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Significant Errors Identified in the IPCC Reports

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Abstract:

Some countries are concerned about increasing levels of carbon dioxide (CO_2) causing dangerous warming of the Earth, as promoted by the Intergovernmental Panel on Climate Change (IPCC). This is a mistake by the IPCC because the warming by CO_2 is too small to measure. This study identifies six serious errors by applying critical thinking and the scientific method. For example, doubling the level of CO_2, i.e., the Equilibrium Climate Sensitivity (ECS), does not measurably affect the Earth's temperature because the warming effect of carbon dioxide (CO_2) is too small to measure. Thus, the plot of the warming effect of CO_2 against the level, whether or not it is a straight line or logarithmic, is irrelevant. The Sun's energy is the primary control of Earth's temperature. However, there is some energy input from the ENSO (El Niño Southern Oscillation). Thus, the Earth's temperature drops when the Sun's energy output falls, as it is currently doing. The IPCC overestimates the warming impact of methane and nitrous oxide, both of which have a negligible warming effect. The Earth's energy balance is incorrect because it is based on averages, and the amount of energy to evaporate water must equal the amount sent to space. It is recommended that people and their governments know about these errors and take appropriate action.

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1. INTRODUCTION

This document excerpts the errors detailed in peer-reviewed published papers in the References. These papers “return to the original, physically grounded formulations of the 19th-century scientists” to provide a clearer, more coherent foundation for physics [1]. They include the modern concept of computer models, satellite information, international weather data via cellphones, Google Earth, and Excel for calculations. Each paper in the References has a URL that allows it to be readily accessed.

The IPCC released six climate assessment reports, starting with the First Assessment Report (FAR) in 1990 and ending with the current Sixth Assessment Report (AR6) in 2021. Few know that these reports contain at least six significant errors.

Many have shown that the Intergovernmental Panel on Climate Change (IPCC)'s concept that increasing carbon dioxide (CO_2) levels in the Earth’s atmosphere can cause dangerous warming is false. However, few have pointed out the additional serious errors in the IPCC reports.

This study identifies these errors, explains the background, and references the documents in which they are presented. The study begins with Figure **1**, which is not from our peer-reviewed papers but shows the results of 39 computer models used by the IPCC that are inconsistent with the measured changes in the Earth’s surface temperature [2]. The climate models in Figure **1** used by the IPCC do not replicate the change in the Earth’s temperature. They fail validation (except, possibly, for the Russian INM model on the extreme right). Thus, these models are at the source of the problem. For example, in this group, Canada's CIESM model, the first on the left, was in error by a factor of six (a 600% error against measured data).

2. CARBON DIOXIDE'S WARMING EFFECT IS LESS THAN 0.01°C, AN AMOUNT TOO SMALL TO MEASURE.

The contribution of CO_2 to global warming shows a maximum increase in the Earth's temperature by CO_2 since 1750: (0.000509 – 0.000329) = 0.000181 °C as determined in Section 6 of Reference [4]. This temperature is negligible compared to the estimated increase of 0.8 °C to 1.3 °C from 1850 to 2019 by the IPCC in AR6 [5].

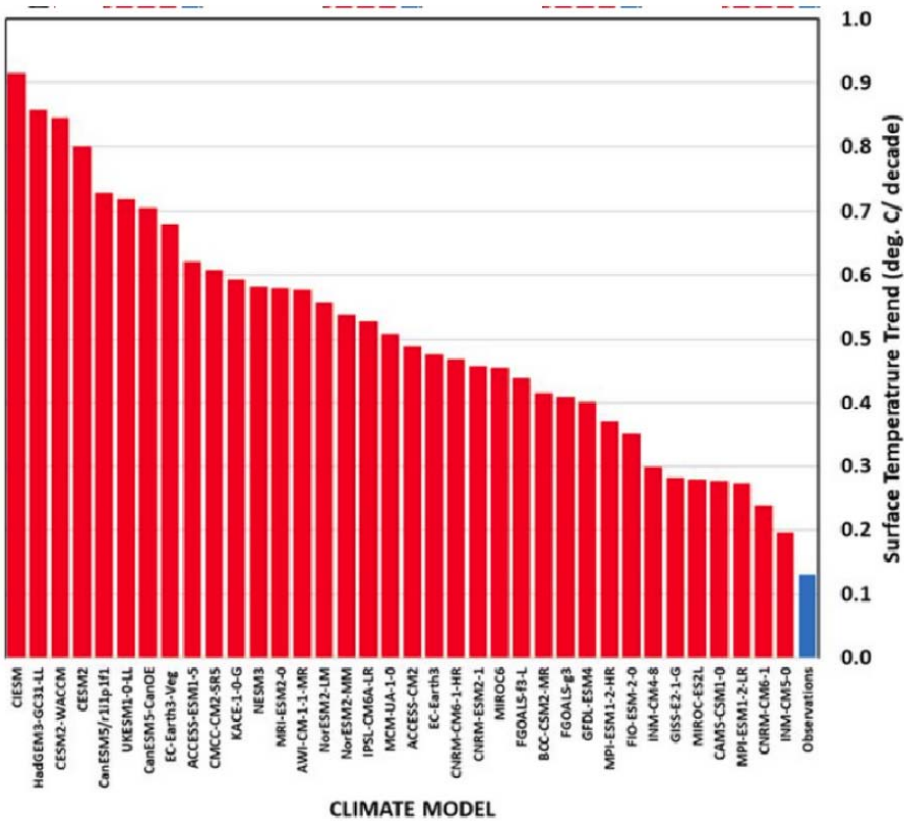

Figure 1: Figure 5.9 of the DOE climate report: Modeled versus observed warming trends in the U.S. Corn Belt, 1973-2022 [2, 3].

The temperature increase of CO_2 is calculated by knowing its measured value in the atmosphere (See section 6 of Reference [4]). For example, on February 21, 2022, the CO_2 concentration was measured at Mauna Loa at 418 ppm. The 418 ppm is 418 molecules of CO_2 per million molecules of dry air, which is the mole fraction, 0.000418 moles per mole of dry air. Dry air has a molar mass of 29; one mole of dry air weighs 29 grams or 29 g/mol. Multiplying 0.000418 by the molecular weight of CO_2, 44, and multiplying by (1000/29) gives grams of CO_2 per kilogram of dry air. This value is 0.0184 grams of CO_2 per kg of dry air, or 0.0000184 kg/kg of dry air.

0.000418 x 44 x (1000/29) = 0.0184 grams of CO_2 per kg of dry air . . . . . (1)

The heat content of CO_2 is weight x specific heat x ΔT, where weight is CO_2, in kilograms per kilogram of dry air. The specific heat of CO_2 is 0.833 KJ/(kg K), and ΔT is the temperature difference in Celsius between two locations of interest.

References [6, 7] also provide methods for showing that carbon dioxide's warming effect is too small to measure.

3. DOUBLING CO_2 INCREASES ATMOSPHERIC TEMPERATURE BY A NEGLIGIBLE AMOUNT

The IPCC claims that CO_2 can raise the Earth's temperature significantly; thus, it shows that doubling CO_2 will substantially increase Earth's temperature by 1.5 °C to 4.5 °C. They have had this or similar ranges for many years. It is termed the Equilibrium Climate Sensitivity (ECS).

Figure **2** below is from Reference [7]. The maximum temperature rise on this set of temperatures is 0.006035 °C at Taoudenni, Mali (Cell BF48 in the SUPPL information) in the Sahara Desert on April 21, 2021, at 16:50. If we doubled the level of CO_2 to 836.48 ppm, the temperature would increase from 0.006035 to 0.012070 ^{o}C. This amount is too small to measure.

4. WHY IS THE WARMING EFFECT OF CO_2 A STRAIGHT LINE AND NOT LOGARITHMIC, AS CLAIMED BY THE IPCC?

The IPCC claims in its Third Assessment Report (TAR) in section 6.3.5 that the warming effect of carbon dioxide (CO_2) is logarithmic and provides a formula: $\Delta T = 5.35LN(C/C_o)$ where the difference in temperature between two CO_2 concentrations is the logarithm (LN) of the ratio of the higher concentration "C" and the lower "C_o".

The IPCC logarithm function is currently used and assumed to be correct in many published works.

In 2014, Orval Mamer and H. D. Lightfoot published Figure **3** below in Reference [8]. At the time, we thought the relationship between CO_2 concentration and temperature was logarithmic. We produced a

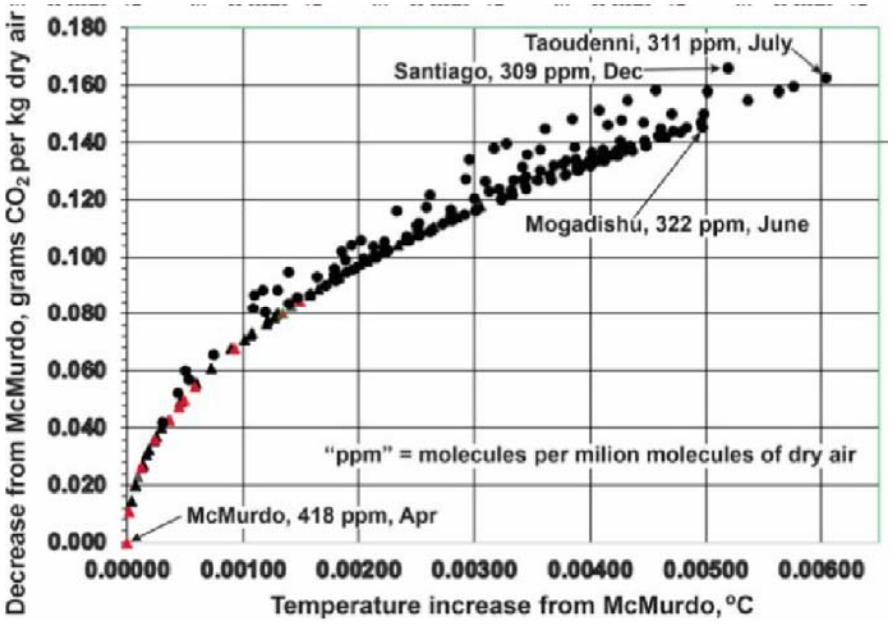

Figure 2: The temperature at Taoudenni, Mali, is 0.006035 °C above. Thus, **t**he Equilibrium Climate Sensitivity (ECS) is negligible and unmeasurable.

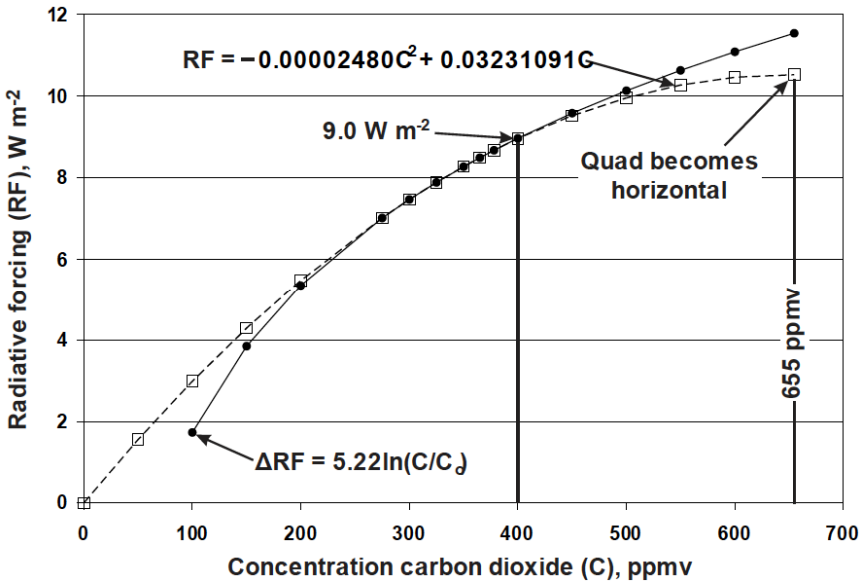

Figure 3: Concentration of CO_2 (ppm) vs. Radiative forcing W m^{-2}. The quadratic curve is a better relationship than the logarithmic curve because it starts at zero and approaches an asymptote.

quadratic curve with the same results between zero and 655 ppm as a logarithmic curve. It is better than the logarithmic curve because it starts at zero and reaches an asymptote, which is necessary, but is impossible with a logarithmic curve.

Later, we plotted the warming from CO_2 in degrees Celsius against the CO_2 concentration, yielding a straight line. This is proved by applying the proven Ideal Gas Laws to dry air, which includes CO_2, and is expressed as:

$$PV = nRT \quad \ldots\ldots\ldots\ldots \quad (2)$$

Where P = pressure, V = volume, R = gas constant, n = the number of moles, and T absolute temperature. Note that the volume of a gas is directly proportional to the absolute temperature (T) and inversely proportional to the pressure (P). When plotted, this equation will produce a straight line. Later, with Gerald Ratzer, we wrote a paper [9] using a different method of showing that the relationship between dry air, CO_2, and temperature is straight, as in Figure **4**. All the gases in Earth's atmosphere, including CO, are above their

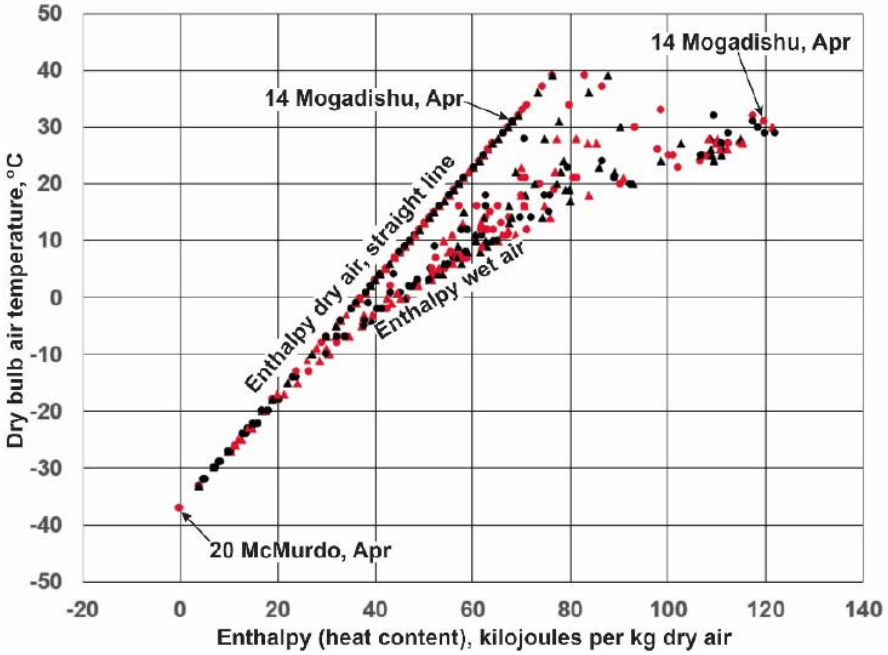

Figure 4: The relationship between dry bulb temperature and heat content (enthalpy) for dry air and wet air with water vapor.

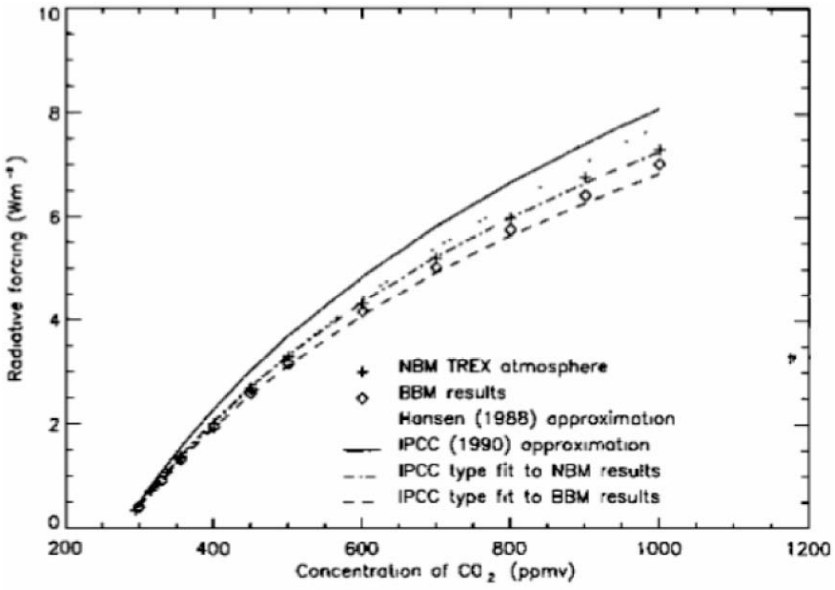

Figure 5: The Myhre *et al*. (1998) diagram shows the basis of IPCC information.

boiling points and act as Ideal Gases. When water vapor (not an Ideal Gas) is added to dry air, it becomes moist air, and the relationship between concentration and temperature curves downward, as shown in Figure **4**.

The 240 points in Figure **4** result from measurements of temperature and relative humidity at twenty representative points around the Earth, taken on the 21st of each month for 12 months starting in March 2021.

It is easy to confuse the warming effect of CO_2 with that of water vapor. Myhre *et al*. (1998) appear to be the origin of the IPCC mistake, as shown in Figure **5**.

If the relationship between temperature and the level of CO_2 were logarithmic, then the warming caused by CO_2 would decrease as the level increased. Eventually, it would no longer have a significant warming effect.

5. THE SUN IS THE PRIMARY ENERGY SOURCE TO WARM THE EARTH

Figure **6**, constructed by Abdussamatov K., from Reference [4, 10], shows that the Earth is headed towards a minimum temperature in 2042 ± 11, similar to the Maunder Minimum. During that period, the River Thames froze thick enough for carnivals to be held on it. Crop failures and starvation were widespread. Other authors, such as Valentina Zharkova [11], provide similar information and convincing evidence.

The Earth is part of our solar system, with the Sun at its centre. The conditions on Earth result from the properties of the Sun and the Earth. The Sun determines the Earth's temperature by sending energy to the Earth through short-wave radiation. The Sun's energy output varies over time, causing warm and cool periods on Earth, as shown in Figure **6** [12].

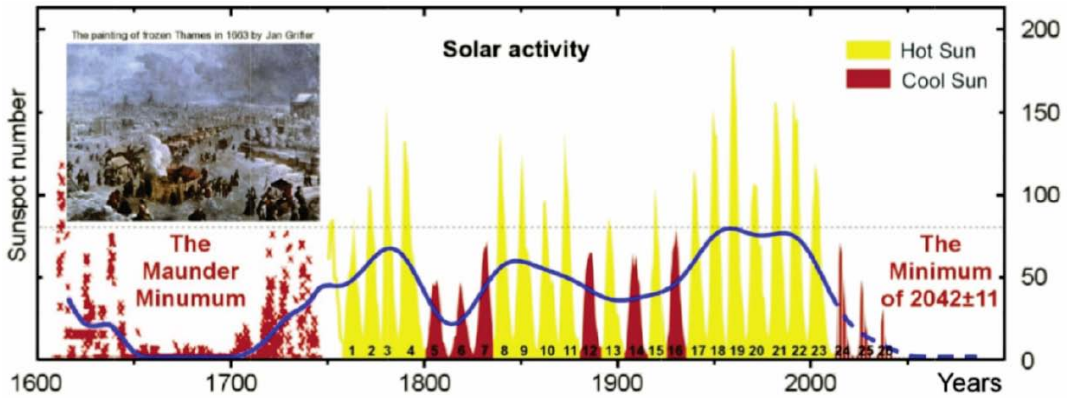

Figure 6: The TSI and solar activity variations since 1611 and the forecast of changes (dashed lines) over time, as in [11].

When the Sun's short-wave radiation hits the Earth, it thermalizes, i.e., converts to heat. Then convection sets in, and the normal chemical and physical processes take over. Water evaporates and eventually condenses in clouds and falls as rain or snow. Enough heat goes to space (in the form of photons) from condensation as long-wave radiation to match the Sun's heat input to the Earth, cooling it sufficiently for current life forms to flourish. The Sun provides most of Earth's energy, but some comes from volcanic activity, especially below the ocean surface, and ENSO. Some water comes from burning fossil fuels, all containing hydrogen that forms water when burned.

A photon's energy equals its frequency multiplied by the Planck constant [13]. Thus, more photons of short-wave energy are arriving at Earth from the Sun than long-wave photons are leaving the Earth to balance the energy flows. The energy per photon of short-wave energy from the Sun is $E = 6.6261 \times 10^{-33}$ Joules. The number of photons per Joule is the inverse of the energy per photon.

The fact that the Sun and the Earth are cooling and not warming, as in Figure **7**, is not well-known, even among people who study the climate. Early frosts have already caused crop failures. By compensating for crop failures, fossil fuels will be crucial to preventing starvation.

When photons from the Sun hit any part of the Earth, they immediately "thermalize", meaning they convert to heat measured in Joules. If they hit solid earth, they warm the Earth and the adjacent air, which rises as convection because the warmer air is lighter.

If the photons hit water, they heat the surface, and the warm water stays on top because it is lighter than cooler water. Water's maximum density occurs at 4 °C. This is an essential property because it means rivers, lakes, and oceans freeze from the top down. Otherwise, animals living in these waters could not survive.

6. THE IPCC GROSSLY OVERESTIMATES THE NEGLIGIBLE WARMING EFFECT OF METHANE AND NITROUS OXIDE.

In Table 2.14 of the Fourth Assessment Report (AR4), the IPCC claims that methane has 21 times the warming effect of CO_2 and nitrous oxide has 310 times [15].

On August 26, 2025, CO_2 was 424.60 parts per million (ppm) in the Earth's atmosphere, methane was

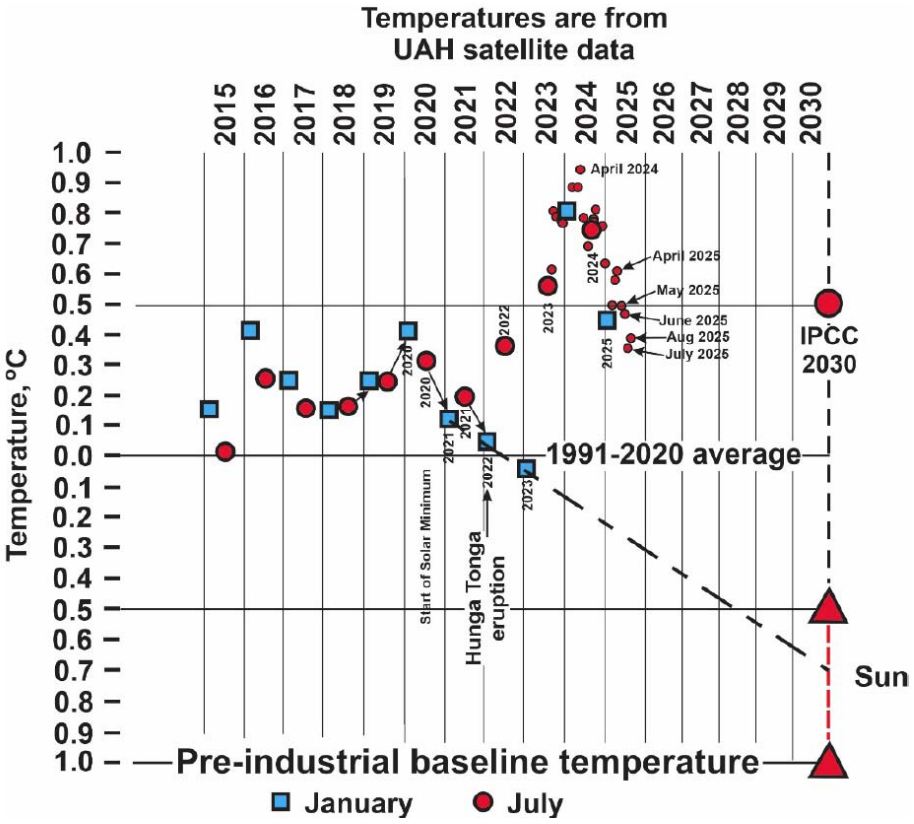

Figure 7: The Earth cooled by 0.6 °C from April 2024 to August 2025. Cooling is likely to continue [14].

1934.91 parts per billion (ppb) in April 2025, and nitrous oxide was 338.66 ppb in April 2025. Note that methane and nitrous oxide values are one thousand times less than those of CO_2. The values are similar in [16] of April 2024. Based on the methane and nitrous oxide levels in Earth's atmosphere as of April 2025, the warming effect of methane is 0.408% of that of CO_2, and nitrous oxide is 0.085% of that of CO_2.

Methane molecules only have a residence time in the atmosphere of about ten years before converting to CO_2 and water vapor, as shown in equation (3):

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O \ldots\ldots\ldots \quad (3)$$

That is why there is no significant accumulation in the Earth's atmosphere. The warming effects of methane and nitrous oxide in the Earth's atmosphere are so minor as to be negligible.

7. THE EARTH'S ENERGY BALANCE, SHOWN IN FIGURE 7.2 IN AR6, IS WRONG BASED ON AVERAGES.

Figure **8** is Figure 7.2 of AR6, the Earth's energy balance.

Figure **8** is wrong because it shows only energy flow averages. For example, the incoming 340 W m^{-2} is the average based on the number of daily sunlight hours and the shape of the Earth as seen from the Sun. We know from [17] that the Sun's energy to evaporate water must be slightly less than the amount sent to space because the Earth is cooling, as described in section 4 of this study.

From the water cycle (Figure **9**), we know that the energy sent to space is from the evaporation of water from all sources, whereas Figure **8** shows energy from only the Sun. Other heat sources, such as submarine volcanic activity, must also be accounted for in the energy sent to space.

The amount of energy reflected to space by the Earth, the albedo, is 29%, which is close to the 30% commonly assumed for albedo.

Figure **9** shows the water cycle and includes evaporation from all energy sources. Although it shows only evaporation from the Sun's energy, all heat sources, including underwater volcanic action, contribute to evaporation. The hydrogen from burning fossil fuels and biomass also adds water to the atmosphere.

The water cycle shows that all evaporated water condenses to form clouds of water droplets. When the clouds form, photons of long-wavelength radiation are sent into space. Many more long-wave photons go to space than short-wave photons from the Sun on Earth because long-wave photons have less energy per photon. The energy input to the Earth from the Sun is 320 exajoules (EJ)/hour [16].

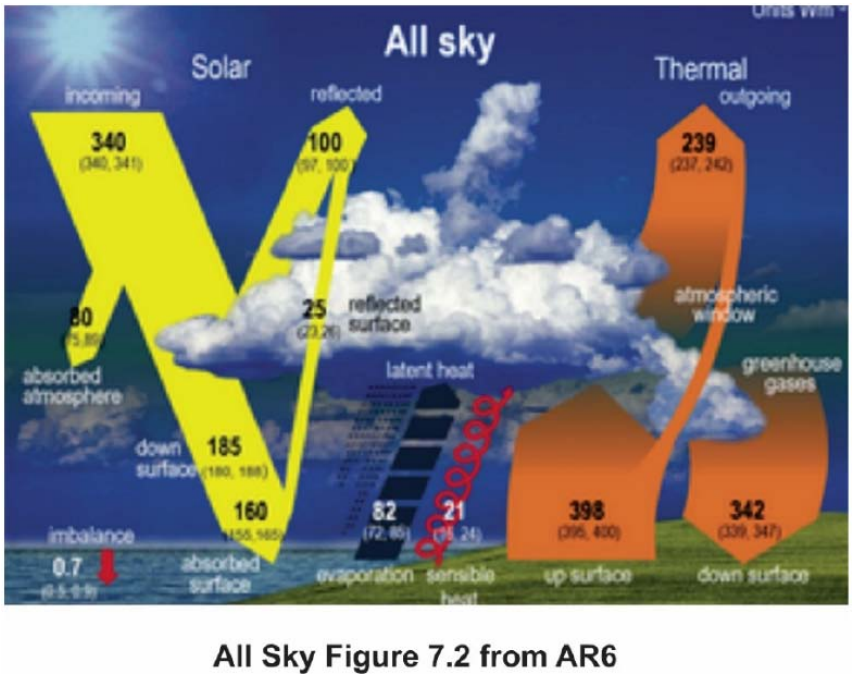

Figure 8: Earth's energy balance from AR6, Figure 7.2.

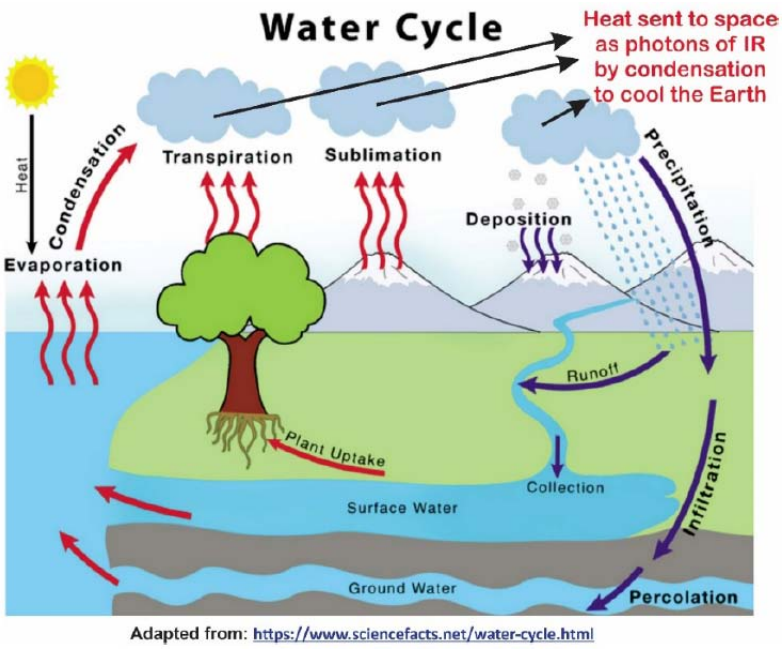

Figure 9: The Earth's water cycle shows evaporation and energy sent to space.

Although Figure **9** shows gentle clouds, much of the water vapor condenses from the estimated 40,000 thunderstorms per day and other large storms [16].

8. SUMMARY AND CONCLUSIONS.

Six serious errors were identified in the Intergovernmental Panel on Climate Change (IPCC) reports using well-known and proven chemistry, physics, and the scientific method.

- The IPCC's claim that rising levels of CO_2 in the atmosphere can cause dangerous warming is false. The warming effect of CO_2 is less than 0.01 °C, which is too small to measure.
- The warming effect of doubled CO_2 is too small to measure. The equilibrium Climate Sensitivity (ECS) is near zero, not 1.5 to 4.5 ^{o}C.
- The warming effect of CO_2 is not logarithmic as claimed by the IPCC. It is a straight line. It is irrelevant because the warming effect of CO_2 is too small to measure.
- The Sun is the primary source of energy that warms the Earth. However, the energy level of the Sun is currently falling. As a result, Earth's temperature is also falling.
- The IPCC seriously overestimates the warming effect of methane and nitrous oxide, which are minor and negligible.
- The Earth's energy balance in Figure 7.2 of AR6 is incorrect because it is based on averages, and the energy required to evaporate water must be close to that sent to space.

9. CONCLUSIONS

Many governments accept these six IPCC mistakes as valid and make inappropriate policies based on them. These policies will produce disastrous results that will become obvious in time.

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