



SCC Publishing
Michelets vei 8 B
1366 Lysaker Norway

ISSN: 2703-9072

Correspondence:

huszarcsaba14@gmail.com
ail.com

Vol. 6.2 (2026)

pp. 37-42

Argued Answers to Questions about the Climate Situation and Energy Production

Csaba Huszar retired chemist
László Garbai retired energeticist
Antal Gajary retired chemist

Abstract

Nowadays, public discourse and scientific interest seem to be dominated by one topic: climate change. The facts are stubborn, extraordinary atmospheric and geological phenomena have multiplied in recent decades and are occurring with unusual intensity. It is foolish to deny their objectivity. However, a meaningful discourse could be conducted about the underlying causes. Are the fluctuations in the climate the result of a series of events superimposed on each other, or is it just a matter of repeating cycles?

According to the followers of the dominant hypothesis, the anthropogenic strengthening of the atmospheric greenhouse effect is responsible for the fact that the average temperature of the Earth is rising. The main reason for this is the proven upward trend in the atmospheric concentration of so-called greenhouse gases. Of these, carbon dioxide and methane are attributed a prominent role. Are they right? The purpose of the following calculation is to clarify the role of carbon dioxide and methane in the increase in atmospheric temperature. Our method is to use only measured and derived data, we ignore all model calculations, we rely only on our physical-chemical knowledge. We do not look for errors in the subtleties of complex climate models or theories. Our arguments are easy to understand even without a mathematical or natural science background. In our calculations, we use physical and chemical relationships taught at university.

Keywords: climate change; emitted IR photons; carbon dioxide molecules; relaxation time of excited molecules; change in internal energy - temperature increase; pyrolysis

Submitted 2026-01-30, Accepted 2026-02-20, <https://doi.org/10.53234/scc202603/22>,

1. Introduction

We have calculated all values below according to valid natural laws, using measured data. We have omitted any data that can be linked to any model. We use $\text{J}/\text{m}^2\text{s}$ instead of the W/m^2 dimension for energy flux, because this way we can also handle changes over time.

2. Relationship between carbon dioxide molecules and the number of photons emitted from the earth's surface

Divide the atmosphere into regular inverted truncated pyramids, the height of which is 80 km, and their base is a regular pentagon or hexagon of 1 m^2 . The atmosphere can be assembled seamlessly from such 3D elements. It is important that the composition of the air does not change when it is blown from one hypothetical volume to another by the wind. The number of carbon dioxide molecules present in this cubature can be calculated using the following formula as shown in Figure 1

| |
|--|
| $(M/m) \times c \times A = \text{number of carbon dioxide molecules in the atmosphere}$ <p style="text-align: center;"> $M = 5.137 \times 10^{18} \text{ kg}$, mass of dry atmosphere, $m = 0.028971 \text{ kg}$, average molar mass of air, $c = \text{carbon dioxide fraction of dry air}$ $A = 6 \times 10^{23}$, Avogadro's number </p> |
|--|

Figure 1: Equation used in our calculations

Dividing this value by the surface area of the earth, we can obtain the number of carbon dioxide molecules in an inverted truncated pyramid with a base area of 1 m^2 . The amount of energy radiated from 1 m^2 of the earth's surface calculated based on the Stephan-Boltzmann law at 288.15 K is: $390.89 \text{ J/m}^2\text{s}$. This value is independent of the composition of the atmosphere! Starting from Wien's law, the energy of the photons with the maximum wavelength at 288.15 K: ($E=2.05 \cdot 10^{-20} \text{ J}$) and the number ($n= 1.9 \times 10^{22}/\text{m}^2\text{s}$) can be calculated in the flux of $390.89 \text{ J/m}^2\text{s}$.

We can conclude that even at the beginning of the industrial revolution, there were 3 orders of magnitude more carbon dioxide molecules in the atmosphere, which were able to absorb the energy flux arriving per second: $1.9 \times 10^{22}/\text{m}^2\text{s}$ photons.

The absorption bands of carbon dioxide in infrared radiation: $\lambda = 2.36\text{-}3.02$; $4.01\text{-}4.80$; $12.5\text{-}16.5 \mu\text{m}$. 98% of the infrared spectrum falls between 3 and $80 \mu\text{m}$. Integrating the equation

$E = hc/\lambda$ between the given limits, the carbon dioxide fraction of the energy flux of $390.89 \text{ J/m}^2\text{s}$ is only: $87.416 \text{ J/m}^2\text{s}$ (22.41%). Only for this intensity is needed to found carbon dioxide molecules from the total surface radiation in the air bath. (Calculated in this way, the water vapor share is 62.42%). This also further increases the CO2 surplus by an order of magnitude.

The radiation lifetime of the carbon dioxide molecule excited by an IR photon can be calculated, its value is about 1 s, after which it returns to its ground state and is capable of absorption again. If we add to this that the excited CO₂ molecules can return to their ground state not only by emitting electromagnetic energy - the reaction time of which is about 1 s - but also by thermalization - by collision with non-IR absorbing N₂ and O₂ molecules, - then the excess is even more frightening, because the energy transfer time in this case is only 420 μs , about five ten-thousandths of the electron emission. Given that 1.9×10^{22} photons are emitted per second from 1 m^2 of the surface, from this point on, in principle - calculated with one secundum of excitation and 1 secundum of charge loss - $2 \times 1.9 \times 10^{22} = 3.8 \times 10^{22}$ CO₂ molecules may be sufficient numerically to carry out the energy transfer. *Thus, in principle, only 0.065% of the carbon dioxide molecules in the atmosphere can be in an excited state. This is an astonishing result. The fact that the carbon dioxide concentration has increased by 46% over the years does not change the situation.*

The carbon dioxide molecules existing in a virtual inverted truncated pyramid with a base area of 1 m^2 had sufficient absorption capacity even at a solar constant 3 orders of

magnitude higher at the beginning of the industrial revolution ($c=280$ ppm). The absorption capacity of methane produced by living organisms is similar to that of carbon dioxide, and it decomposes into carbon dioxide within a short time, so methane emissions do not have a climate-influencing role, because they only add to the huge excess of carbon dioxide.

According to farmers, an increase in the concentration of carbon dioxide in the atmosphere of up to 0.12% would be particularly beneficial and would lead to an increase in production averages. There is no danger of carbon dioxide! The life cycle of a carbon dioxide molecule is more important – from its formation through excitation to charge loss – than just its mere existence, but rather how its encounter with an infrared photon, and what changes this may produce depending on time!

3. Change in the mass of the hydrosphere.

Hydrocarbon molecules coming from the Earth burn into water and carbon dioxide when are used. The water molecules thus formed were not previously part of the hydrosphere, the hydrogen atoms are extracted from the depth of the Earth. Since the mining of hydrocarbons, the volume of the hydrosphere has increased by an amount of $1.54 \cdot 10^{14}$ kg, which has not been taken into account in any calculations so far. This is 1.3% of the mass of the hydrosphere. This will increase as long as we burn oil and natural gas under terrestrial conditions.

4. The increase in internal energy is not from the Sun.

During the oxidation of coal and hydrocarbons, carbon dioxide and water capable of phase change are formed at temperatures of 1000-2000° C. At this time, the rearrangement of chemical bonds occurs, it is no longer important what the released bond energy is transformed into (mechanical, electrical, etc.). The resulting gaseous carbon dioxide and superheated water vapor capable of phase change then cool down to the average temperature of the Earth, driven by the pursuit of energy balance. The latter can still undergo two phase transformations, some of it mixes with the air: therefore, during cooling, it plays a role primarily in cloud formation. However, these water molecules arrive in the condensation air layers from a different direction; not by evaporation from the Earth's surface due to warming, but by the cooling, expansion, mixing, and convection of high-temperature combustion products from the air. One is powered by solar energy, the other gains the energy needed for the gaseous state through bond rearrangements in an oxidation process. This is depicted in Figure 2.

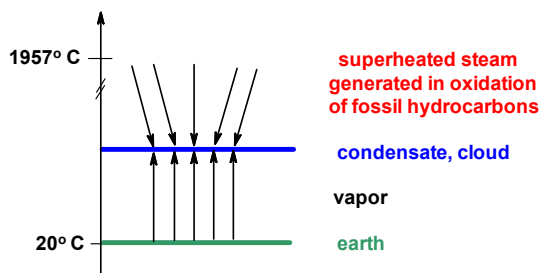


Figure 2: Formation of moisture in the air

This results in a higher condensation temperature, which in turn increases the saturation value assigned to it, and consequently there will be more water vapor in the air. The rate of evaporation varies almost linearly with temperature, while the atmosphere's water vapor-holding capacity increases by a power of ten. This seems as if energy were being pumped into the Earth's atmosphere from another celestial body. The value of the internal energy increases, and the average temperature rises. ($dU = \delta Q + \delta W$)

Our calculations prove that the reason for the temperature increase experienced in the atmosphere is not to be found in the assumed increased reflection of surface IR radiation caused by the increasing amount of carbon dioxide molecules present. The real reasons are: the energy released during the combustion of coal and hydrocarbons, the energy released when the flame temperature carbon dioxide and superheated water vapor molecules are cooled due to the rearrangement of chemical bonds (+ nuclear energy**). This process has been going on for more than 150 years, continues today, and will continue every day as long as we mine coal, oil, and natural gas from the earth's crust and burn them for energy production. (The energy released during nuclear fission and fusion is also not of solar origin, which also increases the internal energy). The amount of energy released during the oxidation of fossil-derived materials and nuclear fission is the order of 10^{24} J. We can state that the increase in carbon dioxide concentration has no effect, but the binding energy released during its formation has a temperature-raising effect. ($dU = \delta Q + \delta W$). The production of carbon dioxide, water and heat between 1850-2025 are shown in Table 1.

Table 1: Production of Carbon Dioxide, Water and Heat from Fossil Fuels

| Fossil source (Carbon content) 1850-2025 | Production of Carbon Dioxide, Water and Heat from Fossil Fuels | | | | |
|--|--|-------------------------------|----------------------|-----------------------|-----------------------------|
| | Quantity of Carbon, kg | Resulting carbon dioxide, mol | Resulting water | | Released amount of heat, kJ |
| | | | number of moles | kg | |
| Coal (90 %) | 4.5×10^{14} | 1×10^{13} | 0 | 0 | 8.27×10^{15} |
| Crude oil (85 %) | 1.62×10^{14} | 3.6×10^{12} | 3.6×10^{12} | 6.48×10^{13} | 6.85×10^{15} |
| Natural gas (75 %) | 1.13×10^{14} | 2.5×10^{12} | 5×10^{12} | 8×10^{13} | 2×10^{16} |
| <i>Total</i> | $\approx 10^{14}$ | $\approx 1.6 \times 10^{13}$ | 8.6×10^{12} | 1.54×10^{14} | 3.5×10^{16} |

Since the Industrial Revolution, the concentration of carbon dioxide in the atmosphere has increased by 130 ppm according to formula 1. This corresponds to a mass of 1.1×10^{18} kg of carbon dioxide. Mass of fossil carbon dioxide is $(1.6 \times 10^{13} \text{ mol}) \times 44 \text{ kg/mol} = 7 \times 10^{14} \text{ kg}$. The ratio of the two carbon dioxide masses is 0.00036. This means that the amount of carbon dioxide from fossil energy sources between 1850 and 2025 is only 0.036% of the total increase in carbon dioxide concentration. Then 3.5×10^{16} kJ amount of heat raises the temperature of the seas and oceans by only 6.3×10^{-5} K. And 3.5×10^{16} kJ amount of heat raises the temperature of the atmosphere by only 6.6×10^{-3} K.

5. Safe energy production

The energy supply of humanity could be solved with a technology known for 3500 years, the pyrolysis of carbohydrates, by heating them in an oxygen-poor environment. (A fundamental difference from biogas production and the pyrolysis of plastics). According to this, without the investment of external energy, the spontaneous rearrangement of chemical bonds produces elemental carbon and a gaseous product, pyrolysis gas (wood gas), which can be utilized in many ways due to its content of hydrogen (50%), methane (38%) and carbon monoxide (1.5%).

Approximately 150 Gt of carbohydrate-containing plant waste is generated worldwide each year. Their average calorific value is 15 MJ/kg. When coal, oil and natural gas are burned, 3.5×10^{13} MJ of energy is released annually. This amount of energy could be obtained by burning 2.33×10^{12} kg (about 2.5 Gt) of plant waste. However, iron ore cannot be smelted with cereal straw. This is where pyrolysis comes into play. By converting plant waste into pyrolysis products and oxidizing them, humanity's fossil energy needs could be met simply by rearranging chemical bonds, without any external energy investment (Figure 3)! Humanity's energy needs could be met by feeding elemental carbon, which can be obtained from carbohydrates through pyrolysis, into thermal power plants. In the pyrolysis of carbohydrates, carbon production is the most essential element.

By pyrolysis of plant waste, 50% elemental carbon and 25% *generator-gas* (caloric value 5 MJ) can be produced on a dry basis^{1,2}. By converting and oxidizing plant waste into pyrolysis products, humanity's fossil energy needs could be met simply by rearranging chemical bonds, without the investment of external energy! There would be no need for nuclear energy (which, including the production of the fuel element, has one of the largest carbon footprints and environmental impacts, and zero energy balance when including the energy demand of production), windmills, or solar panels.

The prototype is operating in Hungary (Pyrowatt Kft Kiskunmajsa)³, and this should be scaled up. The only way to solve humanity's energy problem is to use solar energy. energy problem be solved. The carbon dioxide thus produced would no longer burden the environment, because it had previously participated in an assimilation process.

By spreading pyrolysis coal on farmland, its water-holding capacity can be increased, thereby delaying the occurrence of a drought.

Pyrolysis coal is a source of "green" hydrogen.

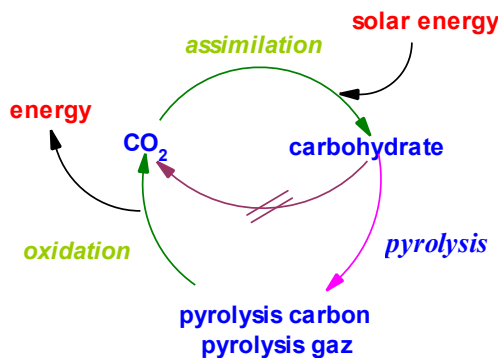


Figure 3. Perfect energy-generating carbon cycle

Funding: No funding of the work.

Co-Editor: Stein Storlie Bergsmark.

Acknowledgements

We would like to thank Professor Laszlo Szarka for his support.

References

Lukács I.: The theory and economic significance of wood distillation, The Forest 1952. Booklet 2, *in Hungarian*

Tobias Pröll et al. / Energy Procedia 114 (2017) 6057 – 6066;
<https://doi.org/10.1016/j.egypro.2017.03.1742>

Madár V., Madár G.: Pyrowatt Ltd.: Method of thermochemical conversion of biomass,
<https://pyrowatt.hu>

*This article is elaborated in 3 papers in an expanded form, with detailed calculations.