



Extended
Producer
Responsibility
Alliance

Simple calculation tool for CO₂ eq savings

Calculation tool for CO₂ eq savings

The model is created in EXCEL.

The model is now built on the basis of the waste streams known from the operation of the EKO-KOM system.

The calculations use primary data and parameters of the collection, recycling, and recovery of waste known and created in the EKO-KOM system, including the calculated environmental impacts of individual processes per declared unit.

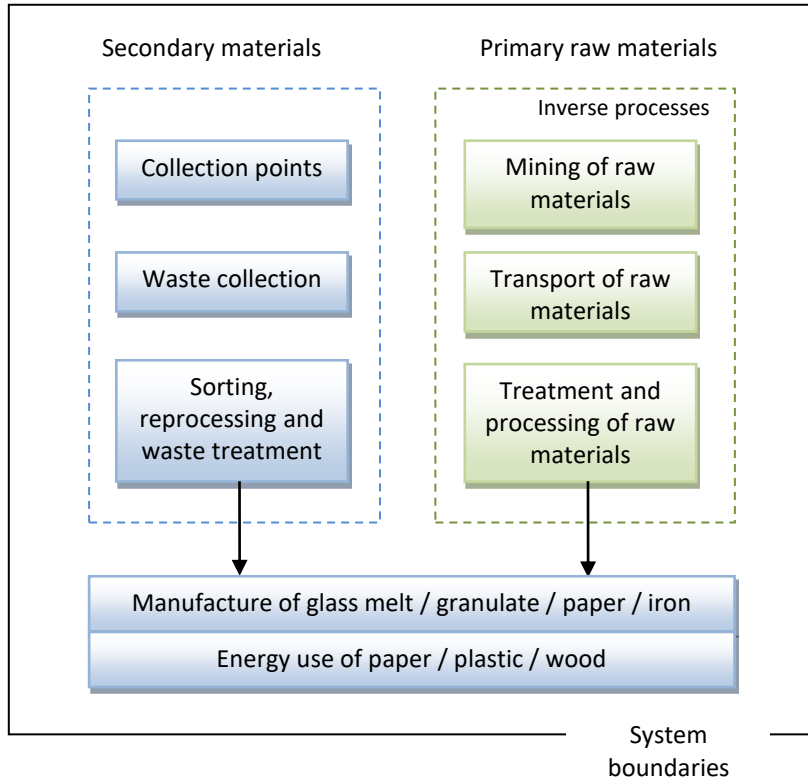
The model makes it possible to model specific flows of individual methods of recycling and waste recovery in terms of the amount of waste passing through each type of technology.

The model makes it possible to model waste flows collected within municipal systems, but also waste flows from other packaging waste generators (shops, HORECA, industry, etc.)



Definition of LCA parameters

System boundaries



System functions, functional unit

The function of the system is the management of wastepaper, plastics, glass, metal and wood contained in municipal waste and trade waste. As this is not the entire life cycle of the product, the declared unit has been determined.

Declared unit DU- treatment with one kg of waste.

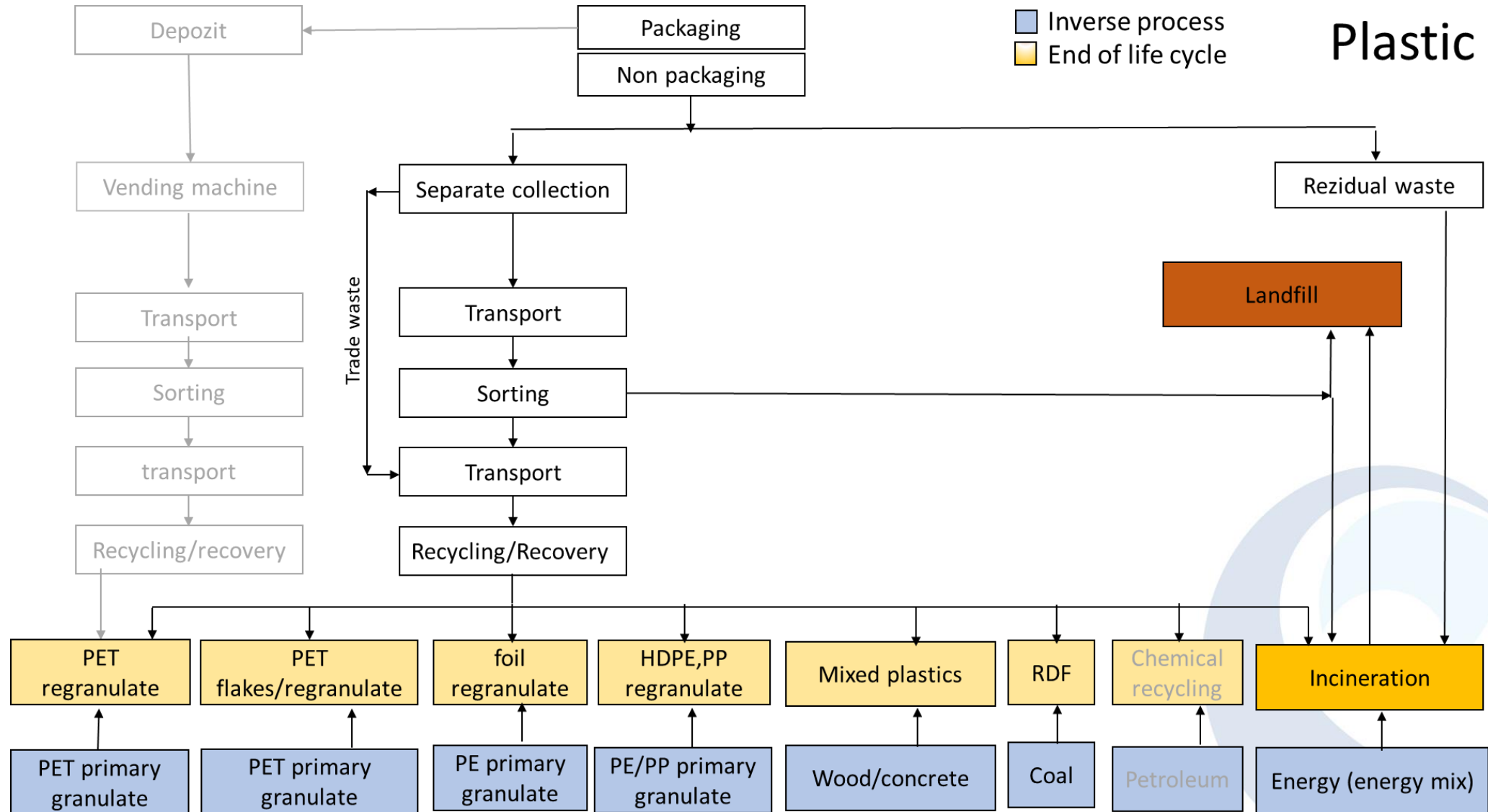
Evaluated impact categories

Global warming (kg CO₂ eq.)

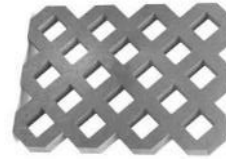
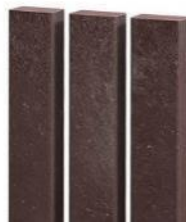
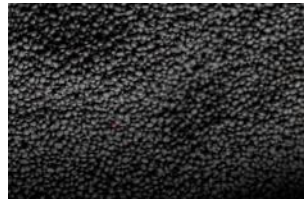
Collection of waste from collection points, their collection, processing, transport of outputs, energy recovery of part of outputs, landfilling of part of outputs up to material recycling of parts of outputs, that's means entry into the next life cycle at the level of replacement of the primary raw material with secondary raw material obtained from the processing of individual types of waste.



Example of the basic flow in the tool (plastic)



End of life of collected plastic waste



Inverse process

Primary granulate

Wood/concrete

Coal

Energy (energy mix)

Inventory analysis = detailed description of the whole system



container
production
installation
maintenance



vehicle type (load
capacity, EURO)
car maintenance
fuel consumption,
lubricants...



technology production
maintenance and consumption of replacement part
electricity consumption, lubricants, water, chemistry, wires
, protective equipment...

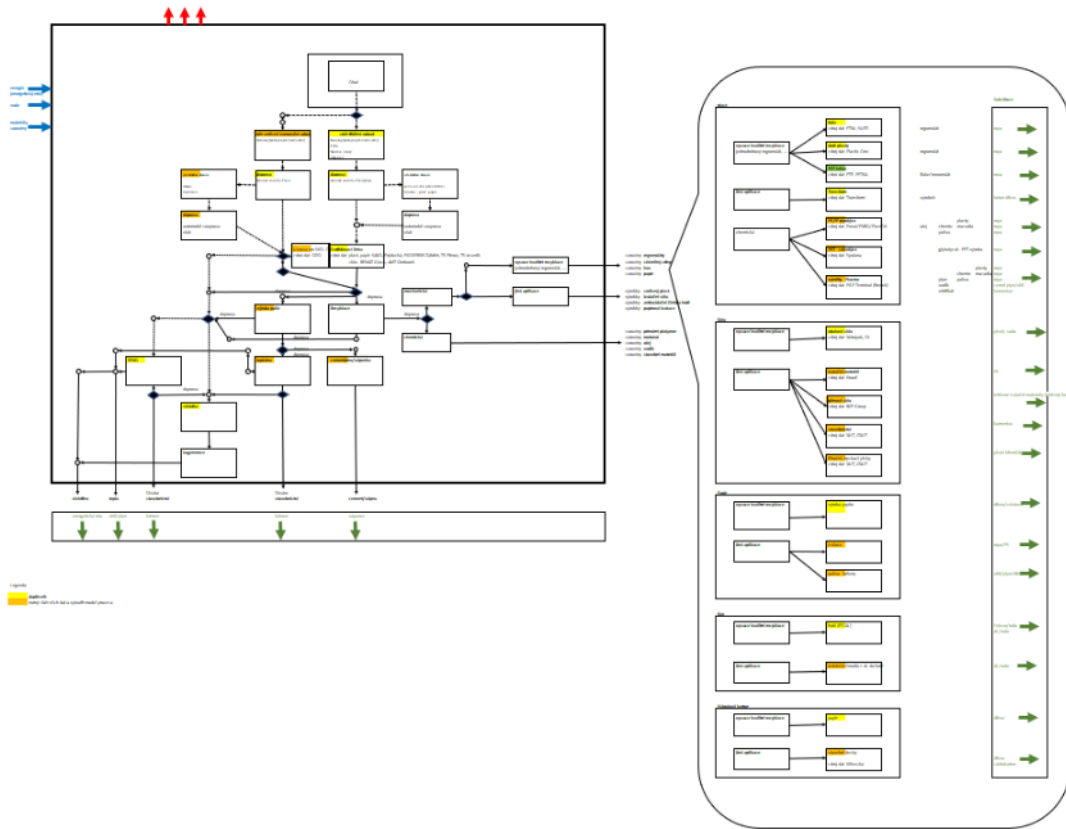


Data:

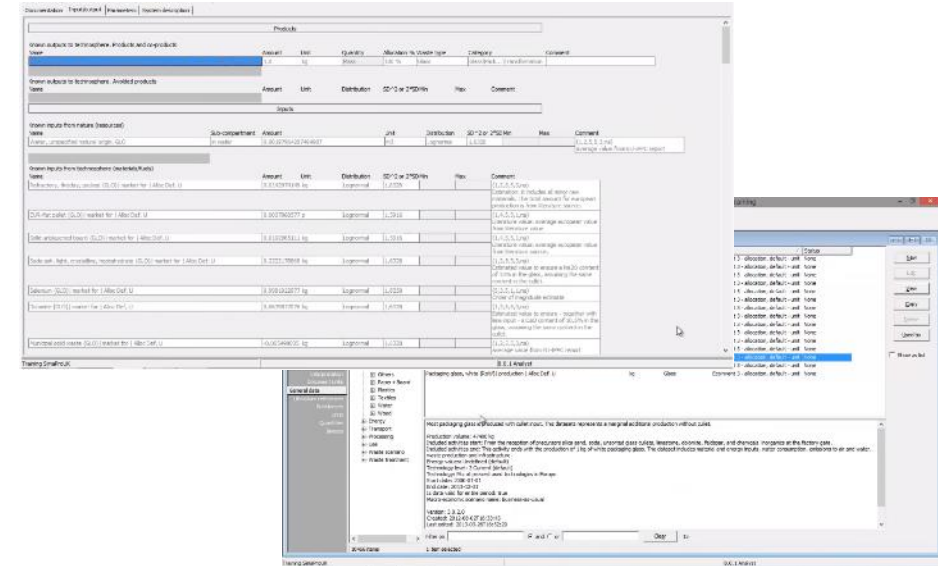
- measured
- calculated data based on measurements
- calculated data partly based on assumptions
- qualified (expert) estimate

= SW input

Model - sample



SimaPro LCA software



Processing of input data for each unit process

Outputs of defined impact categories according to commodities and processes

Calculation tool for CO₂ eq savings

The model has an internal part that each system fills with its data. Data from individual material sheets are aggregated into summary outputs.

Only the summary output for the entire system without detailed data on individual commodities will be sent to EXPRA for processing. This will ensure absolute certainty that internal data cannot be misused.

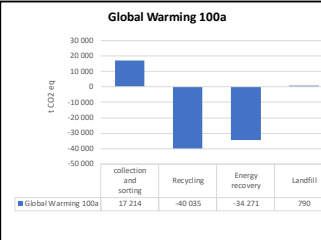
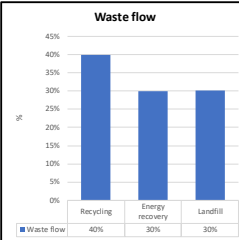
The results will be presented as a whole EXPRA. It is not the intention of EXPRA to present the results of individual Systems. However, individual countries will be able to use the results and present them on their own if they wish.

Calculation tool for CO₂ eq savings (Example of material sheets)

Plastics waste packaging - municipality

Input

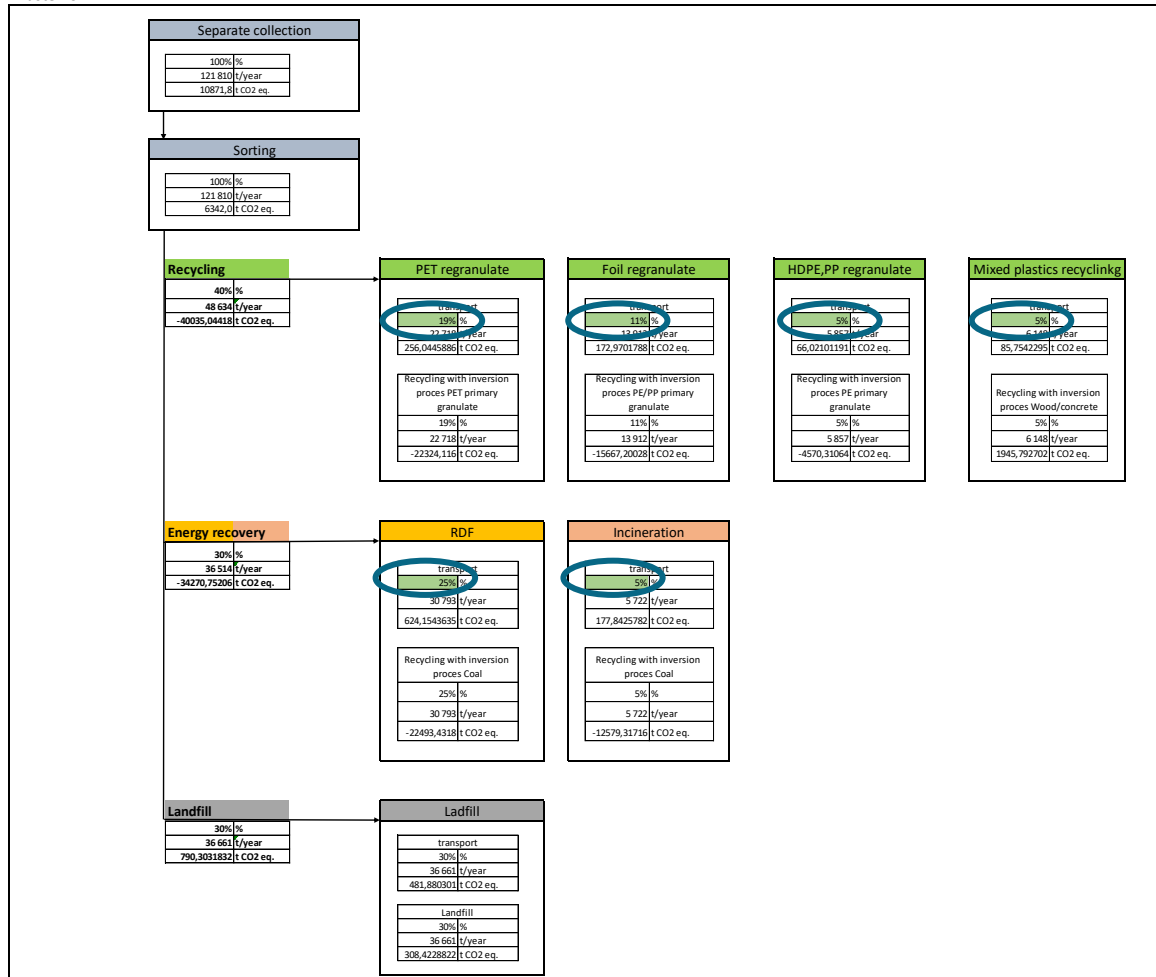
Material	Plastics waste packaging - municipality	
Source	Municipality	
Collected quantity	121809,9851	t/year
Impact categories	Global Warming 100a	t CO ₂ eq.



Results

Waste flow	Collected quantity	Global Warming 100a
collection and sorting	100%	17 213,8
Recycling	40%	-40 035,0
Energy recovery	30%	-34 270,8
Landfill	30%	790,3
Total	100%	-56 301,7

Waste flow



In the model it is necessary to:

- fill in the quantity of collected waste for each stream
- fill in the percentage of waste in each stream to green fields in the model



Calculation tool for CO₂ eq savings (Example of material sheets)

Version:	1.11 Test	
EPR		
Nr. of inhabitant	2 000 000	
Year of data	2022	
Name	Petr	
Date	27.3.2023	
Email	xxxx	
Phone	xxxx	

Input

Material	Packaging
Source	Municipal + Commercial
Collected quantity	75 000 t/year
Impact categories	Climate change - fossil t CO ₂ eq.

Results

Waste flow	Collected quantity %	Climate change - fossil	
		t CO ₂ eq.	kg CO ₂ eq./inh
Collection and sorting	100%	5 515,5	
Recycling	88%	-59 252,2	
Energy recovery	8%	-4 977,6	
Landfill	4%	55,6	
Total		-58 658,7	- 29,33

Waste flow

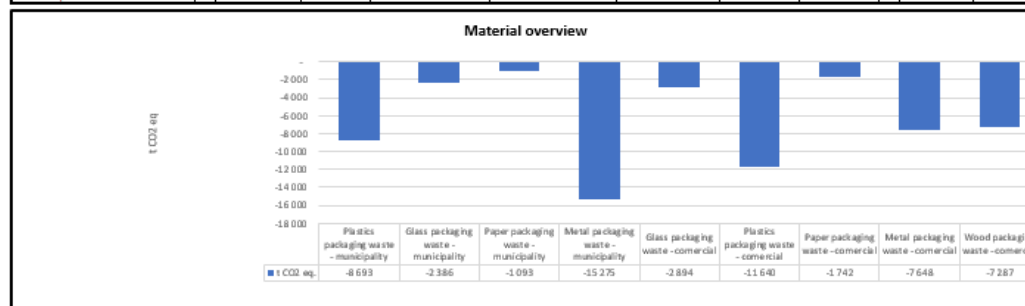
Waste flow	Percentage
Recycling	88%
Energy recovery	8%
Landfill	4%

Climate change - fossil

Category	t CO ₂ eq.
collection and sorting	5 515,5
Recycling	-59 252,2
Energy recovery	-4 977,6
Landfill	56

Material overview

	Plastics packaging waste - municipality	Glass packaging waste - municipality	Paper packaging waste - municipality	Metal packaging waste - municipality	Glass packaging waste - commercial	Plastics packaging waste - commercial	Paper packaging waste - commercial	Metal packaging waste - commercial	Wood packaging waste - commercial
t CO ₂ eq.	- 8 693	- 2 386	- 1 093	- 15 275	- 2 894	- 11 640	- 1 742	- 7 648	- 7 287

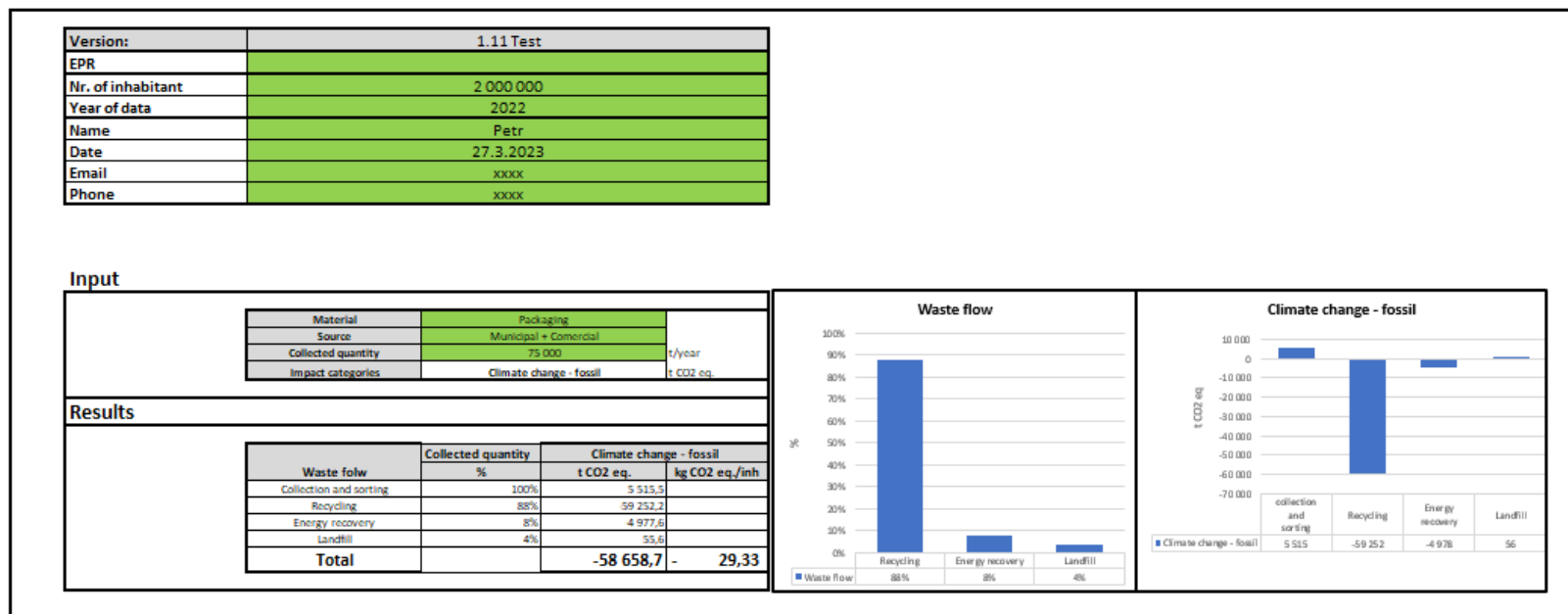


In the model it is necessary to:

- fill in the identification data

Calculation tool for CO₂ eq savings

Example of summary outputs and results to be sent to EXPRA



Material overview

	Plastics packaging waste - municipality	Glass packaging waste - municipality	Paper packaging waste - municipality	Metal packaging waste - municipality	Glass packaging waste - commercial	Plastics packaging waste - commercial	Paper packaging waste - commercial	Metal packaging waste - commercial	Wood packaging waste - commercial
t CO2 eq.	-8 693	-2 386	-1 093	-15 275	-2 894	-11 640	-1 742	-7 648	-7 287

