Int.J.Curr.Res.Aca.Rev.2026; 14(3): 1-11

International Journal of Current Research and Academic Review

ISSN: 2347-3215 (Online) Volume 14 Number 3 (March-2026)

Journal homepage: http://www.ijcrar.com

doi: https://doi.org/10.20546/ijcrar.2026.1403.001

The Function of Carbon Dioxide in Global Warming

Prisyazhniuk Vitaly*

Former Head of laboratory, Research and Design Institute for Basic Chemistry, NIOCHIM, A. Podgorny Institute of Mechanical Engineering Problems of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine

Corresponding author

Abstract

The article reminds us that organic chemistry, that is, the chemistry of carbon-containing molecules, is the basis of all life on Earth. Carbon-containing molecules form the vegetative mass of plants, the muscle mass of animals, and the body of all living things is built from carbon-containing molecules. The Law of Conservation of matter helps us understand that atmospheric carbon dioxide is an element in the trophic food chains of plants and animals inhabiting both water and land. In nature, "carbon emissions" are widespread due to processes occurring in the Earth's crust: the oxidation of coal deposits, the coking of anthracite deposits, and volcanic eruptions. Nature regulates the average annual temperature of the planet by obscuring the Sun with volcanic ash emissions and smoke from fires. The First Law of Thermodynamics states that energy is neither created nor destroyed, therefore, the energy of Solar radiation accumulates in the Earth's ecological system. The Earth's atmosphere (air) traps approximately 50% of infrared (thermal) radiation. It is unlikely that carbon dioxide, which makes up only 0.046% of the air by mass, or 460 ppm, could cause global warming. In 2025, humanity emitted 2.196 megatons of carbon dioxide into the atmosphere through respiration. Statistical data on average annual global temperatures make it possible to detect and estimate the contribution of wars to global warming. Radiofrequency radiation from the Sun is the source of energy for earthquakes and volcanic eruptions.

Article Info

Received: 05 January 2026
Accepted: 22 February 2026
Available Online: 20 March 2026

Keywords

Conservation Laws; Life; Carbon Dioxide; Climate Change

Introduction

After the end of World War II, environmentalists began actively promoting the idea of the decisive role of carbon dioxide in global warming. Today, this thesis has become dominant. Familiarization with some of the articles on climate change reveals that the authors of the published articles typically discuss the 2015 Paris Climate Agreement, the human contribution to global warming, and the need for deep decarbonization of the Earth, but say nothing about the nature of temperature change. Without knowing the cause of the disease, it is impossible to cure it. This is precisely what we have been observing over the past 50-60 years. In 1992, the UN Framework Convention on Climate Change (UNFCCC) was signed at the Rio de Janeiro summit. In 1997, the Kyoto Protocol was signed. In 2015, the Paris Climate Agreement was signed. At least 33 years ago, the cause of universal evil was documented on paper, but the average annual temperature on the Planet continues to rise relentlessly.

Considering the millennia of human knowledge accumulation, the incredible achievements in space exploration, and the development of communications, the situation seems strange. The strange thing is that we see one thing, but develop completely different conclusions and tools for combating climate change. Therefore, let's turn to the history of science.

Where it all began

Nature operates by its own laws. The goal of science is to understand these laws, and the goal of humanity is to learn to adapt to them. Perhaps, to some extent, to change the situation to our advantage. But to do this, we must recall and correctly apply the vast amount of information accumulated by science over millennia.

About 50 years ago, I read a study conducted in the United States on the structure of scientific institutions. Only 5% of employees working in these institutions were "idea generators" and essentially determined the direction of the scientific institution. But without the remaining 95% of employees, the productivity of these "idea generators" would be significantly reduced. After all, they would have to spend time on auxiliary work that doesn't require high qualifications.

I think it's always been this way. Including the Stone Age, when basic tools and weapons were made of stone, wood, and bone, and metals weren't yet in use. This period began around 3 million years ago with the appearance of the first hominids and ended with the development of metallurgy (around 8,000–9,000 years ago in the Ancient East. Along with the development of toolmaking, a language emerged, allowing the 5% of idea generators to share their knowledge and skills with their peers, thereby accelerating scientific and technological progress. Judging by archaeological findings, Stone Age humans emerged at roughly the same time in various regions of the globe. This means that idea generators have always been randomly scattered across the globe.

Protoscience

The initial stage of knowledge development in ancient civilizations, when useful information in astronomy, mathematics, and medicine was accumulated through solving practical problems, is called prescience. This is essentially the period of knowledge accumulation within priestly schools and early cultures, where knowledge (for example, astrology, alchemy) was inseparable from mythology and religion, but already contained the seeds of future scientific knowledge. Alchemy (Alchemy, 2025) was historically practiced in China, India, the medieval Islamic world, and Europe. Alchemists worked to improve or purify certain materials. The common goals of alchemists were: transmuting base metals, such as lead, into noble ones, such as gold; creating an elixir of immortality; and creating a panacea—a medicine capable of curing any disease. Muslim and European alchemists developed a basic set of laboratory tools, technological techniques, terminology, and theoretical generalizations, some of which are still used today.

Chemistry

Alchemy's successor was chemistry, a vast field of natural science that studies substances, their composition and structure, their properties, their transformations leading to changes in composition—chemical reactions—as well as the laws and patterns governing these transformations. By the mid-19th century, chemists, analyzing living and nonliving nature, had discovered many new substances. Each chemist, describing a newly discovered substance, named it at their own discretion. As a result, the same substance could have multiple names. Therefore, in 1861, the International Congress of Chemists in Geneva, Switzerland, adopted the Geneva Nomenclature—the first international system of rules for the systematic naming of chemical compounds, which laid the foundation for the modern systematic nomenclature of IUPAC (International Union of Pure and Applied Chemistry). Organic chemistry (Clayden J., Greeves N., Warren S., 2012) is a subdiscipline within chemistry involving the scientific study of the structure, properties, and reactions of organic compounds and organic materials, i.e., matter in its various forms that contain carbon atoms. That is, organic chemistry is the chemistry of carbon compounds.

The role of organic chemistry at the household level

Carbon (C) is the sixth element in the periodic table, the basis of organic life and a key element in organic chemistry. It has the unique ability to form long, strong bonds (chemical chains and cycles). Even as a chemical element, carbon can exist at room temperature as diamond (hard), graphite (soft), graphene, carbyne, and other crystallographic modifications. The chemical composition of a cell in the human body is: 65% oxygen, 18% carbon, 10% hydrogen and 3% nitrogen (Biologically significant elements, 2025).

Fatty acids are carbon-containing acids that are the main components of fats, oils, and waxes. Neutralizing a fatty acid with sodium hydroxide results in solid soap.

Neutralizing it with potassium hydroxide results in liquid soap. Oleic acid ($C_{17}H_{33}COOH$) is found in many vegetable oils. For example, sunflower oil can contain up to 69% oleic acid. In Ukrainian, sunflower oil is called "oliya." Imagine inviting friends over to celebrate the 50th anniversary of the fight for deep decarbonization of life on planet Earth, as called for by the Intergovernmental Panel on Climate Change (IPCC, 2023). After washing your hands with soap, which is sodium or potassium salt of fatty acids, you sit down with friends at a table where the main course is potatoes (up to 20% carbohydrates) fried in sunflower oil (69% oleic acid).

You care about your friends' health, so you serve salmon, which contains Omega-3 fatty acids—essential polyunsaturated fatty acids necessary for heart, brain, vision, and immune function. The body doesn't produce them in sufficient quantities, so they are obtained from food (fatty fish, seafood, oils). Spirits are an aqueous solution of ethyl alcohol C_2H_5OH (the brand name—cognac, brandy, whiskey, vodka—is unimportant, as it determines only the alcohol concentration and the type of flavorings used).

You dilute the strong beverages with club soda (an aqueous solution of carbon dioxide). By the way, gaseous carbon dioxide is not absorbed by the body, and you usually release it through the mouth into the environment.

Ecology

Ecology (Ecology, 2025) is a branch of biology, and is the study of abundance, biomass, and distribution of organisms in the context of the environment. It encompasses life processes, interactions, and adaptations; movement of materials and energy through living communities; successional development of ecosystems; cooperation, competition, and predation within and between species; and patterns of biodiversity and its effect on ecosystem processes. Ecology has practical applications in fields such as conservation biology, wetland management, natural resource management, and human ecology. The term ecology (German: *Ökologie*) was coined in 1866 by the German scientist Ernst Haeckel. The science of ecology as we know it today began with a group of American botanists in the 1890s. Evolutionary concepts relating to adaptation and natural selection are cornerstones of modern ecological theory.

What happens when you constantly start from scratch

Unfortunately, environmentalists, in their pursuit of originality, have "forgotten" centuries of accumulated knowledge, experience, and achievements in the basic sciences of physics, chemistry, and mathematics, focusing their attention on naked assertions, which often cause confusion. I quote: to reduce global warming "... requires rapid and deep decarbonization» (IPCC, 2023). Let's remember that all exists: plants, fungi, microbes, protozoa, insects, arthropods, amphibians, aquatic animals, mammals, and so on, are composed of carbon-containing molecules. We eat carbon-containing molecules and use them for healing. When a foal is born or a bush grows from the ground, these are all carbon emissions. Therefore, calls for deep decarbonization are analogous to calls to destroy all life on planet Earth. Moreover, the average person inhales atmospheric oxygen and exhales 30 g/hour = 0.03 kg/hour of carbon dioxide. Since there are 24 hours in a day and 365 days in a year, a person exhales approximately 263 kg/year of carbon dioxide. As of December 17, 2025, there were 8.35 billion people living on Planet Earth. Therefore, in 2025, humanity exhaled 2,196,050,000,000 kg of carbon dioxide. Or 2,196,050,000 t = 2.196 megatons of carbon dioxide. And humanity continues to breathe. Could this be the cause of global warming, and is it time to stop breathing to save life on Earth? Preschool-aged children, both land and sea dwellers, are exempt from this obligation: they are unable to read the conclusions of the Intergovernmental Panel on Climate Change.

Where do plants get carbon to synthesize carbon-containing molecules?

If the entire living world is built from carbon-containing molecules, then a simple and natural question arises: where do plants get the carbon to build their biomass? Again, it makes sense to recall the history of science.

In 1756, Russian academician M. V. Lomonosov formulated the law of conservation of mass in chemical reactions based on logical deduction (Volkov *et al.,* 1991). He heated metals in sealed glass vessels. If the vessel was hermetically sealed, the mass of the contents remained unchanged upon heating. If the vessel was open, the mass of the contents increased after heating. Lomonosov guessed that when heated, the metal extracts something from the air and therefore increases its weight. In a hermetically sealed vessel, the metal extracts something from the air, but this something is not replaced in the hermetically sealed vessel after cooling, and therefore the weight of the vessel containing the metal remains invariant. Lomonosov knew nothing about oxygen, as it was discovered later. Oxygen was officially discovered by the English chemist Joseph Priestley (Volkov *et al.,* 1991) on August 1, 1774, extracting it during the decomposition of mercuric oxide. Earlier, in 1771–1772, this gas was isolated by the Swedish chemist Carl Wilhelm Scheele (Volkov *et al.,* 1991), but he published the work later. The French chemist Antoine Lavoisier (Volkov *et al.,* 1991) studied this gas and proved that it was a chemical element. Lavoisier named oxygen "oxygène" (oxygen), derived from the Greek words oxys (sour) and gennao (I give birth), meaning "acid-producing." He gave this name in 1777–1779, mistakenly believing that this element was necessary for the formation of any acid. In 1777, Antoine Lavoisier correctly explained the processes of combustion and oxidation by burning phosphorus and sulfur in hermetically sealed vessels. This was the birth of the Law of Conservation of Mass: the mass of a substance in a closed system remains constant, meaning matter is neither created nor destroyed, but changed from one form to another. In chemistry, this means the mass of reactants and products is equal (Lomonosov's formulation).

In 1771, the English scientist and gas researcher Joseph Priestley (Volkov *et al.,* 1991) demonstrated through experiments that plants release oxygen, "correcting" air "spoiled" by combustion or respiration. This process of converting light into chemical energy, releasing oxygen and absorbing carbon dioxide, became known as photosynthesis thanks to the work of Priestley and later other scientists, such as Jean Senebier (who demonstrated the role of CO_2 and light), Robert Mayer (the law of conservation of energy), and Clement Timiryazev (the role of chlorophyll). So, to build their vegetative mass, plants extract carbon from the air in the form of carbon dioxide. Consequently, apple for deep decarbonization (IPCC, (2023) are essentially calls for global famine: without carbon, plants will be unable to grow vegetative mass, and humans and herbivores will be losses of food. If there is no breathing and nothing to eat, life on Earth will end.

Nature resists

Fortunately for humanity, nature is successfully combating humanity's energy at self-destruction. The constantly active Iwo Jima volcano, located in the southernmost part of the Izu-Ogasawara Arc, is characterized by shallow thermal demonstrations. Small phreatic explosions (water entering magma) have been frequently recorded over the past 100 years, most recently in 1999 and 2001 (Notsu *et al.,* 2005). Judging by the fact that the total CO_2 emission from Iwo Jima is estimated at 760 tons/day, the volcano is located on coking coal deposits. Forest fires, which rage with surprising regularity in Spain, France, California, Russia, and elsewhere, are also quite successful in replenishing the atmosphere with carbon dioxide, which, along with heat, is the result of the oxidation of carbon in plant vegetative mass by atmospheric oxygen during combustion.

Climate Change in Modern Human History

Environmentalists don't offer technical solutions to problems, but rather demand compliance with the "norms" established by international agreements. If this is impossible, they propose changing the "norms» (Hislop, *et al.,* 2025). Therefore, let's talk about "norms" and a benchmark called the "pre-industrial temperature level"—this is the average global temperature of the Earth before the start of active industrial development and large-scale greenhouse gas emissions, usually taken to be between 1850 and 1900. It turns out that even before the "pre-industrial temperature level," global temperatures were not quite right.

The Great Famine

Let us recall the Great Famine—a mass famine that engulfed much of the European territory of the Moscow Principality during the Time of Troubles under Tsar Boris Godunov and lasted from 1601 to 1603 (Great Famine, 2025). According to meteorologists, the mass famine was the result of the eruption of the Huaynaputina volcano in Spanish Peru (February 19, 1600). This ejected volcanic ash into the Earth's atmosphere and triggered a Little Ice Age, characterized by 10 weeks of torrential rains in the summer and early frosts in the fall.

Eighteen hundred and froze to death

Another similar event was the "Year Without a Summer" of 1816, when unusually cold weather hit Europe and North America. Summer temperatures were 2.5-3°C, with snowfall, frost, and rain, leading to famine and crop failures. It was the coldest year on record (Year Without a Summer, 2025). In the United States, it was also nicknamed "eighteen hundred and freeze to death." In

1920, American physicist and climatologist William Humphreys proposed a hypothesis to explain the "year without a summer." He believes climate change was linked to the eruption of Mount Tambora on Sumbawa Island in Indonesia, the most violent volcanic eruption ever recorded, directly killing 71,000 people, making it the highest death toll from a volcanic eruption in recorded history. This eruption, which occurred in April 1815, measured «Seven» on the Volcanic Eruption Index (VEI), and its massive atmospheric ash plume of 150 cubic kilometers (50 cubic miles) may have triggered a volcanic winter in the Northern Hemisphere that was felt for several years.

This fact is not recorded in the history of observations

According to the authors (Cole-Dai *et al.,* 2009), who studied the isotopic composition of Arctic ice in 2009, another eruption occurred in the tropics six years before the "Year Without a Summer." Although the eruption was not recorded in written sources, its impact on weather was comparable to that of Tambora. Theoretically, the combined effects of these two eruptions made the subsequent decade (1810–1819) the coldest in the previous 550 years. Thus, the choice of a reference point for assessing global warming is quite arbitrary. And the anthropogenic contribution to this process is also quite questionable.

Thermodynamics

History of thermodynamics

When discussing the problem of Global Warming, it is appropriate to recall Thermodynamics – the science of thermal energy.

In the third century BC, under the Greek Ptolemaic dynasty, the Library of Alexandria, one of the largest and most significant libraries of the ancient world, was founded in Egypt. This library was located in ancient Alexandria and was part of a research institute known as the Mouseion of Alexandria. It flourished in the third and second centuries BC (Library of Alexandria, 2025). It was there that questions about heat and time were addressed. It was there that the sundial and thermoscope were invented (KrichevskyI, 1970).

In the first century AD, Heron of Alexandria invented a device consisting of a sphere partially filled with water and connected by a tube to a container. When the sphere was heated in the sun, the air inside it expanded, forcing the water into the container. When the sphere cooled in the shade, the air inside the sphere shanked, creating a vacuum that sucked the water from the container back into the sphere. This device was called a *thermoscope.* This meant that it allowed one to "see" temperature changes, but it did not measure them.

The first *thermometer*, a device for measuring temperature, was invented 1,400 years later by Galileo Galilei. A glass tube with a ball sealed to one end was lowered into a container of water. A scale of arbitrary dimensions was engraved on the glass tube. This scale allowed for quantitative temperature measurements. Thus, with the thermometer, thermodynamics was born.

Thermodynamics - what is it about?

Translated from Greek, thermodynamics means "the work of heat." Heat is one form of energy. The most commonly heard are light energy, thermal energy, mechanical energy, gravitational energy, electrical energy, sound energy, chemical energy, nuclear or atomic energy, and so on. Each form of energy can be transformed or changed into other forms. Here are a few examples.

In a car's internal combustion engine, the chemical energy of the interaction of carbon-containing molecules in the hydrocarbon fuel with oxygen in the air (an oxidation reaction) is converted into the kinetic energy of the car's motion.

In a steam-turbine plant of a thermal power station, the chemical energy of the carbon-containing fuel is converted into thermal energy in the boiler furnace during the combustion (oxidation) of the fuel. In the boiler, this thermal energy is converted into the kinetic energy of individual water molecules, which allows these molecules to overcome their liquid state interactions and turn into steam (heat of vaporization). Since any substance in a gaseous state occupies a larger volume than in a liquid or solid state, the pressure in the boiler increases, and water vapor rushes to the area of lower pressure, that is, to the condenser of the steam turbine plant.

The kinetic energy of the moving steam rotates the turbine, on the axis of which is attached the rotor of the electric generator, which, rotating in the stator, generates electric current. Thus, the kinetic energy of the moving steam is transformed into electrical energy.

Exhaust steam enters the turbine condenser and condenses, turning into a liquid. This reduces the pressure, releasing the heat of condensation (the energy of interaction between molecules in the liquid state), which is numerically equal to the heat of evaporation. This heat of condensation is removed by cooling water.

Laws of thermodynamics (Prisyazhniuk, 2007)

The Zeroth Law of Thermodynamics, the Law of Heat Equilibrium. J. Black (1728 – 1799) put forward the following wording of the Law: All bodies freely communicating with one another and not subject to a nonequilibrium impact of the ambient conditions acquire one the same temperature, as determined with the thermometer. The First Law of Thermodynamics. This is a variant of the Law of Conservation. In Helmholtz's formulation, this law states: energy neither appears nor disappears, but only changes from one form to another.

Where does the Sun's energy vanish?

If the Sun has been irradiating Planet Earth around the clock for billions of years, then where does the energy coming from the Sun vanish? The First Law of Thermodynamics states that the energy coming from the Sun to Earth does not disappear. This energy accumulates in the ecological system of Planet Earth. From all of the above, another conclusion follows: no matter what you call energy, it will still remain energy. The energy of falling water, wind energy, tidal energy, green energy, energy produced by solar panels from the energy of solar radiation, the energy of an atomic bomb explosion, and so on and so forth. By the way, the dimension of energy, regardless of the name used, does not change. In the International System of Units (SI), the dimension of energy is the joule (J), which is defined as the product of a force (Newton, N) and a distance (meter, m): $1 J = 1 N*m$

In basic SI units, these are kg m^2/s^2, electron volts (eV, in high-energy physics), kilowatt-hours (kWh), and calories. Could it be that the constant pumping of energy into the Earth's ecosystem is the cause of Global Warming?

Solar Radiation and The Earth's Atmosphere

Composition of the Earth's atmosphere

The Earth's atmosphere is a mixture of gases. The concentration of gases in the air can be expressed in various units of measurement: volume percent (vol.%), weight percent (mass. %), and the number of particles of a given gas per million particles of the gas mixture (ppm). Note that chemists always report the composition of absolutely dry air, as it is virtually constant across all regions of the globe. However, the water vapor content in the air is not reported, as its value varies extremely widely. Over the sea, it is one value, and over the desert, a completely different one. Including water vapor in the air would affect the numerical value of the concentration of all gases, and the composition of the atmosphere would be described by an infinite number of options. Another note is worth making regarding expressing concentration in ppm. While this isn't formally prohibited, chemists avoid using this unit because it doesn't take into account the properties of a specific substance. The molecular weight of hydrogen is 2, and the molecular weight of mercury is 201. However, using ppm, the hydrogen and mercury content in a gas mixture could in some cases be expressed as the same number. This would significantly complicate the standardization of MACs (Maximum Permissible Concentrations of Harmful Gases in the Air).

Absorption of solar radiation by the atmosphere

The solar constant is the amount of energy per unit area irradiated by sunlight. The solar constant is approximately 1368 W/m² (watts per square meter) at a distance of one astronomical unit from the Sun (that is, on or near Earth). The distance from the Earth to the Sun is used as a unit of measurement in astronomy. The gas molecules that make up our planet's atmosphere are constantly moving, and the energy that powers this movement comes from the Sun. Thus, sunlight reaching the Earth's surface is attenuated by the Earth's atmosphere. Therefore, on a cloudless day, when the Sun is near its zenith, less power reaches the surface directly, approximately 1000 W/m² = 1 kW/m². Recall that the Earth's atmosphere also contains carbon dioxide. See Table 1.

Sunlight in the upper layers of the Earth's atmosphere consists of approximately 50% infrared (thermal) radiation, 40% visible light, and 10% ultraviolet radiation. We assume that only infrared (thermal) radiation heats the Earth's surface. Let's estimate the amount of thermal energy reaching the Earth's surface per year. Considering the fact that the "sun is near the zenith" for approximately 1 hour per day, the amount of heat reaching a square meter of the Earth's surface is $1*0.5 = 0.5\ kW*h/m^2$.

The surface area of Planet Earth is 510,072,000 km^2 (510.072 * 10^12 m^2) [15]. Therefore, the amount of heat entering the total surface of the Earth is $510.072*10^{12}*0.5=255.036*10^{12}$ kW*h= $255.036*10^{12}*3.6*10^6$J= $918.13*10^{12}*10^6$J = $918.13*10^6$ TJ. Previously [16], an estimate was made of the amount of heat produced by humanity from all types of fuel. In 2000, for example, humanity produced $412*10^6$ TJ of thermal energy. This amounted to ($412*10^6$ TJ/$918.13*10^6$ TJ) *100 = 44.9% of the amount of thermal energy that the Sun delivered to the Earth during a year for one hour per day of its zenith.

Only one small detail is giving rise to doubt. How is it possible for carbon dioxide, with a content of 0.046% by weight (see Table 1), along with other gases, to trap 50% of the Sun's thermal (infrared) radiation, but at the same time, Global Warming is attributed to carbon dioxide?

Please note that the amount of carbon dioxide in the atmosphere has the dimension of concentration, while energy has the dimension of Joules or Watts. That is, considering carbon dioxide as energy and trying to account for its quantitative contribution to energy is like counting cats on the street not in pieces, but in liters or meters.

Antropogenic's Contribution to Global Climate Change

The impact of wars on Global Climate Change.

In 1945, the United States ended World War II by dropping two atomic bombs on the Japanese cities of Hiroshima and Nagasaki. Measurements showed that the temperature at the core (center) of the atomic bomb explosion reached one million degrees Celsius. Recall the Zeroth Law of Thermodynamics. J. Black (1728 – 1799): "All bodies freely communicating with one another and not subject to a nonequilibrium influence of the ambient conditions acquire one the same temperature, as determined with the thermometer." What temperature do you think the surrounding environment heated up to after the atomic explosion, and was this reflected in the average annual temperature (Prisyazhniuk, 2009)?

But let's cross from rhetorical questions to reality. The unique connection between wars and global warming is that its manifestation is delayed. Years can pass between the manufacture of explosives, shells, missiles, and bombs and their use. While the world is quiet and there are no wars, the energy of warfare can sit in warehouses for years, awaiting its moment of deployment. But as soon as war breaks out, everything stored in warehouses is instantly and quickly converted into heat energy on the battlefield. Fires caused by military action further exacerbate the impact of wars on global warming. The curve of data on changes in global average annual temperature for the period from 1880 to 2007 shows the presence of several extremes [(Prisyazhniuk, 2012). Differentiating the curve allows us to identify the location of the extreme point in the period from 1939 to 1945, when World War II raged across the planet. The extreme point in the average annual temperature during this period exceeds the standard deviation (see Section 5.3) by 2-3 times. A smaller spike in average annual temperatures in 2002-2007 coincides with the wars in Iraq and Afghanistan. It should be noted that no such "anomalies" in the atmospheric CO_2 concentration growth curve were detected during these periods.

Data from the first quarter of the 21st century

United States National Climatic Data Center (NCDC) renamed National Centers for Environmental Information (NCEI) starting in 2025. Key findings from the latest NCEI annual reports (2024-2025): U.S. Climate in 2025. The Southwest had its warmest year on record, with Utah and Nevada having their warmest years on record. Global Temperature in 2025: 2025 was the third-warmest year globally since 1850, exceeding the 20th-century average by 2.11°F (1.17°C). Drought in 2024: More than half of the continental United States (54%) was in drought by the end of October 2024. The annual reports summarize measurements from more than 8,000 stations across the United States and cover temperature, precipitation, snowfall, and degree-days.

It's a annoyance that NCEI doesn't record atmospheric carbon dioxide levels, which opens the door to extensive manipulation when discussing the role of this gas in global warming. After all, only measurements can be trusted, not declarations.

I came across an article about atmospheric carbon dioxide measurements in Ukrainian (Vakoliuk, 2014). It turns out that the entire attention of leaders in developed countries—except for the United States, which funds the development and operation of atmospheric carbon dioxide monitoring systems, and researchers in developed countries, who develop and operate these monitoring systems—is focused on continuous monitoring of atmospheric CO_2 levels. Continuous measurements are conducted by spectrometers on specially designed satellites of the European and Japanese Space Agencies, while ground-based measurements are taken from research towers at various altitudes located around the globe between 82° north and 30° south latitude. Hungary uses aircraft to collect air samples for carbon dioxide measurements. Unfortunately, the article does not provide data on the construction and operation costs of this entire extensive observation network.

The article contains numerous tables and graphs showing that atmospheric CO2 concentrations are higher in winter than in summer. This is easy to guess without measurements. After all, in winter, trees shed their leaves, which, with the help of chlorophyll and the sun's ultraviolet radiation, absorb carbon dioxide from the air and synthesize organic (carbon-containing) chemical compounds. In other words, plants are dormant in winter. This may be why observation stations were not located in the tropics or at the equator, where green plants synthesize vegetative mass and oxygen year-round. The article does not indicate how the accumulated data on atmospheric carbon dioxide levels will be used to combat global climate change.

The Function of Space in Global Warming

Planet Earth is part of the Solar System, and the Solar System is an integral part of the Cosmos. All members of the Cosmic Community exchange energy in the form of radiation at different frequencies. This is why they are visible. However, we are interested in solar radiation, without which life on Earth simply would not exist. In this section, we will focus on the radio frequency range of solar radiation.

Radio frequency radiation from the Sun

The sun emits radiation over an extremely broad range of frequencies. Humans see only the visible site of the solar spectrum, with a frequency of 400-790 THz. Do you remember the seven colors of the rainbow? The lower limit (red light) is 400-430 THz. The upper limit (violet light) is approximately 750-790 THz. This range corresponds to wavelengths in a vacuum (380-750) $*10^{-9}$ m. The Sun emits a wide range of radio frequencies, from very long waves to centimeter and millimeter wavelengths, including bursts in the meter (300–10 MHz) and decameter (10–0.5 MHz) ranges. The standard index of radio frequency activity is the flux at 2800 MHz (10.7 cm). These radio waves are generated by the movement of charged particles in the Sun's magnetic fields and are important for studying solar activity and its impact on Earth. But they are of interest to us because they penetrate the Earth and "heat" it from within. It is the solar radio frequency range that powers earthquakes and volcanic eruptions [19].

Use of radio frequency radiation in everyday life

Everyone has used a microwave oven in the kitchen (Prisyazhniuk, 2023). A microwave oven's emitter operates in the radio frequency range. A water molecule, which is found in any food, receives an energy impulse from the microwave emitter at a specific frequency (absorption spectrum) and rises to a higher energy level. However, a molecule cannot store energy. Therefore, it expends some of its energy to support all the inherent motions of a molecule, and releases the excess energy as infrared (thermal) radiation (emission spectrum). Thus, each water molecule in the food in the microwave becomes a heater. Another way to convert radio frequency energy into thermal energy is induction heating using eddy currents. However, this method is only applicable to electrically conductive materials, such as metal ore deposits (Prisyazhniuk, 2023).

Use of radio frequency radiation on an industrial scale

The use of geothermal fluids for heating homes and industrial purposes has long been known. Iceland's energy sector relies entirely on geothermal waters. Iceland's power plants and utilities rely exclusively on geothermal sources. Iceland has established the Krafla Magma engineering test bed, which uses the temperature of magma beneath the earth's surface to generate high-temperature geothermal fluids (Franco, 2024). In 2009, researchers drilled a hole at the volcano's summit to a depth of 4.5 kilometers (about 2.8 miles) above the magma chamber. However, at a depth of only about 2 kilometers (1.2 miles), the equipment penetrated the upper part of the chamber, where hot magma damaged the drill and released a stream of toxic gas into the atmosphere. And it wasn't carbon dioxide, but sulfur dioxide.

Ecologically clean geothermal sources

The funniest thing is that apologists of carbon dioxide as a cause of global warming are proud of Iceland, which emits no carbon dioxide into the atmosphere and therefore does not contribute to global warming.

Table.1 Composition of Absolutely Dry Atmospheric Air (Chemist's Handbook, 1966)

Gases	Volume percent., % vol.	Weight percent. % mass.	ppm
Nitrogen, N_2	78,03	75,47	754700
Oxygen, O_2	20,99	23,20	232000
Argon, Ar	0,933	1,28	12800
Carbon dioxide, CO_2	0,030	0,046	460
Hydrogen, H_2	0,010	0,001	10
Other gases	0,007	0,003	30

The temperature of magma (lava) during volcanic eruptions typically ranges from 700°C to 1200°C, with the most common basaltic lavas having temperatures of 1000–1200°C. It turns out that magma with temperatures of 700°C to 1200°C does not warm the surrounding environment. The main thing is that it does not emit carbon dioxide.

Conclusion

1. Millennia of scientific development led, in particular, to the development of organic chemistry, or the chemistry of carbon compounds. The unique ability of carbon atoms to bond with each other and other elements through single, double, and triple bonds in the most bizarre spatial configurations enabled the initiation and development of life on Earth. The chemistry of carbon compounds is the chemistry of life on Earth. All living things, that is, things capable of reproduction, on Earth are built from carbon-containing molecules. Therefore, the call by the IPCC (Intergovernmental Panel on Climate Change) for the deep decarbonization of life on Earth is extremely alarming. Are the governments of all countries really aiming to destroy life on Earth?

2. The tree of knowledge—modern science—has spread its branches so widely that individual branches of science have lost touch not only with each other but also with their roots, that is, with basic disciplines such as physics, chemistry, and mathematics. The young branch of science, ecology, which emerged from botany only in the late 19th century, somehow forgot that all plants are built from carbon-containing molecules, as well as the Great and Mighty Law of Conservation: it is impossible to create something from nothing. Where do all the plants on Earth get the carbon to build their vegetative mass?

3. In Nature, "carbon discharges" or greenhouse gases are widespread due to processes occurring in the Earth's crust: the oxidation of coal deposits, the coking of anthracite deposits, and volcanic eruptions. Cardinally influencing these processes is undesirable, as it would be very costly and would also mean unauthorized interference with food cycles. Perhaps humanity's strategic course of action should be reconsidered, shifting from fighting nature to optimizing conditions for coexistence with it.

4. Estimates of Global Climate Change date back to the period 1850–1900, when Europe's industrial development began. Manual labor was replaced by steam-powered machines. This led to the massive combustion of carbon-containing fuels and increased carbon dioxide emissions into the atmosphere. However, historical observations have documented instances of summer temperatures in Europe and the United States dropping to 2.5–3°C due to massive volcanic ash emissions that obscured the sun. If we take these periods in historical observations as the "baseline," then the 1.5°C limit for average annual temperature increase established by the Intergovernmental Panel on Climate Change is irrelevant, and the anthropogenic contribution to global warming has no bearing on the observed warming.

5. More than 2,000 years ago, scientists were asking the question: what is heat and what is cold? However, it is generally accepted that thermodynamics—the science of energy and heat, in particular—was born with the invention of the thermometer by Galileo Galilei. The First Law of Thermodynamics states that energy is neither created nor destroyed, but only transformed from one form to another. Let's consider the answer to the question: where does the Sun's energy go, after billions of years of input into planet Earth's ecosystem? According to the First Law of Thermodynamics, the Sun's energy has been accumulating in planet Earth's ecosystem for billions of years.

6. The Earth's atmosphere plays a crucial role in the emergence and development of life on Planet Earth. Sunlight in the upper atmosphere consists (by total

energy) of approximately 50% infrared (thermal) radiation, 40% visible light, and 10% ultraviolet radiation. The estimated energy reaching the Earth's surface from the Sun is $918*10^6$ TJ. It remains a mystery how carbon dioxide, which constitutes only 0.046% of the Earth's atmosphere by mass, or 460 ppm in the units used by ecologists and climatologists, is capable of causing Global Warming.

7. Carbon-containing molecules are initial cause of all life on Earth. The chemical composition of a cell in the human body is: 65% oxygen, 18% carbon, 10% hydrogen and 3% nitrogen. The most accessible source of carbon for plants is carbon dioxide, which is found in the air. In the 19th century, photosynthesis was discovered. Green plants absorb carbon dioxide from the air and, with the help of the chlorophyll in their leaves and the photon energy of sunlight, convert the carbon dioxide into carbon-containing molecules, from which the plants create their vegetative mass. A waste product of photosynthesis is oxygen, which all life on Earth breathes, except for anaerobic bacteria. Herbivores consume the vegetative mass of plants and synthesize protein in their bodies. Protein, blood, DNA (deoxyribonucleic acid) and RNA (ribonucleic acid), muscles, fats, etc. are formed from carbon-containing molecules. Humans consume plants, animals, and inhabitants of the waters, synthesizing everything they need for life from the carbon-containing molecules of the food they consume. This is how the human trophic cycle is formed.

8. Since nature doesn't read international climate agreements and doesn't consider itself obligated to comply with them, it solves the problem of supplying plants with carbon dioxide by any means available to it. Nature has brought the process of carbon dioxide production to an industrial scale. The permanently active Iwo Jima volcano, located in the southernmost part of the Izu-Ogasawara Arc, produces up to 760 tons of carbon dioxide per day. It appears to be located on coking coal deposits.

9. The physics of the Earth's atmosphere allows us to estimate the amount of solar infrared (thermal) energy reaching the Earth's surface (see Chapter 4.2). Thermochemistry allows us to calculate the anthropogenic contribution to global warming (see Chapter 4.2). If we only consider the Sun's zenith time in our estimates, i.e., one hour per day every year, the anthropogenic contribution to global warming would be approximately 45%.

10. Statistical data on average annual global temperatures allow us to detect and assess the contribution of wars to global warming. This contribution is revealed by the presence and magnitude of extremes on the average annual temperature curve compared to the standard deviation of the data used to construct the curve.

11. The world is divided in its perception of the role of carbon dioxide in global warming. In the United States, the National Climatic Data Center (NCDC) was renamed the National Centers for Environmental Information (NCEI) in 2025. NCDC-NCEI's annual reports summarize data from more than 8,000 stations across the United States and cover temperature, precipitation, snowfall, and degree days. These stations do not measure atmospheric CO_2 concentrations. In other highly developed countries in Europe and Japan, atmospheric CO_2 concentrations are measured by all available means, including satellite spectroscopy. This has revealed that atmospheric CO_2 concentrations increase in winter, when trees are bare and photosynthesis is halted, while they decrease significantly in summer, when vegetation is abundant.

12. Solar radiation in the visible spectrum, infrared (thermal), and ultraviolet ranges is widely known and used by humanity daily. However, the Sun also emits radio frequency radiation. It is radiation in this range that penetrates the Earth's crust and, most importantly, causes geomagnetic storms when it interacts with the Earth's magnetic field. Radio frequency radiation is used in microwave ovens in the kitchen. Geomagnetic storms are regularly reported in the media to warn the sick about dangerous times. However, the fact that radio frequency radiation is the source of energy for earthquakes and volcanic eruptions has only recently become apparent. It turns out that volcanic eruptions and earthquakes can be predicted up to a month in advance. Consequently, thousands of lives can be saved.

Competing Interests

Author has declared that no competing interests exist.

References

Alchemy. Wikipedia. https://en.wikipedia.org/wiki/Alchemy]

Biologically significant elements in the human body. Wikipedia. In Russia.

Chemist's Handbook. (1966). Moscow-Leningrad, Publishing house Chemistry, pp. 564.

Clayden, J., Greeves, N., Warren, S. (2012) Organic Chemistry. Oxford University Press. pp. 1–15. ISBN 0-19-927029-5.

Cole-Dai. David, F. *et al.,* (2009). Cold decade (AD 1810–1819) caused by Tambora (1815) and another (1809) stratospheric volcanic eruption. Geophysical Research Letters. vol. 36, no.22. ISSN 1944- 8007. Earth. Wikipedia. https://en.wikipedia.org/wiki/Earth Ecology. Wikipedia. https://en.wikipedia.org/wiki/Ecology

Franco, M. (2024). Drilling into magma: Risky plan takes geothermal to supercritical extremes, New Atlas, May 08 2024. Available: https://newatlas.com/energy/kmt-magma-geothermal-supercritical/#:~:text= The%20Krafla%20Magma% 20Testbed% 20%22 has%20the%20potential, Hadron%20Collider%20 has%20been%20for% 20 particle% 20physicists

Great Famine (1601—1603). Wikipedia.

Hislop, C. *et al.,* (2005). A climate risk management typology: Integrating approaches to reduce risk. Dialogues on Climate Change. October 27. OnlineFirsthttps://doi.org/10.1177/29768659251377869 https://ru.wikipedia.org/wiki/%D0%92%D0%B5%D0%BB%D0%B8%D0%BA%D0%B8%D0%B9_%D0%B3%D0%BE%D0%BB%D0%BE%D0%B4_(1601%E2%80%941603)

Intergovernmental Panel on Climate Change (IPCC), (2023). https://www.ipcc.ch/

Krichevsky, I.R. (1970) Concepts and fundamentals of thermodynamics. Chemistry. Moscow. pp. 92-93. In Russia.

Library of Alexandria. Wikipedia. https://en.wikipedia.org/wiki/Library_of_Alexandria

Notsu, K. Sugiyama, K. *et al.,* (2005). Diffuse CO_2 efflux from Iwojima volcano, Izu-Ogasawara arc, Japan. Journal of Volcanology and Geothermal Research. no.139, pp. 147-161.

Prisyazhniuk, V A. (2007). Lows of thermodynamics. Tom Lawrence (Topic Editor). December. In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). http://www.eoearth.org/article/Laws_of_thermodynamics

Prisyazhniuk V A. (2009). What is not mentioned in the Kyoto Protocol 243–263 in (Ed. Vasser, Ch. P.). Kyoto Protocol: Economic Assessments, Implementation Mechanisms and Policy Implications (New York: Nova Science Publishers Inc., 2009). ISBN: 978-1-60456-983-4

Prisyazhniuk V A. (2012). World energy and environment. Environ. Sci. Indian J. vol. 7, pp. 397–340 Prisyazhniuk V A. (2023). Humanity Leaves on the Cosmic Microwave. Journal of Geography, Environment and Earth Science International, vol. 27, no. 2, pp. 1- 6. https://doi.org/10.9734/jgeesi/2023/v27i2660

Volkov, V.F., Vronsky, E.V., Kuznetsov, G.I. (1991) Outstanding Chemists of the World. Biographical Handbook, Higher School, Moscow. In Russia.

Vakoliuk, M V. (2014). Measuring CO_2 concentration in the atmosphere by the GOSAT satellite and research towers. Kyiv National University of Civil Engineering and Architecture. Proceedings of the 13th Ukrainian Conference on Space Research. *https://repositary.knuba.edu.ua/server/api/core/bitstreams/6cef29df-fdfd-450c-8b0a-17c4651aac56/content* In Ukraine.

Year Without a Summer (1816), Wikipedia.

How to cite this article:

Prisyazhniuk Vitaly. 2026. The Function of Carbon Dioxide in Global Warming. *Int.J.Curr.Res.Aca.Rev.* 14(3), 1--11. doi: https://doi.org/10.20546/ijcrar.2026.1403.001