exchange of data for monitoring and prediction of the environment. With a current membership of 193 Member States and Territories, it originated from the International Meteorological Organization (IMO) and was established by the ratification of the WMO Convention in 1950, becoming a specialised agency of the United Nations a year later.

The WMO facilitates free and unrestricted exchange of data and information, products and services on issues relating to safety and security of society, economic welfare and the protection of the environment. It contributes to policy formulation in these areas at national and international levels.

Issue

“Greenhouse gas (GHG) concentrations have reached the highest level in three million years and are showing no signs of levelling off. This commits our planet to a much warmer future, with more extreme weather and more challenges to our daily lives and to our economies,” said WMO Secretary-General Petteri Taalas.

Climate Change is the defining issue of our time and we are at a defining moment. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in

scale. Without drastic action today, the impacts in the future will be catastrophic, expensive and irreversible.

Melting ice, hottest years and extreme weather events recorded by WMO highlight the need to reduce greenhouse gas emissions, reimagine the way our economy functions and transition to a carbon neutral economy that simultaneously benefits society, the environment and the economy thus putting Ecology, Economy and Equity at the heart of the transition.

The transition to a carbon neutral economy means mitigation. Climate change mitigation is achieved by limiting or preventing greenhouse gas emissions and by enhancing activities that remove these gases from the atmosphere. Therefore, climate information is essential for monitoring the success of efforts to reduce greenhouse gas emissions that contribute to climate change, as well as for promoting efforts to increase energy efficiency in order to transition to a carbon-neutral economy.

Greenhouse gases can come from a range of sources and climate mitigation can be applied across all sectors and activities, including energy, transport, buildings, industry, waste management, agriculture, forestry, and other forms of land management. Cooperation between governments, multinational companies and individuals will be necessary for a successful transition to a carbon neutral economy.

According to the Chair of the Intergovernmental Panel on Climate Change (IPCC), and the Executive Director of the International Energy Agency “We need a simultaneous focus on both ambitious, near-term reductions in emissions and accelerating investment in the full range of clean and sustainable energy technologies necessary to get all the way to net zero.”

KEY WORDS

Carbon neutral economy: refers to achieving net zero greenhouse gas emissions (as carbon composed GHGs make up 92% of emissions), by balancing carbon emissions with carbon removal or simply eliminating carbon emissions altogether in all sectors of the economy such as transportation, energy production, agriculture, and industrial processes.

Carbon offsetting: The process of compensating for carbon dioxide emissions from industrial or other human activity, by participating or donating to schemes designed to make equivalent reductions of carbon dioxide in the atmosphere, therefore making your carbon emissions neutral.

Circular economy: A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

Climate change: Significant and long lasting change in the Earth’s climate or weather patterns, such as higher temperatures, increased rainfall or drought and rising sea levels.

Climate Change Mitigation: Efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behavior.

Cryosphere: The cryosphere refers to frozen components of the Earth system.

Greenhouse gases (GHGs): Gas that absorbs and emits radiant energy, in such a way as to trap heat in the atmosphere.

Radiative forcing : physical measure of the energy trapped at the Earth's surface, an effect amplified by greenhouse gases in the atmosphere. It is the difference between radiant energy received by the earth and energy radiated back to space. A positive forcing warms the system while negative forcing cools it.

Vegetated coastal ecosystems: e.g. mangroves, saltmarshes, seagrass meadows, they protect the coastline from storms and erosion and provide an essential place to trap and store carbon .

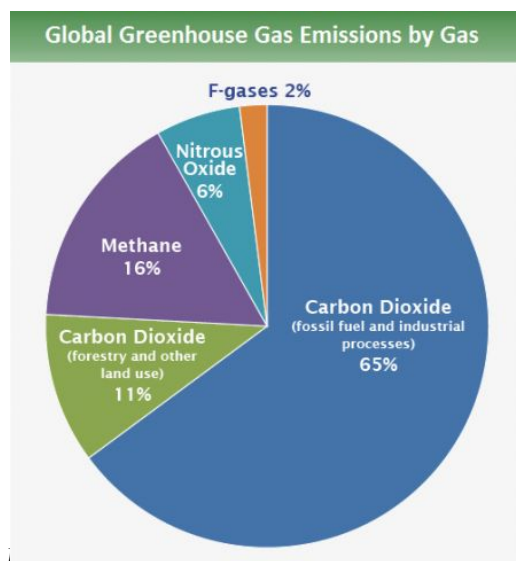
OVERVIEW

ENVIRONMENT

The effects humans have on the environment is unprecedented, unwavering and unsustainable. From our excessive emission of greenhouse gases and fossil fuels, industrial animal agriculture and land use to waste disposal and pollution. Production and consumption on this scale is fatal to human health and natural ecosystems.

Greenhouse gases

From 1990 to 2018 radiative forcing by long-lived greenhouse gases (LLGHGs) increased by 43%, with CO₂ accounting for about 81% of this increase. (The National Oceanic and Atmospheric Administration (NOAA) Annual Greenhouse Gas Index)



Source: [IPCC \(2014\)](#) based on global emissions from 2010

Greenhouse gas emissions and carbon emissions are often used interchangeably. Why? Because CO₂ and CH₄ (methane) emissions make up 92% of global greenhouse gas emissions (illustrated on the pie chart).

Carbon dioxide is the single most important anthropogenic GHG, and persists for many centuries in the atmosphere (i.e. it is a long-lived greenhouse gas (LLGHG)). Atmospheric CO₂ is due to emissions from combustion of fossil fuels and cement production, deforestation and other land-use change.

The second most important GHG, methane, contributes about 17% of the radiative forcing by LLGHGs. Approximately 40% of methane is emitted into the atmosphere by natural sources (e.g., wetlands and termites) and about 60% comes from human sources (e.g., cattle farming, rice agriculture, fossil fuel exploitation, landfills and biomass burning).

Analysis by the IPCC clearly shows us that global emissions need to be reduced by 45% from 2010 levels by 2030 and to net-zero by 2050 to avoid a dangerous increase in global temperatures.

Cryosphere

According to the IPCC, global-scale glacier mass loss, permafrost thaw, and decline in snow cover and Arctic sea ice extent are projected to continue in the near-term (2031–2050) due to surface air temperature increases. The rates and magnitudes of these changes are projected to increase further in the second half of the 21st century in a high greenhouse gas emissions scenario. However, strong reductions in greenhouse gas emissions in the coming decades are projected to reduce further changes after 2050.

Since 1993, the rate of ocean warming has likely more than doubled and marine heatwaves have very likely doubled in frequency since 1982 and are increasing in intensity. With these rates of ocean warming attributed to anthropogenic forcing, marine ecosystems are disrupted or destroyed due to rising temperatures.

Furthermore, Vegetated coastal ecosystems help buffer the impacts of sea level rise. However, nearly 50% of coastal wetlands have been lost over the last 100 years, as a result of the combined effects of localised human pressures, sea level rise, warming and extreme climate events. Vegetated coastal ecosystems are important carbon stores and if lost carbon is released.

GRAPHIC: Software adapted from Zachary Labes' GitHub

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979	15.97	16.29	16.44	15.62	14.09	12.75	10.8	8.46	7.56	9.04	11.21	13.5
1980	15.08	16.13	16.2	15.59	14.06	12.53	10.76	8.63	8.24	9.5	11.61	13.79
1981	15.12	15.74	15.74	15.19	14.06	12.78	11.02	8.52	7.82	9.28	11.27	13.62
1982	15.35	16.34	16.25	15.65	14.24	12.83	11.04	8.79	7.84	9.55	13.07	13.8
1983	15.13	16.13	16.19	15.3	13.72	12.59	11.17	8.73	7.98	9.57	11.6	13.47
1984	14.58	15.45	15.73	15.09	13.73	12.39	10.52	8.38	7.44	8.8	11.01	13.2
1985	14.88	15.59	16.07	15.44	14.22	12.46	10.48	8.0	7.4	8.84	11.09	13.24
1986	14.97	15.9	16.02				10.76	8.45	7.94	9.69	11.63	13.43
1987	15.31	15.17	15.88	15.32	13.92	12.73	10.83	8.01	7.76	9.31	11.37	
1988	15.23	15.76	16.13	15.22	13.63	12.15	10.31	8.21	7.77	9.39	11.43	13.66
1989	15.04	15.61	15.53	14.38	13.04	12.36	10.56	8.16	7.35	9.08	11.2	13.43
1990	14.83	15.69	15.98	14.71	13.28	11.78	9.82	7.09	6.57	8.67	11.14	13.12
1991	14.4	15.37	15.47	14.94	13.51	12.18	9.98	7.76	6.86	8.75	10.96	13.04
1992	14.77	15.55	15.98	14.75	13.28	12.23	10.63	8.25	7.82	9.46	11.43	13.48
1993	14.98	15.71	15.83	15.1	13.4	11.98	9.98	7.7	6.83	9.0	11.44	13.42
1994	14.77	15.61	15.62	14.85	13.68	12.08	10.34	8.02	7.58	9.07	11.14	13.34
1995	14.67	15.25	15.26	14.44	12.99	11.61	9.42	7.14	6.5	8.15	10.8	12.98
1996	14.25	15.21	15.2	14.26	13.15	12.17	10.53	8.46	7.95	9.29	10.46	12.93
1997	14.5	15.54	15.57	14.59	13.25	11.89	9.93	7.56	7.02	8.6	10.9	13.25
1998	14.8	15.88	15.69	14.95	13.68	11.9	9.88	7.84	6.99	8.76	10.63	12.9
1999	14.48	15.36	15.42	15.11	13.84	11.96	9.85	7.59	6.58	8.92	10.98	12.77
2000	14.31	15.21	15.26	14.61	13.23	11.8	9.97	7.55	6.74	8.67	10.52	12.73
2001	14.32	15.33	15.57	14.87	13.62	11.61	9.52	7.78	7.13	8.6	10.79	12.7
2002	14.41	15.43	15.38	14.34	13.06	11.75	9.76	7.02	6.23	8.45	10.52	12.77
2003	14.53	15.34	15.64	14.58	13.1	11.79	9.72	7.34	6.55	8.2	10.27	12.74
2004	14.1	15.0	15.07	14.03	12.6	11.57	9.89	7.19	6.3	8.18	10.52	12.65
2005	13.69	14.49	14.74	14.1	12.94	11.33	9.25	6.65	5.82	7.72	10.38	12.36
2006	13.62	14.45	14.52	13.94	12.67	11.18	9.07	6.97	6.35	7.98	9.91	12.2
2007	13.82	14.62	14.69	14.04	12.97	11.51	8.54	5.85	4.7	6.56	10.05	12.27
2008	14.09	15.14	15.32	14.5	13.17	11.54	9.28	6.61	5.32	7.84	10.59	12.56
2009	14.16	14.98	15.18	14.66	13.42	11.71	9.36	6.7	5.83	7.42	10.1	12.45
2010	13.88	14.75	15.31	14.86	13.11	11.01	8.95	6.55	5.47	7.54	9.93	12.06
2011	13.65	14.54	14.73	14.26	12.96	11.19	8.73	6.21	5.13	6.99	10.05	12.46
2012	13.97	14.8	15.46	14.83	13.25	11.13	8.5	6.06	4.98	6.35	9.69	12.31
2013	13.95	14.9	15.08	14.4	13.24	11.73	8.8	6.5	5.61	7.87	10.23	12.37
2014	13.88	14.63	14.94	14.21	12.92	11.42	8.78	6.58	5.75	7.66	10.38	12.54
2015	13.74	14.5	14.47	14.02	12.64	11.22	9.17	6.27	5.22	7.46	10.1	12.13
2016	13.65	14.36	14.57	13.82	12.5	11.05	8.69	6.07	5.09	6.56	9.8	12.0
2017	13.43	14.36	14.46	13.87	12.77	11.13	8.75	6.04	5.32	7.19	9.81	12.03
2018	13.44	14.11	14.11	13.81	12.44	11.12	9.05	6.12	5.28	6.6	10.14	12.11
2019	13.75	14.52	14.67	13.98	12.35	11.0	8.5	5.65	4.83	6.05	9.65	12.14
2020	13.77	14.73	14.83	13.78	12.53	11.01						

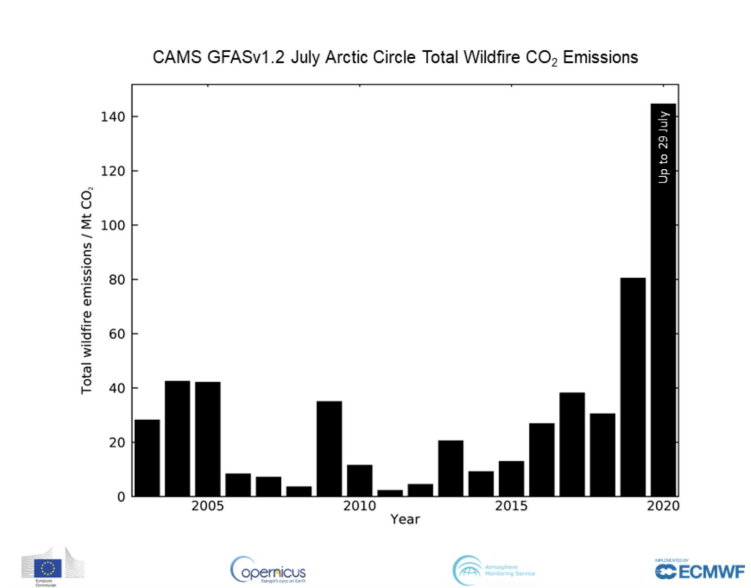
Source: WMO, Arctic sea ice monthly values



SEA ICE EXTENT (Mill. km²)
[OSISAF Northern Hemisphere]

Wildfires

In an IPCC Special Report, wildfire was projected to increase significantly for the rest of this century across most Arctic regions. This has been proven true as the recent 2019 and 2020 wildfires in Siberia were caused by scorching arctic temperatures. However, wildfires not only illustrate the effects of global warming but contribute to it, as the equivalent of 56 megatonnes of carbon dioxide were released across the Arctic in June 2020 according to scientists at the Copernicus Atmosphere Monitoring Service (CAMS). Wildfires emit different types of pollutants, many of which can affect our health. Wind can also blow this pollution thousands of kilometres away from its source, affecting air quality around the world.



Source: CAMS, Total carbon emissions for June 2020 compared to previous Junes

Water and sea level rise

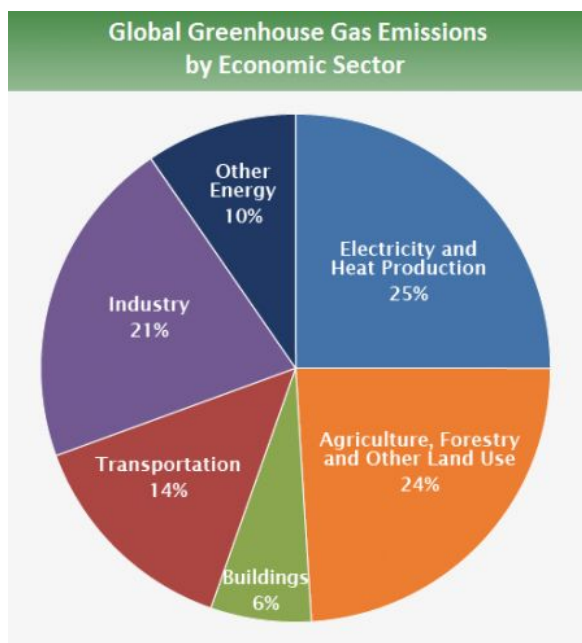
The ocean has taken up between 20–30% of total anthropogenic CO₂ emissions since the 1980s. Sea level rise has accelerated due to the increased ice loss from the Greenland and Antarctic ice sheets. Mass loss from the Antarctic ice sheet over the period 2007–2016 tripled compared to 1997–2006. This sea level rise can cause dangerous, unpredictable flooding in unprepared areas, destructive erosion, contamination of agricultural soil, contamination with salt and lost habitat for birds, fish and plants. These changes will endanger homes or basic services such as internet access, disrupt natural ecosystems and make food production and agriculture more difficult.

ECONOMY

The current global economic system is reliant on fossil fuels. Although solutions to the climate crisis are initially expensive, the health and economic benefits in the future will be incredibly beneficial, as UN Secretary General Mr. Guterres highlighted when he spoke encouragingly about “enormous opportunities” linked to climate action. According to the UN chief, shifting to a low-carbon economy represents a \$26 trillion-dollar growth opportunity that could create 65

million new jobs by 2030 – with solar, wind and geothermal energy already being the fastest-growing job creators in several economies.

“The green economy is the economy of the future and we need to make way for it right now”, he stated, encouraging countries to re-train people so they can “switch careers with the concept that education now becomes a lifelong enterprise”, therefore creating “green jobs” and new employment. With the global coronavirus lockdown creating the worst economic downturn since the Great Depression according to the International Monetary Fund, with a recession at least as severe as during the 2008 global financial crisis or worse, and the impact equivalent to 305 million job losses, governments, workers and employers need to implement a sustainable economic recovery plan to reduce greenhouse gas emissions, create green jobs and reduce inequalities to power long term economic growth.



[IPCC \(2014\)](#)

Energy

As energy accounts for over two-thirds of global greenhouse gas emissions, it must be at the heart of any solution to a carbon neutral economy. The coronavirus pandemic has resulted in a drop in emissions this year but there are already signs that emissions are rebounding as economies reopen. The world cannot afford to repeat past mistakes as the economic recovery following the 2008 global financial crisis brought with it the biggest jump in emissions in history.

In order to reach our global climate and sustainable energy goals, we quickly need to put emissions into sharp structural decline. This requires a dramatic acceleration in the transitions to clean, sustainable energy. The rise

of renewable technologies such as solar panels and wind turbines in recent years provide reliable, healthy and clean solutions. Deployed quickly and on a major scale, these energy technologies can bring about the kind of decline in energy-related emissions needed to put the world on track for our longer-term climate goals.

Additionally, the net-zero challenge calls for technology innovation in critical areas like enhancing energy efficiency, making low-carbon electricity the main source for heating buildings and powering vehicles, capturing, storing and utilizing carbon dioxide before it escapes into the atmosphere, realising the potential of clean hydrogen across many industries and massively expanding the use of sustainable bioenergy.

Today, overall investment in clean energy innovation is increasing, but only gradually – far too slowly to meet our climate goals. Governments and the private sector both have critical roles to

play in making sure investment in clean and sustainable energy innovation increases and does not decrease at this pivotal moment during the pandemic.

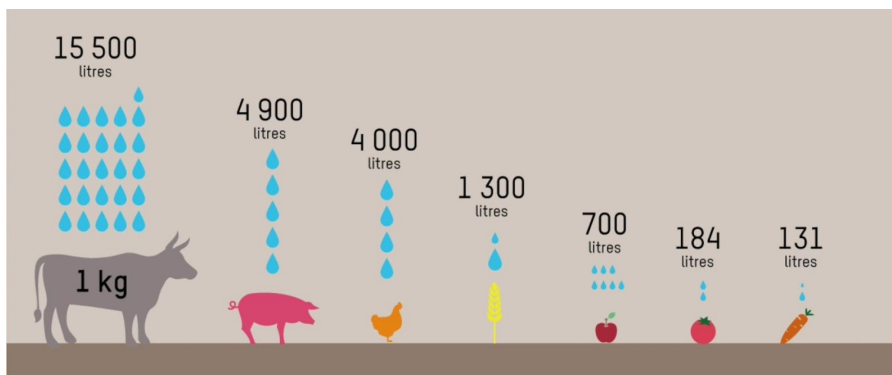
Agriculture, Forestry and Other Land Use are responsible for close to a quarter of global GHG emissions, predominantly from deforestation and agricultural emissions from livestock, soil and nutrient management.

Forests are intrinsically linked to carbon emissions, as they absorb the heat-trapping greenhouse gases human activities emit or, when burnt or cut down, contribute to emissions. Large areas of tropical forest remain in certain regions, which is where the highest physical potential for emissions reductions lies. While some countries have successfully reversed trends of forest loss through reforestation and plantations, in many countries natural forests continue to be lost at a daunting pace. Mitigation from forestry, such as reducing emissions from deforestation and forest degradation, and agriculture has a high potential at a relatively low cost but demands governance and market action to reduce forest losses. It is estimated that 70% of agriculture is responsible for deforestation.

Food production

The Food and Agriculture Organization of the UN (FAO), estimates that livestock farming accounts for 14.5% of global GHG emissions, of which 9.7% for bovines alone, and 50% of nitrous oxide and methane emissions. These emissions come from all stages of the process: the establishment of livestock areas, the production and transport of feed for livestock, their droppings and the digestive gases of cattle, and, finally, the slaughter and distribution of meat.

In agriculture, water management is one of the most important practices affecting emissions. In the case of a 750kg cow intended for meat production, its maintenance consumes more than 11.6 million litres of water. Technical and financial support to promote sustainable, resilient and low-carbon water resources management is essential in achieving global climate agendas.



Industry

Greenhouse gas emissions from industry primarily involve fossil fuels burned on site at facilities for energy, including emissions from chemical, metallurgical and mineral transformation

processes. The energy intensity of the sector could be reduced by approximately up to 25 % compared to current levels through widespread upgrading, replacement and deployment of best available technologies, particularly in countries where these are not in practice and for non-energy intensive industries.

Mitigation measures in the industry sector are often associated with co-benefits which could drive industrial decisions and policy choices. They include enhanced competitiveness through cost reductions, new business opportunities, better environmental compliance, health benefits through better local air and water quality and better work conditions, and reduced waste, all of which provide multiple indirect private and social benefits.

Transport

Transport will have a distinct impact on future emissions as demand increases, and there is an urgent need to encourage compact, connected urban forms linked by sustainable transit solutions, instead of sprawling, car-dominated and high-emission development. Some countries have introduced more sustainable transport systems such as Bus Rapid Transports (BRT), but there remains a need to scale up their reach, coverage and functionality. Similarly, low carbon transport programmes need to be implemented and funded, like limiting short interior flights within the country in favour of train journeys through government incentives, varying on the percentage of emissions from transport in different countries.

SOCIETY

The effects of greenhouse gases on the environment pose a significant risk to a large portion of the population, especially communities in close connection with coastal environments, small islands (including Small Island Developing States), polar areas and high mountains that are particularly exposed to ocean and environment change, such as sea level rise, extreme sea level and shrinking cryosphere. Other communities further from the coast are also exposed to changes, such as through extreme weather events. Coastal ecosystems are affected by ocean warming, including intensified marine heatwaves, acidification, loss of oxygen and sea level rise as well as other effects from human activities on ocean and land.

ILO Director-General called for “a jobs-and-human-centred policy agenda for climate action, based on country-level assessments, innovative social protection”. “The fight against climate change is inextricably linked with the battle for greater social justice”, he concluded.

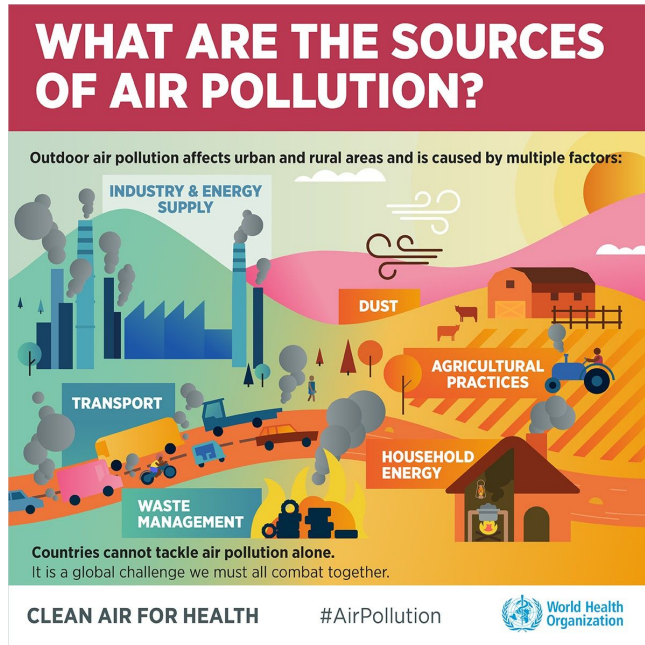
Health, food and water security

Climate change is expected to have major effects on health and well-being, as well as food and water systems everywhere but especially in developing countries. A changing climate will affect all aspects of food security, mainly as a result of disruptions to agriculture and food production systems. Food and water disruptions as a result of climate change may in turn result in health impacts. Climate change further exacerbates the risks of hunger and malnutrition through extreme weather events including sea level rise and accelerated glacial melt which have the potential to destroy crops and critical infrastructure. Climate change will likewise result in further scarcity in water. Renewable surface water and groundwater resources are expected to be significantly reduced in some regions, as will freshwater withdrawals for agricultural, industrial

and domestic use. Timings and quantities of precipitation are expected to be far less predictable, affecting agricultural production.

Adaptation efforts include support for environmentally and socially sustainable climate-smart agriculture, which can reduce food security risks as well as pressures on water supply.

Pollution



Carbon emissions not only contribute to climate change but also cause deadly pollution, which is responsible for about 7 million deaths globally per year, according to the World Health Organization. It can lead to severe cardiovascular diseases and is therefore a threat to our health, our society and quality of life. Furthermore some of the same sectors that contribute to carbon emissions are also major contributors to air pollution, therefore highlighting the necessity and benefits of reducing emissions.

Green jobs

“Jobs cannot be sustained on a dying planet.”

The coronavirus pandemic could cause an equivalent of 305 million job losses and endanger nearly half of the global workforce according to ILO. However, working to create green jobs is essential to provide environmental protection, economic development and social inclusion. These long term beneficial engagements in terms of climate and health will be created by transitioning these jobs and many others lost into green renewable energy, sustainable farming or innovation, etc. in order to create decent employment opportunities, enhance resource efficiency and build low carbon sustainable societies.

The [Climate Action for Jobs](#) initiative puts job creation and livelihoods at the centre of national climate action plans with measures to ensure inclusivity, such as assessing the employment, social and economic impacts of ecological transition and the potential of green jobs.

Mr Guterres underscored that economic growth and tackling climate change are “mutually reinforcing”, as an ILO report shows that the transition to a net-zero emission economy could create 15 million net new jobs in Latin America and the Caribbean alone by 2030

Housing, Buildings, cities, industries and appliances

There is a high potential for energy efficiency across countries and sectors. Increasing the efficiency of buildings and appliances offer significant mitigation and economic returns through

the adoption of better technologies, energy-efficient designs, as well as introducing incentives that change behaviour can help reduce energy use. Consumers further benefit from energy efficiency measures by reducing household costs spent for energy. There is a need to rapidly improve the efficiency of energy consumption, but the high upfront costs associated with these investments need to be addressed.

Individuals



Individuals can put pressure on governments and businesses to take action, such as Fridays For Future groups who strike for the climate, demand action on climate change and a just recovery from the coronavirus pandemic and the climate crisis. With a global response to COVID-19, governments could ensure a just recovery for everyone and the planet in the wake of this crisis by “Putting people’s health first, no exceptions. Providing economic relief directly to the people. Helping our workers and communities, not corporate executives. Creating resilience for future crises.” Additionally, large shifts in global consumption attitudes are essential in the transition to a green economy such as using sustainable, low or no carbon modes of transport, reducing waste to reduce emissions and consuming local, seasonal organic produce in favor of less meat heavy diets.

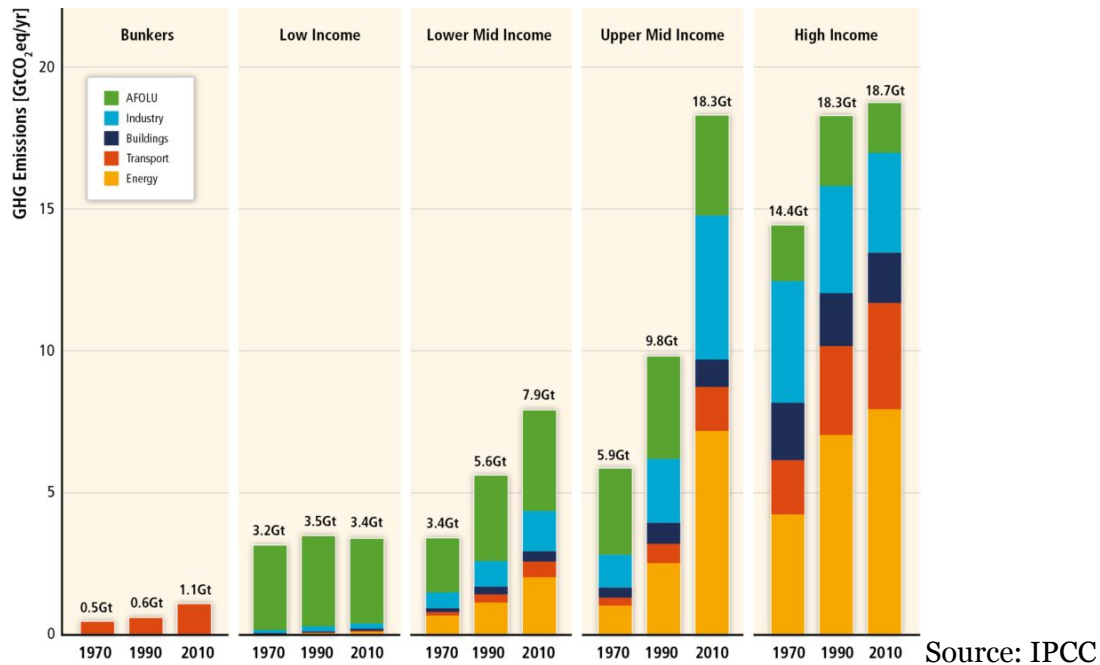
GOVERNMENT

Governments have a significant role to play in the transition, through political will, incentives for companies and legislation. António Guterres in a speech to the annual Caring for Climate Meeting, held during the UN COP25 stated “I’m meeting more and more business leaders that complain that they cannot do more because governments will not allow them to do so, because of the environment that is still created in the bureaucratic, administrative, tax regulatory and other frameworks that are under government control”.

However, different governments will have different parts to play. High Income Countries (HICs) emit more than low or lower/middle income countries and therefore need to reduce their emissions more significantly. Whereas more vulnerable countries and Small Island Developing

States suffer and are most at risk from climate change and the effects of extreme weather sea level rise, despite having contributed very little to global greenhouse gas emissions.

The statistics below prove that HICs not transitioning are one of the biggest barriers to a carbon neutral economy, as they miss the opportunity to halt the majority of emissions, and encourage other developing countries to follow a successful carbon neutral transition.



Government priorities to tackle the climate crisis should include ensuring that all governments commit to coming forward with net zero emissions strategies for 2050, drastically reducing emissions and ensuring that national commitments include a just transition for people whose jobs and livelihoods are affected in the transition to a green economy.

Governments have the power to transition to a successful carbon neutral economy that creates jobs through ambitious recovery plans to counter the damage caused by the pandemic to drive much greater investment in key energy technologies such as more efficient vehicles and buildings, renewables and state-of-the art electricity grids.

Helpful government policies can include taxes on carbon, regulations banning highly polluting technologies, practices or subsidies, financial incentives for renewable energy and energy conservation, government investment in low carbon infrastructure, research and transport systems as well as monitoring large company emissions.

MAIN INTERNATIONAL ACTORS

CHINA

China is the world's largest emitter of greenhouse gases. China's economic growth has been primarily powered by coal and in 2018 the country released 10065 Megatons of CO₂ (MtCO₂).

The industrial sector is China's primary coal consumer with manufacturing, agriculture, mining, and construction collectively made up 49 percent of China's coal use in 2017. Power production activities were responsible for 46.5 percent of coal consumption. Construction-related activities are also among the main sources of carbon dioxide emissions. However, it is also the world's leading generator of renewable electricity.

UNITED STATES OF AMERICA

The USA is the world's second largest emitter of GHGs, with 5416 MtCO₂ in 2018 primarily due to the transport and electricity sector. While Green New Deal propositions are optimistic in the hope of a carbon neutral economy, current 2017-2021 policies such as scrapping limits on methane leaks at oil and gas sites, executive orders calling for a 30% increase in logging on public lands and intending to withdraw from the Paris Agreement lead the country and the world towards a disastrous high emission scenario.

RACE TO ZERO

Race To Zero is a global campaign to mobilize leadership and support from businesses, cities, regions and investors for a healthy, resilient, zero carbon recovery which creates jobs, unlocks inclusive, sustainable growth and reduces the risk of future shocks. Collectively these actors now cover nearly 25% of global CO₂ emissions and over 50% of GDP, rallying behind the same overarching goal: achieving net zero emissions by 2050 at the very latest.

TIMELINE

15/03/2019

Youth Climate strikes. The first coordinated international protest, demanding action from political leaders to prevent climate change and for the fossil fuel industry to transition to renewable energy, took place with an estimated 1.6 million students from 125 countries walking out of school.

23/09/2019

Greta Thunberg speaks at the UN's Climate Action Summit in September, telling world leaders that they are "failing" her generation, by not taking significant or fast enough action on the climate crisis. "You all come to us young people for hope. How dare you!" "People are suffering. People are dying. Entire ecosystems are collapsing. We are in the beginning of a mass extinction and all you can talk about is money and fairytales of eternal economic growth. How dare you!"

05/06/2020

Launch of Race To Zero Campaign, an international campaign with the aim of achieving net zero emissions by 2050 at the very latest through a healthy, resilient zero carbon recovery.

RELEVANT UN TREATIES AND EVENTS

1992

United Nations Framework Convention on Climate Change

The "Earth Summit" produced the United Nations Framework Convention on Climate Change (UNFCCC) as a first step in addressing climate change. With near-universal membership, the

197 countries that have ratified the Convention are Parties to the Convention with the ultimate aim of preventing “dangerous” human interference with the climate system.

2007

The Caring for Climate initiative mobilizes business leaders to implement and recommend solutions and policies to beat climate change and is convened by the UN Global Compact, the secretariat of the UNFCCC, and the UN Environment Programme (UNEP).

12/12/ 2015

COP21 and Paris Agreement

The Paris Agreement’s central aim is to strengthen the global response to climate change with the goal of limiting global temperature rise this century to 1.5 degrees Celsius above pre-industrial levels. This will require reducing greenhouse gas emissions, which contribute to global warming, by 45 per cent by 2030, and achieving carbon neutrality by 2050.

2015

The Climate Neutral Now initiative is launched by UN Climate Change to encourage everyone in society to take action to help achieve a climate neutral world by mid-century, as specified in the Paris Agreement. The initiative invites organizations, governments and citizens to work towards global climate neutrality by addressing their own carbon footprint.

10/12/2018

Katowice - WMO and the Green Climate Fund (GCF) signed a formal agreement to work together to leverage WMO expertise on weather, climate and water to increase effectiveness of GCF funded activities and support low carbon and climate resilient development.

06/2019

Geneva Declaration – 2019

The World Meteorological Congress adopted Resolution 80 of Geneva Declaration (2019) on Building Community for Weather, Climate and Water Actions. This policy act reflects new cooperation and partnership between stakeholders from all sectors of the weather enterprise needed as a collective response to global societal risks related to extreme weather, climate change, water scarcity and other environmental hazards.

12/2019

COP25 is held in Madrid under Chilean presidency as Secretary General of the UN calls on states to show political ambition and the private sector to accelerate its efforts to tackle the climate crisis.

POSSIBLE SOLUTIONS

Many of the possible solutions rely on humans changing the way we behave, shifting the way we produce and consume. The required changes span technologies, behaviors, and policies that encourage less waste and smarter use of our resources. For example, improvements to energy efficiency and vehicle fuel economy, increases in renewable energy, biofuels from organic waste, setting a price on carbon and protecting forests are all ways to reduce the amount of carbon dioxide and other gases trapping heat on the planet.

According to recent analysis by the International Energy Agency and the International Monetary Fund, a combination of policy actions and targeted investments over the next three years could bring about a sustainable Covid-19 recovery, boosting global economic growth, creating millions of jobs and making 2019 the definitive peak in global emissions.

Energy

Producing and supplying more energy from clean, renewable sources, using fuels with no carbon content and investing in energy efficient technologies are ways to reduce carbon emissions. These alternatives can include solar, wind, water or renewable hydrogen.

Shifting investment towards renewable and low emission sources of energy will also offer related benefits, including the improvement of air quality and health, as well as the creation of new jobs and industries. Reducing emissions from energy production enables increases in large-scale deployment of low carbon electricity instead of fossil fuels and can increase access to low emission energy technologies with interventions relevant in areas where people still lack access to electricity.

Education

Retraining or educating to create green employment and job opportunities as well as education in schools or otherwise, in order to change high waste and emission habits within populations, are crucial.

Agriculture

Reducing emissions from deforestation and forest degradation caused by agriculture or livestock farming can involve forest governance reform, land use rights clarification and reform, and removal or creation of subsidies. Permaculture is a form of agriculture with an ethical design approach aimed at building sustainable human habitats by imitating the functioning of nature by taking inspiration from natural cycles. For example, farmers will grow different kinds of plants on the same piece of land, growing more on less space. Farmers will thus practice non-planting and take advantage of the symbioses that can exist between plants and different species of insects. Thanks to these practices, which eliminate the use of pesticides, fertilisers and herbicides, the soil is enriched and becomes more and more fertile. So production could eventually increase tenfold. The result could be a society that is less dependent on industrial production and distribution systems and more attuned to ecological and human needs.

Examples of good water management contributing to carbon sequestration in agriculture and other sectors include conservation agriculture practices, sustainable soil management that increases soil organic carbon content, agroforestry and forest landscape restoration, including protection of wetlands, that lead to enhancement of carbon stocks.

Industry

Technologies such as efficient motors, electronic control systems, and cross-cutting measures such as reducing air or steam leaks help to optimize performance of industrial processes and improve plant efficiency cost-effectively with both energy savings and emissions benefits.

Systemic approaches and collaboration within and across industrial sectors at different levels, e.g. sharing of infrastructure, information, waste and waste management facilities, heating, and cooling, may provide further mitigation potential in certain regions or industry types. The formation of industrial clusters, industrial parks, and industrial symbiosis are emerging trends in many developing countries.

Decarbonising transport

This solution could include traveling in electric vehicles powered by renewable energy sources, creating more compact, low emission routes, incentives to encourage train transport instead of planes for example and developing new technologies for more difficult sectors such as shipping or aviation.

Housing renovation

Improving the insulation of buildings, adopting better technologies, and using more energy efficient buildings and electrical appliances are all ways to reduce energy use, and thus CO₂ emissions.

Carbon Capture and Sequestration

Carbon dioxide capture and sequestration is a set of technologies that can potentially greatly reduce CO₂ emissions from new and existing coal and gas-fired power plants, industrial processes, and other stationary sources of CO₂. However, we cannot be reliant on these technologies to extract existing carbon in the atmosphere. This solution is the last step after having reduced all emissions in high emission sectors.

Legislation, Green Deal

Green or Green New Deals are ambitious policy programmes that typically fight inequity and tackle climate change by totally transforming our economy. However, some deals focus primarily on tackling climate and environmental challenges by reducing emissions whilst then ensuring that endangered jobs are protected. For example the European Green Deal provides an action plan to boost the efficient use of resources by moving to a clean, circular economy, restoring biodiversity and cutting pollution with the aim of providing a sustainable, just and healthy net zero transition for all.

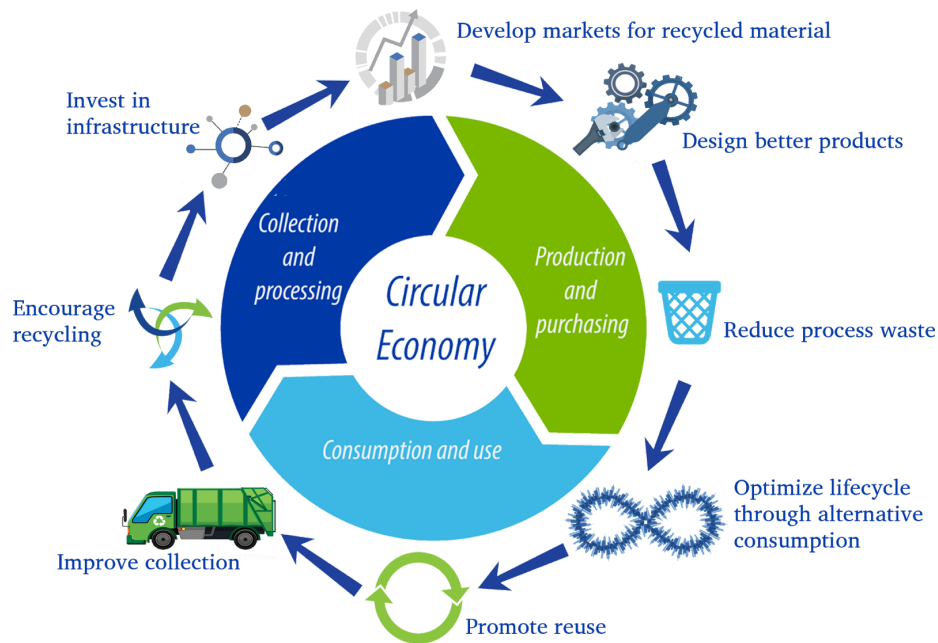


Image: Sustainable Global Resources Ltd.
Recycling Council of Ontario

International cooperation and sharing best practices

Various countries and governments have successfully implemented beneficial solutions and practices to counter the climate crisis such as the United Kingdom's 2008 Climate Change Act setting out emission reduction targets that the UK must comply with legally or the fact of Costa Rica generating 98% of electricity from renewable sources in 2018 - for the fourth consecutive year. Even though no current national measures are perfect, sharing these methods through international cooperation will advance the global transition to a carbon neutral economy.

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