environmental situation

The environment is life and life is the environment" It is undeniable that life needs to depend on the physical and biological environment as supporting factors. However, it was found that human lifestyle behavior has a serious effect on the environment both directly and indirectly. Although some activities lead to development and progress. At present, the world faces the problem of climate change caused by global warming that has severely affected the global society. These are from the rapidly growing world population. Behavior in wasteful and irresponsible use of natural resources and energy. Technological advances in machinery that require fuel to drive have caused carbon dioxide emissions, or pollution, that lead to large amounts of greenhouse gases in the atmosphere. and affect nature such as changes in rainfall Variable climate Natural disasters (forest fires, floods, earthquakes) There are more serious tendencies, etc. In academics, "environmental problems" refer to the problem of deterioration of the quality of the natural environment, which exists in 2 ways: From various human activities and 2) pollution refers to the presence of foreign matter in the environment. to a level that may cause harm to human health Harmful to living resources to the ecosystem (Kittiphum Mee Pradit, 2016) The issue of global warming and climate change has attracted attention from all sectors, including the international government, private sector and people as the global warming crisis affects and damages the world and intensifies. In addition, global warming not only causes global temperatures to rise. But also cause natural disasters. A new epidemic affecting the lives and well-being of humans and other creatures. Therefore, different countries are concerned and cooperate to solve such problems

environmental situation

According to the Environmental Quality Situation Report 2021, it states that in the year 2020, the average global temperature is approximately 1.2 ± 0.1 degrees Celsius higher than the temperature in the industrial age (1850-1900). Arctic sea ice is at its lowest level. The high concentration of carbon dioxide in the atmosphere makes natural disasters more severe. Climate change has various impacts such as drought, heat waves, wildfires, floods, tropical cyclones. cyclone frequency Deteriorated water sources due to pollution contamination Impacts on forest areas, wildlife, biodiversity As well as the spread of the COVID-19 disease that affects human health and livelihoods and has caused many deaths. Despite the decrease in travel due to the Lock Down measure, resulting in less greenhouse gas emissions, it was found that the amount of waste from single-use materials is increasing, including infectious waste. (Bureau of Natural Resources and Environmental Policy and Planning,2564)

Global warming and climate change

Over the past several decades, we have often heard the term “Global Warming” or (Global Warming) Many people wonder what causes global warming. forgetting to think that the source of such a crisis was caused by "us" itself In addition to global warming, we may have heard the word. “Greenhouse Gases (GHGs), Greenhouse Effect,” “Carbon Footprint,” and “Climate Change.” These terms all have meaning. different but are related

“Global warming” (Global Warming) refers to the increase in the average temperature of the Earth, either in the air near the Earth's surface or the water in the oceans. which is caused by some gases accumulating in the atmosphere beyond balance Global warming causes climate change (Climate Change). In human life and various industries have released a lot of greenhouse gases, increasing the amount of greenhouse gases in the atmosphere is a major cause of the crisis. global warming

"Greenhouse gases" (Greenhouse Gas: GHGs) are gases that have the ability to store and absorb thermal radiation from the sun. Major greenhouse gases include (Ministry of Energy, M.P.A.)

1) Carbon dioxide (Carbon Dioxide: CO2) Produced from energy production from burning fuels for industries such as burning wood, gas, coal and oil, including the rapidly increasing amount of carbon dioxide from logging and deforestation. Natural balance

2) Methane (Methane: CH4), although it seems to be the least toxic because methane gas occurs naturally from animal dung such as cattle, buffalo, fuel combustion. coal and natural gas degradation of living organisms or the decomposition of organic matter in the soil But methane is a greenhouse gas that is 23 times more powerful than carbon dioxide.

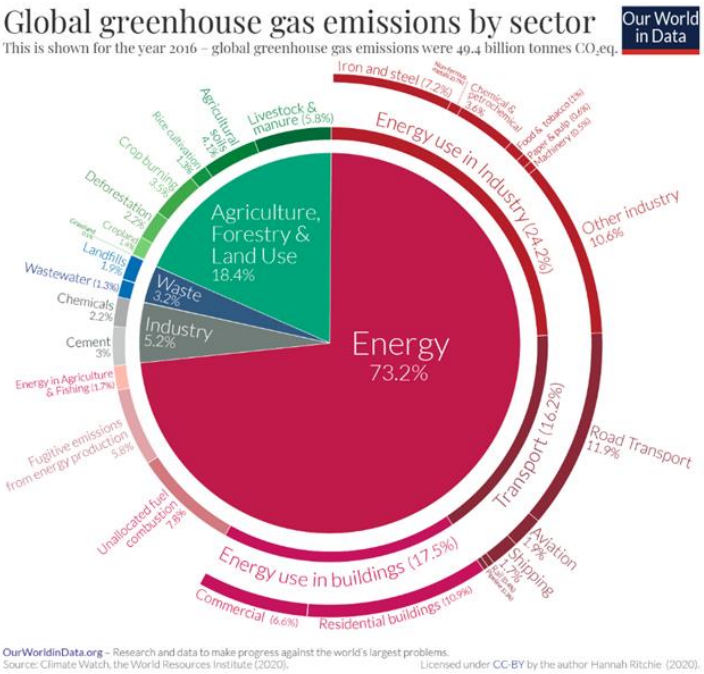
3) Nitrous Oxide: N2O occurs naturally such as lightning, lightning, volcanic eruptions, the use of decomposed manure and manure. Or it may be caused by human actions such as burning fuel, industries that use nitric acid in the production process, such as the chemical industry. some plastic industries Nylon fiber industry, nitric acid industry, sulfuric acid, metal plating, and explosives.

4) Chlorofluorocarbon. (Chlorofluorocarbon: CFCs) is a synthetically created substance consisting of carbon (C), chlorine (CI) and fluorine (F) for use in industries such as air conditioning. Refrigerator coolers, foam, fire extinguishing agents, aerosol cans. Industrial Detergents electronic etc.

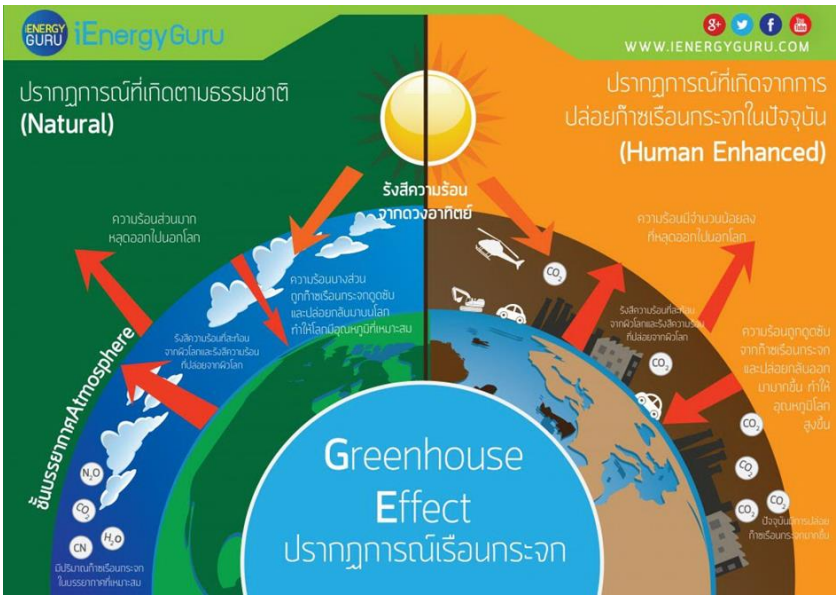
Greenhouse gases are essential to maintaining the Earth's atmospheric temperature. greenhouse gases Under normal conditions, the Sun emits shortwave radiation into the Earth's atmosphere and is reflected back up into the atmosphere as longwave or infrared radiation. Some of the heat energy will be absorbed by these greenhouse gases, resulting in the temperature of the earth at a level that various living things can sustain. If the earth's atmosphere does not contain greenhouse gases, the temperature during the day will be very hot and the night will be very cold. This is because these gases absorb heat waves during the day and gradually radiate heat at night. Therefore, the temperature in the global atmosphere does not change suddenly. And the world has a temperature suitable for the life of various creatures, so the greenhouse effect is important to our world.

Greenhouse gases are typically generated in two ways: (1) naturally occurring and (2) arising from human activities. Naturally occurring greenhouse gases gradually allow ecosystems and organisms to adapt accordingly. But the main reason for the rapid increase in the amount of greenhouse gases is due to human actions and activities such as mining fossil energy such as oil, coal, using natural gas. This causes large amounts of carbon dioxide to be released into the atmosphere faster than trees and other plants, including the ocean, can absorb. Including turning forest areas into agricultural areas and building habitats is another reason why the carbon stored in the wood in the roots in the soil is released into the atmosphere. (The Stock Exchange of Thailand, P.O.P.)

From Figure 1, it can be seen that greenhouse gases are generated from energy use the most. followed by agriculture various industrial sectors and solid waste respectively



The "greenhouse effect" (Greenhouse effect) is the world being enveloped by greenhouse gases. Greenhouse gases are by nature a constituent of the Earth's atmosphere. Or is it a phenomenon in which global temperatures are heating up due to an overabundance of greenhouse gases? These gases allow heat from the sun to pass through to the earth. but will absorb the heat in the world, not reflecting it, causing the heat to spread over the surface of the earth and the temperature at the surface of the earth is therefore higher than normal (Figure 2)



Carbon Footprint is the amount of carbon dioxide emissions. including other greenhouse gases such as methane, nitrous oxide released throughout the product, service and organization life cycles. It measures the quantitative impact of human activities on the environment. The indicators are Global Warming Potential (GWP) and quantitatively expressed in kilograms (kg CO2 equivalent) or tons (tons CO2 equivalent) (Bureau of Environmental Health, Department of Health, Ministry of Public Health, 2020: 3). Greenhouses created by human behavior are like "footprints" that are left everywhere until the term "carbon footprint" or carbon footprint has been used to describe such behavior. Both climate change and carbon footprint are serious issues facing the world today, both of which are becoming more and more important for organizations to take responsibility (Hrasky, 2012) due to the growing awareness of the impacts of climate change. Measurement of concrete carbon dioxide or "Carbon Footprint Carbon footprint is therefore used as an indicator of an organization's environmental performance in production or organizational activities (Laurent, Olsen & Hauschild, 2010)

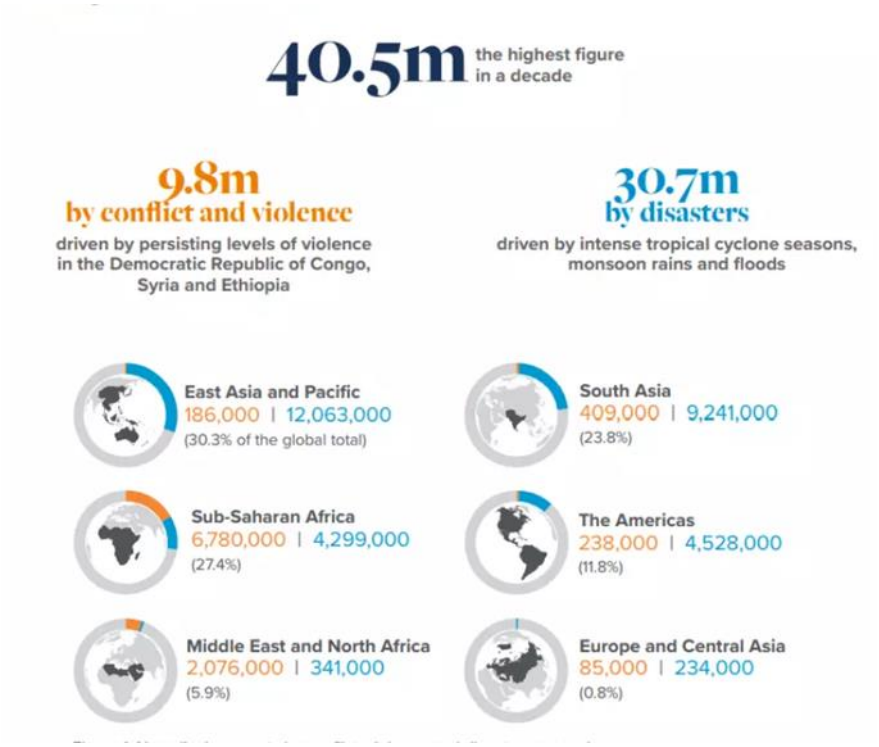
“Climate Change” (Climate Change) is a long-term change in the climate. Caused by global warming and climate change, which are more frequent and severe, such as droughts,

floods, storms, and others, which will have enormous impacts on society and the economy. (Thai Environment Institute Foundation, P.O.P.) Such changes can occur spontaneously, but since the 1800s climate change has been caused by human action. This is mainly due to the burning of fossil fuels (such as coal, oil and gas), which generate greenhouse gases. That is like a blanket covering the earth, causing the heat from the sun to not be released, causing the temperature to rise. In addition, climate change, within the FCCC (Framework Convention on Climate Change) definition, is the direct and indirect effect of human activities and changes in the composition of the atmosphere beyond. from natural variations (Department of Environmental Quality Promotion, 2020)

In summary, climate change (Climate Change) is caused by the change in the average weather (Average Weather) in an area. which refers to all weather-related characteristics such as temperature, rain, wind, etc. The behavior of humans such as deforestation fuel combustion including natural variations These cause climate change. And in the atmosphere, the amount of greenhouse gases (Greenhouse Gases) increases until the greenhouse effect (Greenhouse Effect) is more severe than usual, causing the temperature of the Earth's surface to rise, causing global warming (Global Warming).

The United Nations has stated that greenhouse gas concentrations have reached the highest levels in two million years, or the warmest period on record. Today, global temperatures are 1.1 degrees Celsius higher than they were in the late 1800s. But Yang is the starting point of consequences because everything on earth is systematically interconnected. A change in one area will result in a change in all other areas. severe drought sea level rise Natural disasters intensify, devastating fires, melting polar ice caps. loss of biodiversity, etc. At the same time, climate change affects humans as well. Whether it is health, cultivation, housing, safety and work. In the future, it is expected that "Climate Refugee" (Figure 3) These populations live in countries or areas affected by climate change more than other countries. relocate In some developing countries where there is food shortage due to prolonged drought, for example, climate management is a concern for everyone, especially in the countries that generate the most greenhouse gases. The 100 least emitting countries contribute 3% of total emissions. But the 10 most emitting countries contribute 68% of GHG emissions, so countries with the highest emissions must take action by taking early action. A 2018 United Nations report said that if we cannot keep global temperatures from rising above 1. 5 degrees Celsius Human beings will face the worst climate impacts that support livelihoods. However, the current national climate plan suggests that global warming is likely to touch. 2.7 degrees Celsius by the end of the century Although many countries are working together to reach zero greenhouse gas emissions by 2050, to prevent global warming from rising above 1.5 degrees

Celsius, emissions must be halved by 2030 and production. Fossil fuels must be reduced by about 6% per year between 2020 and 2030 (United Nations, Thailand, UNC)



The research paper, Frontiers in Sustainable Cities, looked at greenhouse gas emissions by cities in 167 countries and found that 25 of the world's largest cities, including Europe, Australia and the United States, accounted for hundreds of thousands of emissions. 52% of total greenhouse gas emissions and even though the cities In Asia, it emits the most greenhouse gases. But cities in Europe, Australia and the United States have higher greenhouse gas emissions per capita (World Economic Forum ,2021), which UNEP said that without serious action to reduce the climate crisis. Global temperature will increase by more than 3°C by the end of the 21st century (United Nations Environment Programme, 2020)

Many people may wonder how global warming affects. Or is it just a rising temperature? Indeed, the rapid rise in temperature over the past decade has had serious consequences in terms of damage, harm, economic and non-economic losses. From this period to the year 2100, an estimated 3.3 to 3.6 billion people in underdeveloped areas are estimated to be highly vulnerable to the effects of climate change.

- The polar ice caps are melting. Evidence has been found In North America, Europe and Asia, the snow cover has decreased, and the permafrost of the world has decreased by about 10% (Department of Health, 2020). The multiple effects are

- Animals that live in these areas have become extinct, such as emperor penguins, due to lack of hatching facilities. And penguins drown without a place to live.
- Sea levels are rising. and coastal water flowing into communities living along the seashore until being affected Normally, Earth is 70% water surface and only 30% land, so the melting of the polar ice caps increases the amount of water level rising. and eroding the land area causing the land area to tend to decrease which is contrary to the increasing population of the world
- Polar ice cap habitats are unstable. Causing the population to be evacuated, such as Russia's Roshydromet Research Station People had to be evacuated urgently within three hours because the ice sheet was rapidly breaking. and could not locate a new research station because there was no strong enough ice to build on. It also causes the coast to be eroded. and may cause some small islands to disappear from the world map
- Opportunities for viruses and bacteria that have been buried under ice for decades. can spread to people living in the polar regions again The polar regions are generally low temperatures. The amount of germs is very small and some of the germs are frozen in ice. no oxygen no light cool Therefore, when the polar ice cap melts, pathogens in the ice are released into the air and spread to humans, such as data from a research team from the Chinese Academy of Sciences (CAS), which Published in the journal Nature Biotechnology. A large number of microbes were found in glaciers in the Tibetan Plateau. The discovery of a greater diversity of microbes, coupled with the rapid melting rate of glaciers caused by climate change, has led the researchers to worry that these microbes are likely to cause glacier erosion. Most of the bacteria will escape.

- inclement weather Due to the global average temperature increase around the world. With the global average temperature increasing by about 1 degree Celsius (1.8 degrees Fahrenheit) (Department of Health, 2020), the tendency for natural disasters to occur more often and more severely, such as forest fires, floods, tropical typhoons, etc. Causing more deaths, for example, in July 2021, a major flood in Europe caused 242 deaths, with Germany having the most victims, 196 people, followed by Belgium with 42 people, with many districts in Germany experiencing the heaviest rainfall. Around more than 100 years or maybe more than 1,000 years, total damage more than 11. 8 million US dollars and in October India-Nepal There were flash floods and landslides

in many areas. At least 201 people have died, 104 of them in Nepal and 70 in Uttarakhand. In December 2021, at least 35 tornadoes hit parts of five US states. There were 93 deaths and more than 1,000 houses were destroyed (Thairath Online, 2021). Data from the National Oceanic and Atmospheric Administration (NOAA) reveals storm statistics in the western Pacific during The past 50 years (1970–2020) show that storms and super typhoons occur more frequently in Asia than other regions (Chart 1). Also, the Shenzhen Academy of Meteorological Innovation and the Chinese University of Hong Kong analyzed statistics on tropical cyclones occurring in Southeast Asia since 1970.

- Seasons are variable. Global warming will make summers last longer and arrive faster. As the winter shortens The water cycle changes due to precipitation patterns and changing temperatures. including the effects on the flow of surface water systems and groundwater levels. Causing the ecosystem and animals in the ecosystem to change and lose balance, for example, when the temperature rises, many animals in North America will migrate to the north. It may expand the territory of some animals. while some species may become extinct Some animals struggle to survive while others have nowhere to go due to space constraints. Fish that live in warm currents encroach on the territory of cold-water fish as many cold-water fish species lose their habitat. Including resulting in the reduction of agricultural and fishery areas. (Thailand Greenhouse Gas Management Organization (Public Organization), 2021). In addition, changes in marine ecosystems cause the death of some corals. and the phenomenon of coral bleaching, etc
- The report 'Climate Change 2022: Impacts, Adaptation and Vulnerability', conducted by the IPCC, highlights four key health impacts of climate change crisis (Warisara Jaruwanno, 2022).

1) Emerging Infectious Diseases

• Emerging pathogens in food and water. Expanding the reproductive species of new vectors animal-to-human disease And humans to animals such as bacteria Vibrio spp.

• Increased rainfall and floods contaminate drinking water supplies. cause gastrointestinal infections and cholera and the danger from cyano toxins from freshwater bacteria increases with rising CO2 levels.

2) Heat, malnutrition, and other (heat, malnutrition, and other)

• Warmer weather causes frequent wildfires. The result is wildfire smoke. dust in the atmosphere and airborne allergens This increases the risk of cardiovascular disease. and respiratory diseases, etc.

• Extremely hot weather in all regions results in deaths and illnesses. The heat wave affects vulnerable populations such as the elderly or patients.

• Extreme heat affects work efficiency.

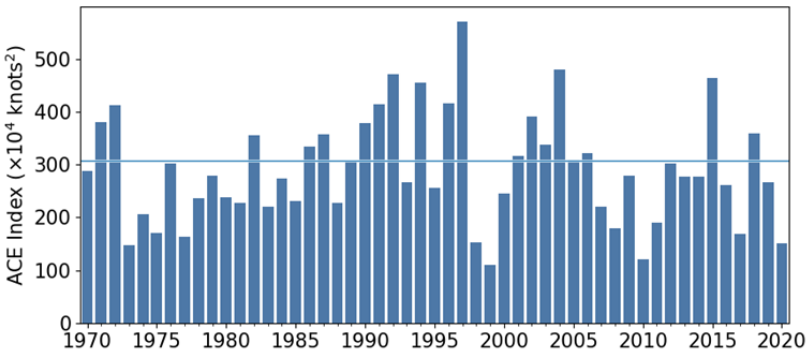
• Damage to agricultural products. agricultural productivity declines Not producing as it should causing insufficient food for the population lead to food shortages and malnutrition.

(3) Mental Health

• Mental health problems resulting from exposure to extreme weather and frequent disasters; and (4) displacement.

• Populations in some areas affected by repeated and increasingly severe climate change may need to relocate, such as those in coastal areas. or in areas that are so dry that they can no longer be cultivated

In addition to these issues, the impact of climate change could result in the emergence of previously severe diseases such as malaria due to increased mosquito populations caused by global warming. as well as respiratory disease and asthma Higher temperatures in the tropics make the cardiovascular system work harder. to maintain a cool body temperature Heat waves increase the concentration of ozone in the atmosphere and damage lung tissue, especially in people with asthma. and cause lung disease as well



According to the Copernicus Climate Change Service (C3S) project by European Union climate scientists, 2021 will be the fifth warmest on record. The average global temperature in 2021 is 1.1-1.2 degrees Celsius higher than the level in 1850 -1900 and when compared back to 1850, it was found that the world was clearly the hottest in the past 7 years. The record highs were 2016 and 2020 (Chart 2), and global carbon dioxide and methane levels continued to rise and hit record highs in 2021 (previously down in 2019 during the COVID-19 pandemic).

This counteracts a commitment to cut greenhouse gas emissions by more than half by 2030 under the commitment of the Paris Agreement to limit global temperature rise to 1 C.

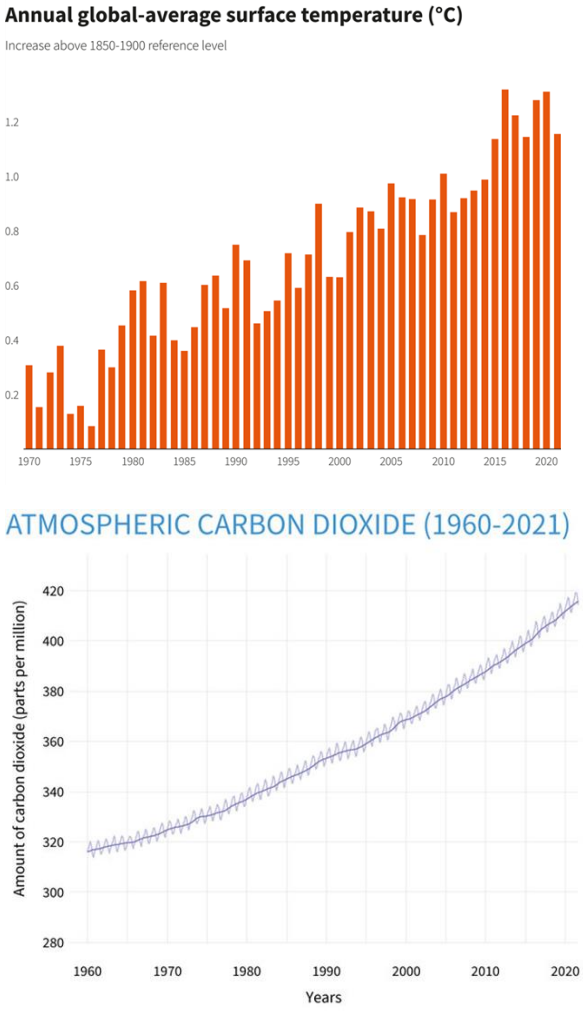


Chart 3 The amount of carbon dioxide in the atmosphere Since the start of the industrial revolution in 1750, emissions have been increasing slowly by about 5 billion tonnes per year by the mid-20th century before the end of the 20th century. skyrocketing to more than 35 billion tonnes a year by the end of the century.

Climate crisis and human red code

The red code is a warning from the United Nations, indicating that the global average temperature will rise by more than 1.5 degrees Celsius by 2030. This is a figure 10 years faster than experts expected, higher than the level before the industrial revolution. Such a rise in temperature will have a huge impact on the global situation. The most likely phenomena range from natural disasters to deterioration. The sea level will rise rapidly due to the melting of polar ice 1979) Global climate negotiations have been going on, but human beings and forests have failed to cope with and solve this situation. Greenhouse gas

emissions Despite several warnings issued by scientists, GHG is still growing rapidly, causing greater damage to the global climate. However, greenhouse gas emissions have not decreased. The steady growth of population and per capita meat production, the loss of global trees, Global economic growth rate (global GDP), fossil fuel consumption, number of air passengers Since 2000, more than 11258 scientists from 153 countries have been named the World Union of Scientists. (World Union of Scientists) signed a statement warning people to pay attention to the emergency state of global warming published in the journal Biological Science. On November 5, 2019, we stressed that the world is facing a "climate emergency" "Unprecedented suffering" (Ripple, William, 2019) This report is a data collection for more than 40 years. There are a wide range of environmental indicators covering fossil fuel energy consumption, meat consumption and so on. Fertility and growth rate of the world population, global surface temperature level and atmospheric carbon emission rate Including economic losses caused by severe climate change. According to these data, human beings will face more serious consequences than ever before, and may lead to the inability of some regions of the earth to survive. Global environmental scientists team In order to alleviate this situation, everyone can take immediate action, including (Praornpit Katchwattana, 2019)

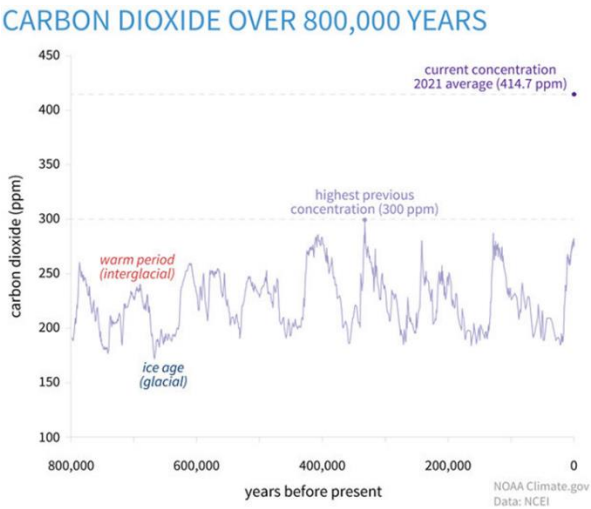


Chart 4 shows that atmospheric carbon dioxide per million (ppm) over the past 800,000 years has been low during the Ice Ages. and warm periods in the Ice Age (Interglacial) the amount of carbon dioxide will be higher. During this cycle, CO2 has never been above 300 ppm. The increase in CO2 over the past 60 years is 100 times faster than the previous natural increase, which on a geological time scale the increase from the end of the The last Ice Age to date seems almost instantaneous.

(1) Energy: Set policies to conserve energy sources and save energy at the macro level. by promoting the use of sustainable renewable energy instead of fossil fuels Does not subsidize oil prices or policies to support the fossil fuel industry. Charge carbon emissions so that businesses and industries avoid using fossil fuels (2) short-term pollutants. By reducing short-term pollutants by reducing the use and emissions of methane. hydrofluorocarbons Including various soot This may help reduce the severity of global warming in the next 20-30 years by up to 50% (3) Nature: Stop encroaching on forests and destroying nature. Strict measures to stop the clearing of forest areas to conserve and restore ecosystems such as forests, grasslands, and mangroves, which are important factors for absorbing carbon dioxide in the Earth's atmosphere.(4) Food: Create food security in a concrete way. Encourage people to reduce their consumption of animal food products and support the consumption of more vegetables. to reduce emissions of methane and other greenhouse gases Including reducing the clearing of forest areas for livestock farming as well. (5) Economic aspect: change direction/policy for economic development for the world. Abolish plans for reliance on fossil fuels Change the direction of policies that only seek wealth and increase GDP by destroying resources. instead, it is a policy that takes into account the sustainability of the 'biosphere' in the long run. (6) Population: Control the world's population to fit. Trying to limit the world's population to a stable and reasonable level. by means of economic and social justice Because at present there are more than 200,000 new borns per day.More than 28 governments around the world and the scientific community have now declared a climate emergency declaration to raise public awareness that humanity is facing a climate crisis. While Thailand is ranked among the world's most vulnerable and vulnerable to climate crises (Table 1), the Climate Center The Meteorological Department forecasts that the change in conditions over the 20-year period from 2016 to 2035 in Thailand will have an increase in average temperatures. During the summer months, the average maximum temperature is over 35 degrees Celsius. Extremely hot days occur more often. summer is longer While the winter will be shorter and less cold. Natural events become more severe, for example, when there is a storm or heavy rain, but the number of precipitation decreases and drought increases. The wind grew stronger each time. And although there is data showing the number and severity of climate-related disasters in Thailand,

Over the past few years, such as a long drought inverse temperature Floods and severe storms That damages the lives and property of people many times. That flood alone occurred 67 times during 1989-2018 (Table 2) (Tara Buakamsri, 2020), but the government itself has not yet declared a climate emergency. In November 2019, more than 1,000 youths and general public were called and marched in the Climate Strike activities around Lumpini Park. to call

on governments to take urgent action to address climate change (Figure 11). from the local level to the national level At the local level, there may be differences in detail depending on the local context.

No.	Country	CRI Score	Fatalities	Loss Per Unit GDP in %
1 (1)	Puerto Rico	7.17	149.85	3.66
2 (2)	Myanmar	10	7056.45	0.8
3 (3)	Haiti	13.67	274.05	2.3
4 (4)	Philippines	18.17	859.35	0.54
5 (14)	Mozambique	25.83	125.40	1.33
6 (20)	The Bahamas	27.67	5.35	3.81
7 (7)	Bangladesh	28.33	572.50	0.41
8 (5)	Pakistan	29.00	502.45	0.52
9 (8)	**Thailand**	**29.83**	**137.75**	**0.82**
10 (9)	Nepal	31.33	217.15	0.39

Global Efforts to Address Climate Change over the past two decades It operates globally in a connected and interrelated way. regional and national for managing climate

change problems Finding a way to prevent or reduce the impact that may occur in the future world classScientific evidence has proved that the main threat to the world since the 1980s, posed by human activities that generate greenhouse gas emissions, led to the drafting of the United Nations Convention on Climate Change. Climate Change (United Nations Framework Convention on Climate Change: UNFCCC) in 1992 and Kyoto Protocol (KP) in 1997, of which Thailand is a member of both mechanisms. But with the situation of climate change intensifying. enabling States parties to the Convention Need to negotiate a new climate change agreement During the 21st Meeting of the Parties to the Framework Convention (COP21) held in Paris, France Between November - December 2015 and the Paris Agreement (Department of International Organizations) Ministry of Foreign Affairs, 2022) at the next session, or COP22, on April 22, 2016, which coincides with Earth Day, officially opened for signing of the Paris Agreement at the United Nations Headquarters in New York. And came into force on November 4, 2016. Currently, there are 197 member countries that have signed the Paris Agreement. and a group of countries which are developing countries Thailand joins “Paris Agreement” On September 21, 2016, Prime Minister General Prayut Chan-o-cha attended the 71st session of the United Nations General Assembly in New York, United States of America and ratified Thailand's accession to the Paris Agreement. Ban Ki-moon, Secretary-General of the United Nations at the United Nations Headquarters (Green Network, 2021).That is to say, efforts to solve the global climate change problem have continued until now, there have been 3 international agreements on climate change, namely the United Nations Framework Convention on Climate Change; Kyoto Protocol and the Paris Agreement as follows: (Department of Environmental Quality Promotion, EMP., online)

1) United Nations Framework Convention on Climate ChangeIt is a convention arising from the efforts of the world community to solve climate change problems that are believed to be caused by the greenhouse effect (Greenhouse Effect) caused by the accumulation in the atmosphere of various gases, including 1. Carbon Dioxide (CO2) 2. Methane (CH4) 3. Nitrous Oxide (N2O) and CFCs Substitutes In 1990, data was published by the Intergovernmental Panel on climate change (Intergovernmental Panel on Climate Change: IPCC) to reaffirm climate change as a result of greenhouse gas emissions into the global atmosphere and anticipate potential threats such as melting icebergs and glaciers. sea level rise in the oceans The more frequent violent formation of natural disasters. The results of the assessment led to negotiations for the United Nations Framework Convention on Climate Change (UNFCCC) to build international cooperation to address the issue.The obligations of the Parties are in principle. "common but differentiated responsibilities" aims to keep the concentration of greenhouse gases in the atmosphere at a safe level. for the ecosystem to adapt to natural

climate change and no impact on food production and sustainable economic development But does not specify the exact level or amount of gas treatment or reduction, but requires Annex I countries to have policies and measures to reduce emissions. together to the level of the 1990s, but without compulsory measures. Thailand is a signatory to the Convention. In June 1992 and ratified as a party to the Convention on December 28, 1994.

2) Kyoto Protocol In 1995, considering the national reports of the Parties to the Convention (Group 1 countries) found that these countries are unable to reduce greenhouse gas emissions to the level specified in the Convention. Including the amount of GHG emissions reductions pursuant to the obligations are insufficient to achieve the ultimate objectives of the Convention. Consequently, an ad hoc action committee, the Ad Hoc Group on Berlin Mandate (AGBM), has been created to review its obligations and formulate more thorough and concise measures. The meeting continues to pursue the ultimate objective of the Convention, which is to achieve a stable level of greenhouse gas concentrations in the atmosphere that is safe from human economic and social development for sustainable development. sustainable and under specific principles of equality and shared responsibility at different levels (Office of Energy Policy and Planning Ministry of Energy, 2016) Date: 11 December 1997 (1997) in Kyoto, Japan The meeting agreed on the Kyoto Protocol, which is a legal commitment undertaken to achieve the goal of combating global warming and addressing climate change. concretely The Kyoto Protocol establishes international cooperation mechanisms, namely: (1) Trading Mechanisms for Greenhouse Gas Units or Carbon Credits among Annex 1 countries (Emission Trading) (2) Investment in joint greenhouse gas reduction projects. (Joint Implementation) and (3) joint implementation of greenhouse gas reduction projects between countries in and outside the Annex 1 countries, known as Clean Development Mechanism (CDM) which Thailand has ratified the Kyoto Protocol on 28 August 2002 (2002).Later in December 2012 (2012), the 8th meeting of the Parties to the Kyoto Protocol in Doha, Qatar, the Parties to the Protocol resolved to amend the Protocol with the following key points: (Environment, 2016) • New commitments to reduce greenhouse gas emissions for Kyoto Protocol Parties to Annex I or developed countries. which accepted commitments during the Second Commitment Phase from 1 January 2013 to 31 December 2020 • List of greenhouse gases for which Parties are required to report in the Second Commitment Phase Amendment • Amends several articles of the Kyoto Protocol. Related to the first commitment phase and need to be updated for the second commitment phase, Thailand ratified the Kyoto Protocol on 2 February 1999 and ratified it on 28 August 1999. . 2002 as a member of the developing countries3) Paris AgreementThe Paris Agreement is the latest edition of the United Nations Framework Convention on Climate Change (UNFCCC) agreement that expands and supplements.

(Supplementary Agreement) after the Kyoto Protocol (KP) in 1997 because the Kyoto Protocol has limitations and cannot fully solve climate change problems (Green Network, 2021). The main points of the Paris Agreement are: 1) a common basic goal for countries to keep the increase in global average temperature below 2 degrees Celsius, while keeping the increase in global average temperature even lower; up to below 1.5 degrees Celsius (Greenpeace, University of Thailand p) Such actions shall be based on the principle of equity and shared responsibility according to the different levels of developed and developing countries. And taking into account the potential of each country according to the situation of different countries and 2) The operation covers various issues such as greenhouse gas reduction (Mitigation), adaptation to climate change (Adaptation), financial structure. (Climate Finance) Transparency Mechanism Transparency, global stocktake review, and support in various fields including development and technology transfer. capacity building of developing countries, including financial States parties must make a nationally determined contribution (NDC) for the country every five years (Department of International Organizations). Ministry of Foreign Affairs, 2022, Green Network, 2021)Thailand ratified the Paris Agreement on 21 September 2016.

ASEAN regional level

The ASEAN Community has been involved in international negotiations for efficiency and equality in tackling climate change since 2007 (2007). Efforts to tackle climate change align with the Sustainable Development Goals (SDGs) and reiterate the importance of regional ecosystem diversity as a basis for tackling climate change.In the document ASEAN 2025: FORGING AHEAD TOGETHER, in addition to the social, cultural, economic and security development plans, it also mentions strategies. It outlines what member states need to do, such as enhancing the capacity of their organizations and people to take action on climate change adaptation and climate change mitigation. Climate especially affects vulnerable and marginalized communities. Enhance private sector and community access to new and innovative financing mechanisms to combat climate change. Promote efforts by governments, the private sector and communities to reduce greenhouse gas emissions from key development activities, etc. (Thipwan Suphamitkitja and Department of ASEAN Ministry of Foreign Affairs, 2016)

National level Climate change is a major global problem that poses a challenge for each country, including Thailand, in terms of sustainable development. The economic development of developed countries during the post-industrial revolution caused the atmosphere to accumulate greenhouse gases faster. Until causing the greenhouse effect and

more severe climate change. Although this is a global problem, it has a huge impact on developing countries like Thailand. both the impact of climate change fluctuation of seasons More severe and frequent disasters, such as during the year During 2021-2022, Thailand faced several severe flooding problems in many areas of the country (Figure 15). Forms and distribution of pathogens and vectors that cause re-emerging and emerging diseases. Therefore, climate change poses a threat to countries' actions in achieving the Sustainable Development Goals. both in terms of economic growth Eradication of poverty and improving the quality of life of the population. as well as maintaining the balance of the ecosystem In addition, Thailand has to cope with the problem of increasing greenhouse gas emissions from developing countries that need to use fossil fuels as their main energy source. and the use of more energy from the expansion of urban areas. In addition, Thailand has to cope with the problem of increasing greenhouse gas emissions from developing countries that need to use fossil fuels as their main energy source. and the use of more energy from the expansion of urban areas. In addition, Thailand has to cope with the problem of increasing greenhouse gas emissions from developing countries that need to use fossil fuels as their main energy source. and the use of more energy from the expansion of urban areas.

For many years, the country has been committed to solving the problem of climate change on a global scale. ASEAN and national level, for example. Put forward suggestions to the international community on national participation in greenhouse gas emission reduction and climate change actions (determined by the country) According to the draft national greenhouse gas emission reduction guidelines, the goal of contribution (NDC) is to reduce greenhouse gas emissions by 20-25% by 2030. 2021 to 2030 (Thailand's National Defined Contribution Roadmap or NDC Roadmap for Mitigation from 2021 to 2030) 2021 to 2030) through operations in the fields of energy and transportation, industrial processing and product use, and waste management. Ratification of accession to the United Nations Framework Convention on Climate Change The Climate Change (UNFCCC) and the Tokyo Protocol (KP) were issued in 1994 and 2002 respectively. Global climate change cooperation framework In addition, Thailand has formulated the National Climate Change Management Strategy for 2008-2012. Provide important national institutions, such as: Office of the National Economic and Social Development Commission and Office of Natural Resources and Environmental Policy and Planning Climate change in 2015-2020 as a long-term operational and policy framework Establish mechanisms and tools to promote climate change solutions Climate change actions have been integrated into major national strategic policies, including:

20-Year National Strategy (2017-2036) in the draft 20-Year National Strategy (2017-2036) which consists of 6 key strategies, namely Strategy 1: Security Strategy Strategy 2: Strategy for

Building Competitiveness Strategy 3: Strategy for developing and enhancing human resource potential Strategy 4: Opportunity Creation Strategy and Social Equality Strategy 5: Strategy for building growth on the quality of life that is friendly to the environment Strategy 6: Strategy for Balancing and Developing the Government Administrative SystemIn strategy 5, to create growth on the quality of life that is friendly to the environment. It has important goals such as sustainable consumption and sustainable production. Conserve and restore natural resources. Integrated water management Enhance the ability to prevent impacts and adapt to climate change and disasters. nature and adapting to a form of production and consumption that emits low carbon emissions and is more environmentally friendly, etc. (Draft 20-Year National Strategy 2017-2036) Sustainable Development Goals Driving PlanOn December 19, 2019, it resolved to approve the principle of drafting a plan to drive the Sustainable Development Goals for Thailand (Thailand's SDG Roadmap), with the establishment of the Sustainable Development Committee (NESDB) as the main working group. too The plan covers the implementation of 6 main strategies. 4 strategies for government work and another 2 strategies for working with society as follows: 1. Raising awareness 2. Linking the Sustainable Development Goals to the national three-level plan 3. Establishing a mechanism to drive the development goals 4. Establishing projects/operations/development to achieve the Sustainable Development Goals 5. Development partners that aim to involve both domestic and international sectors in driving the SDGs6. Monitoring and evaluation of the SDGs drive aimed at systematic monitoring and evaluation. Currently, a national monitoring and evaluation system called eMENSCR has been designed.

Thailand Climate Change Master Plan (2015-2050) Climate Change Master Plan (2015-2050) was developed by the Office of Natural Resources and Environmental Policy and Planning under the supervision of the Ministry of Natural Resources and Environment. It has a growth goal that is climate resilient and a low carbon society in line with the Sustainable Development Goals by 2050. (2015-2036) Electricity Network Development Master Plan national genius (2015-2036) Alternative Energy Development Plan (2015-2036) Environmental Sustainability System Plan (2013-2030) National Industrial Development Plan (2012-2031) and other waste management plans (Raweewan Boondej, 2015)