

# Versions of the AGHE

Compiled by Carl Brehmer and Joe Postma

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Although these various explanations of the “atmospheric greenhouse effect” (AGHE) have a similar theme they are different from one another in that they each invoke different laws of physics and thermodynamics to explain how “greenhouse gases” warm the planet. Some of these “laws” don't even exist or are a complete impossibility.

- 1) The radiative surface combined with lapse rate
  - GHG's cause the atmosphere to emit OLR from a progressively higher and higher altitude. This forces the surface temperature to increase due to the lapse rate.
- 2) Back-radiative heating where cold radiation heats a warmer surface
  - Radiation from a colder source and/or radiation scattered back from the same source will cause a temperature increase on a warmer object/same source (self-heating) because radiation doesn't have to follow the Laws of Thermodynamics as we understand them for matter. Back-conduction is non-sensical and can't increase temperature but radiation can do this.
- 3) Radiative-resistance where back-radiation does not cause actual active heating but slows the cooling which thus leads to higher average temp.
- 4) The gaseous atmosphere acts like a piece of solid glass and blocks IR radiation from leaving the atmosphere.
  - This is the “atmosphere is a rigid piece of glass” argument.
- 5) There is only a GHE at night because the nighttime dew emits the wavelengths of IR radiation that water vapor can absorb (Tyndall)
  - This argument was unique to Tyndall and we haven't heard it used in modern times.
- 6) GHG's “insulate” the planet like a blanket or jacket
  - This is the insulation or “atmosphere is a blanket” argument and it is similar to #3.

- 7) IR radiation is “trapped” in the atmosphere by GHG's and this warms it up: “The carbon dioxide strongly absorbs infrared and does not allow as much of it to escape into space.” Georgia State University
  - This is the "IR radiation trapping" argument.
- 8) “For when carbon dioxide is released into the atmosphere, it acts like the ceiling of a greenhouse, trapping solar energy and retarding the escape of reflected heat. It is therefore a species—the most important species—of a ‘greenhouse gas’.” Massachusetts, *et al.*, Petitioners v. EPA, *et al.*
  - This is the “I don't have a clue what the greenhouse effect is, but this string of words sounds impressive to the uneducated” argument.
- 9) “Greenhouse gases reduce the rate at which the Earth's surface loses infrared radiation to outer space. Because one way to increase the temperature of anything is to reduce its rate of energy loss to its surroundings, this makes the Earth's surface and lower atmosphere warmer than they would otherwise be.” Roy Spencer
  - This is the “greenhouse gases decrease the emissivity of the atmosphere” argument. It is, of course, is completely backwards since “greenhouse gases” increase the emissivity of the atmosphere and allow it to emit the same amount of IR radiation at a lower temperature.
- 10) “The surface of the Earth is warmer than it would be in the absence of an atmosphere because it receives energy from two sources: the Sun and the atmosphere.” Penn State University
  - This is the “atmosphere is a secondary heater” argument, which is related to the back-radiation argument.
- 11) The greenhouse effect is “what allows Earth to stay warm enough for life to survive. Without it, Earth would feel something like Mars.” <http://science.howstuffworks.com>
  - This is the “without greenhouse gases it would be as if the earth were 75,000,000 km further away from the Sun and our atmosphere lost 99% of its mass” argument.
- 12) The atmosphere of Venus is 97% carbon dioxide and is causing its surface temperature to be 460C.
  - This is the “as greenhouse gases increase in the atmosphere it will be as though the earth moves closer to the sun and its atmosphere becomes 9300% more massive” argument.
- 13) Global temperatures are rising and so are carbon dioxide levels, therefore the carbon dioxide must be causing the warming. (G.S. Callendar 1938, C.D Keeling 1960's, Al Gore 2006)
  - This is the correlation equals causation argument.

- 14) Sunlight only provides  $-18^{\circ}\text{C}$  worth of constant heating at the surface and therefore the atmosphere must provide twice as much heat as the Sun.
- This is the “Earth can be thought of as flat and with no day & night and with Sunshine as uniform and freezing cold so that we must invent a GHE where the atmosphere is twice as hot as Sunshine even though it has no sources of energy” argument.
- 15) “It would become a runaway greenhouse effect if the rising temperature approached the boiling point of water, because then the oceans would begin to convert to water vapor.” University of Tennessee, Knoxville
- This is the “runaway greenhouse effect due to positive water vapor” feedback argument.
- 16) “Greenhouse gases in the atmosphere contribute to global warming by adsorption and reflection of atmospheric and solar energy.” <http://www.lenntech.com>
- This is the “greenhouse gases act like a mirror” argument.
- 17) “We are also protected by the atmosphere. It acts as a huge blanket, keeping the Earth warmer than it would be without the atmosphere. This is known as the greenhouse effect.”
- This is the “without greenhouse gases the earth's surface would be the same temperature as if it didn't even have an atmosphere” argument.

We have also witnessed the following to be claimed as “just like the GHE”

- 18) A laser was said to be just like the GHE
- 19) Chemical release of energy such as that from a flint-match was said to be like the GHE
- 20) Cavitation from a submarine propeller has been said to be just like the GHE
- 21) A refrigerator doesn't follow the 2<sup>nd</sup> Law of Thermodynamics and so the GHE is like a refrigerator where heat flows from cold to hot.
- But a refrigerator makes things cold inside, not hot, and, it doesn't violate the 2<sup>nd</sup> Law of Thermodynamics in any case because it has outside work input from the electrical cord. So it has never made sense why a refrigerator is said to be like a GHE.