Supplementary Material for the T-reX Tool

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5th March 2024

1 Metadata of the T-reX tool

Table 1: T-reX tool metadata

Item	Details
Current version	0.1.21
DOI	zenodo.org/doi/10.5281/zenodo.10431180
Code repository	github.com/Stew-McD/T-reX
License	CC0–1.0 license
Versioning system	git
Language	Python
Documentation	T-reX.readthedocs.io
Main dependencies	brightway2, premise, wurst

2 List of modules in the T-reX python package

2.1 Functional modules

- `future_scenarios`: Creates prospective LCA databases based on future scenarios.

- `explode_database`: Responsible for expanding a Brightway2 database into detailed exchange lists.

- `search_waste`: Provides functions for searching and categorising waste generation-related exchange data.

- `search_material`: Provides functions for searching and categorising material demand-related exchange data.

- `make_custom_database`: Facilitates the creation of custom databases based on the waste and material search categories.

- `method_editor`: Manages the custom LCIA methods for waste and material footprint calculations.

- `exchange_editor`: Appends 'pseudo-biosphere' exchanges to activities to match their waste generation and material demand exchanges in the technosphere.

- `verify_database`: Performs verification of the manipulated databases.

2.2   Configuration modules

- `custom_config`: Provides functions for managing the configuration of the T-reX package.

- `user_settings`: The main configuration file, for defining the project and database settings (user editable).

- `queries_waste`: Defines search parameters and categories for waste generation exchanges (user editable).

- `queries_materials`: Defines search parameters and categories for material demand exchanges (user editable).

3   Flowchart of the T-reX tool

4   List of Materials and Their Markets

Table 2: A comprehensive list of various materials in the default configuration.

Market Name	Material group
market for aluminium	aluminium
market for antimony	antimony
market for bauxite	bauxite
market for beryllium	beryllium
market for bismuth	bismuth
market for cadmium	cadmium
market for calcium borates	borates
market for cement	cement
market for cerium	cerium
market for chromium	chromium
market for coal	coal
market for cobalt	cobalt
market for coke	coke
market for copper	copper
market for dysprosium	dysprosium
market for erbium	erbium
market for europium	europium
market for electricity	electricity
market for ferroniobium	niobium
market for fluorspar	fluorspar
market for gadolinium	gadolinium
market for gallium	gallium

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Table 2 – *Continued from previous page*

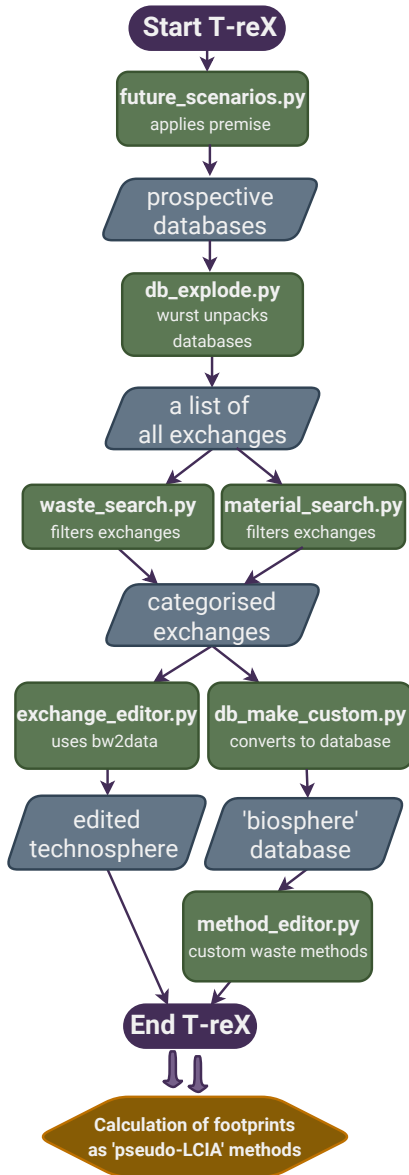| Market Name	Material group
market for gold	gold
market for graphite	graphite
market for hafnium	hafnium
market for helium	helium
market for holmium	holmium
market for hydrogen	hydrogen
market for indium	indium
market for latex	latex
market for lithium	lithium
market for magnesium	magnesium
market for natural gas	natural gas
market for nickel	nickel
market for palladium	palladium
market for petroleum	petroleum
market for phosphate	phosphate rock
market for platinum	platinum
market for rare earth	rare earth
market for rhodium	rhodium
market for sand	sand
market for selenium	selenium
market for scandium	scandium
market for silicon	silicon
market for silver	silver
market for sodium borates	borates
market for strontium	strontium
market for tantalum	tantalum
market for tellurium	tellurium
market for tin	tin
market for titanium	titanium
market for uranium	uranium
market for tungsten	tungsten
market for vanadium	vanadium
market for vegetable oil	vegetable oil
market for tap water	water
market for water	water
market for zinc	zinc
market for zirconium	zirconium

Figure 1: Computational flowchart of the T-reX tool