Data Archiving for WG III

**Instructions: Please complete one file per figure.**

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| **Report** | WG III TS |
| **Figure Number**  (e.g. SPM.1) | TS.6 |
| **Authors Names** | William F. Lamb |
| **List of all input research papers and grey literature sources**  Please provide links or DOIs where applicable. This step is crucial for traceability. | Minx, J. C., Lamb, W. F., Andrew, R. M., Canadell, J. G., Crippa, M., Döbbeling, N., Forster, P. M., Guizzardi, D., Olivier, J., Peters, G. P., Pongratz, J., Reisinger, A., Rigby, M., Saunois, M., Smith, S. J., Solazzo, E., & Tian, H. (2021). A comprehensive and synthetic dataset for global, regional, and national greenhouse gas emissions by sector 1970–2018 with an extension to 2019. *Earth System Science Data*, *13*, 5213–5252. https://doi.org/10.5194/essd-13-5213-2021  IEA. (2021). *CO2 emissions from fossil fuel combustion 2020*.  Lamb, W. F., Wiedmann, T., Pongratz, J., Andrew, R., Crippa, M., Olivier, J. G. J., Wiedenhofer, D., Mattioli, G., Al Khourdajie, A., House, J., Pachauri, S., Figueroa, M., Saheb, Y., Slade, R., Hubacek, K., Sun, L., Ribeiro, S. K., Khennas, S., de la Rue du Can, S., … Minx, J. C. (2021). A review of trends and drivers of greenhouse gas emissions by sector from 1990 to 2018. *Environmental Research Letters*, *16*, 073005. https://doi.org/10.1088/1748-9326/abee4e |
| **Data Source**  If the data is provided by IEA (International Energy Agency) then we will use the follow statement:  *OR*  EDGAR (Emission Database for Global Atmospheric research) then we will use the following statement: | Minx et al. (2021), IEA (2021). References above. |
| **Data processing or treatment**  Please provide a text based description of any data pre-processing or transformations undertaken to the input or source data in order to produce the figure in the report.  This is important if the traceable dataset or numbers are different from those appearing on the figure. The reader should be able to understand how we arrived to the final data appearing on the SPM figure from reading this field, and should be able to replicate the steps. Therefore, the level of details presented here should be enabling such replication. | * Direct GHG emissions are allocated to sectors using IPCC 2006 codes, as described in Annex II * Indirect CO2 emissions are sourced from the IEA dataset “CO2 emissions from fossil fuel combustion” * Indirect CO2 emissions are harmonized with the direct GHG emissions database using the 2019 data points as follows: * Aggregate emissions categories are removed to avoid double counting (TOTIND, TOTTRANS, MANUFACT) * ONONSPEC is allocated to the residential, commercial, agriculture/forestry/fishing sectors, based on the fraction of CO2 relative to the total in each of these sectors * IEA sectors are then matched to the IPCC AR7 sectors, described in Annex II * The fraction of total IEA electricity and heat emissions is calculated for each subsector * This fraction is then multiplied by the electricity and heat emissions value in the EDGAR database to harmonize the IEA indirect emissions with the EDGAR direct emissions * These steps are all described in Annex II   The code for the data processing procedure is available online: <https://github.com/mcc-apsis/AR6-Emissions-trends-and-drivers/blob/master/R/Data%20preparation/build_indirect_emissions.Rmd>  And the code for producing the figure and figure data: <https://github.com/mcc-apsis/AR6-Emissions-trends-and-drivers/blob/master/R/Analysis%20and%20figures/direct_indirect_emissions.Rmd> |
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