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Interactive comment on "The PRIMAP-hist national historical emissions time series" *by* Johannes Gütschow et al.

Anonymous Referee #1

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The paper "The PRIMAP-hist national historical emission time series" describes the emission data set for each country and the gases covered by Kyoto protocol. The data set is based on the combination of the published data sets. The added value as well as possible applications of the composite inventory are not clearly articulated in the paper. The assessment is biased to the period from 1990, while historical emissions are not covered properly. The composite data set is created as a pure statistical exercise through series of multiplications, additions and extrapolations, through it is not clear if the data sets can be combined together, under what condition, and what the final combination actually means. The final product is expressed through IPCC 1996 main categories, but is unclear how the diverse categories used in original inventories were converted into IPCC categories. Language of the paper also needs correction. The paper is full of jargon and abbreviations, as well as punctuation mistakes. In places

explanations are extremely brief and do not allow to judge if the sources of information are appropriate for combination or not. The paper is also unspecific in many places in relation to what gases and what sectors are addressed (everything is just emissions). More specific comments: p.1 (abstract) – what is a temporal resolution of the composite inventory p.2 (10-15) – to what extent current IPCC emission categories are applicable to historical emissions (as there was a substantial change in technology, use of fuels, efficiency etc.)? p.3 (20) – reference is made to the use of growth rates. Are these emissions growth rates (at what temporal resolution)? How those are constructed? p.4 – CDIAC is presented as a country specific inventory. How the historical boarders are taken into consideration in this inventory? p.5 (7) – please spell out KP p.7 – sections 2.3.1 and 2.3.2 are very brief. How do these pieces complement each other or do they provide a repetitive information. Do both sources use the same emission factors for their calculations? How different are the estimates based on fossil fuel consumption and fossil fuel burning and flaring? Section 2.3.2 refers to the emissions based on the statistics of fossil fuel production and trade combined with the information on the chemical composition (of what?) for the period 1751 to 1949. Where does such information come from? p.7 (26-30) – the paragraph claims that emissions in EDGAR are calculated using technology dependent emission factors for EACH technology determined by the end of pipe measurements. If each emission factors could have been determined as claimed, the emission inventories would have been much more precise. There are plenty of technologies, especially in developing countries, which are very poorly described in a sense of emission factors, the same applies to historical emission factors. p.8 (5)- The sentence states that land use emissions are categorized into forestland, grassland, cropland and biomass burning, but they are applicable to CO_2 only. It is a bit confusing though, as cropland should theoretically include rice paddies, which are one of the important source of CH_4. Line 10 later speaks of agricultural emissions. What is the difference between cropland land use emissions and agricultural emissions? How these emission categories are mapped into IPCC categories? p.8 – sections 2.4.1 and 2.4.2 are extremely short. How these two sources compare

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to each other? Do they use the same regional definitions and source categories? If not, how the original data were processed for the composite inventory? Line 21 refers to constant emissions outside of tropical regions prior to 1990. Where do these data come from? Based on what principle the HOUGHTON2008 is downscaled to country level? Description of RCP historical dataset is very poor. What gases are covered? In what cases atmospheric inverse modelling is used? p.9 (7) – the need for categories mapping is indicated, but details of how it is done are not provided p.9 – sections 2.6.1 and 2.6.2 have very short description of data sources. What emission categories and gases are covered? How do these inventories compare with the one of FAO? p.11 presents the source preprocessing but does not describe how diverse categories are mapped against IPCC before being used in the composite source generator p.13 – the compilation of the composite source as presented on the figures creates a question of consistency. If the inventories are different during one period and you just combine them multiplying by coefficients, what value does it bring? What additional uncertainty is introduced through such data treatment? p.15 (15-16) – how far back can the RCP growth rates based on atmospheric concentration measurements be extended? Is this approach applicable to all countries and all sectors? p.17 (10) – does the statement mean that you assume no land use emissions before 1850? p.18 – how large forest fires are reflected in the considered historical emissions? p.21 (23) – what emissions are discussed here? The paragraph is absolutely unclear. p.22 (27) – it is very unfortunate that the uncertainty estimate of the dataset is left for a future publication as uncertainty is a natural part of any dataset delivered and allow for evaluation of applicability of the data set for specific tasks. p.26 – section 7.0.2 presents the comparison of the compiled product with the other data sources, though the comparison is made with the data sources used to create the composite inventory. It is obvious that as it is a composite product of original datasets it will follow the features the authors prioritize in compilation, hence such a comparison does not bring any value and cannot be considered as an independent verification.

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