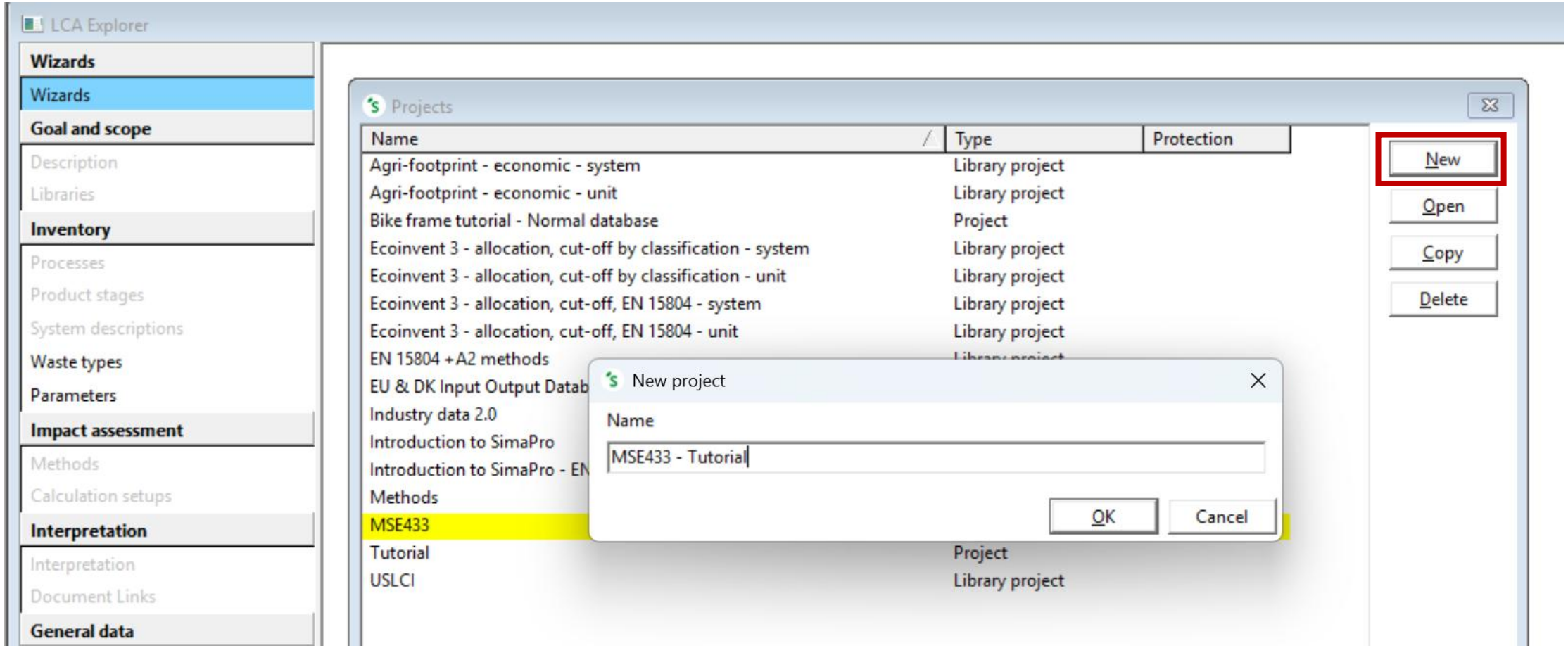
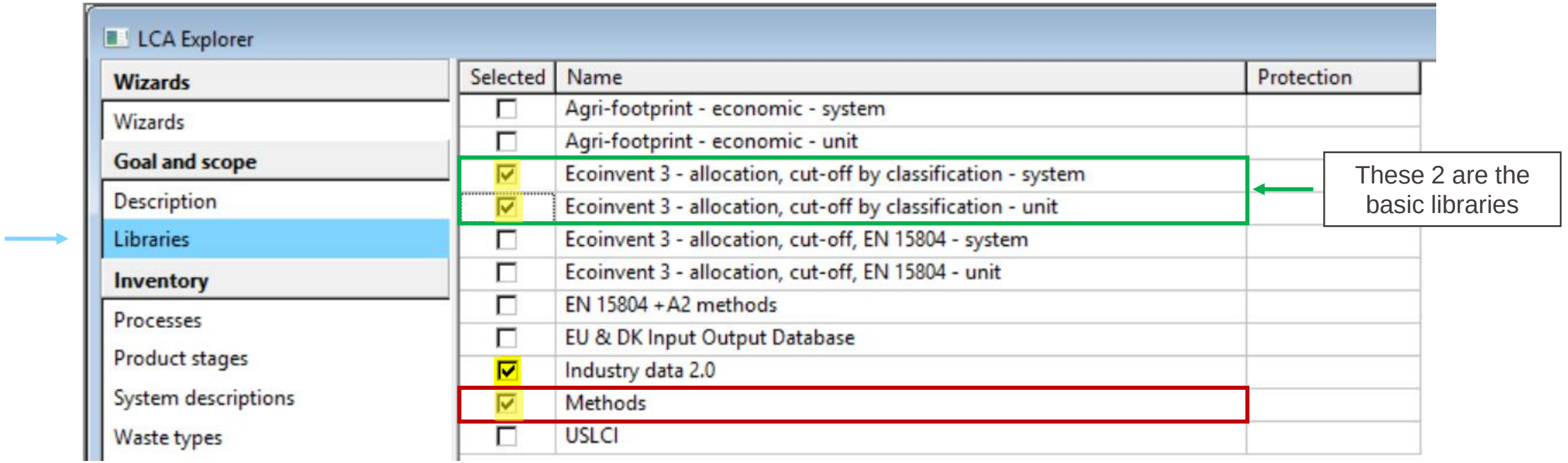
MSE 433 - SimaPro tutorial

Open SimaPro and create a new project

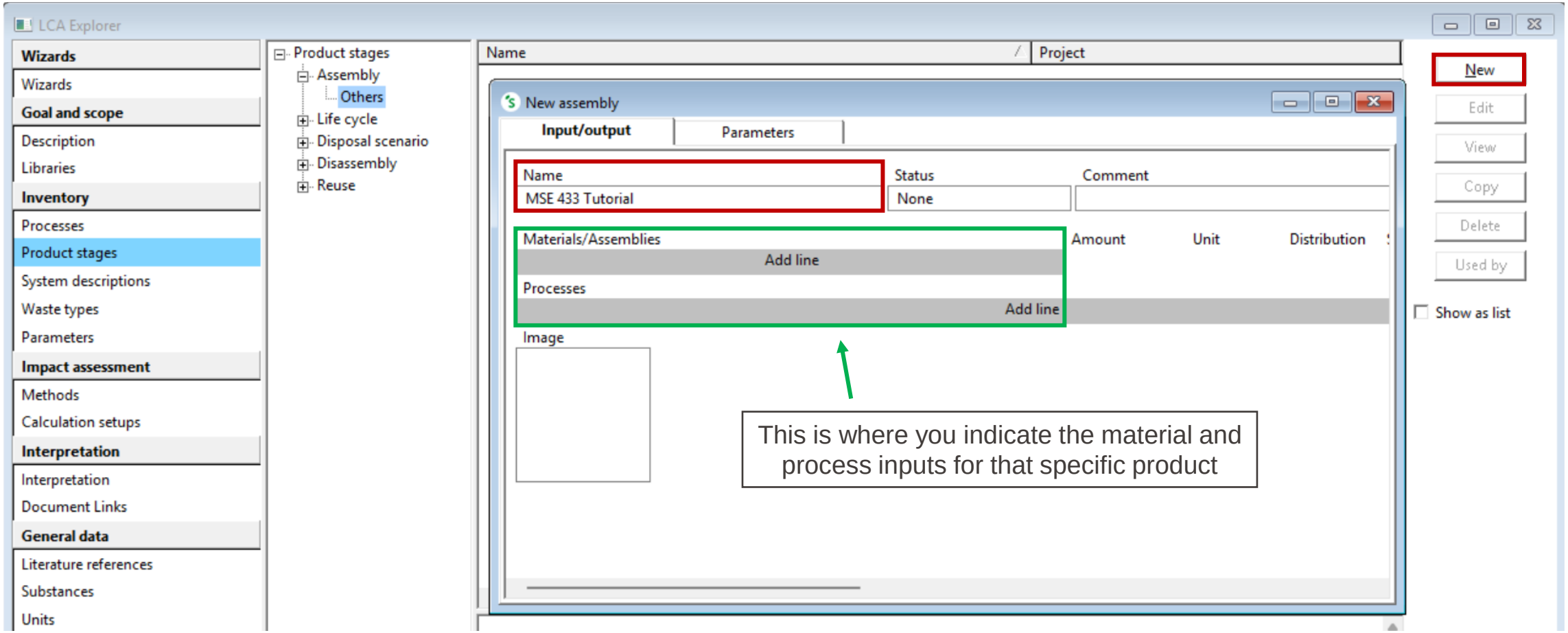


Select the libraries to use in the project



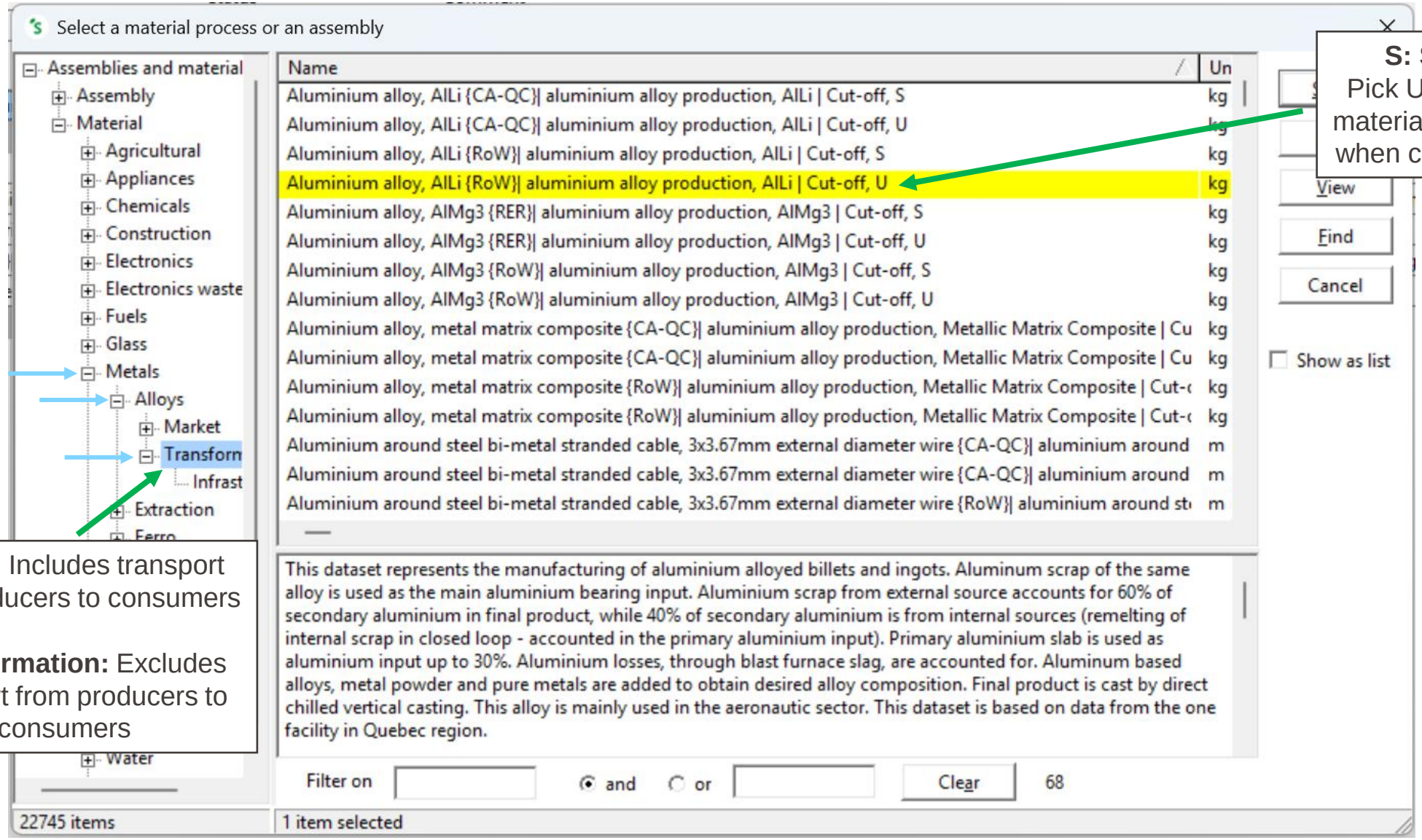
Make sure to always include Methods to avoid problems when modelling the impacts!

Create a new product and give it a name



We now add 1.7 kg of Aluminium alloy

Double click on Add line underneath the Materials/Assemblies box and find the Aluminium we need for this tutorial



S: System, U: Unit
Pick U when selecting the materials, it can be changed when calculating the impact

Market: Includes transport from producers to consumers

Transformation: Excludes transport from producers to consumers

Add the amount of Aluminium needed

Name	Status	Comment
MSE 433 Tutorial	None	

Materials/Assemblies	Amount	Unit	Distribution	SD2 or 2SD	Min
Aluminium alloy, AlLi {RoW}| aluminium alloy production, AlLi | Cut-off, U	1.7	kg	Undefined		

Add line

We want to add Processes, Transportation, Energy…

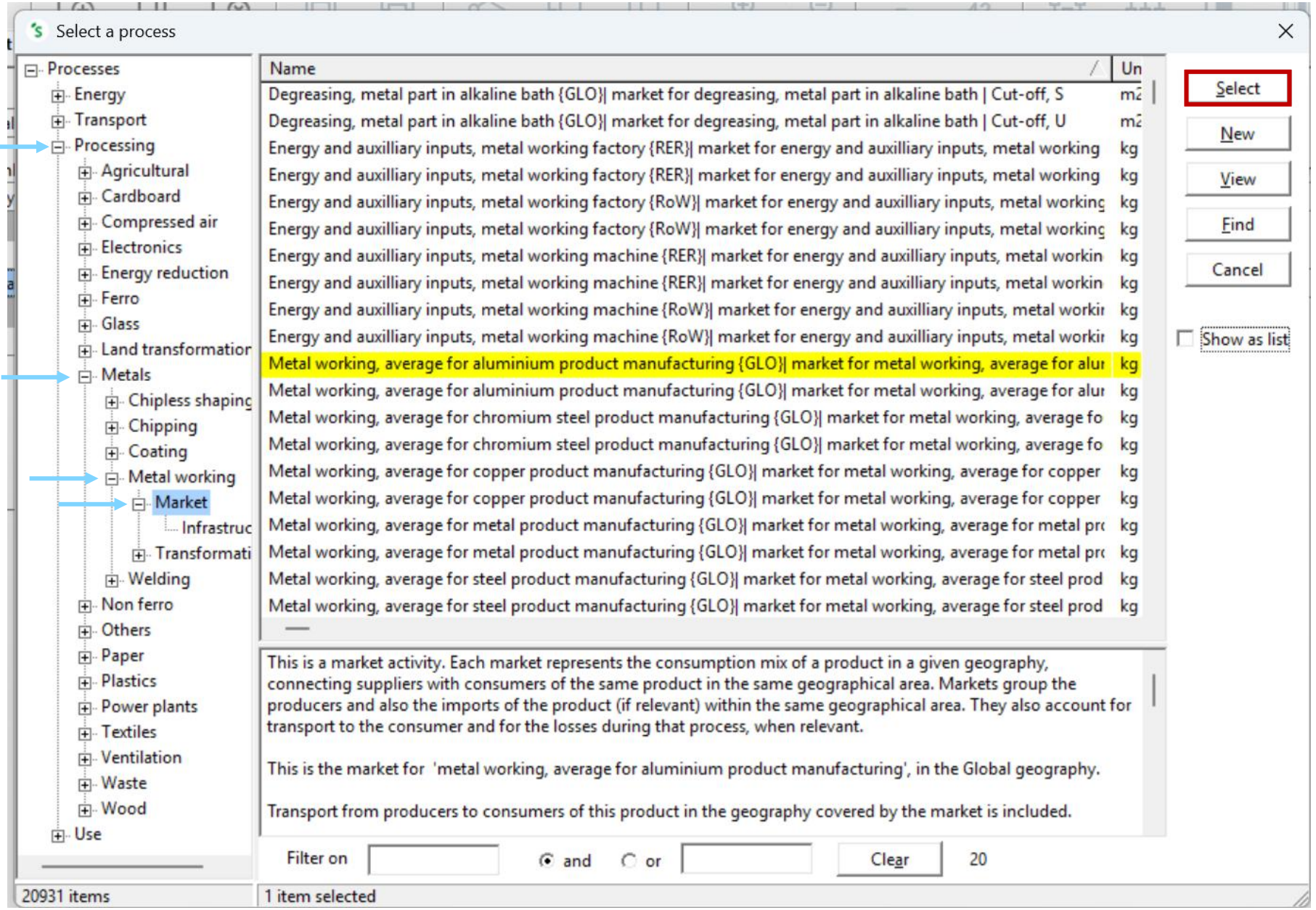
Processing: Metal working, average for aluminium product manufacturing {GLO}| market for metal working, average for aluminium product manufacturing | Cut-off, U

Transportation: Transport, freight, lorry >32 metric ton, EURO6 {RER}| market for transport, freight, lorry >32 metric ton, EURO6 | Cut-off, U

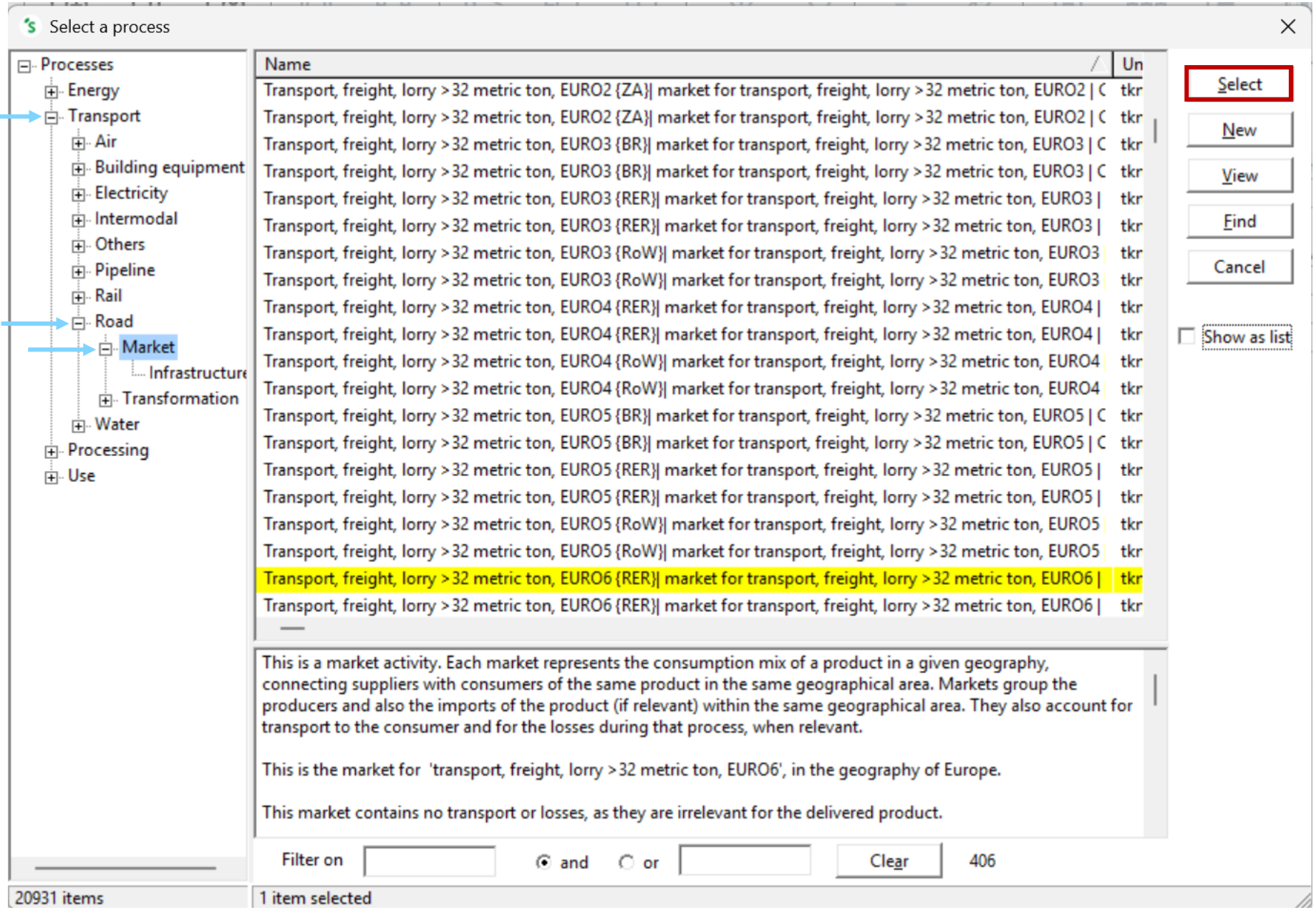
Electricity: Electricity, medium voltage {CH}| market for electricity, medium voltage | Cut-off, U

Heat: Heat, central or small-scale, other than natural gas {CH}| heat production, light fuel oil, at boiler 10kW condensing, non-modulating | Cut-off, U

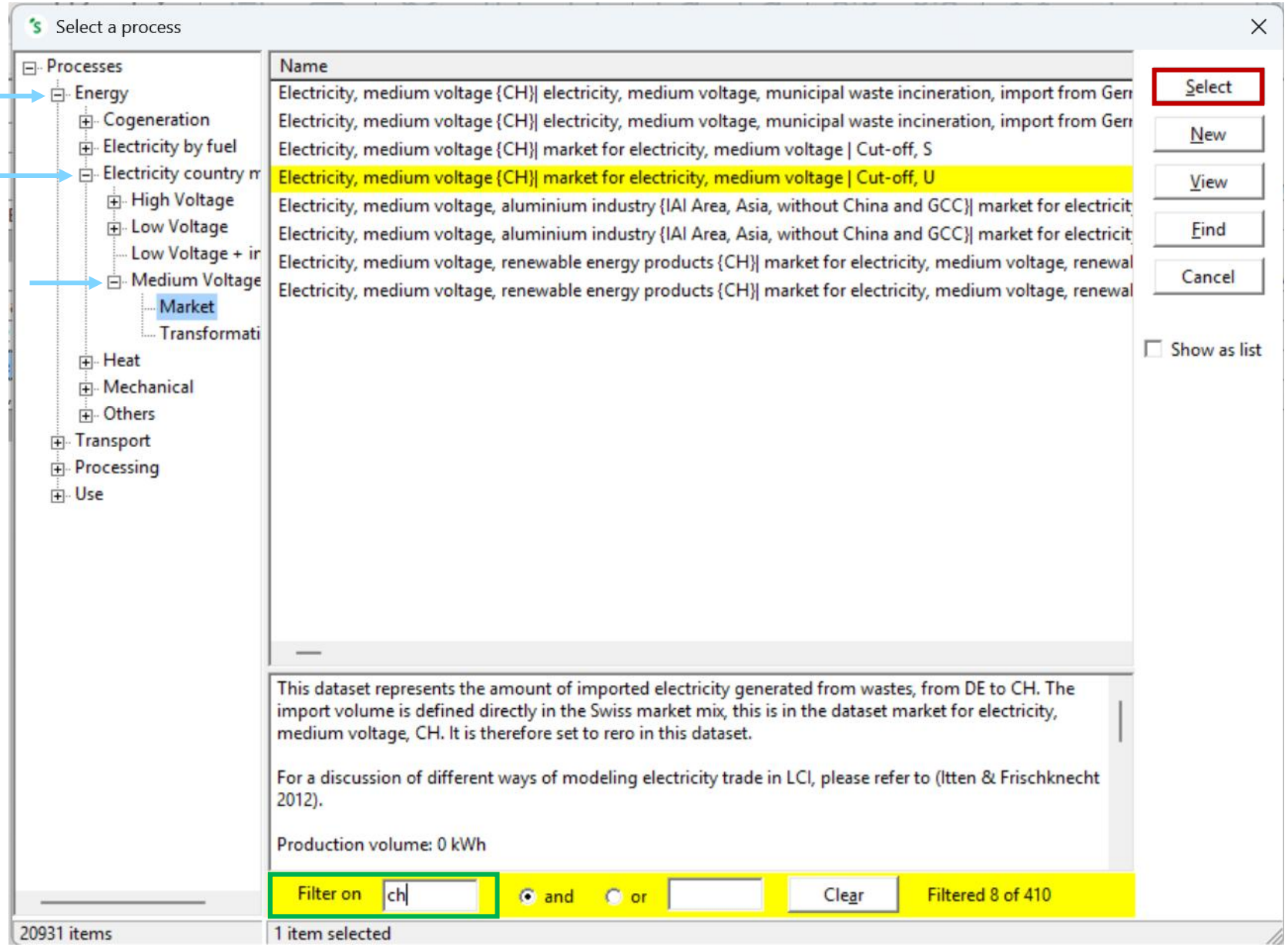
Selecting the processing of the aluminium



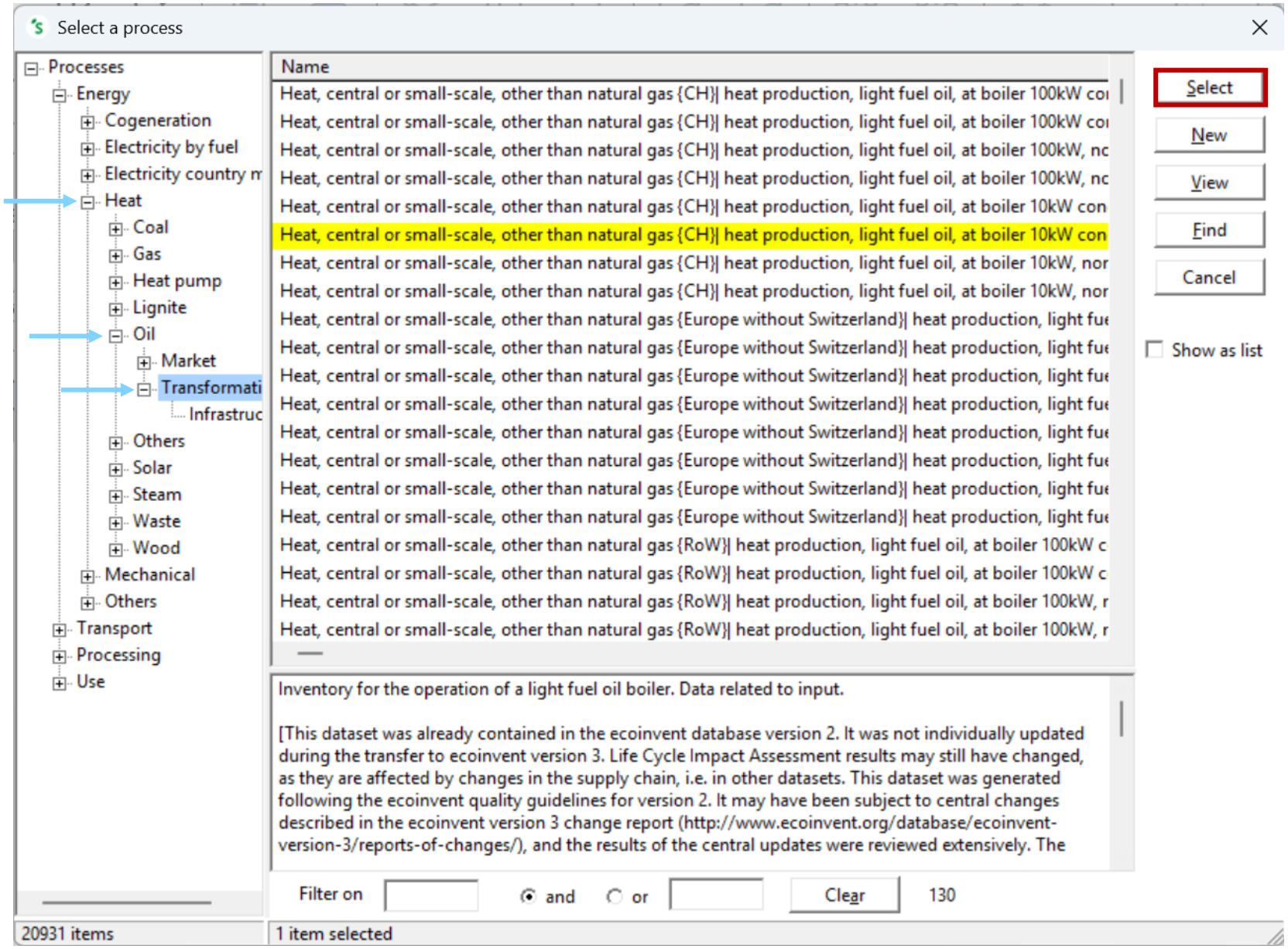
Selecting the transportation



You can use the filter on option to help



Selecting heat with oil



Now we are ready to calculate the impacts

Name	Status	Comment
MSE 433 Tutorial	None	

Materials/Assemblies	Amount	Unit	Distribution	SD2 or 2SD	Min	Max	Comment
Aluminium alloy, AlLi {RoW}| aluminium alloy production, AlLi | Cut-off, U	1.7	kg	Undefined				

Add line

Processes	Amount	Unit	Distribution	SD2 or 2SD	Min	Max	Comment
Metal working, average for aluminium product manufacturing {GLO}| market for metal working, average for aluminium pro	1.7	kg	Undefined				We assume no waste produced
Transport, freight, lorry >32 metric ton, EURO6 {RER}| market for transport, freight, lorry >32 metric ton, EURO6 | Cut-off, U	1.7/1000*10000 = 17	tkm					
Electricity, medium voltage {CH}| market for electricity, medium voltage | Cut-off, U	30	kWh	Undefined				Assuming production in Switzerland
Heat, central or small-scale, other than natural gas {CH}| heat production, light fuel oil, at boiler 10kW condensing, non-mod	15	MJ	Undefined				

Add line

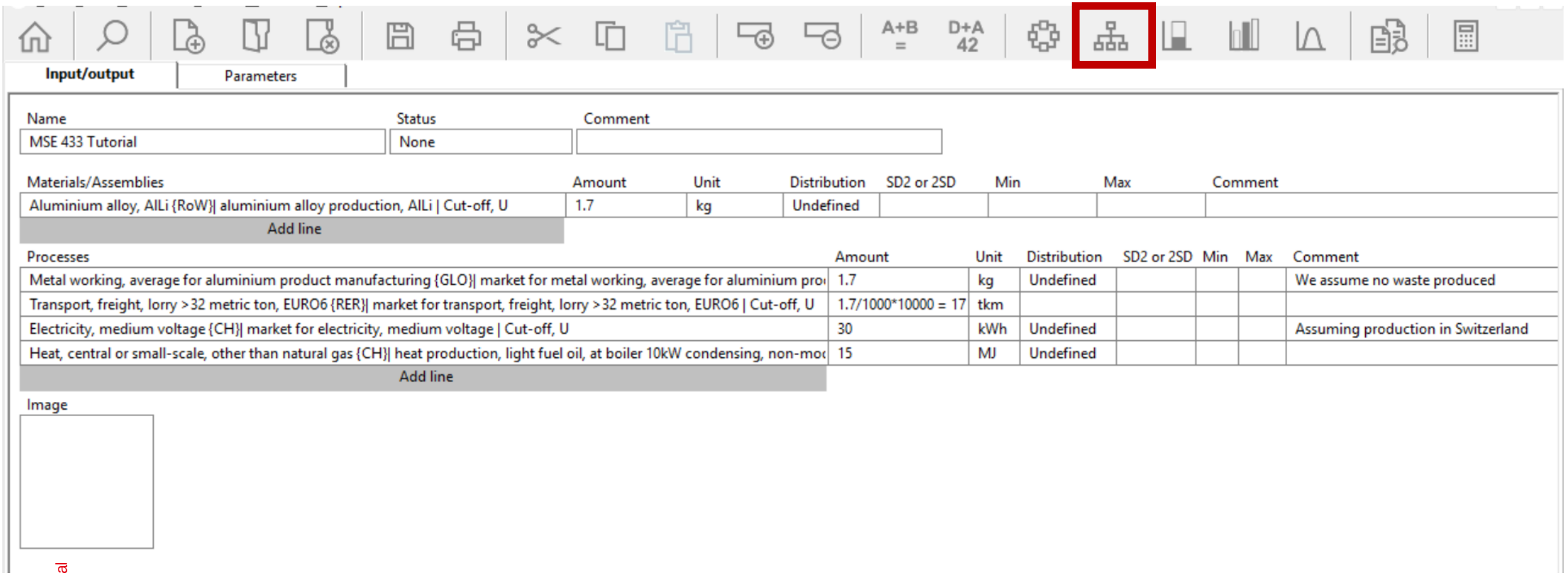
Image

It can be helpful to add comments

It is possible to add the amount using formulas

Remember to save to avoid losing your work!!

Click on the tree to start calculate the impact of the product



Input/output | Parameters

Name	Status	Comment
MSE 433 Tutorial	None	

Materials/Assemblies	Amount	Unit	Distribution	SD2 or 2SD	Min	Max	Comment
Aluminium alloy, AlLi {RoW}| aluminium alloy production, AlLi | Cut-off, U	1.7	kg	Undefined				

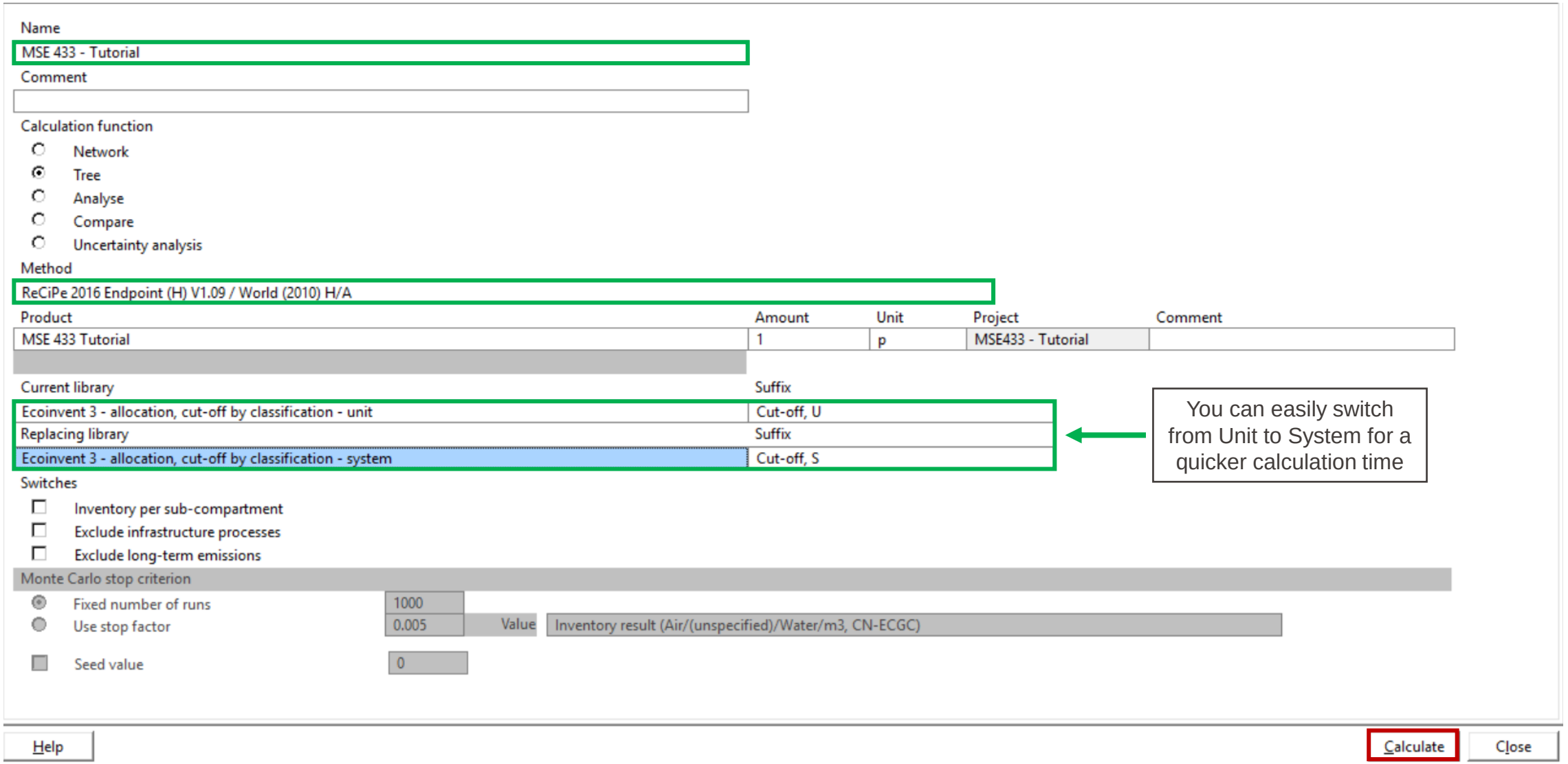
Add line

Processes	Amount	Unit	Distribution	SD2 or 2SD	Min	Max	Comment
Metal working, average for aluminium product manufacturing {GLO}| market for metal working, average for aluminium pro	1.7	kg	Undefined				We assume no waste produced
Transport, freight, lorry >32 metric ton, EURO6 {RER}| market for transport, freight, lorry >32 metric ton, EURO6 | Cut-off, U	1.7/1000*10000 = 17	tkm					
Electricity, medium voltage {CH}| market for electricity, medium voltage | Cut-off, U	30	kWh	Undefined				Assuming production in Switzerland
Heat, central or small-scale, other than natural gas {CH}| heat production, light fuel oil, at boiler 10kW condensing, non-mo	15	MJ	Undefined				

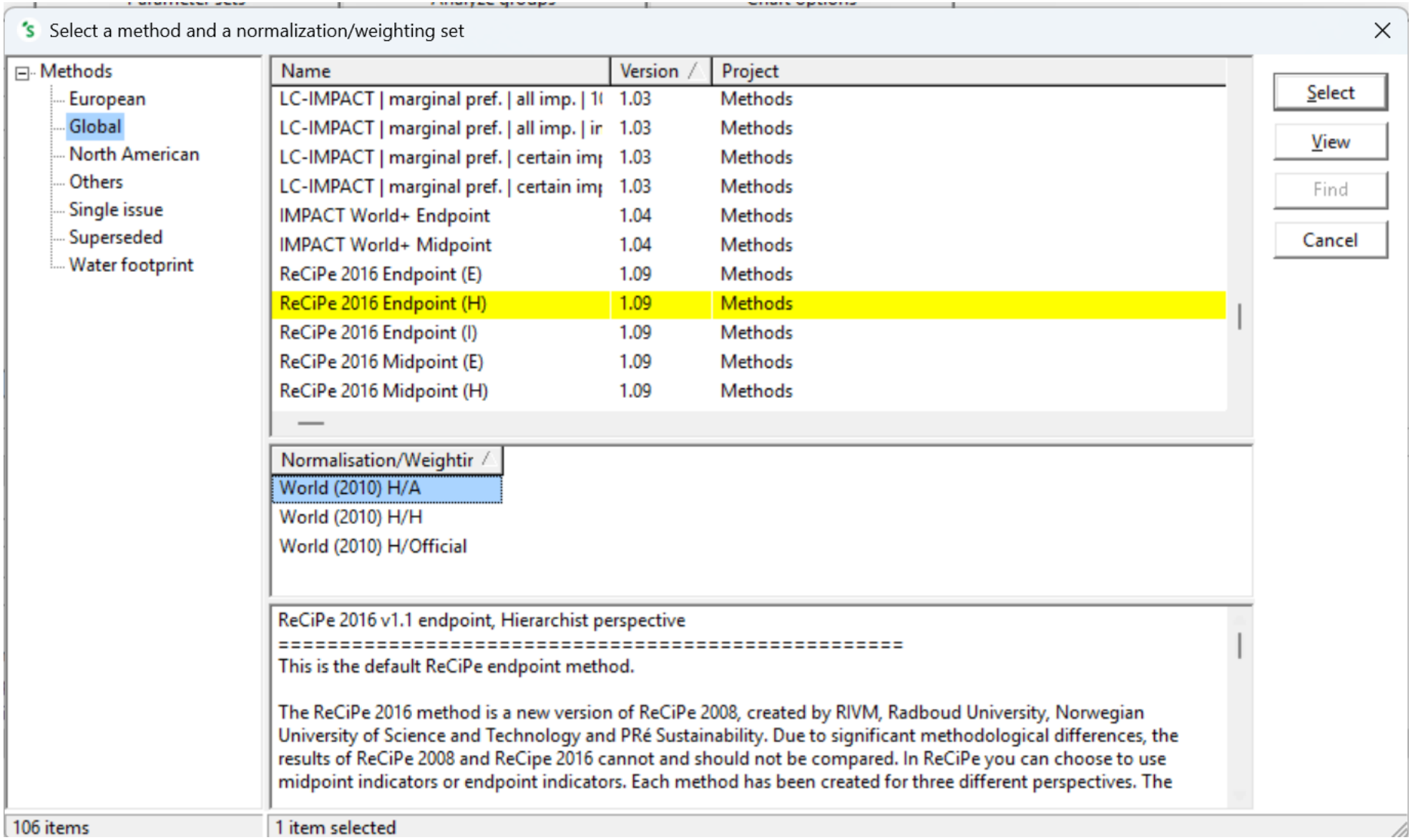
Add line

Image

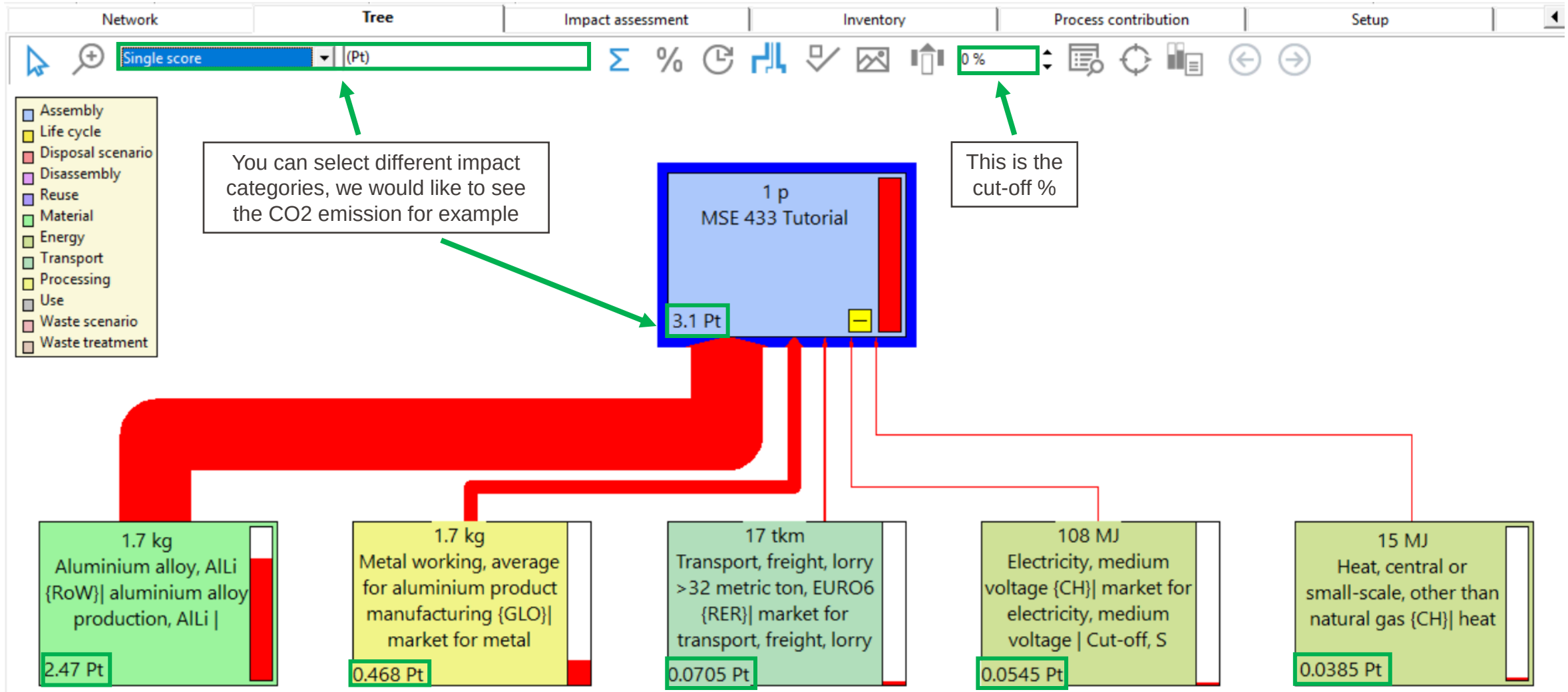
Give it a name, select the method, switch to system (if needed) and start the calculation



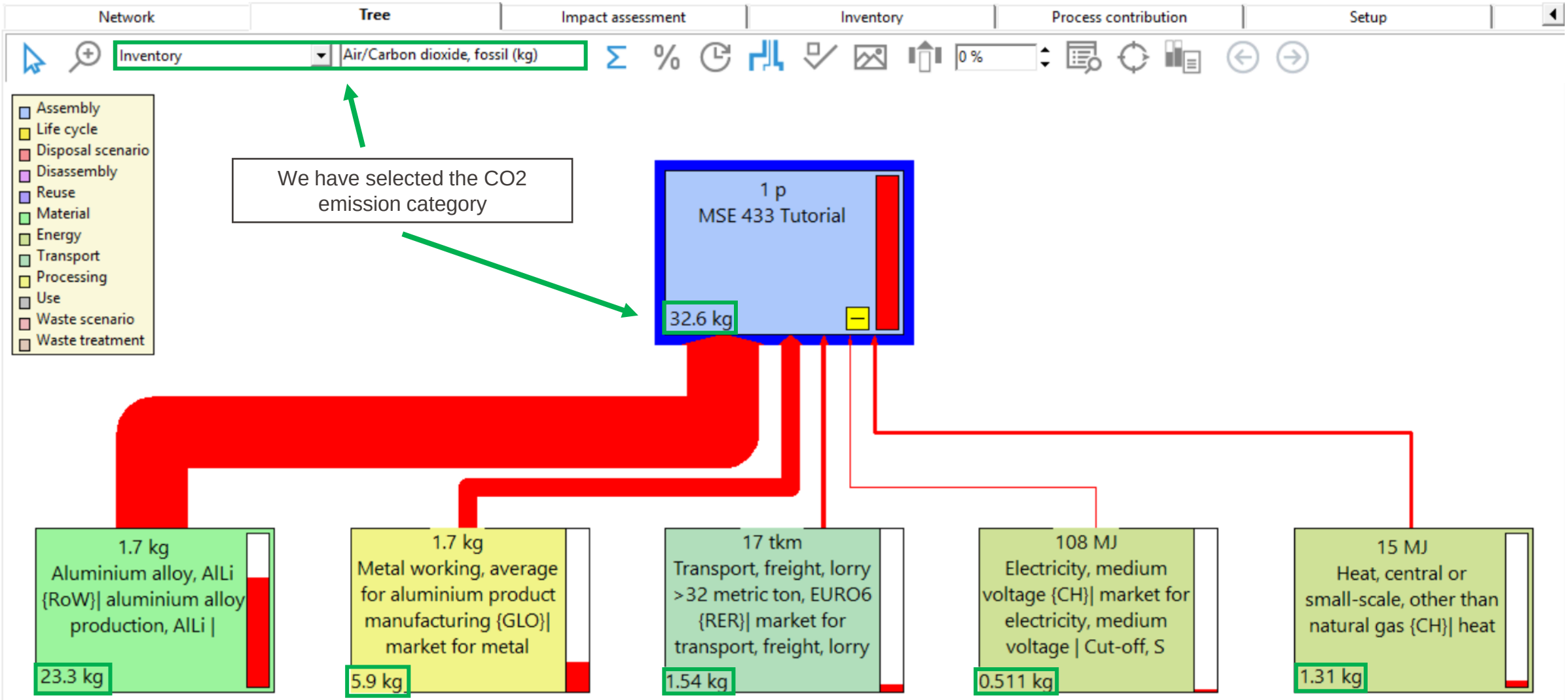
Selection of method



Now we have our tree

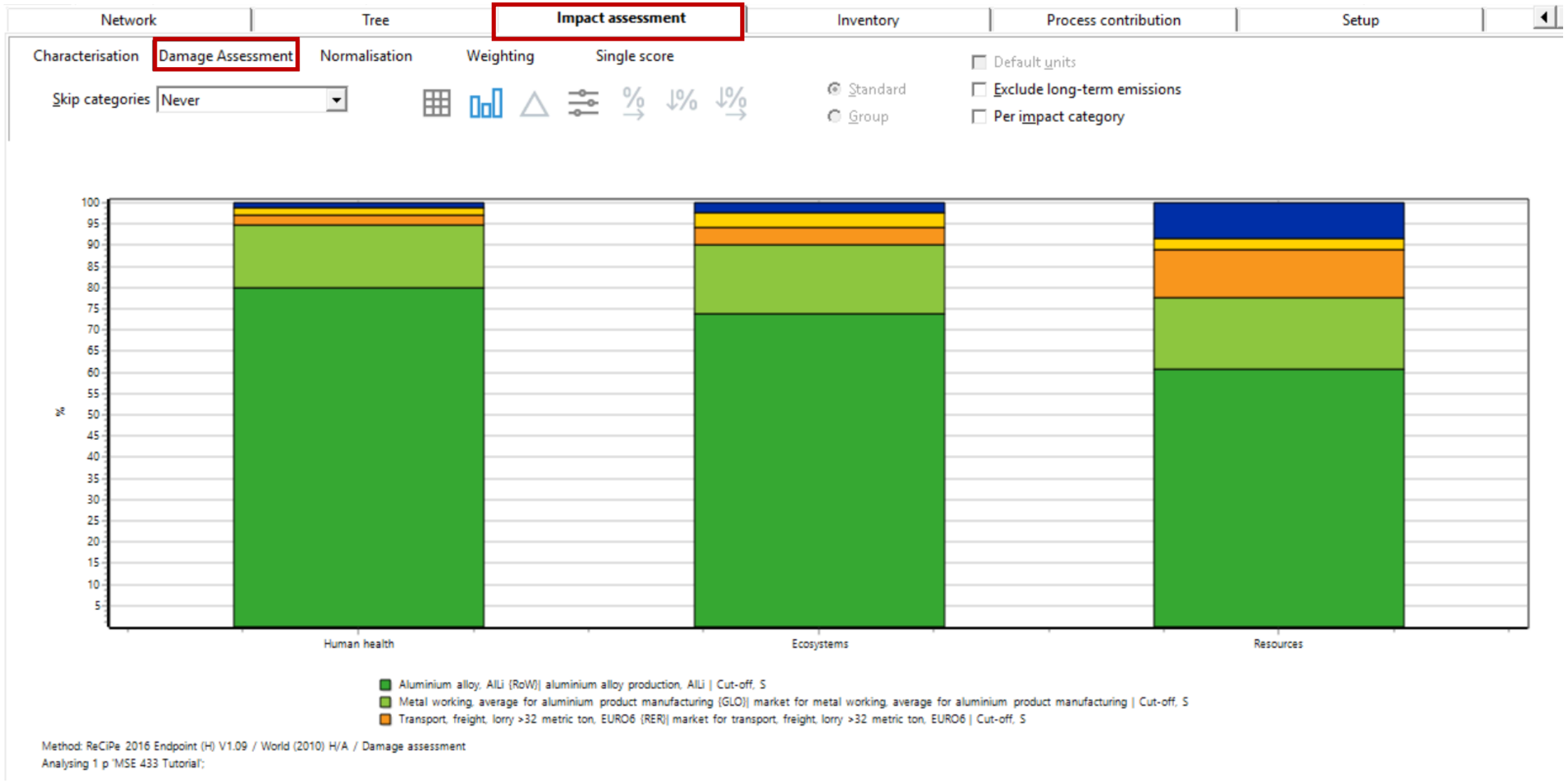


The CO2 (not kgCO2e) tree for the same product



Impact assessment - Characterisation

Impact assessment – Damage Assessment



Damage Assessment: Table form

Characterisation | Damage Assessment | Normalisation | Weighting | Single score

Skip categories: Never

Standard / Group

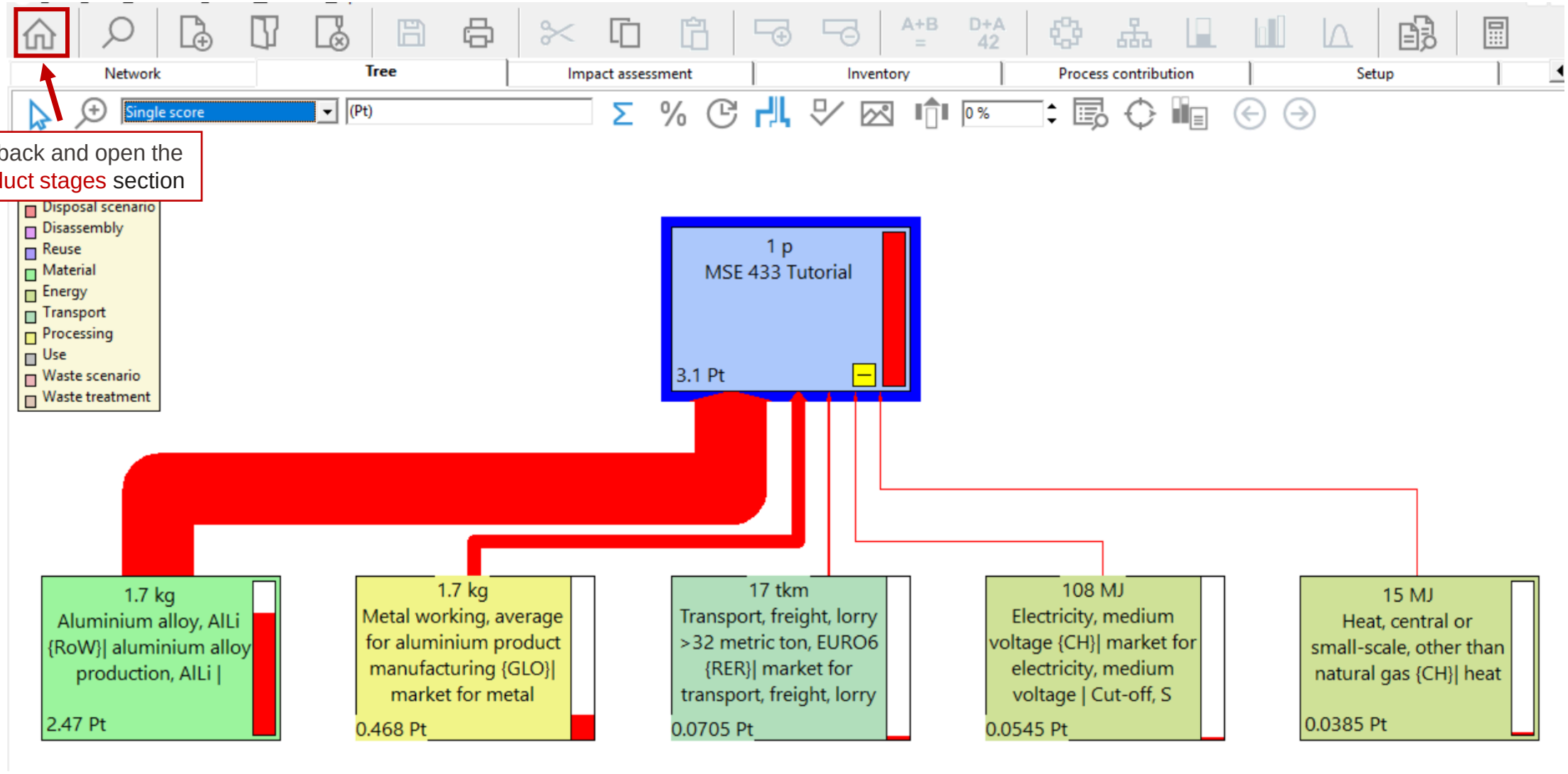
Default units

Exclude long-term emissions

Per impact category

Se	Damage category	Unit	Total	Aluminium alloy, AlLi	Metal working, average for	Transport, freight, lorry >32	Electricity, medium voltage	Heat, central or small-scale,
☑	Human health	DALY	0.000181	0.000145	2.74E-5	3.98E-6	3.13E-6	2.15E-6
☑	Ecosystems	species.yr	2.06E-7	1.52E-7	3.37E-8	8.13E-9	7.07E-9	5.04E-9
☑	Resources	USD2013	2.24	1.36	0.377	0.256	0.0583	0.189

What if we substitute the Aluminium for recycled Aluminium?



Substitute the Aluminium for scrap Aluminium

Input/output | Parameters

Name	Status	Comment
MSE 433 Tutorial	None	

Materials/Assemblies	Amount	Unit	Distribution	SD2 or 2SD	Min	Max	Comment
Aluminium, cast alloy {RER}| treatment of aluminium scrap, post-consumer, prepar	1.7	kg	Undefined				

Add line

Processes

- Metal working, average for aluminium product manufacturing {GLO}| market for metal
- Transport, freight, lorry >32 metric ton, EURO6 {RER}| market for transport, freight, lorry
- Electricity, medium voltage {CH}| market for electricity, medium voltage | Cut-off, U
- Heat, central or small-scale, other than natural gas {CH}| heat production, light fuel oil,

Add line

Image

Select a material process or an assembly

Assemblies and material
- Assembly
- Material
  - Agricultural
  - Appliances
  - Chemicals
  - Construction
  - Electronics
  - Electronics waste
  - Fuels
  - Glass
  - Metals
    - Alloys
    - Extraction
    - Ferro
    - Non Ferro
      - Market
      - Transform
        - Infrast
    - Waste metals
  - Minerals
  - Others
  - Paper + Board
  - Paper+ Board
  - Plastics
  - Textiles

Name	Un
Aluminium scrap, new {GLO}| aluminium scrap, new, Recycled Content cut-off | Cut-off, S	kg
Aluminium scrap, new {GLO}| aluminium scrap, new, Recycled Content cut-off | Cut-off, U	kg
Aluminium scrap, post-consumer {GLO}| aluminium scrap, post-consumer, Recycled Content cut-off | Cut-off, S	kg
Aluminium scrap, post-consumer {GLO}| aluminium scrap, post-consumer, Recycled Content cut-off | Cut-off, U	kg
Aluminium scrap, post-consumer, prepared for melting {GLO}| aluminium scrap, post-consumer, prepared for m	kg
Aluminium scrap, post-consumer, prepared for melting {GLO}| aluminium scrap, post-consumer, prepared for m	kg
Aluminium, cast alloy {RER}| treatment of aluminium scrap, new, at refiner | Cut-off, S	kg
Aluminium, cast alloy {RER}| treatment of aluminium scrap, new, at refiner | Cut-off, U	kg
Aluminium, cast alloy {RER}| treatment of aluminium scrap, post-consumer, prepared for recycling, at refiner | C	kg
Aluminium, cast alloy {RER}| treatment of aluminium scrap, post-consumer, prepared for recycling, at refiner | C	kg
Aluminium, cast alloy {RoW}| treatment of aluminium scrap, new, at refiner | Cut-off, S	kg
Aluminium, cast alloy {RoW}| treatment of aluminium scrap, new, at refiner | Cut-off, U	kg
Aluminium, cast alloy {RoW}| treatment of aluminium scrap, post-consumer, prepared for recycling, at refiner | C	kg
Aluminium, cast alloy {RoW}| treatment of aluminium scrap, post-consumer, prepared for recycling, at refiner | C	kg
Aluminium, in mixed metal scrap {GLO}| aluminium, in mixed metal scrap, Recycled Content cut-off | Cut-off, S	kg

Select | New | View | Find | Cancel | Show as list

This dataset is based on two sources: the European Aluminium Association 2005 LCI data (EAA, 2008); and (2) the ecoinvent v2.2 dataset for the same activity (Althaus, 2009), itself largely based on EAA data from 2000. Priority was given to data contained in EAA (2008); Althaus (2009) was used only in cases where it was found to be more complete that EAA (2008).

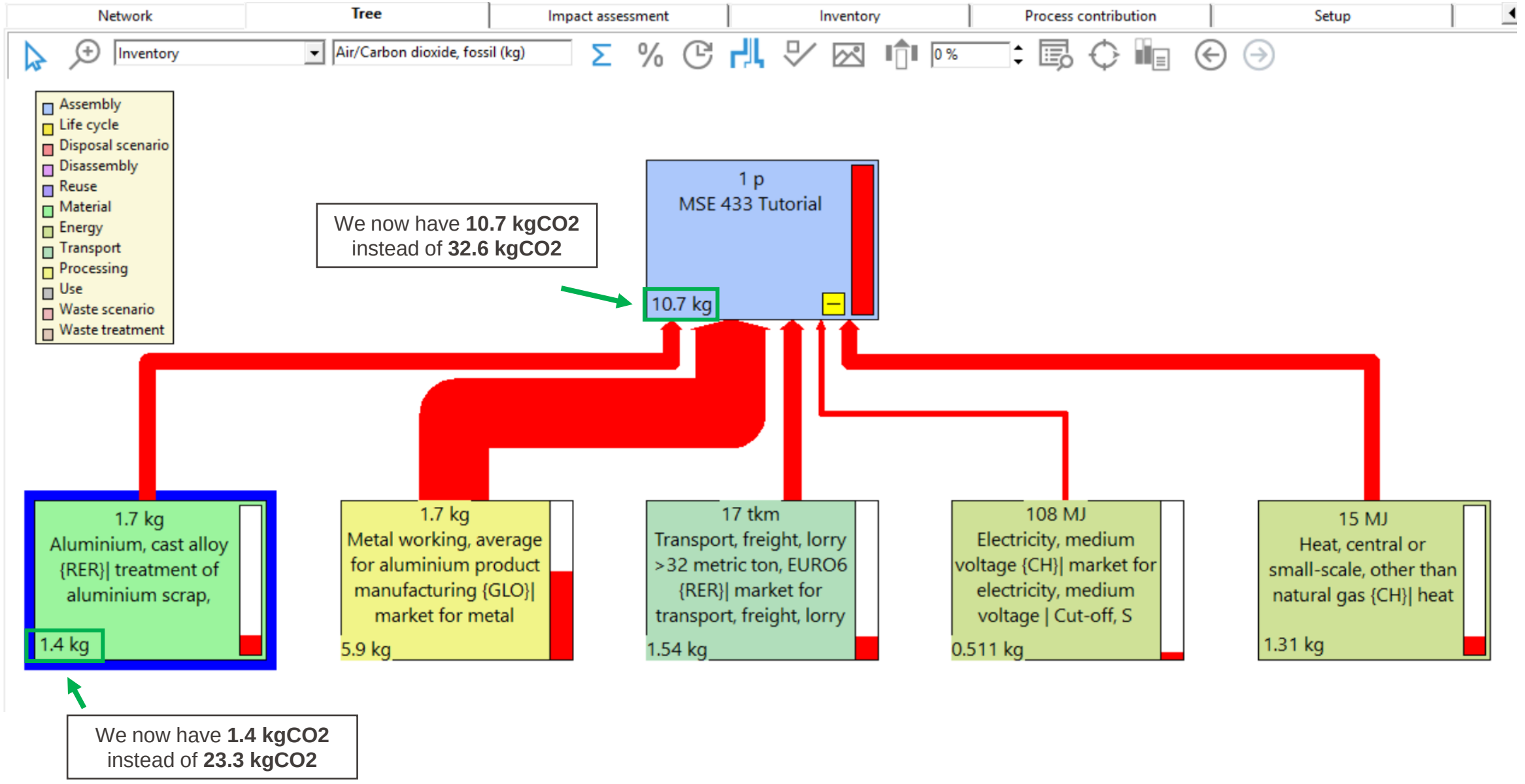
While this dataset represents the refining of prepared post-consumer scrap aluminium, the inputs and outputs reported by EAA (2008) actually refer to refining of all scrap, including post-consumer scrap, scrap from foundries, turnings, skimmings (dross) and aluminium metallics. In the ecoinvent database, the refining of post-consumer

Filter on | and | or | Clear | 476

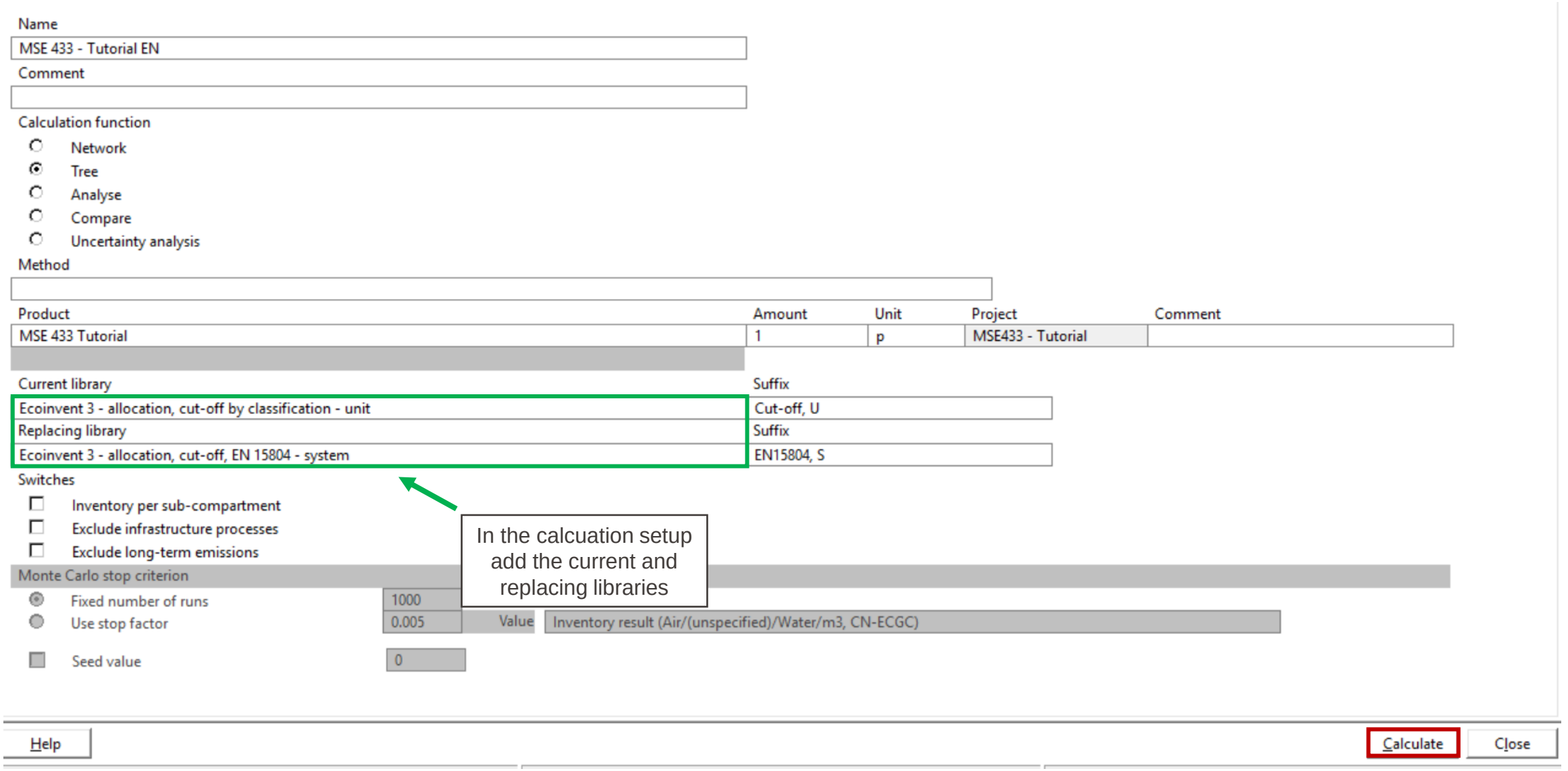
22935 items | 1 item selected

Go back to the tree and calculate the imapct

The CO2 tree for scrap Aluminium

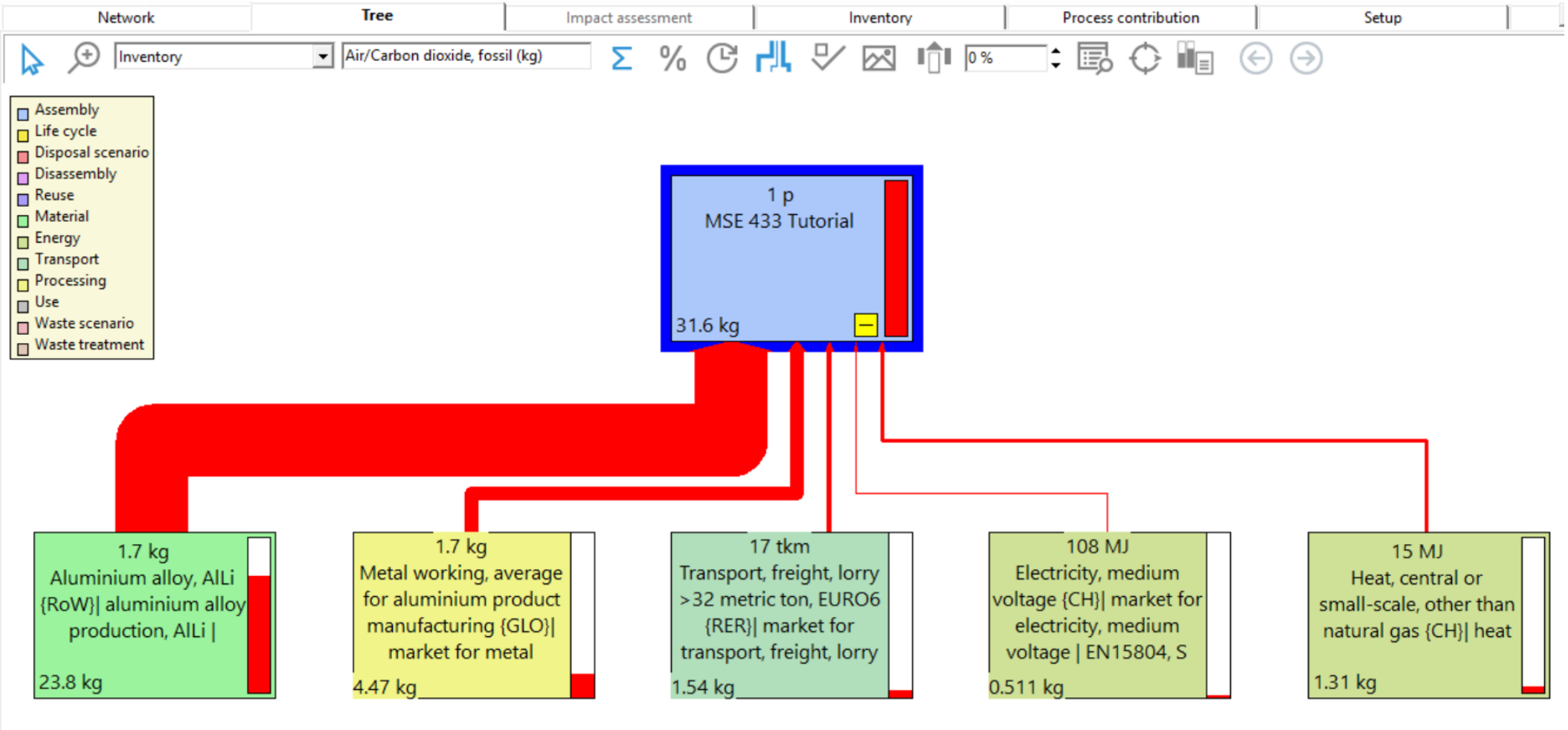


We can quickly switch to EN15804 if needed

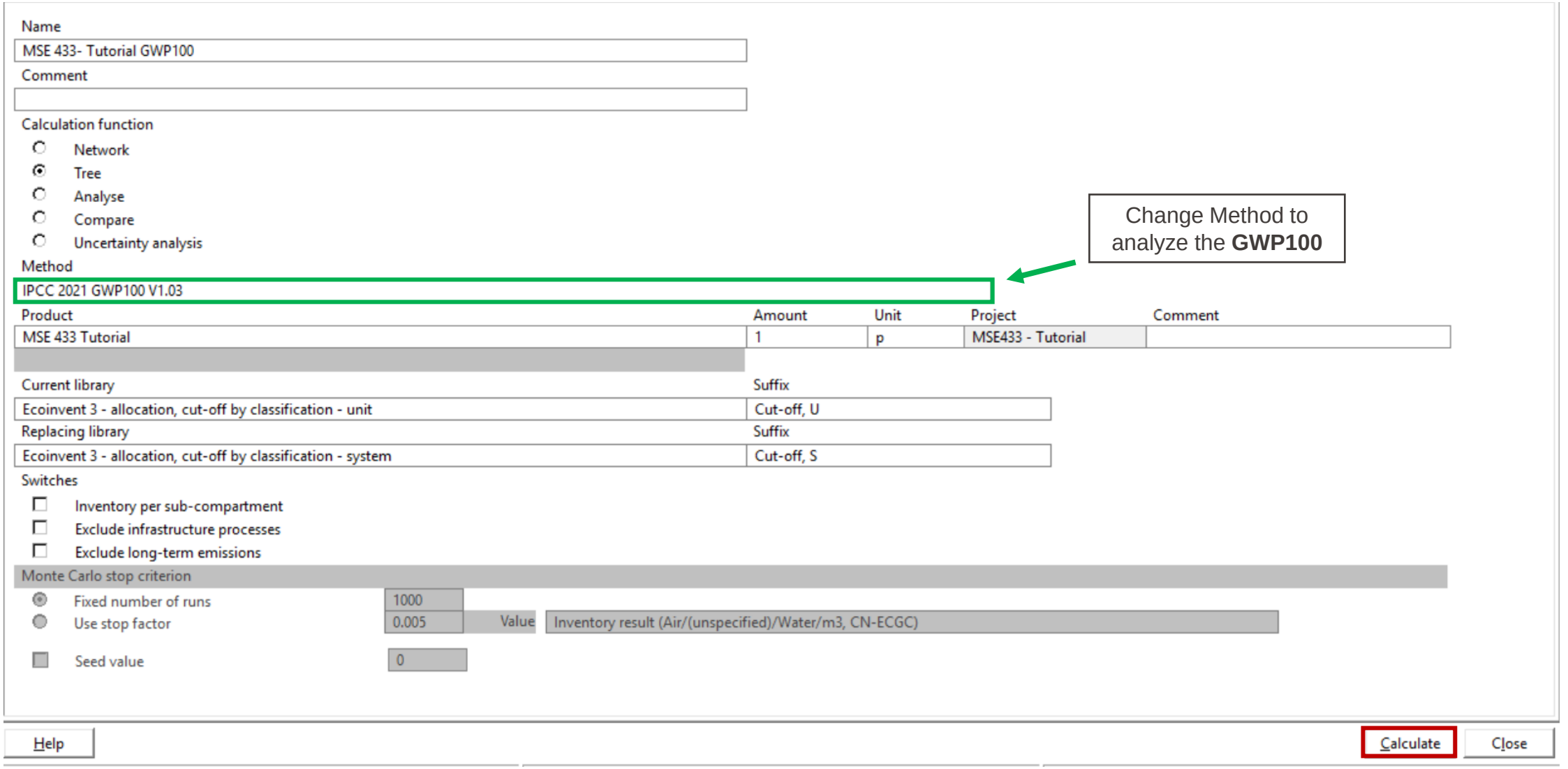


In the calcuation setup add the current and replacing libraries

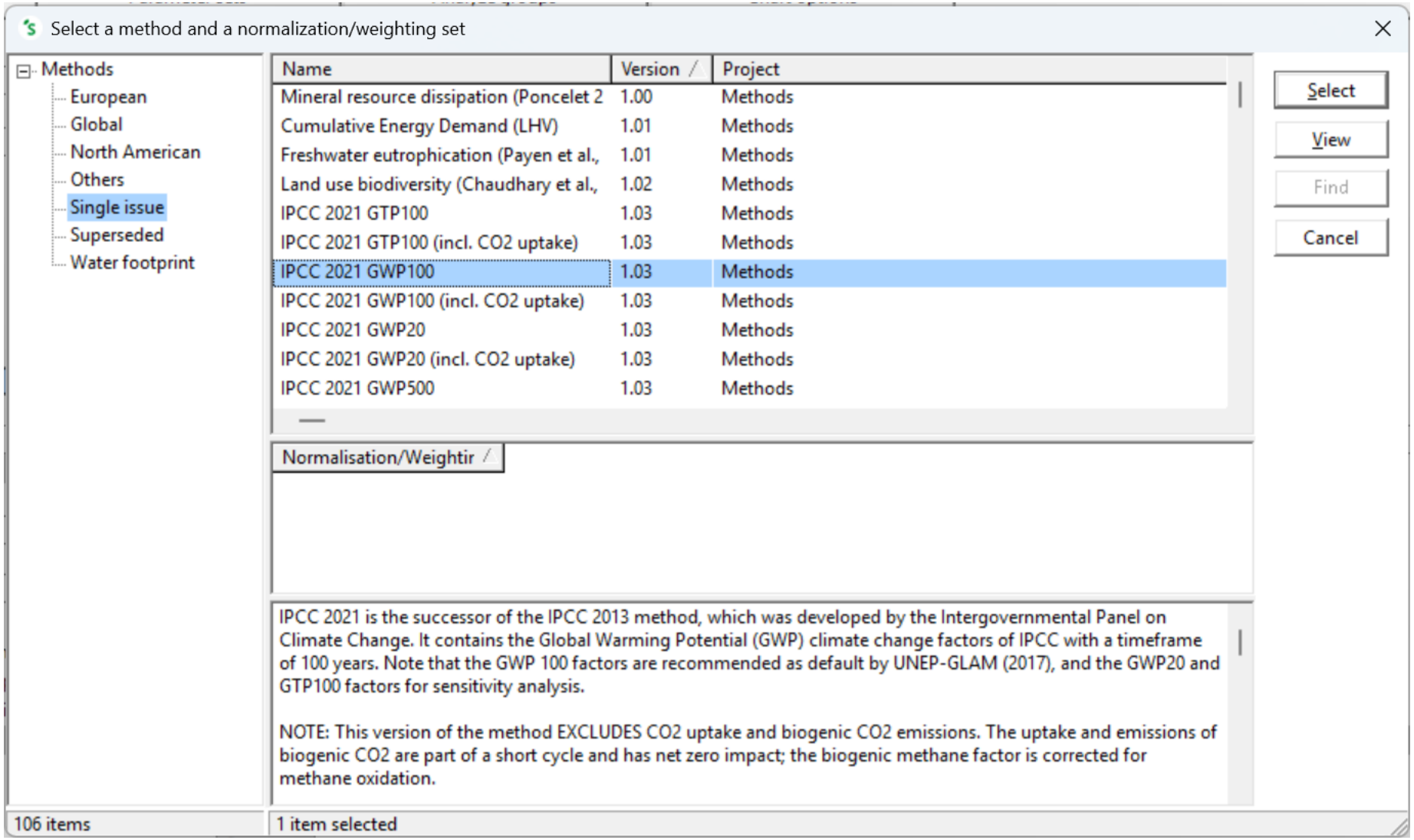
EN15804 Calculation with the previous Aluminium (not the scrap)



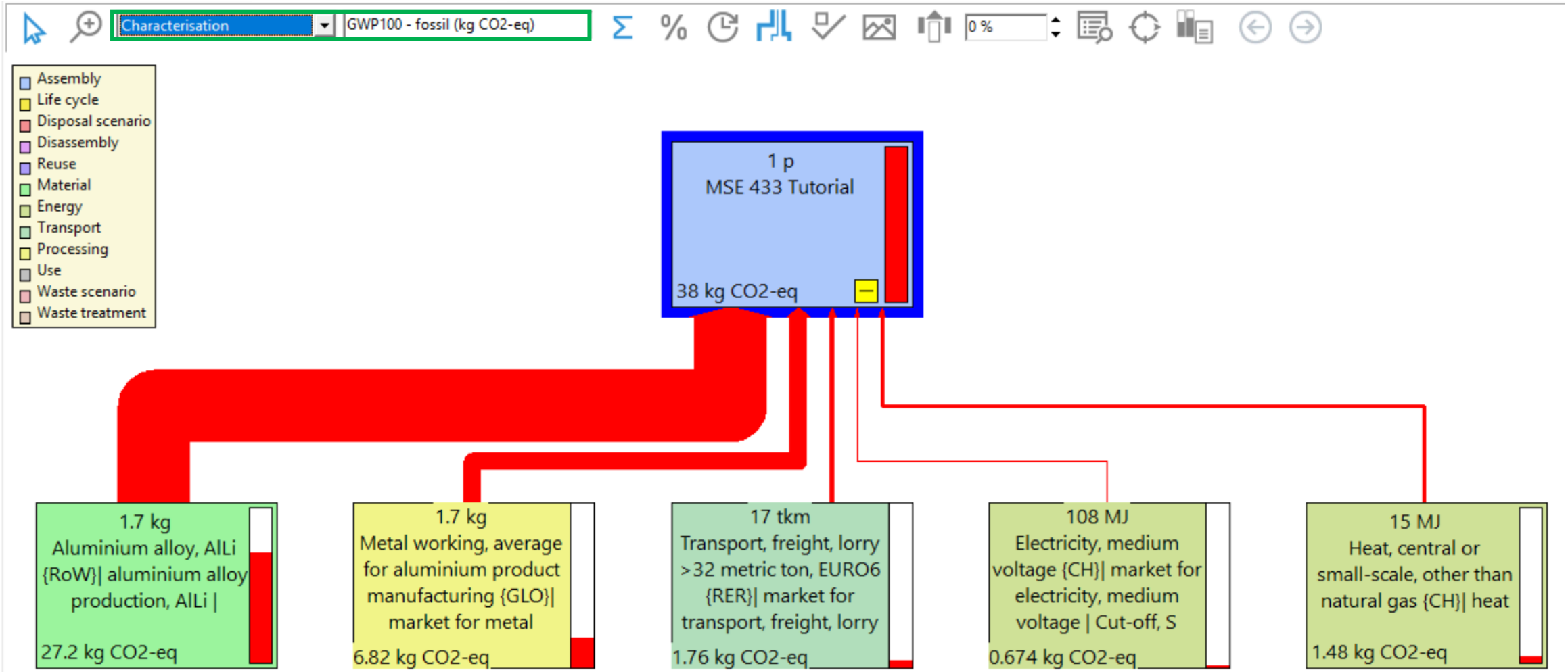
What if we want to calculate the kgCO2e?



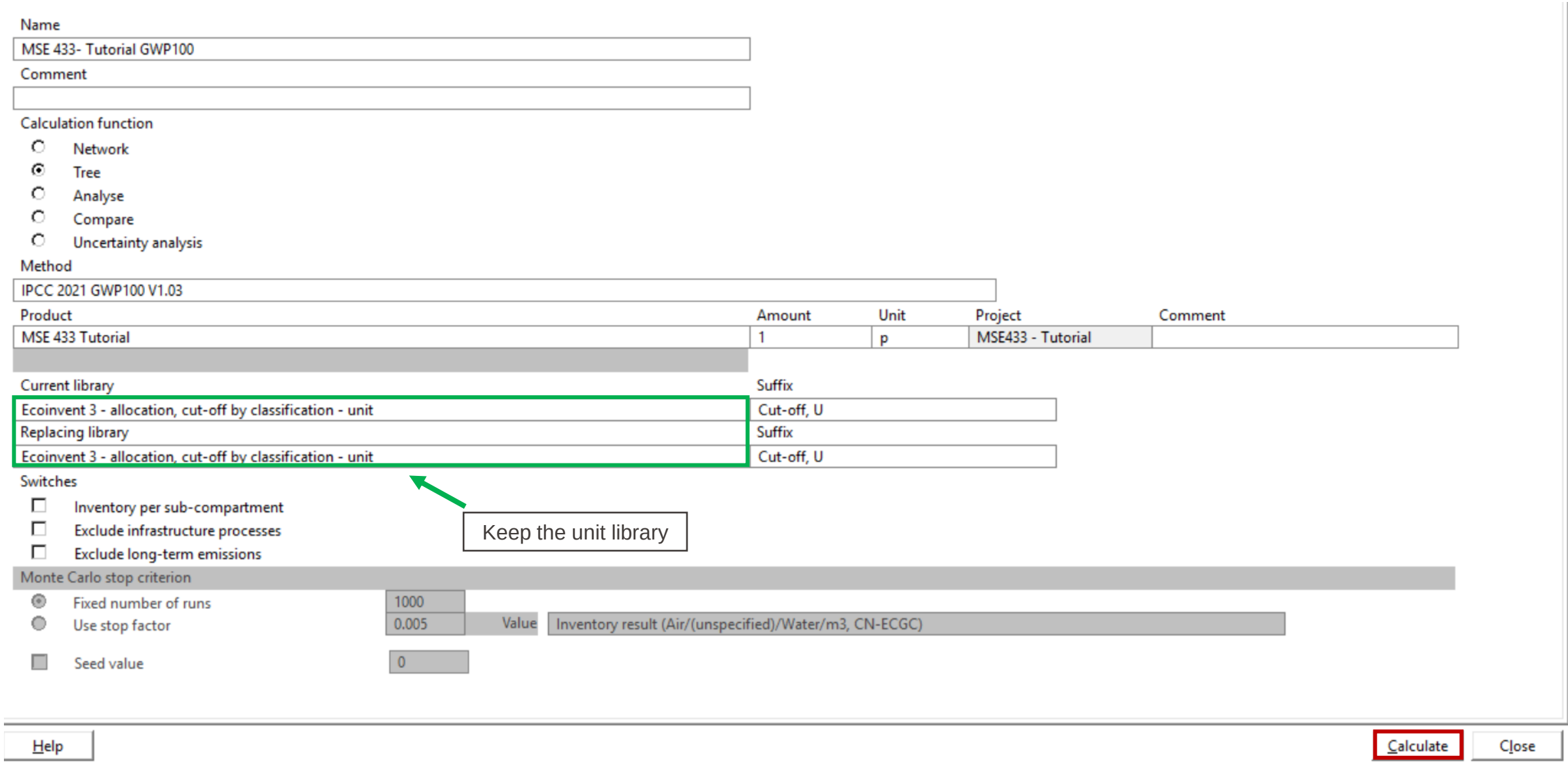
What if we want to calculate the kgCO2e?



What if we want to calculate the kgCO2e?



What if we want to see the flow in more details?



What if we want to see the flow in more details?