**Global distribution of material inflows to in-use stocks and its implication for a circularity transition**

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# Procedure

The following presents the procedure to import from EXIOBASE v3.3.17, use ***main.py***, obtain ***Data\_S1.xls***, ***Data\_S2.xls***, ***Data\_S3.xls,*** and creating the global map shown in Figure 2 from ‘Global distribution of material inflows to in-use stocks and its implication for a circularity transition’ paper.

## Import data

The dataset is stored as tab-delimited text file (txt.file) in the folder ***EXIOBASE\_3.3.17\_hsut\_2011***. In order to obtain EXIOBASE v3.3.17 txt.file, the following steps are implemented:

1. From ‘Data Download’ in EXIOBASE website (<http://www.exiobase.eu/>), download ‘EXIOBASE\_3.3.17\_hsut\_2011’
2. From folder ‘EXIOBASE\_3.3.17\_hsut\_2011’, open ‘MR\_HSUT\_2011\_v3\_3\_17\_extensions.xlsb’. This file contains spreadsheets with the accounts of: material inflows to in-use stock additions (‘stock\_add\_act’ and ‘stock\_add\_FD’), and stock additions from transport equipment (‘mach\_use\_waste\_act’ and ‘mach\_use\_waste\_fd’).
3. Copy each spreadsheet in a separate Excel file. Apply:
   1. Delete rows with sector codes leaving only country abbreviation and activity name as headers (usually correspond to rows 3 and 4 of the array).
   2. Save files as tab delimited files (.txt)
   3. Re-name files as follow: ‘stock\_add\_act’ = SA\_ACT ; ‘stock\_add\_FD’ = SA\_FD.txt; ‘mach\_use\_waste\_act’ = TR\_act; and ‘mach\_use\_waste\_fd’ = TR\_FD
4. For population:
   1. Download data from World Bank Statistics (2020) website (<https://data.worldbank.org/indicator/SP.POP.TOTL>)
   2. Copy dataset in Word Bank to EXIOBASE convertor (in ***wb\_to\_exio\_conv.xls***, from Aguilar-Hernandez et al. (2019))
   3. In ‘coverted\_data’ spreadsheed, copy and save array as tab-delimited text file (.txt), and re-name file as: population data = POP.txt
5. Save all files in folder as ***EXIOBASE\_3.3.17\_hsut\_2011***

## Use main.py, Data\_S1.xls, Data\_S2.xls, and Data\_S3.xls

1. Run ***main.py*** using Python 3.7.6
2. ***Data\_S1.xls*** is a modified Excel file with all results from by using ***save\_result( )*** function
3. ***Data\_S2.xls*** combines data from ‘sa\_all\_tot’ ***Data\_S1.xls*** and income classification World Bank Statistics (2020). This file was uploaded to Tableau Public version 2019.4 Software (2019)
4. ***Data\_S3.xls*** brings the EXIOBASE classification combined with World Bank groups.

# Comparison between material inflow to in-use stocks data from EXIOBASE v3.3.17 and previous studies

Table 1 shows a comparison between data from EXIOBASE v3.3.17 and other sources of material flow accounts. This allows to demonstrate that the sum of inflows to in-use stocks in EXIOBASE v3.3.17 extensions is similar to those reported by previous studies.

Table 1. Comparison between material inflows to in-use stocks (or stock additions) of EXIOBASE v3.3.17 and other studies

|  |  |  |  |
| --- | --- | --- | --- |
| Source | EXIOBASE v3.3.17  (Merciai and Schmidt 2018; Schmidt and Merciai 2017) | MISO database (Wiedenhofer et al. 2019) | Haas et al. (2015) |
| Year reference | 2011 | 2011 | 2005 |
| Global stock additions (Gigatonnes) | 29.4 | 29.8 | 26.0 |

# Literature

Aguilar-Hernandez, G.A., C.P. Sigüenza-Sanchez, F. Donati, S. Merciai, J. Schmidt, J.F.D. Rodrigues, and A. Tukker. 2019. The circularity gap of nations: A multiregional analysis of waste generation, recovery, and stock depletion in 2011. *Resources, Conservation and Recycling* 151: 104452. https://linkinghub.elsevier.com/retrieve/pii/S0921344919303581.

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