Hot Spots vs. Green House Gases - Contribution to Global Warming – New Theory

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Abstract

In this paper we provide a simple thermodynamic proof that man made Hot Spot heat generation would also create global warming even if CO_2 emissions were at normal levels. We introduce the concept of global warming equilibrium heat index to establish this proof. We define man made hot spot emission as the excessive unnatural heat emission produced by man that would not have occurred prior to the industrial revolution. The CO_2 theory of global warming, while central to the issue as a huge part of the problem, has created a diversion to this other likely major contributor, namely hot spots to global warming. It is obvious that there if a major focus on CO_2 emissions and absolutely no focus on hot spot reduction in terms of solving the global warming crisis. This paper will hopefully provide motivation for the mitigation of hot spot creation. Knowledge of the root causes of the global warming problem is important to addressing the problem properly.

1. Basic Proof

We introduce the concepts of hot spots defined as *man made emission of excessive unnatural heat emission produced by man that would not have occurred prior to the industrial revolution.* We define hot spots further in Section 2. First we will provide the general proof that without CO_2 increase, we would still have global warming.

In order to provide this proof, we first define the global warming equilibrium heat index I_G simply as

$$I_G = \left(\frac{dS_{generated} / dt}{dS_{released} / dt} \right)_C \tag{1}$$

If we enclose the earth and its atmosphere denoted by C, then $S_{generated}$ is the entropy generated inside of C while $S_{released}$ is the entropy released out of C both taken per unit time in the above equation.

We now define I_G as

$$I_G = \begin{cases} 1 \ \ for \ \ t < IR \\ > 1 \ for \ t \geq IR \end{cases} \tag{2}$$

where $t=IR$ indicates the time t which is the start of the Industrial Revolution (IR).

For $t<IR$ we assume that $S_{generated}$ is only due to solar heating of the earth all other entropy contribution enclosed by C are taken to be zero.

$$S_{generated}=S_{solar} \tag{3}$$

Since $I_G=1$ then we must have

$$dS_{generated} / dt = dS_{released} / dt \tag{4}$$

Therefore

$$dS_{generated} = dS_{released} \tag{5}$$

We now model $S_{generated}$.

$$S_{generated} = S_{released} + \left(S_{Unreleased} \right)_C \tag{6}$$

By Equation 4 then

$$\frac{d\left(S_{Unreleased} \right)_C}{dt} = 0 \ \ or \ \ \left(S_{Unreleased} \right)_C = \text{Constant} \ \ for\ t<IR \tag{7}$$

At this point, we make the assumption that that this unreleased entropy is due to normal constant CO2 prior to the industrial revolution

After the industrial revolution we have

$$\frac{d\left(S_{Unreleased}\right)_C}{dt} = \frac{\mathrm{dS_{CO2+}}}{\mathrm{dt}} + \frac{\mathrm{dS_{Hot\ Spots}}}{\mathrm{dt}} \quad \textit{for t>IR} \tag{8}$$

And then

$$I_G = \left(\frac{dS_{generated}/dt}{dS_{released}/dt}\right)_C = \left(\frac{dS_{released}/dt + dS_{unreleased}/dt}{dS_{released}/dt}\right)_C = \left(1 + \frac{\frac{\mathrm{dS_{CO2+}}}{\mathrm{dt}} + \frac{\mathrm{dS_{Hot\ Spots}}}{\mathrm{dt}}}{dS_{released}/dt}\right)_C > 1 \tag{9}$$

We see that even if $\frac{\mathrm{dS_{CO2+}}}{\mathrm{dt}}$ =0, we still would have I_G greater than 1. This means that global warming would occur even if CO2 levels were not increased.

2. Examples of Hot Spots

We have defined hot spots as man-made emission of excessive unnatural heat emission produced by man that would not have occurred prior to the industrial revolution. Below is a list that further defines hot spots examples:

Table 1 Some Key Examples of Hot Spots

Hot Spot Example	Heat Ranking (Subjective)
Burning Fossil Fuels	1
Burning Coal Fuel	2
Explosion (Bombs)	3
Nuclear Power	4
Engines (Cars)	5
Roads – Conversion Solar to heat	6
Buildings – Conversion Solar to heat	7

We should not take buildings and roads lightly. The figures below provide some indication of the huge problem man has created with poor chose simply of color related to solar conversion to heat.

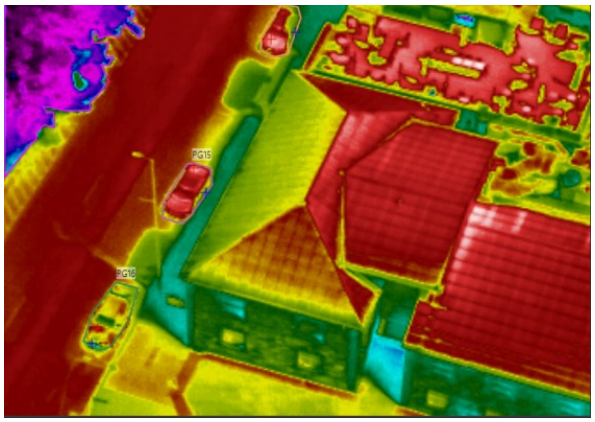

Figure 1 Thermal image showing a hot day with black roof tops and roads, color is a real issue

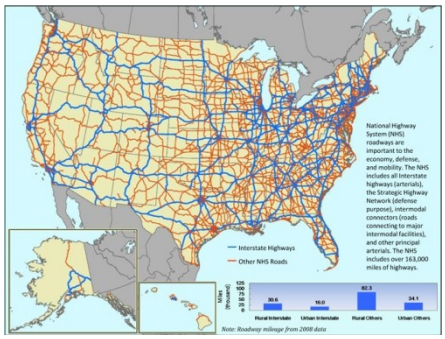

Figure 2 The increase of Black asphalt roads all over the world. Here displayed in the U.S.

Biography

Alec Feinberg is the founder of DfRSoft. He has a Ph.D. in Physics and is the principal author of the books, Design for Reliability and Thermodynamic Degradation Science: Physics of Failure, Accelerated Testing, Fatigue, and Reliability Applications. DfRSoft provides consulting in reliability and shock and vibration, training classes and DfRSoftware. Please contact us if you need help. Alec has provided reliability engineering services in diverse industries (AT&T Bell Labs, Tyco Electronics, HP, NASA, etc) for over 35 years in aerospace, automotive and electrical and mechanical systems. He has provided training classes in Design for Reliability & Quality, Shock and Vibration, HALT and ESD. Alec has presented numerous technical papers and won the 2003 RAMS best tutorial award for the topic, "Thermodynamic Reliability Engineering."