

PRIMUS' LCA tool with the connection to a supply chain traceability system

Julia Cilleruelo Palomero, GreenDelta GmbH
Michael Srocka, GreenDelta GmbH

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Introducing the PRIMUS project I



PRIMUS is an European project that will improve the plastic recycling industry with new polymer recycling technologies for automotive and home appliances applications.

PRIMUS demo cases

Pilot 1.
Automotive
interior

Pilot 2.
Automotive
cooling circuit

Pilot 3.
Refrigerator to
refrigerator -
Food contact
demonstration

Pilot 4.
Washing
machine door
seal

Introducing the PRIMUS project II

PRIMUS partners' location

start: **01.05.2022**
duration: **3 years**
budget: **6,9M€**
TRL: **3-6**
partners: **10+2 AE**

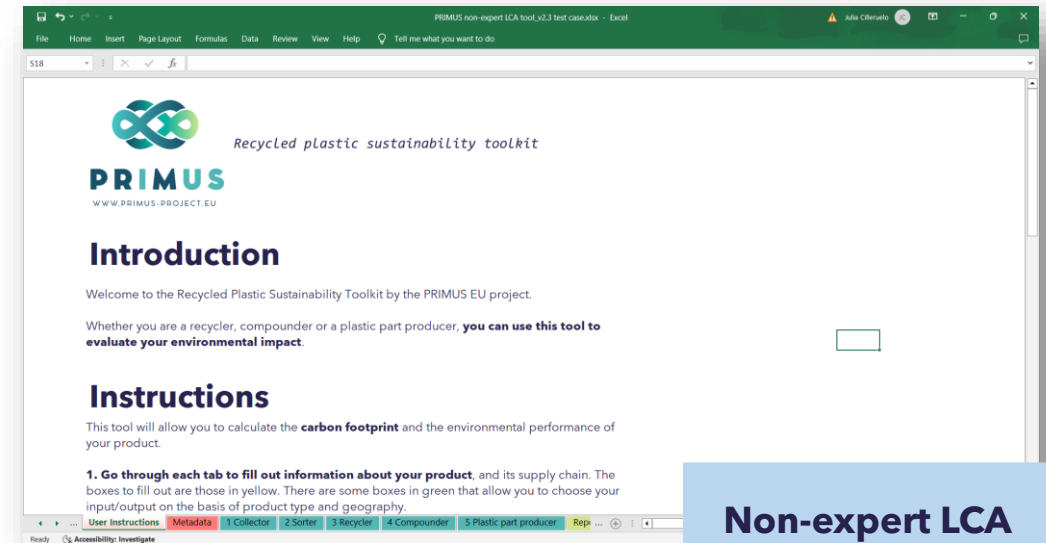


GreenDelta's job in PRIMUS

- Sustainability Assessments



Expert LCA tool



Non-expert LCA tool



LCA tool

Expert LCA tool

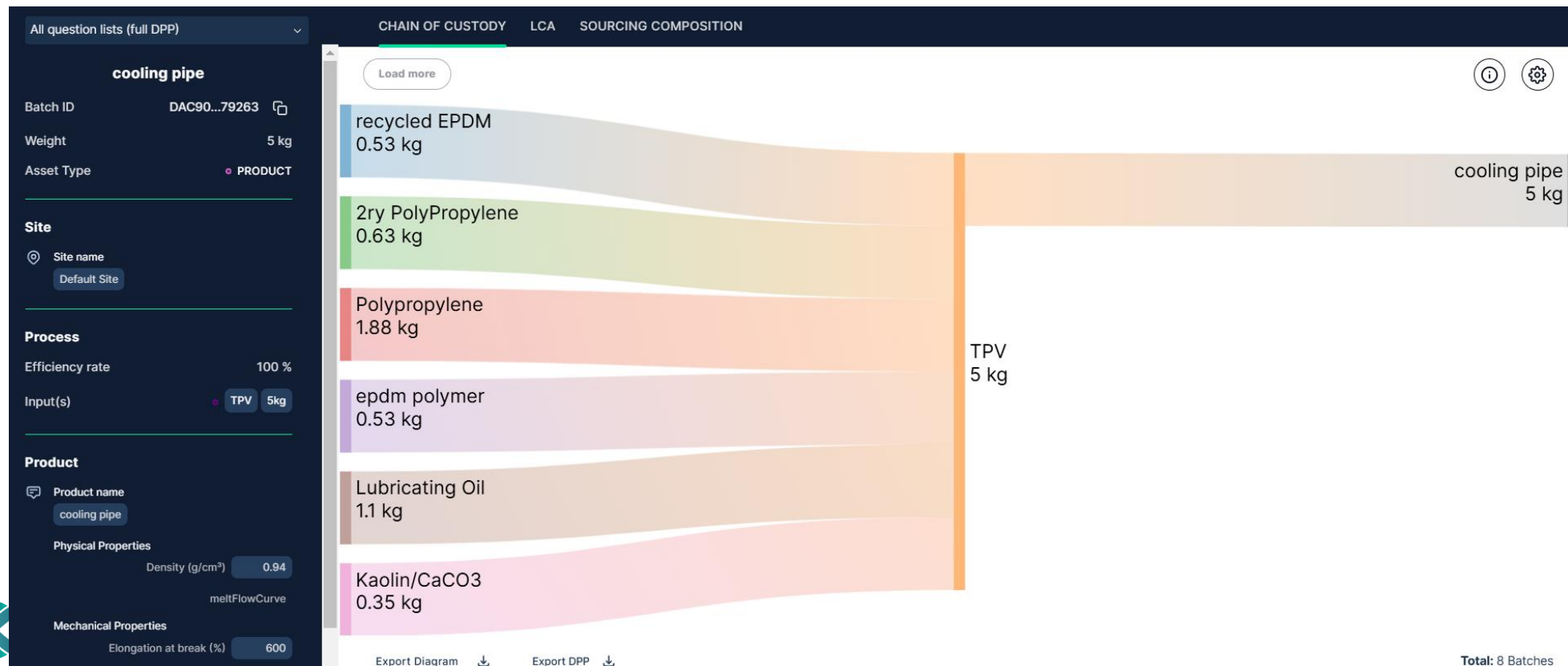
- Based on openLCA
- Contains the PRIMUS master database
- Connects to a traceability system for supply chain information



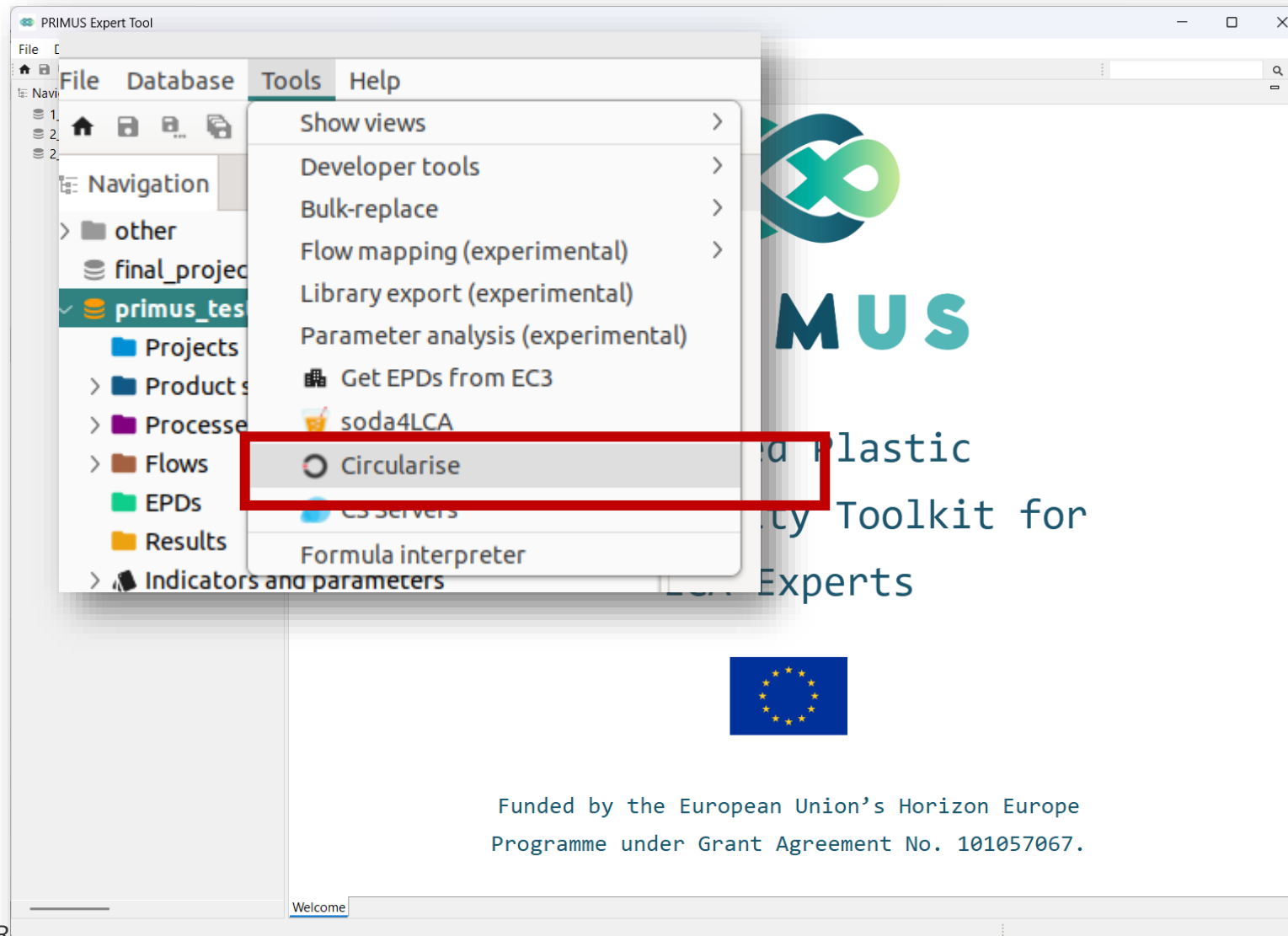
Traceability system for supply chain information?



Product traceability platform for supply chain compliance

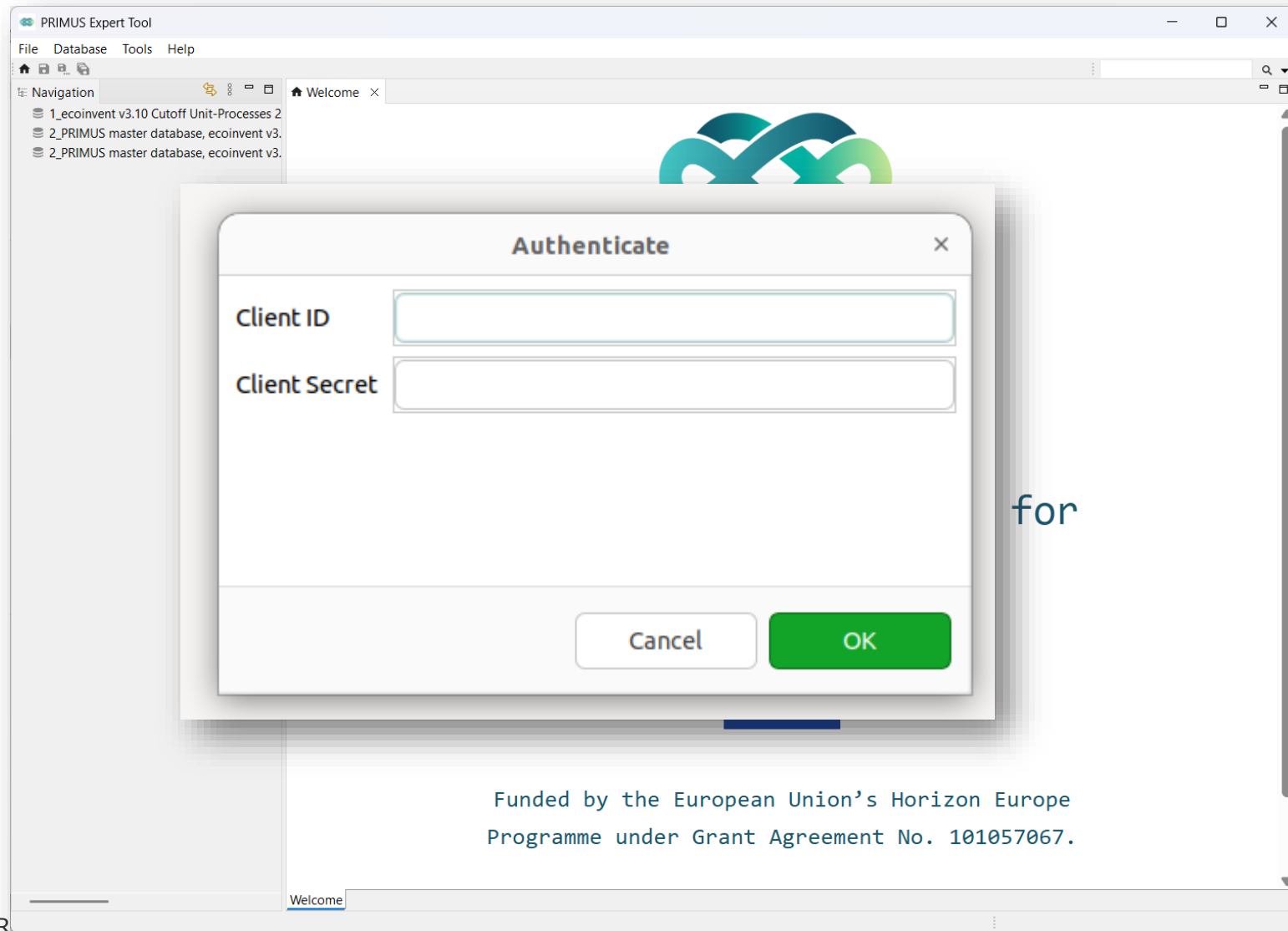


API connection



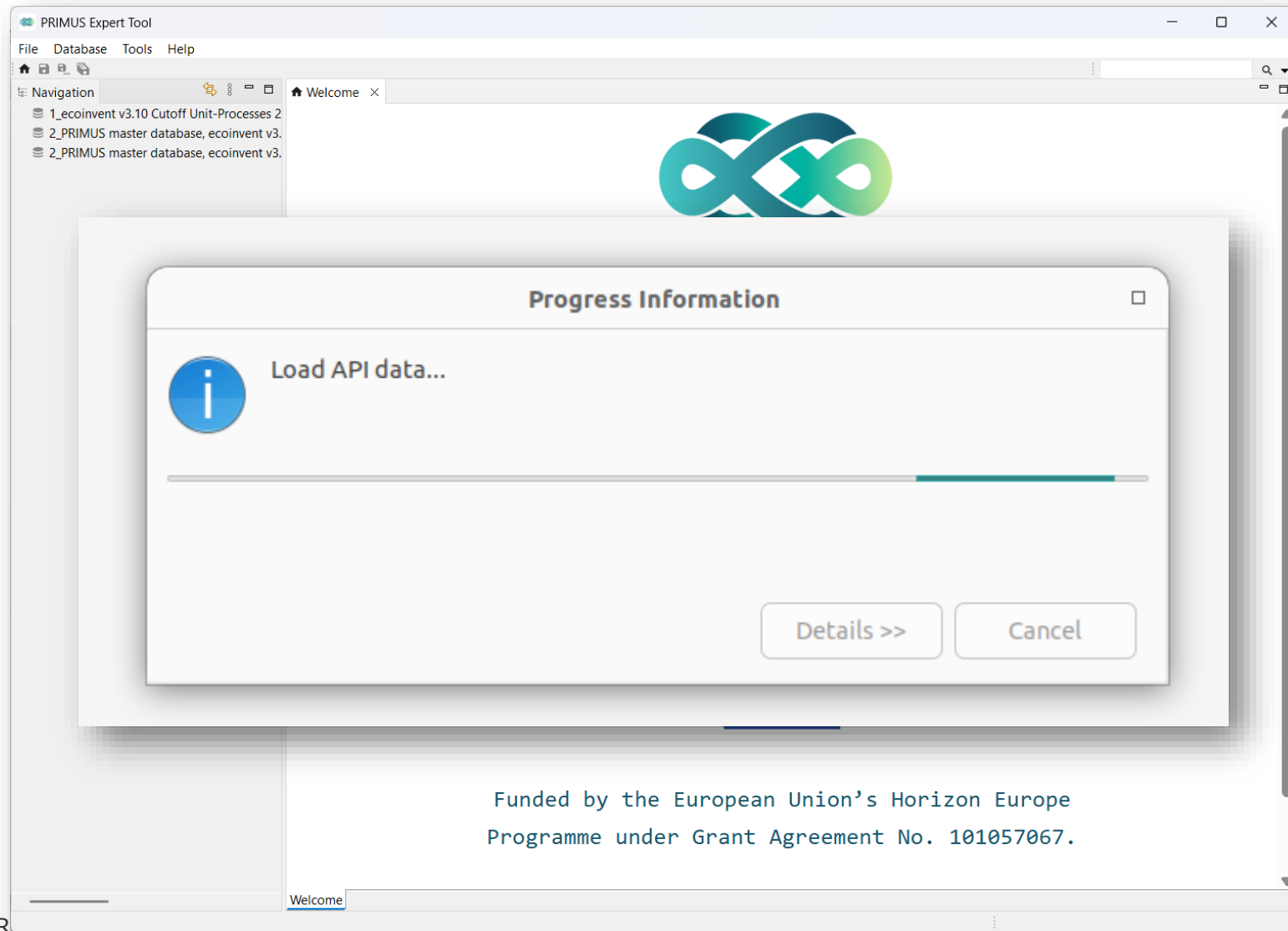
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API connection



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API connection



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API client tool

- User information
- Parameter bindings
- Batches
- Templates

PRIMUS Expert Tool - 2_PRIMUS master database, ecoinvent v3.10 Cutoff, Circularity 2.1, criticality, plastic litter, social olca V2.3_CIRCULARISE test connection

File Database Tools Help

Navigation

- 1_ecoinvent v3.10 Cutoff L
- 2_PRIMUS master databa
- 2_PRIMUS master databa
 - Projects
 - Product systems
 - Processes
 - Flows
 - EPDs
 - Results
 - Indicators and paramet
 - Background data

Circularise API Client

Circularise

► User

▼ Parameter bindings

Parameter	Formula
* energy_perkg_MJ	product_energyUsemass
* perc_ABS_PC	product_compositionPolymerPlus_abs_postConsumerRC / 100
* perc_PC_PI	product_compositionPolymerPlus_pc_preConsumerRC / 100
* perc_total_ABS	product_compositionPolymerPlus_abs_wtPctTotal / 100
* perc_total_compatibilizer	product_compositionPolymerPlus_compatibilizer_wtPctTotal / 100
* perc_total_neutr_agent	product_compositionPolymerPlus_neutralizingAgent_wtPctTotal / 100
* perc_total_PC	product_compositionPolymerPlus_pc_wtPctTotal / 100
* site_air_pmEmissions_kg	site_airEmissions_pmEmissions

▼ Batches

Direction	Product	Weight
Input	Central Console component	0.36 kg
Input	Compatibilizer	0.00 kg
Input	cooling pipe	5.00 kg
Input	DM4-009	10.00 kg
Input	Example Polymer	9.00 kg
Input	MichaelTestOct15	3.00 kg

▼ Templates

ID	Name
67c6c68998c366980681c169	LCA results test 1
67c6c50c4e7b8c912ccbc5c	Test product 2
66db099d4b8d492bd53700b4	PRIMUS example product
667a583c7d5855f817a856c2	Test product
6720d45caad32d936043173e	All waste
6720b0073be97600a5c1c612	Sorted waste
670cd4b2bab922d6c6c926ea	Another test product

Circularise



Parameter bindings

- Matches data coming from the traceability platform and parameters in the LCA tool

▼ Parameter bindings

Parameter	Formula
fx energy_perkg_MJ	product_energyUsemass
fx perc_rABS_PC	product_compositionPolymerPlus_abs_postConsumerRC / 100
fx perc_rPC_PI	product_compositionPolymerPlus_pc_preConsumerRC / 100
fx perc_total_ABS	product_compositionPolymerPlus_abs_wtPctTotal / 100
fx perc_total_compatibilizer	product_compositionPolymerPlus_compatibilizer_wtPctTotal / 100
fx perc_total_neutr_agent	product_compositionPolymerPlus_neutralizingAgent_wtPctTotal / 100
fx perc_total_PC	product_compositionPolymerPlus_pc_wtPctTotal / 100
fx site_air_pmEmissions_kg	site_airEmissions_pmEmissions



Batches

- Batches are products logged in the traceability system that has been shared with us

▼ Batches

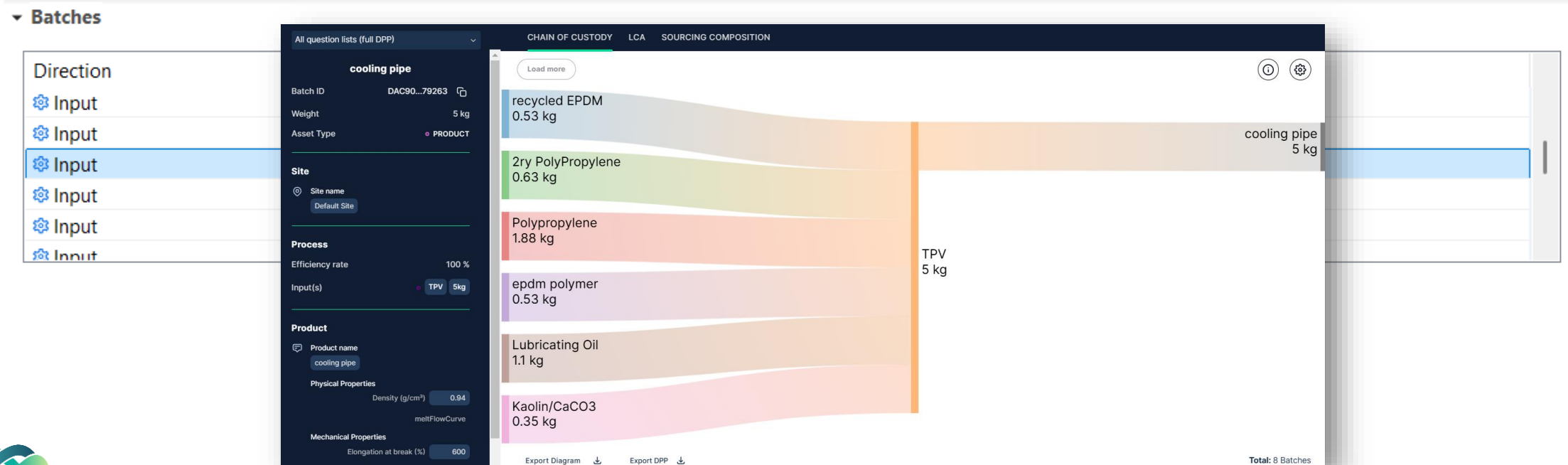
Direction	Product	Weight
⚙ Input	Central Console component	0.36 kg
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⚙ Input	MichaelTestOct15	3.00 kg

- ▶ Calculate
- Show parameters



Batches

- Batches are products logged in the traceability system that has been shared with us




Batches – parameter values


Parameter values of batch			
Circularise datapoint	Value	Is numeric	Parameter
<input type="radio"/> product.energyUsemass	51.7896	<input checked="" type="checkbox"/>	fx product_energyUsemass
<input type="radio"/> product.eoLscenarios.mechanicalRecycling	Yes	<input type="checkbox"/>	-
<input type="radio"/> product.eoLscenarios.reuse	No	<input type="checkbox"/>	-
<input type="radio"/> product.mechanicalPropertiesPrecycling.charp...	205.80	<input checked="" type="checkbox"/>	fx product_mechanicalPropertiesPrecycling_cha...
<input type="radio"/> product.mechanicalPropertiesPrecycling.charp...	26.51	<input checked="" type="checkbox"/>	fx product_mechanicalPropertiesPrecycling_cha...
<input type="radio"/> product.mechanicalPropertiesPrecycling.elong...	0.2533	<input checked="" type="checkbox"/>	fx product_mechanicalPropertiesPrecycling_elo...
<input type="radio"/> product.mechanicalPropertiesPrecycling.heat...	98	<input checked="" type="checkbox"/>	fx product_mechanicalPropertiesPrecycling_he...
<input type="radio"/> product.mechanicalPropertiesPrecycling.tensil...	2071.31	<input checked="" type="checkbox"/>	fx product_mechanicalPropertiesPrecycling_tens...
<input type="radio"/> product.mechanicalPropertiesPrecycling.yield...	43.51	<input checked="" type="checkbox"/>	fx product_mechanicalPropertiesPrecycling_yiel...
<input type="radio"/> product.partFastening	snapFit	<input type="checkbox"/>	-
<input type="radio"/> product.physicalPropertiesPrecycling.density	1.1260	<input checked="" type="checkbox"/>	fx product_physicalPropertiesPrecycling_density
<input type="radio"/> product.physicalPropertiesPrecycling.meltFlow...	14.61	<input checked="" type="checkbox"/>	fx product_physicalPropertiesPrecycling_meltFl...
<input type="radio"/> product.productDimensions.depth	75	<input checked="" type="checkbox"/>	fx product_productDimensions_depth
<input type="radio"/> product.productDimensions.length	290	<input checked="" type="checkbox"/>	fx product_productDimensions_length
<input type="radio"/> product.productDimensions.units	millimeter	<input type="checkbox"/>	-
<input type="radio"/> product.productDimensions.width	280	<input checked="" type="checkbox"/>	fx product_productDimensions_width
<input type="radio"/> product.productName	Automotive Interior Front Cons...	<input type="checkbox"/>	-
<input type="radio"/> product.renewableEnergyUseRatio.nonren	95	<input checked="" type="checkbox"/>	fx product_renewableEnergyUseRatio_nonren
<input type="radio"/> product.renewableEnergyUseRatio.ren	5	<input checked="" type="checkbox"/>	fx product_renewableEnergyUseRatio_ren


OK Cancel











Calculation

 Calculate product system with batch data ✕

Product system  [1 material](#) ✕

Impact method  [EF v3.1](#) ✕


Parameter	Formula	Value	
 energy_perkg_MJ	product_energyUsemass	1.26000	
 perc_rABS_PC	product_compositionPolymerPlus_abs_postConsumerRC / 100	0.76000	
 perc_rPC_PI	product_compositionPolymerPlus_pc_preConsumerRC / 100	1.00000	
 perc_total_ABS	product_compositionPolymerPlus_abs_wtPctTotal / 100	0.33000	
 perc_total_compa...	product_compositionPolymerPlus_compatibilizer_wtPctTotal / 100	0.04000	
 perc_total_neutr_a...	product_compositionPolymerPlus_neutralizingAgent_wtPctTotal / 1...	0.00500	
 perc_total_PC	product_compositionPolymerPlus_pc_wtPctTotal / 100	0.62000	
 site_air_pmEmissi...	site_airEmissions_pmEmissions	0.00000	


OK


Cancel


▼ Batches


Direction


 Input

 Input

 Input

 Input

 Input

 Input

Templates

- For writing back information to the traceability system

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Circularise API Client X

Circularise

User

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*perc_total_compatibilizer	product_compositionPolymerPlus_compatibilizer_wtPctTotal / 100
*perc_total_neutr_agent	product_compositionPolymerPlus_neutralizingAgent_wtPctTotal / 100
*perc_total_PC	product_compositionPolymerPlus_pc_wtPctTotal / 100
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Circularise




Templates


▼ **Templates**

ID
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 667a583c7d5855f817a856c2
 6720d45caad32d936043173e
 6720b0073be97600a5c1c612
 670cd4b2bab922d6c6c926ea

Update template results

Template

Gate to gate  [1 material pc/absBlend](#) ×

Cradle to gate  [- none -](#) ×

[Circularise](#)

Update results

Update results

product

product



Conclusions and final thoughts

Conclusions

- The PRIMUS expert LCA tool is based on openLCA 2.4 and contains a master database and a connection to a traceability system.
- The connection to a traceability system was successful.
- The tool successfully obtains supply chain information and writes back sustainability results.



Further information and final thoughts

- The tool is published for free in openLCA Nexus (not open source).
- The relevance of the connection depends on how much the traceability platform is used.
- We are open to further projects to connect an LCA software to a traceability / blockchain solution.



GreenDeLTa



PRIMUS

WWW.PRIMUS-PROJECT.EU



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European Union

Thank you!

ANY QUESTIONS?

Julia Cilleruelo Palomero
cilleruelo@greendelta.com

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