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Comment on essd-2021-242

Anonymous Referee #1

Referee comment on "CAMS-REG-v4: a state-of-the-art high-resolution European emission inventory for air quality modelling" by Jeroen Kuenen et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-242-RC1, 2021

CAMS-REG-v4: a state-of-the-art high-resolution European emission inventory for air quality modelling

Jeroen Kuenenet al.

The manuscript describes an emission inventory developed for the European domain for a 18-year time series (2000–2017) at high spatial resolution, designed to support air quality modelling. It reports emission of NO_x, SO_2, NMVOC, NH_3, CO, PM_{10} and $PM_{2.5}$ and CH_4. This database is an updated and improved inventory (TNO_MACC inventories). It is complemented by other national/international databases. Use official reported emission data from national inventories for both the greenhouse gases and the air pollutants and redistribute it spatially according to some proxy information. Also, for regions with poor data uses estimations from IIASA GAINS model. This paper describes the methodology used to derive the CAMS-REG inventory, version 4, covering years 2000-2017. Finally, it compares to EDGARv5.0 international inventory and early versions of the same CAMs inventory group.

The manuscript is well described and clearly documented. It is easy to read and follow. It includes a good effort to harmonize different sources of information (specially from eastern/southeastern countries) to conform an adequate state of the art inventory useful for air quality modelling and climate change. Worth mentioning is the description and impact of national inventories uncertainties. So, I encourage its publication in the present issue.

Minor comments.

Point sources. Reading your manuscript, I understand, that the EPRTR databases includes emissions from both fuel consumption and processing. You only had to organize and classified the information (by fuel, industry type, and so on). But you have not calculated the emissions using activity data + emissions factors. Eventually any calculation was provided by IIASA-GAINS model. Is this correct?. So, the main job was to harmonize the time series and eventually correct some missing/mistaken data. If such a complete database is available, why is there important differences with your previous version of the inventory or EDGAR (Figure 10, or Figure 8, although I understand that this figure is for total emissions).

Regarding the road transport. Road network are available form Openstreetmap.org . You also say that road traffic is also available for Europe from OTM. Given that information may not have the same quality for all countries and region. What kind of data quality checking have you performed on traffic volume? Have you performed some fuel-mass balances?, Car registry? Tonn/passenger km travelled?

Regarding the shipping sector. Have you directly adopted the STEAM outputs, or was it processed again?. Are STEAM data public available?. Since STEAM is a Model, it has its own uncertainties and proxies to fill their own gaps. Have you performed any kind of double checking the information from this model?. Fuel checking, ports arrivals, tons and passenger movements by ports and so on?.

Figure 10: caption should include the sector names for A, B., C…. (or " see Table 5")