The referee writes:

> The principal problem is that no account is taken of the much greater persistence time of CO_2 perturbations, especially the fact that some of that CO_2 is an essentially permanent addition to the atmosphere. This is acknowledged at p 2;l 28-29, but plays no subsequent part in the analysis. The only timescale used in the paper is methane's decay time.o

The thought experiment described in this paper features two greenhouse gases: CO_2 and CH_4. Both are described mathematically by Eq. (3), which has a homogeneous decay term and an inhomogeneous source term. CH_4 has a finite lifetime $\tau = 12.4$ year; the lifetime of CO_2 is approximated by ∞, exactly as the referee expects.

This infinite lifetime appears in the denominator and is consequently mis-identified by the referee as missing from the analysis. Indeed, the equation that ultimately determines the time-development of the carbon-equivalent concentration c_e lacks a decay term. It only features a source term due to the combustion of CH_4 and the carbon-equivalent effect of the fugitive CH_4. Both the infinite time scale of CO_2 and the finite one of CH_4 are not only present in the analysis; they are crucial. In other words, the statement the referee makes in the last sentence of the comment quoted above is incorrect.

One might criticize the paper for not using better Green functions for CO_2 and CH_4, but in the thought experiment I chose for simplicity for clarity's sake, rather than for accuracy. This seems to have confused the referee. Nevertheless, crude as it may be, the model used in the paper is a vast improvement over the widespread, misleading use of the 100-year time horizon used by the UFCCC and the U.S. Environmental Protection Agency.

Let me reiterate that the main results of the thought experiment described in this paper are as follows:

1. The paper provides a rough estimate of how long it will take to a see reduction of global warming due to switching to $CH_4$with its higher energy content relative to coal and oil. This cross-over shows up in the carbon-equivalent greenhouse gas concentration illustrated in Figs. 3, 4, 6, and 7. In the long run, the red and blue CH_4 curves all intersect the black coal/oil curves. Except in one case, as shown in Fig. 6, these cross-over points are too far into the future to be relevant for decision makers and do they not actually show up in the figures.

2. The elementary kinetic equations used in the paper show that any global warming potential with a greater than zero time horizon precludes a time-dependent analysis as presented. As a consequence, not even a rough estimate of the cross-over time can be made on the basis of these quantities.

Since the "principal problem" the referee claims to have identified a problem does not exist, it seems pointless to address secondary issues brought in this report.