IDN-InDepthNews
Analysis That Matters
Flagship Agency of the Non-profit International Press Syndicate

SGI Soka Gakkai International

A project of the Non-profit International Press Syndicate Group with IDN as the Flagship Agency in partnership with Soka Gakkai International in consultative status with ECOSOC

Watch out for our new project website https://sdgs-for-all.net

Goal 13+14+15

The Future of Human Civilization Is at Stake

By Franz Baumann

This article was issued by Meer and is being republished with the author's permission.

NEW YORK | 11 December 2023 (IDN) — A Freudian Slip is a revealing blunder: saying what one really thinks rather than what is expected, polite, or politically correct.

A textbook example is Sultan Ahmed Al Jaber's claim, made in a recorded Zoom conversation on 21 November 2023, that phasing out fossil fuels is not needed to prevent further global warming. Al Jaber, the president of COP28 —the 28th conference of the 194 countries (plus the European Union) that have signed the United Nations Framework Convention on Climate Change—insists that there is "no science out there[1], or no scenario out there that says that the phase-out of fossil fuels is what's going to achieve 1.5." Well, he's wrong.

What did we know, and when did we know it? The basics of anthropogenic global warming have been understood since the 19th century, as can easily be established by googling, for instance, Joseph Fourier, Claude Pouillet, John Tyndall, Svante Arrhenius or Eunice Foote[2]. The essence of their discovery is that greenhouse gas molecules in the atmosphere – mainly nitrous oxide (N2O), water vapour (H2O), carbon dioxide (CO2), and methane (CH4) – absorb and trap the sun's heat[3] that hits the Earth and is reflected back into space. The more greenhouse gases there are in the atmosphere, the less heat escapes from Earth into outer space and the higher the Earth's median temperature. This is taught to school kids[4]. The temperature rises as foreseen by the models, perhaps a bit faster. Ever more sophisticated models enhance their predictive precision.

The gaseous composition of the atmosphere is measured in parts per million. Nitrogen (78%) and oxygen (21%), respectively, account for 99 percent[5]. Carbon dioxide, an invisible, odourless trace gas—called so because it is in the 0.03 to 0.04 percent range—was about 280 parts per million (ppm) in 1750. In the 200 or so years until 1959, it rose by 12 percent to 316 ppm, while in the sixty-four years since then, it rose by 50 percent to 420 ppm, as per the famous Keeling Curve. It is now higher than at any point during the past 800,000, perhaps three million years[6],

when temperatures were 2°–3°C (3.6°–5.4°F) higher than during the pre-industrial era and the sea level was 15–25 metres (50–80 feet) higher than today. Annual increments of 2 to 3 ppm, as they have been for the past decades, or 71 ppm during the 20th century, are historically unprecedented. They were larger during the industrial era than during any period of the past sixteen thousand years[7]. At current emission levels and in the absence of negative emission technologies deployed at scale, it will be around six years before we blow past the goalpost of the remaining 250 billion tons of carbon dioxide that corresponds to 1.5°C warming.

The science is unequivocal

The science is unequivocal. Yet it would be simplistic to consider greenhouse gases bad tout court. To the contrary, they are enablers of life on Earth and controllers of the climate that, for the past 10,000 or so years, have made human civilization possible. Without greenhouse gases[8], the average temperature would be minus 18°C (-0.4°F), instead of the current plus 15°C (+59°F). But there can be too much of a good thing. Methane, black carbon, and fluorinated gases are short-lived because they linger less in the atmosphere than carbon dioxide.

Methane, like carbon dioxide, is an invisible, odourless trace gas. It is present in the atmosphere at just under two parts per million molecules; this is a 400th of carbon dioxide[9]. Methane traps nearly ninety times as much heat as carbon dioxide but dissipates in about a decade. Still, it has been responsible for approximately a quarter of global warming since 1750. Numbers are rising steeply, mainly on account of increasing meat consumption and oil industry offshoots, including fracking.

Carbon dioxide, the biggest contributor to global heating, is an infinite-lifetime gas, so called because, as a cumulative pollutant, it stays in the atmosphere for centuries. This is highly relevant in the context of international negotiations on climate mitigation. Since today's warming climate is both a stock issue (the cumulative buildup over time) and a flow issue (current emissions), the burden of reductions cannot, in fairness, be the same for all countries. The Industrial Revolution, which was highly energy-intensive, laid the basis for the current wealth in North America, Europe, and Japan. The world's developed countries account for three-quarters of historic emissions (1850 – 2002), developing countries for one quarter[10]. While China is the greatest emitter today, it has a lot of catching up to do in per capita terms to equal Europe and the United States.

Until the Industrial Revolution, the primary energy sources supporting human life were plants for food, either directly or through meat, and biomass for warmth and light. They were climate-neutral. Animal and human muscles, water, and wind, as well as the burning of wood and animal dung, had practically no effect on the composition of the atmosphere because it only slightly speeded up the natural decay processes that continually recycle carbon from the biosphere to the atmosphere. The use of coal ruptured the shackles of direct photosynthesis and the real-time use of biomass as humanity's main energy source. The Industrial Revolution enabled humans to reach into the Earth's store of millions of years[11] of plant matter converted by solar energy into coal, oil, and gas.

Coal fueled the Industrial Revolution. It converted heat into mechanical power, such as in steam engines, and movement, such as in railways and ships. Oil, first struck in 1859 in Pennsylvania, supplanted coal in importance after World War II when road and air transport mushroomed, thus changing the world. Oil was the largest single item in the dollar budget of most Western European countries.

Coal, oil, and gas are organic materials, the result of millions of years of stored photosynthesis—plants having converted solar energy into biomass—which returned to the atmosphere and oceans that stored carbon. At the end of the 19th century, fossil fuels began to power electrification; during World War I, they were also used as raw materials for explosives and fertilisers. In the 1920s, chemical conversion turned coal into gasoline, industrial grease, synthetic rubber, and even margarine.

Upsurge of productivity

Excavating and burning fossil fuels—the sun's energy stored for aeons—in ever greater quantities laid the basis for the upsurge of productivity, production, and consumption of the past decades. No doubt, scientific and technological advances were additional catalysts for the great acceleration after World War II, but it was the burning of fossil fuels in ever greater quantities that catapulted humanity into the modern age of mass production and consumption. A few generations of humanity are burning the fossil fuels that were generated over several hundred million years, a stunning excess that is problematic not because it exhausts finite resources but because it destroys the natural life support systems on which animals, plants, and humans depend.

The science is clear. To prevent global heating from exceeding 1.5°C—an ever more elusive goal, even given the catastrophic consequences of failing to do so – fossil fuel energy use must decrease by 45 percent by 2030 and reach net zero around 2050[12]. In fact, there is no serious scientific analysis that envisages limiting warming to 1.5°C without the rapid phase-out of fossil fuels. At stake is not the future of the planet or the future of the human race, but the future of human civilization. COP28 will conclude on December 12, at which time we will have a good sense of the odds. [IDN-InDepthNews]

**Dr. Franz Baumann is a former Assistant Secretary-General of the United Nations and Visiting Research Professor at New York University. His most recent assignment was as Special Adviser on Environment and Peace Operations with the rank of Assistant Secretary-General.*

Original Link: https://www.meer.com/en/77404-the-science-of-global-heating

Photo: A black bird elegantly perched on a leafless tree

References

[1] The recording of the conversation between Sultan Ahmed Al Jaber and Mary Robinson before #cop28.
[2] Warming the world, The Carbon Dioxide Greenhouse Effect, Note on the Transmission of Radiant Heat through Gaseous Bodie, Overlooked No More: Eunice Foote, Climate Scientist Lost to History, On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground.
[3] The Causes of Climate Change.
[4] Making a Greenhouse.
[5] Earth Fact Sheet.
[6] Mid-Pleistocene transition in glacial cycles explained by declining CO2 and regolith removal.
[7] Kevin A. Baumert, Timothy Herzog, Jonathan Pershing, Rates of change in natural and anthropogenic radiative forcing over the past 20,000 years, 2005.
[8] Overview of Greenhouse Gases.
[9] Global Monitoring Laboratory.
[10] Navigating the Numbers, Greenhouse Gas Data and International Climate Policy.
[11] Natural gas explained.
[12] Global Warming of 1.5 ºC.

Striving for People, Planet and Peace

2023 JOINT MEDIA PROJECT REPORT

INPS | Soka Gakkai International | IDN-InDepthNews

MAPTING

PARTNERS

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

SDG MEDIA COMPACT

UN WOMEN

UN Climate Change Newsroom

UNCCD

Convention on Biological Diversity