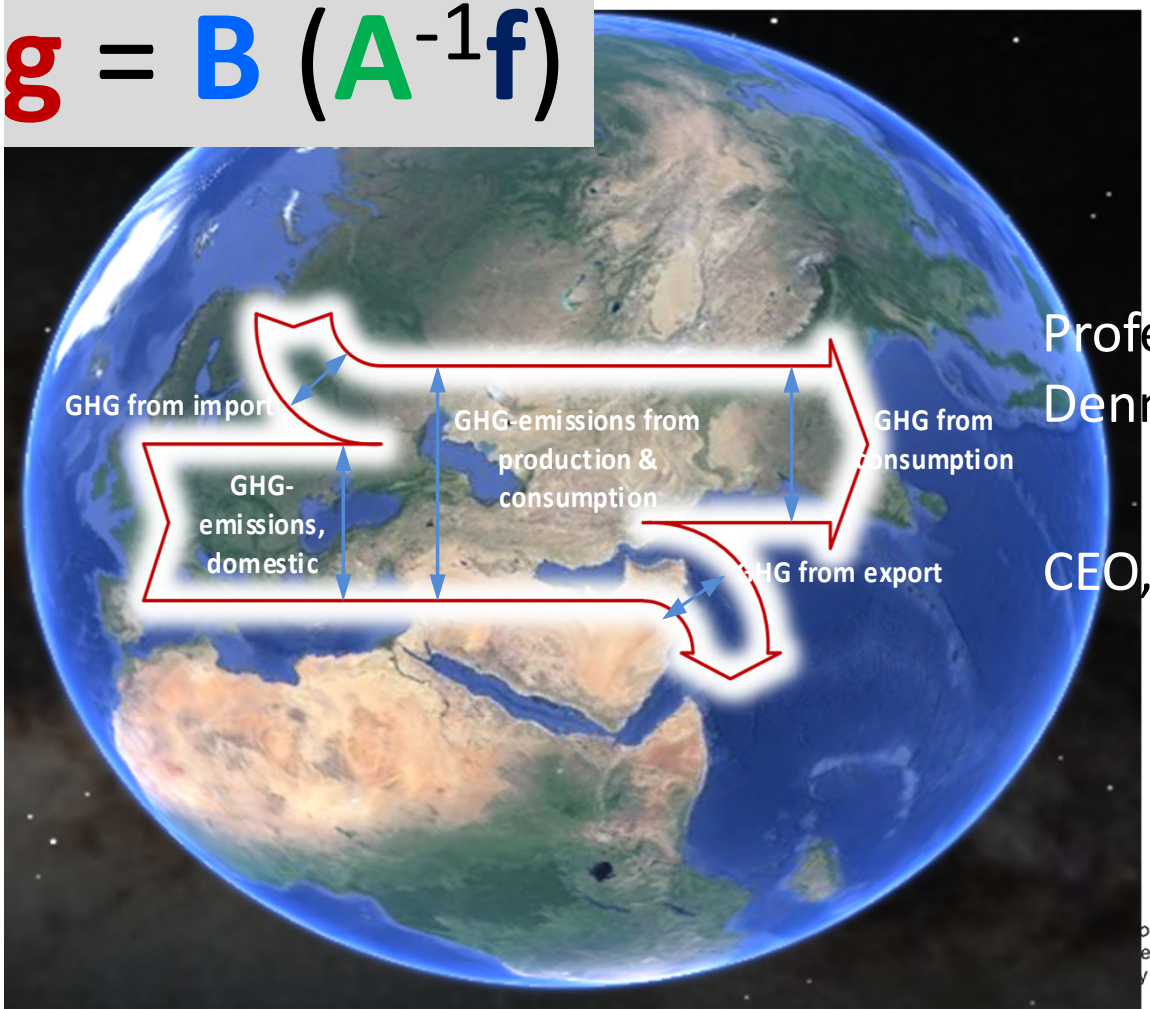
Input-output modelling

Modelling of waste treatment and by-product utilisation in the SUT framework

$$g = B\,(A^{-1}f)$$



Jannick Schmidt

Professor, PhD, Aalborg University, Denmark

DCEA | THE DANISH CENTRE FOR ENVIRONMENTAL ASSESSMENT

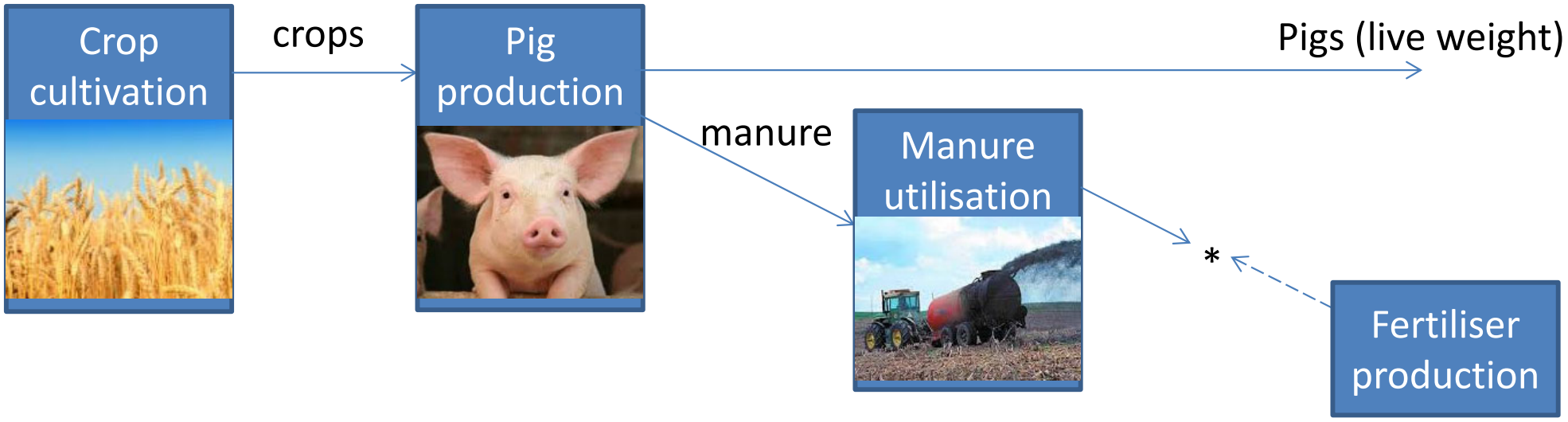
CEO, 2.-0 LCA consultants

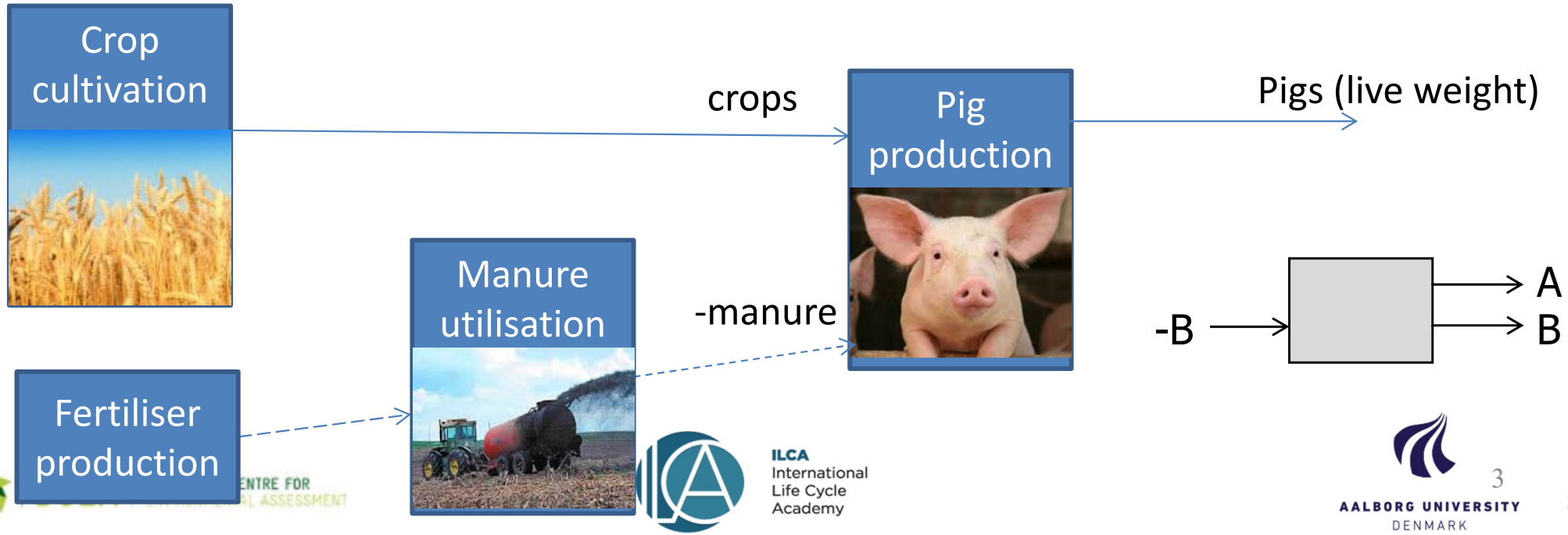
Updated: 29th April 2022

Agenda

- Principle for organizing materials for treatment in the SUT framework
- Estimating waste quantities and type of treatment

Materials for treatment in the SUT framework





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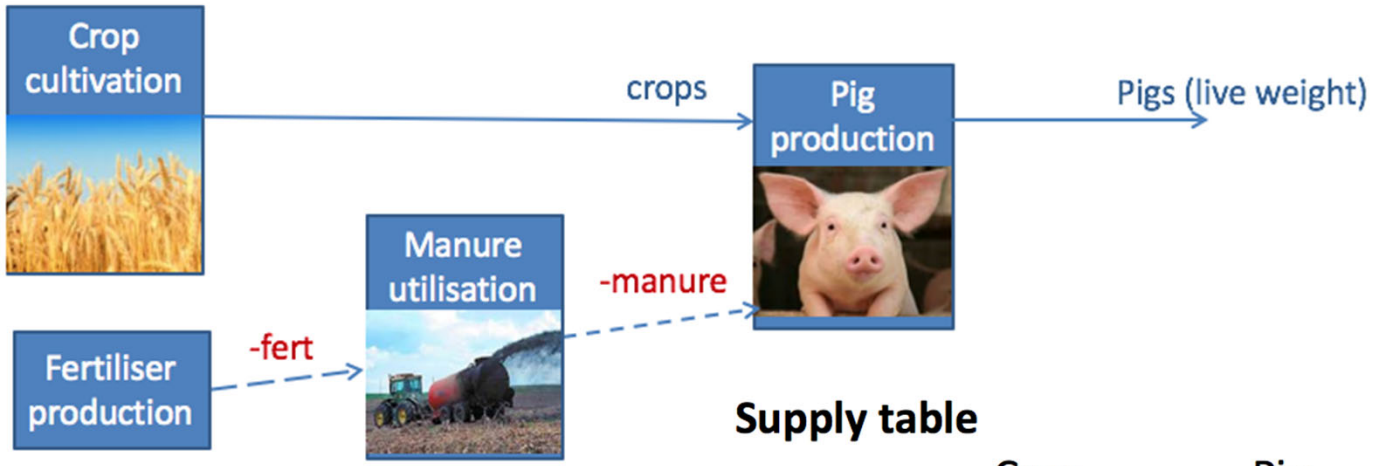
MFT in the SUT framework



Supply table

	Crop cultivation	Pig production	Manure treatment	Fertiliser production
Crops	crops			
Pigs		pigs		
Manure			-manure	
Fertiliser				fertiliser

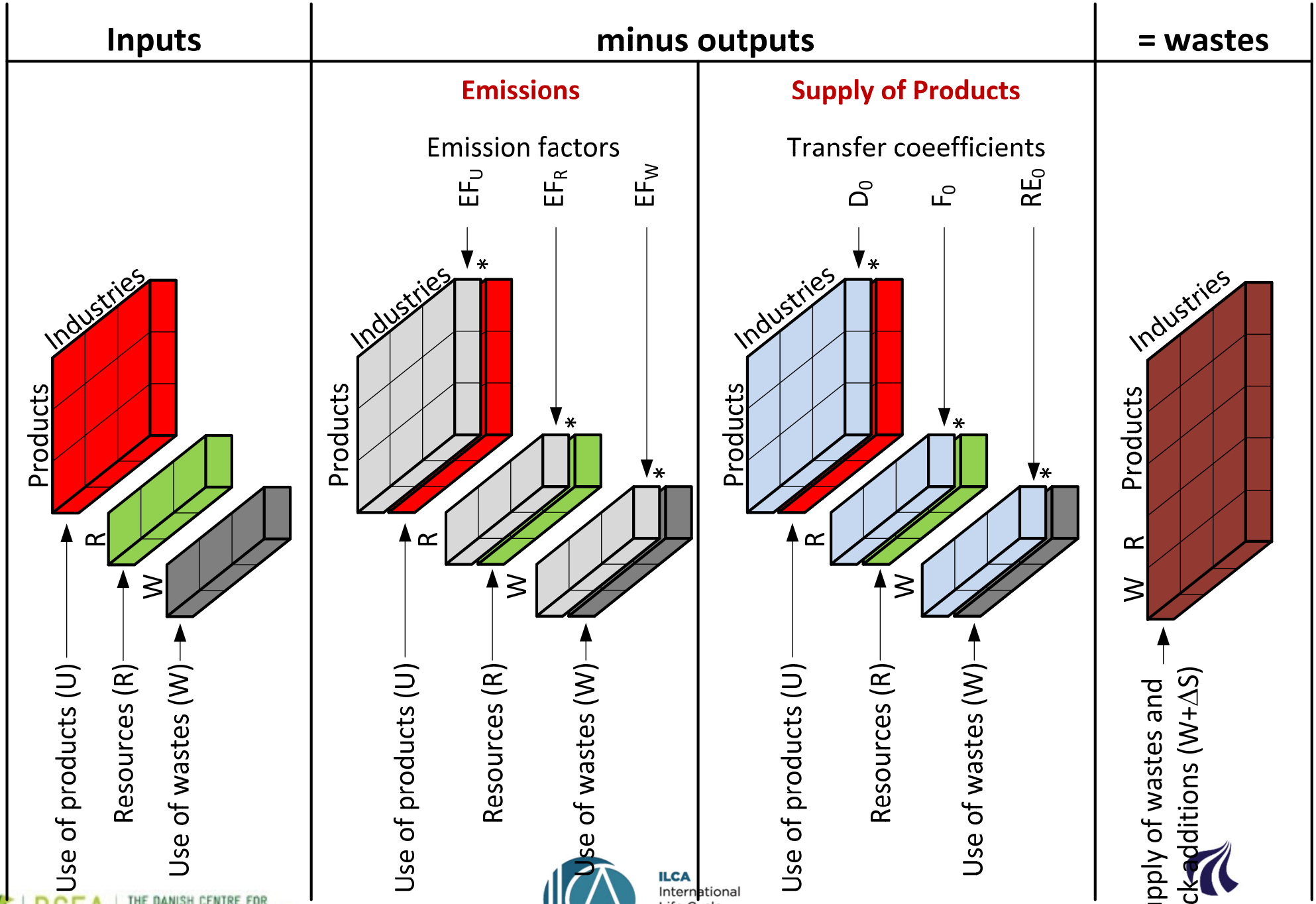
Use table

	Crop cultivation	Pig production	Manure treatment	Fertiliser production
Crops		crops		
Pigs				
Manure		-manure		
Fertiliser	fertiliser		-fertiliser	

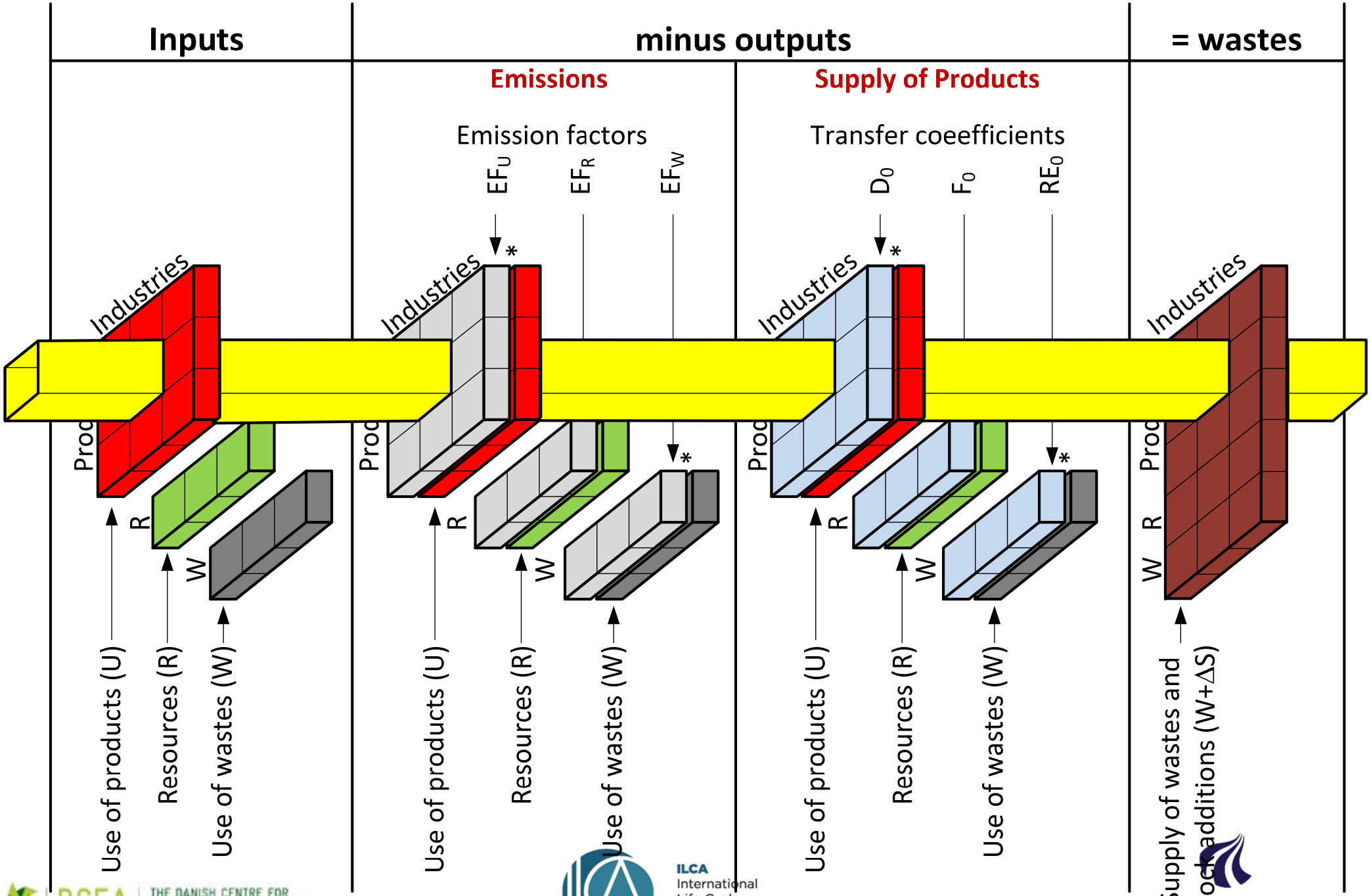
Agenda

- Principle for organizing materials for treatment in the SUT framework
- Estimating waste quantities and type of treatment

Calculation of waste per fraction

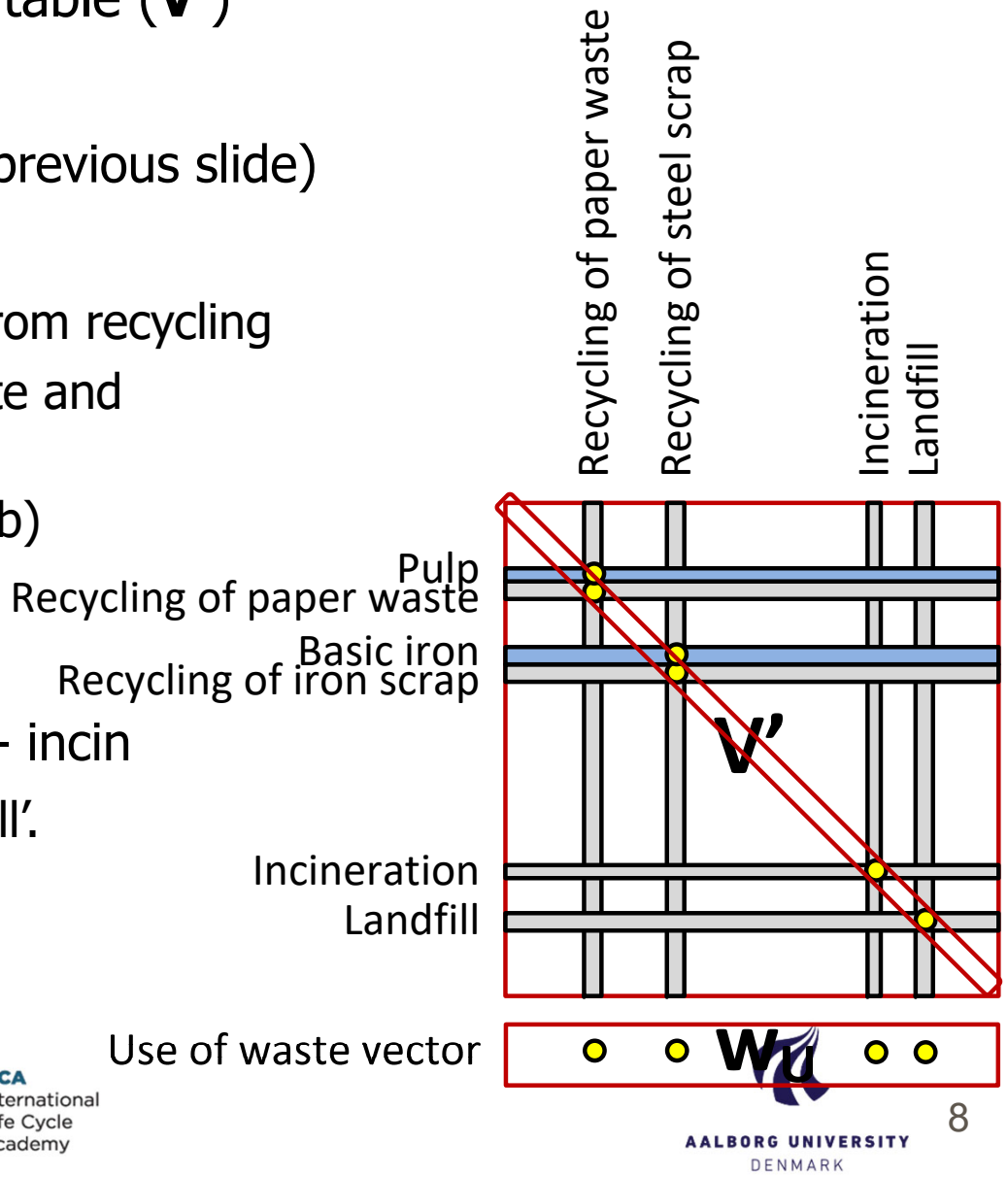


Calculation of waste per fraction



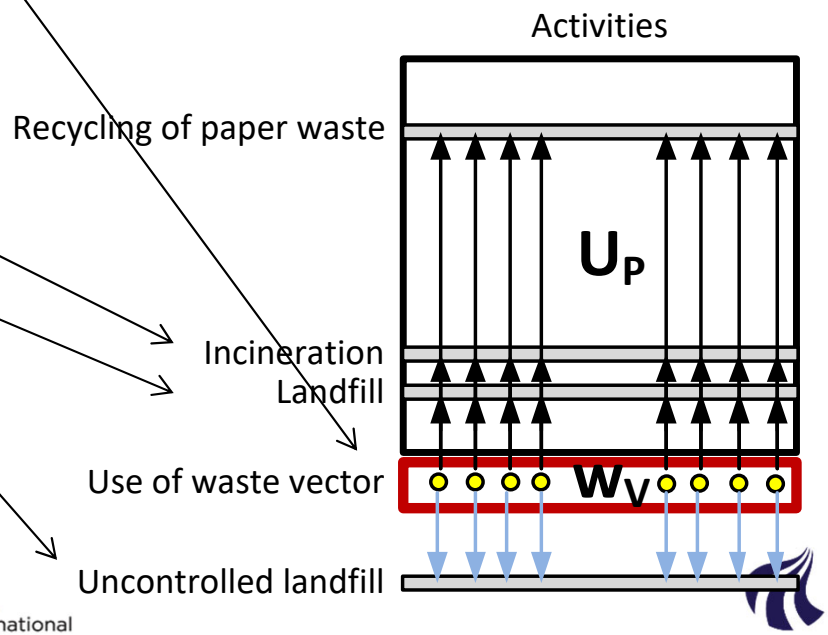
Materials for treatment (waste) in the SUT framework – supply table

- Input of waste ($\mathbf{w_U}$) appears in supply table (**V'**)
- Estimating waste quantities:
  - Totals per waste fraction calculated (previous slide)
  - Waste inputs to recycling:
    a) Known: quantities of by-products from recycling
    b) Known: ratio between ingoing waste and outgoing by-product
    c) Calculated: ingoing waste = (a) x (b)
  - Waste inputs to landfill/incin
    - Statistics or calculated
  - Residual = Total – recycled – landfill - incin
    - categorised as: 'Uncontrolled landfill'.



Materials for treatment (waste) in the SUT framework – use table

- Output of waste ($\mathbf{w_V}$) appears in use table (**U**)
- From mass balance calc, we have total output of each waste fraction ($\mathbf{W_V}$)
- Previous slide (supply-side data):
  - x tons recycling
  - y tons incin
  - z tons landfill
  - Then the 'uncontrolled landfill' will be = total – x – y - z
- Waste treatment mix (**J**) for each fraction can be calculated as:
  - Recycling = x / total
  - Incin. = y / total
  - Landfill = z / total
  - Uncontr. = uncoltr. / total



… if you want to know more

- The International Life Cycle Academy (https://ilca.es/)
- Consequential LCA (https://consequential-lca.org/)