



ENV 370 (GR A332 – GRB001)

Environmental system analysis and assessment – Evaluation et analyse environnementale systémique

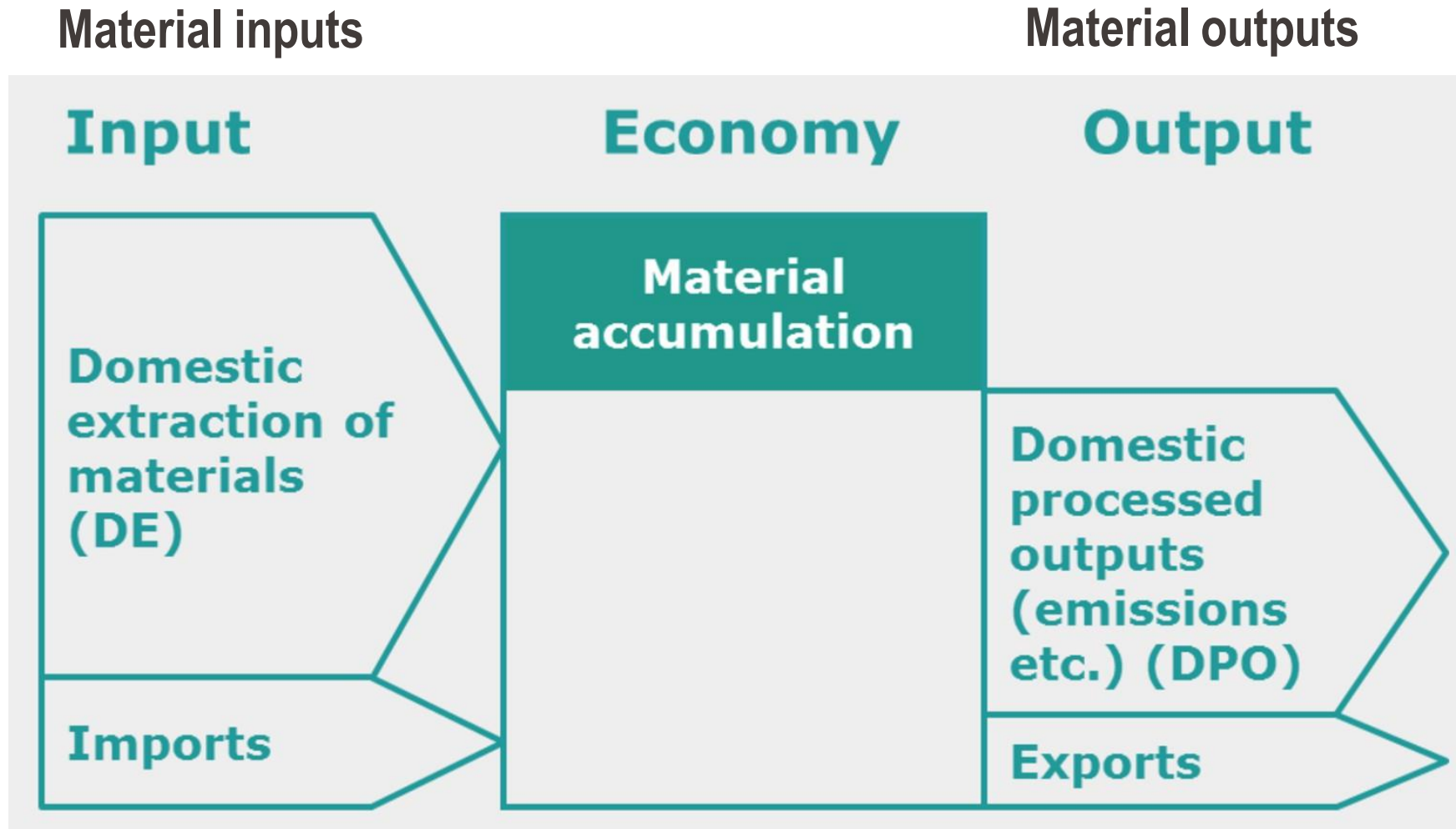
Aristide Athanassiadis / aristide.athanassiadis@epfl.ch

Jérôme Payet / jerome.payet@epfl.ch

Claudia R. Binder / claudia.binder@epfl.ch

EPFL - Spring 2025

Exercise



Eurostat, 2018

Material flows within the economy, Water flows and electricity flows are not represented in EW-MFA

Perform an EW-MFA for the 36 countries reporting

Basic flow types

- Domestic extraction (DE)
- Domestic processed output (DPO)
- Imports (IMP)
- Exports (EXP)
- NAS

<https://ec.europa.eu/eurostat/web/environment/database>

The screenshot displays the Eurostat Environment Database interface. On the left, a sidebar menu includes 'Overview', 'Database' (selected), 'Publications', 'Information on data', 'Methodology', and 'Legislation'. The main content area is titled 'Database' and is divided into two sections: 'Selected datasets' and 'Detailed datasets'. The 'Selected datasets' section lists several categories: Environment (t_env), Emissions of greenhouse gases and air pollutants (source: EEA) (t_env_air), Material flows and resource productivity (t_env_mrp), Environmental taxes (t_env_eta), Environmental protection expenditure (t_env_epe), Waste (t_env_was), Water (t_env_wat), Chemicals (t_env_chm), and Biodiversity (t_env_biodiv). The 'Detailed datasets' section lists more specific datasets: Environment (env), Emissions of greenhouse gases and air pollutants (env_air), Material flows and resource productivity (env_mrp), Material flow accounts (env_ac_mfa) (highlighted), Material flow accounts - domestic processed output (env_ac_mfadpo), Material flow accounts - balancing items (env_ac_mfabl), Material flow accounts - main indicators (env_ac_mfain), Resource productivity (env_ac_rp), Material import dependency (env_ac_mid), Circular material use rate (env_ac_cur), Circular material use rate by material type (env_ac_curm), and Material flows for circular economy - Sankey diagram data (env_ac_sd).

https://docs.google.com/spreadsheets/d/1qTkRZDWqiPrYQAQDC_Ty3OSsS_Ly5a31Zh8-pDiW8zDAQ/edit?usp=sharing

Compare and discuss per capita, GDP values

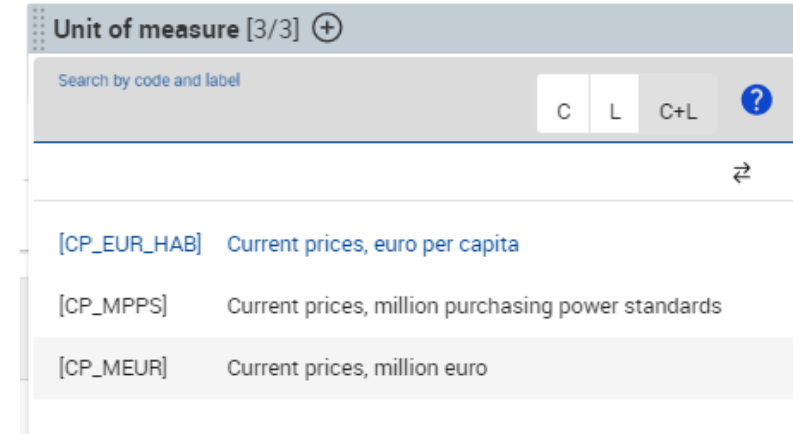
Find the population, GDP, km2 of your country



Population (national) :

https://ec.europa.eu/eurostat/databrowser/view/demo_pjan/default/table?lang=en

Page



GDP (national – current prices, million euro) :

<https://ec.europa.eu/eurostat/databrowser/view/tec00001/default/table?lang=en>

Surface (km2) :

https://en.wikipedia.org/wiki/List_of_European_countries_by_area

https://docs.google.com/spreadsheets/d/1qTkRZDWqiPrYaqDC_Ty3OSsS_Ly5a31Zh8-pDiW8zDAQ/edit?usp=sharing

Calculate the rest of the indicators

Flows types are basis for indicators

- Domestic material input (DMI) = DE + IMP
- Domestic material consumption (DMC) = DE + IMP – EXP
- Physical trade balance (PTB) = IMP – EXP
- Net additions to stock = DMI – DPO – EXP

https://docs.google.com/spreadsheets/d/1qTkRZDWqiPrY AQDC Ty3OSsS_Ly5a31Zh8-pDiW8zDAQ/edit?usp=sharing

Compare and discuss per capita, GDP values

Which country has the highest extraction per capita ?

Which country has the highest imports per capita ?

Which country has the highest exports per capita ?

Which country has the highest resource productivity ?

Why ? Let's discuss

https://docs.google.com/spreadsheets/d/1qTkRZDWqiPrYQAQDC_Ty3OSsS_Ly5a31Zh8-pDiW8zDAQ/edit?usp=sharing

Compare and discuss

Which material does your country extract, import and export the most ?

Why ? Let's discuss

Table 2: Classification of materials in EW-MFA (cross tabled with type of flows)

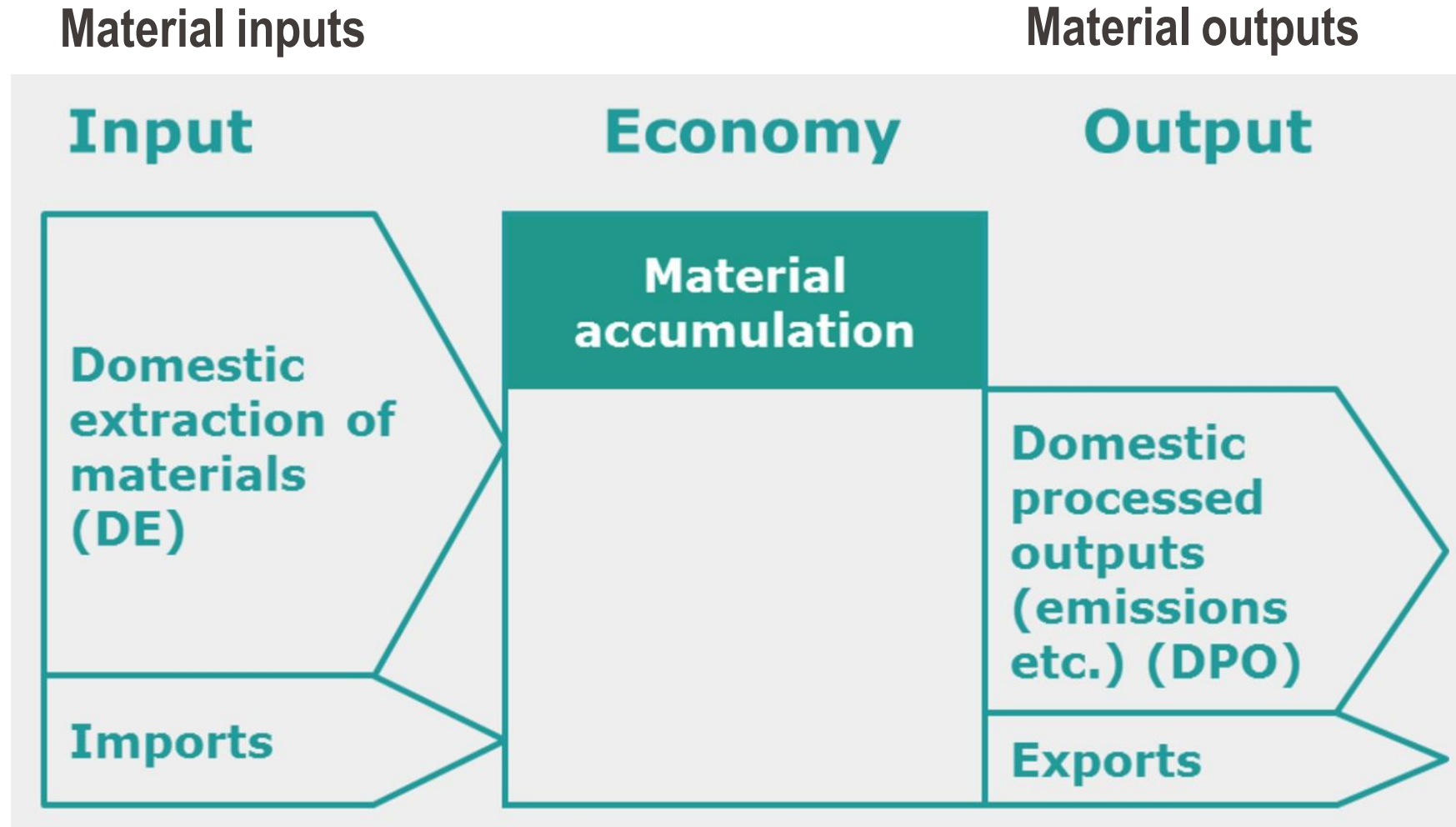
Code	Label	EW-MFA Questionnaire Table				
		EW-MFA type of flow:				
		domestic extraction	physical imports	physical exports	domestic processes output	balancing items
	SEEA-CF type of flow:	natural inputs	products	products	residuals	natural inputs or residuals
MF.1	Biomass	X	X	X		
MF.1.1	Crops (excluding fodder crops)	X	X	X		
MF.1.1.1	Cereals	X	X	X		
MF.1.1.2	Roots, tubers	X	X	X		
MF.1.1.3	Sugar crops	X	X	X		
MF.1.1.4	Pulses	X	X	X		
MF.1.1.5	Nuts	X	X	X		
MF.1.1.6	Oil-bearing crops	X	X	X		
MF.1.1.7	Vegetables	X	X	X		
MF.1.1.8	Fruits	X	X	X		
MF.1.1.9	Fibres	X	X	X		
MF.1.1.A	Other crops (excluding fodder crops) n.e.c.	X	X	X		
MF.1.2	Crop residues (used), fodder crops and grazed biomass	X	X	X		

<https://ec.europa.eu/eurostat/documents/3859598/9117556/KS-GQ-18-006-EN-N.pdf/b621b8ce-2792-47ff-9d10-067d2b8aac4b?t=1537260841000>

https://docs.google.com/spreadsheets/d/1qTkRZDWqiPrY AQDC Ty3OSsS_Ly5a31Zh8-pDiW8zDAQ/edit?usp=sharing

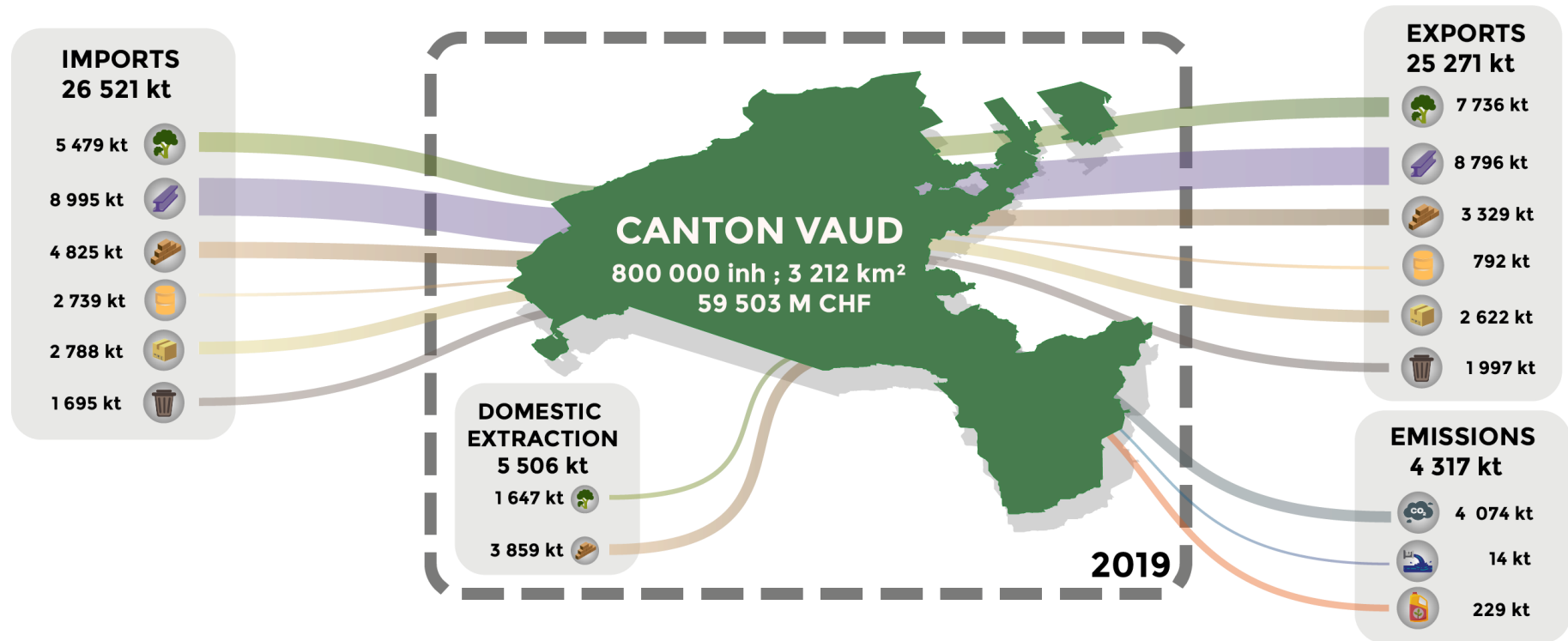
Exercise - continued

MFA (Eurostat): method



Material flows within the economy, Water flows and electricity flows are not represented in EW-MFA

Sankey Diagrams



Legend



Biomass



Metal ores



Non-metallic minerals



Fossil energy carriers



Other products



Waste for final treatment



Emissions to air



Emissions to water

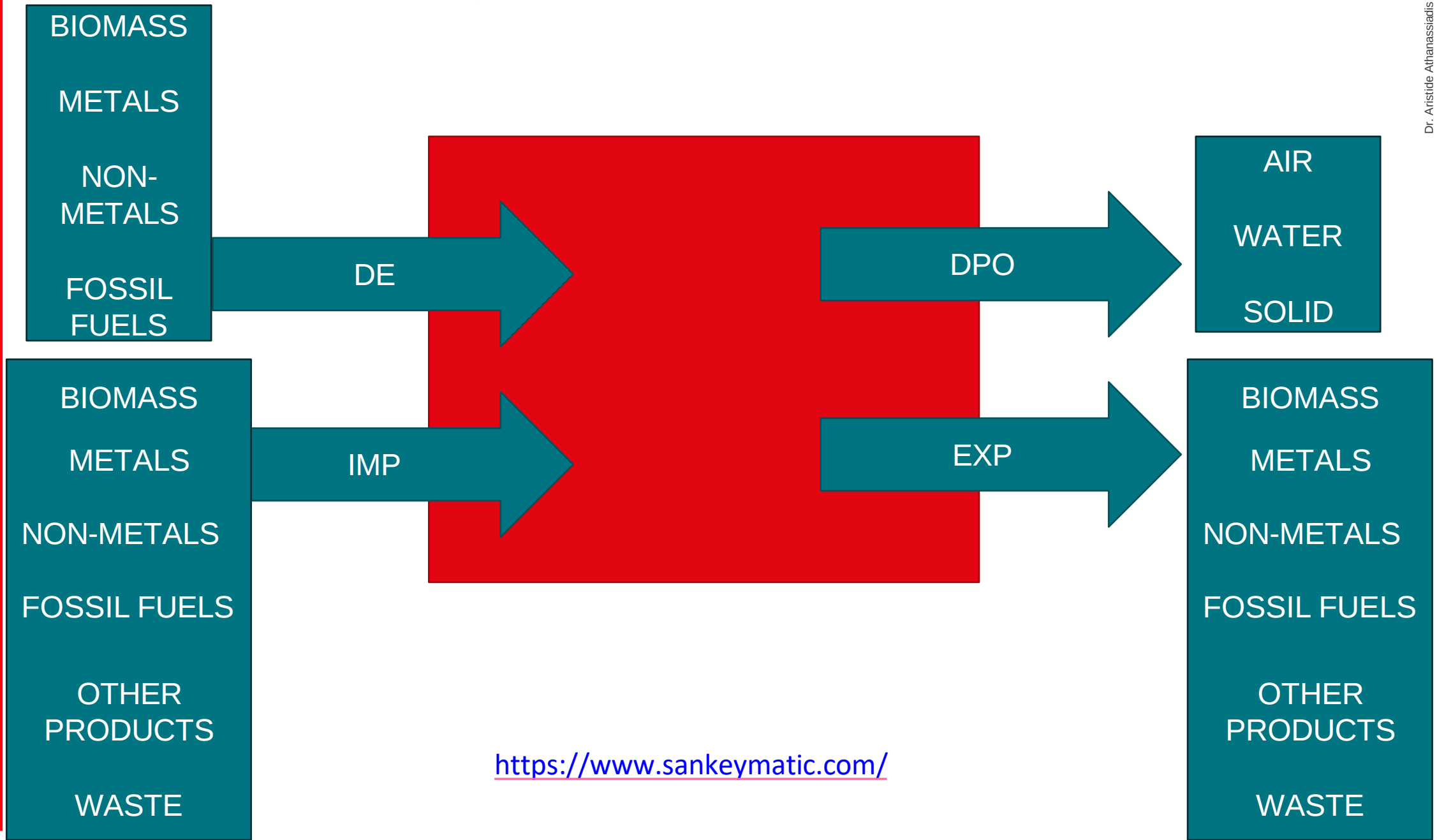


Dissipative use of products

<https://www.sankeymatic.com/>

Create your own Sankey Diagram

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<https://www.sankeymatic.com/>

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