



## ***Interactive comment on “Atmospheric concentrations of carbon dioxide and its isotopic composition in southern Poland: comparison of high-altitude mountain site and a near-by urban environment” by L. Chmura et al.***

**Anonymous Referee #1**

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The authors present a study dealing with the concentrations and isotopic composition of atmospheric carbon dioxide, and compare the results obtained in mountainous and urban environments. The topic is highly relevant to the atmospheric research community and suitable for Biogeosciences. The comparison between two contrasting sites increases the value of the study. Furthermore, multi-year observations during changing energy consumption strategies in the Eastern Europe provide valuable information of current anthropogenic influences on atmospheric composition. The manuscript is clear in structure and easy to follow. However, the discussion in the manuscript is rather short and shallow. Authors do not give thoroughly explained arguments for their conclusions. I agree with the authors' suggestion to reorganize the material into two

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manuscripts. This will create better possibilities for in-depth analysis and discussion.

Detailed comments: p. 1855 Causes for CO<sub>2</sub> variability in Krakow and Kasprowy Wierch should be discussed further. For example, do you observe peaks due to daily high traffic hours or seasonal changes in traffic intensity and heating etc. in Krakow? Is there any dependency on wind direction? Can you observe influences from Upper Silesia, as suggested in p. 1853? For Kasprowy Wierch the statement about background concentration should be clarified. How do you select background data in Kasprowy Wierch? In which conditions are Krakow and Kasprowy Wierch concentrations comparable, and can those cases always be defined as non-background?

p. 1856 Please show Mace Head data for comparison. Please clarify the seasonal cycles of 13C in connection with 14C and CO<sub>2</sub>. In Kasprowy Wierch, is it possible to separate the biospheric and anthropogenic influences in the updrafts from the valleys?

P. 1857 Is it possible to see the changes in energy usage in the Krakow CO<sub>2</sub> record, as shown by the 14C record? Do the growth rates in Krakow and Kasprowy Wierch differ from each other?

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