Ara Marderosian

From: Todd Shuman <tshublu@yahoo.com>
Sent: Sunday, February 12, 2017 8:03 PM
To: ryan.mccarthy@arb.ca.gov; craig.segall@arb.ca.gov
Cc: Ara Marderosian; Jan Dietrick
Subject: Re: Comments on CA ARB SLCP Reduction Strategy and Revised Draft EA; Supplement
Attachments: Anthropogenic GHG Emissions and Global Surface Temperature Change Values, 1950-2016 Text Version 2.pdf; Anthropogenic GHG Emissions and Global Surface Temperature Change Values, 1950-2016 Spreadsheet Set.ods; Figure 2d todd grid 5.jpg; Allen et al. 2016 SLCP GWP GTP.pdf

February 12, 2017

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Proposed Short-Lived Climate Pollutant Reduction Strategy and Revised Draft Environmental Analysis

To Ryan and Craig:

In the previous January 17, 2017 submission by Wasteful Unreasonable Methane Uprising, Sequoia ForestKeeper, Todd Shuman, Ara Marderosian,and Jan Dietrick, a spreadsheet set concerning global GHG emissions and global surface temperature change values was submitted. Subsequently, I have prepared an associated document to enable easier comprehension of the spreadsheet set and the data within it that supports the findings presented in our January 17, 2017 comments. I am attaching that document, as well as the revised spreadsheet set, and Figure 2d with grid superimposed. A few minor errors concerning notes on Sheet 1, lines 57, 58, and 70 have been corrected, as well as a few other changes have been incorporated.

I am also attaching the paper by Allen et al. (2016) upon which the spreadsheet set is fundamentally based. Though we submitted this paper to CA ARB back in May, 2016, resubmitting it again with these other files presents the full set of files to CA ARB needed for enhanced comprehension of the spreadsheet set and associated text

in one single email.

While I focus primarily on Figure 2d in this paper by Allen et al. (2016), there are other findings which CA ARB might find germane to California GHG-related regulatory matters. In addition to re-submitting the paper, I am also including a few select quotations from the paper below in the appendix below. I pray that these might assist CA ARB in addressing a variety of GHG-related matters currently "on its plate" and in the future.

Sincerely,

Todd Shuman, Senior Analyst, WUMU-WURU, Camarillo, CA 805.987.8203

Appendix:

New use of global warming potentials to compare cumulative and short-lived climate pollutants, Myles R. Allen, Jan S. Fuglestvedt, Keith P. Shine, Andy Reisinger, Raymond T. Pierrehumbertand Piers M. Forster, Nature Climate Change, PUBLISHED ONLINE: 2 MAY 2016 | DOI: 10.1038/NCLIMATE2998

Allen et al. (2016), page 3:

“So a sustained emission rate of 0.01 tonnes per year of methane has the same impact on peak warming as a pulse of 28 tonnes of CO_2 released at any time between now and when temperatures peak, GWP^{100} of methane being 28.”

Allen et al. (2016), page 4:

“A permanent reduction of 50-75% in these SLCPs could reduce global temperatures by over 0.5 [degree] C by mid-century[4], comparable to the impact on

these timescales of similar-magnitude reductions of CO2 emissions and, it has been argued, at much lower cost.[4,5,29] Stabilizing global temperatures, however, requires net emissions of cumulative pollutants, predominantly CO2, to be reduced to zero."

"GWP^{100} can be used in the traditional way, comparing pulse emissions of different GHG[s], to specify how mitigation of both short-lived and cumulative climate pollutants may reduce the rate and magnitude of climate change over the next 20-40 years, but only over that time."

"The conventional use of GWP^{100} to compare pulse emissions of all gases is an effective metric to limit peak warming if and only if emissions of all climate pollutants, most notably CO2, are being reduced such that temperatures are expected to stabilize within the next 20-40 years.

This expected time to peak warming will become clear only when CO2 emissions are falling fast enough to observe the response.

Until such a clear end point is in sight, only a permanent change in the rate of emission of an SLCP can be said to have a comparable impact on future temperatures as a one-off pulse emission of CO_2, N_2O or other cumulative pollutant."

Allen et al. (2016), page 5:

"Hence, in the limit of a very short-lived gas and infinitely persistent reference gas, the GTP for a pulse emission evaluated at 21 years will be equal to the GWP_{100}. The expression becomes more complicated if $k_1H'=1$ [approximately], as is the case for methane, but this limiting case serves to show that the equality of GWP_{100} and $GTP_{20\text{-}40}$ arises primarily from the thermal adjustment time of the climate system."