



EGUsphere, author comment AC2  
<https://doi.org/10.5194/egusphere-2022-5-AC2>, 2022  
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## Reply on CC2

Dimitre Karamanev

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Author comment on "The effect of anthropogenic heat emissions on global warming" by  
Dimitre Karamanev, EGU sphere, <https://doi.org/10.5194/egusphere-2022-5-AC2>, 2022

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"Note that the author's own reference from 2016 by Bing Chen, et.al., completely contradicts this paper and the author's claims where Chen, et.al, used a sophisticated climate model."

Reply: That is correct, my paper contradicts the methodology and findings in the paper of Chen et al. (2016). The reasons are shown in lines 70-89 of my manuscript.

"They find that the total increase in the global average temperature is only about 0.032 degrees C by 2012 due to the heat inputs to the atmosphere by human beings. As they say, so far that is fairly small compared to the overall increase by 2012 of about 1.0 degrees C as one might expect."

Please see my response above.

"In fact, Karamanev completely mis-characterizes the scope of the Chen paper as being limited to local heat island effects, which it is not, which might explain why he did not realize that it contradicted his own methodology."

Reply:

- Chen et al (2016) stated: "Anthropogenic heat was considered as an essential aspect of urban heat islands (IPCC, 2007), which are important for urban climates. With the rapid increase in global urbanization, the impact of AHR on the climate is increasing."

My paper: "... anthropogenic heat accumulation has been studied mostly on a local scale in relation to "urban heat islands" (Chen et al., 2016; Dong et al., 2017)", L. 48-50.

- Chen et al (2016) stated: "The high-resolution global distribution of anthropogenic heat release (AHR), which is generated by human energy consumption, is estimated by means of applying satellite remote sensing. Additionally, it was considered into a global climate model and the possible climatic effect of AHR is examined in this study"

My paper: "The global effect of direct anthropogenic heat release into the atmosphere has been studied in several papers, and it has been found that the amount of anthropogenic heat flux comprises only approximately 1% of greenhouse gas forcing (Chen et al., 2016; Crutzen, 2004; Flanner, 2009)", L. 50-52.

Therefore, Chen et al. (2016) discussed both heat islands and global temperature effect, and I cited both of them.

"To repeat one of the arguments I made in my first comment. The concept of the atmosphere having a heat capacity at any given time is not valid, since the heat is constantly leaking out to space. Thus, the 2.3 degree C result cited on line 264 if no heat was leaking is invalid, since heat is constantly flowing out of the atmosphere to space. Similarly, because the concept of the atmosphere having a heat capacity is wrong, Karamanev cannot rely on equation 7 on line 285 to calculate the incremental increase in the temperature of the atmosphere in any given year.

Reply: Air, as well as any other physical object having mass, has heat capacity. You are wrong saying: "the concept of the atmosphere having a heat capacity is wrong". In addition, Chen et al. (2016) shows an air temperature increase (unfortunately, greatly underestimated) as a result of human heat release. That contradicts also the statement in your previous comments: "In fact, if CO<sub>2</sub> were not increasing in the atmosphere due to the combustion of fossil fuels, and if only heat were released due to their combustion, there would probably be no yearly average incremental heating of the air at all, since the incremental heat would be radiated out into space very quickly, on a daily basis".

"While I have not reviewed the Chen, et.al., paper in detail, its basic methodology seems to be correct since it models the constant flow of heat from its release in energy supply technologies out into space, implying that the Karamanev paper should not be published."

Reply: I completely disagree with you that because my paper shows different results from these of Cheng, it should not be published.

"Note also that Karamanev also makes some very silly comments about the science of climate change, e.g. stating that "Therefore, there is still no direct proof that carbon dioxide emissions cause global warming." So he is dismissing all the results of climate science models done since the 1970s in one short sentence."

Reply: My paper states the following: "... the Intergovernmental Panel for Climate Change concluded in its latest report (Stocker et al., 2013) that the probability of global warming being caused by increasing atmospheric CO<sub>2</sub> concentration is 95%. While this number seems high, it is still far from 100%. There have been many projected events of different nature with a higher expected probability that never actually occurred" (L. 43-47). Therefore, the "very silly" comments that there is still no 100% confidence in the cause of global warming were made by IPCC, and I have just cited them.