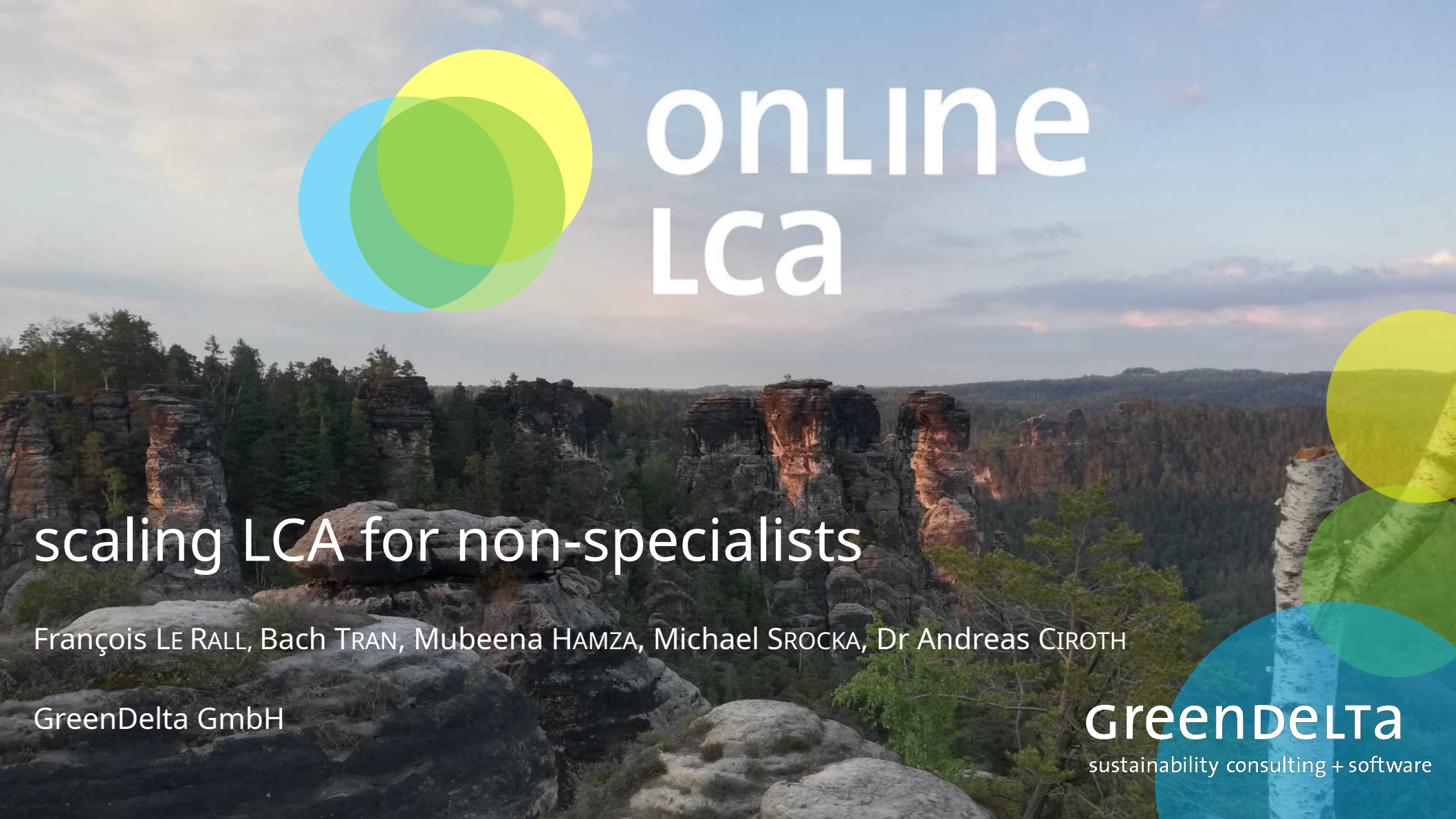


scaling LCA for non-specialists

François Le Rall, Bach Tran, Mubeena Hamza, Michael Srocka, Dr Andreas Ciroth

GreenDelta GmbH

GreenDelta
sustainability consulting + software

A *new* LCA app

Accessible

Collaborative

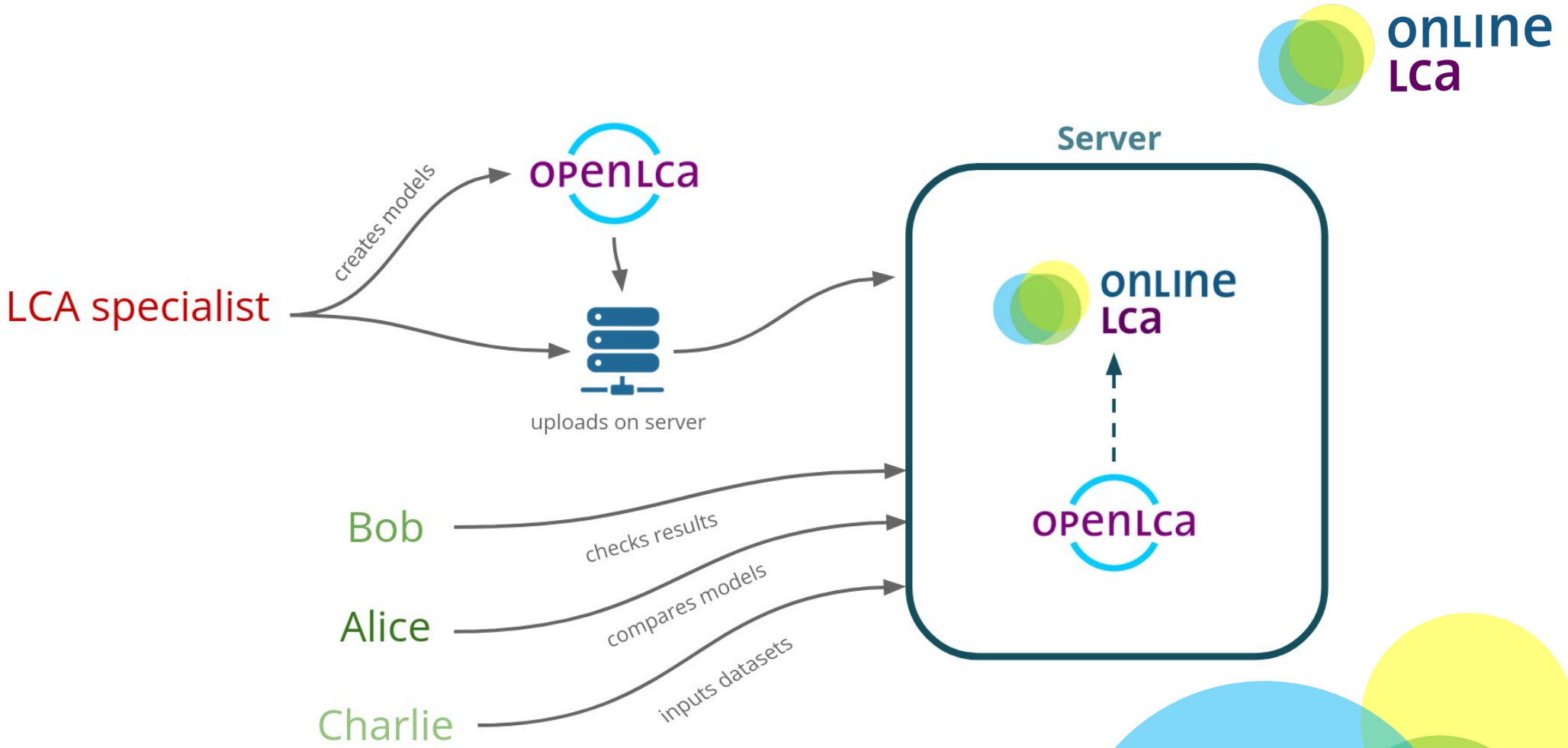
Scalable

Communicative

Beautiful

onlineLCA

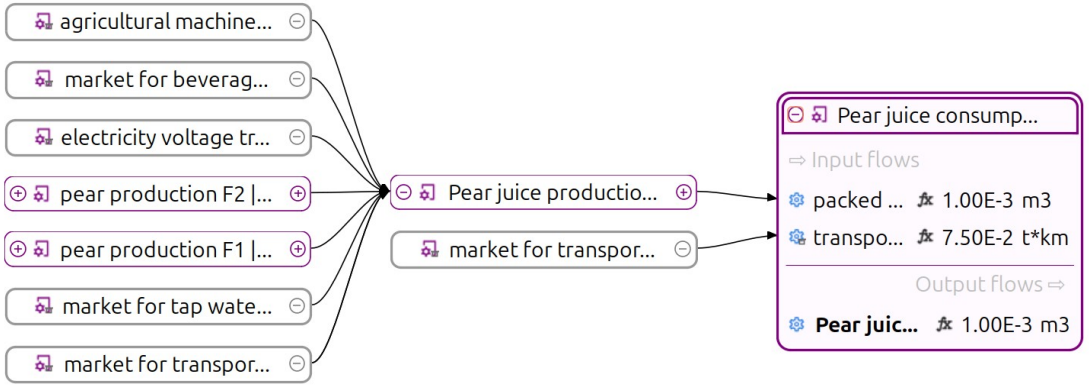
- 🌍 Web-based and *non LCA specialist*-friendly
- 🔧 Easy result sharing with transparency
- 👥 Built-in user management
- 📈 Visual and interactive
- 🎨 Customizable design
- 📦 Bulk LCA generation
- ⚡ Fast and standards-compliant LCAs


ONLINE LCA
Server
openLCA
creates models
LCA specialist
uploads on server
ONLINE LCA
openLCA
Bob
checks results
Alice
compares models
Charlie
inputs datasets
GREENDELTA

Demo

Model

- pear and apple juice consumption
- parameters:
  - quantities of fruits
  - distances between farms and factory




onLIne
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Email
lerall@greendelta.com
Password
Go!
GreenDeLTa

Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (4

Yesterday
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1,Option 2
Apple juice consumption (1
Apple juice consumption
Apple and Pear Juice

Analyze life cycle models

Select a product system

Select a product system
Apple juice consumption
Pear juice consumption

Life cycle models
Compare
Setups
Admin

Yesterday
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1,Option 2
Apple juice consumption (1
Apple juice consumption
Apple and Pear Juice

Analyze life cycle models

Select a product system
Apple juice consumption

Apple juice consumption

Category	Reference process	Flow property	Unit
	Apple juice consumption	Volume	m3

PROVIDER MAP

Description
First created: 2024-08-27T12:18:59 Linking approach during creation: Prefer default providers; Preferred process type: System process

CALCULATE | SAVE

Amount
0.001

Select an allocation method
Use default allocation

Select an impact method

Select a normalization and weighting set

Regionalized calculation

Include cost calculation

Parameters

Search parameter name or context

RESET

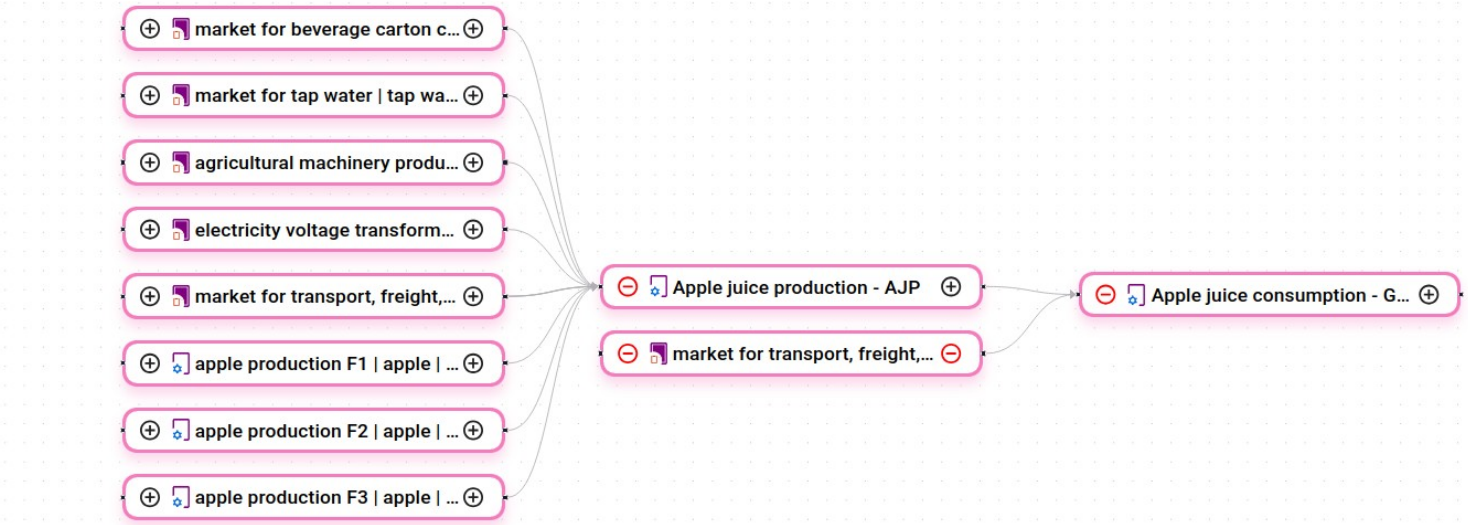
Name	Value	Context
distance_farm1	km 25	

Life cycle models
Compare
Setups
Admin

Yesterday
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1,Option 2
Apple juice consumption (1
Apple juice consumption
Apple and Pear Juice

Select a product system
Apple juice consumption



Life cycle models
Compare
Setups
Admin

Yesterday
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1,Option 2
Apple juice consumption (1
Apple juice consumption
Apple and Pear Juice

Analyze life cycle models

Select a product system
Apple juice consumption

Apple juice consumption

Category	Reference process	Flow property	Unit
	Apple juice consumption	Volume	m3

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Regionalized calculation

Include cost calculation

Parameters

Search parameter name or context

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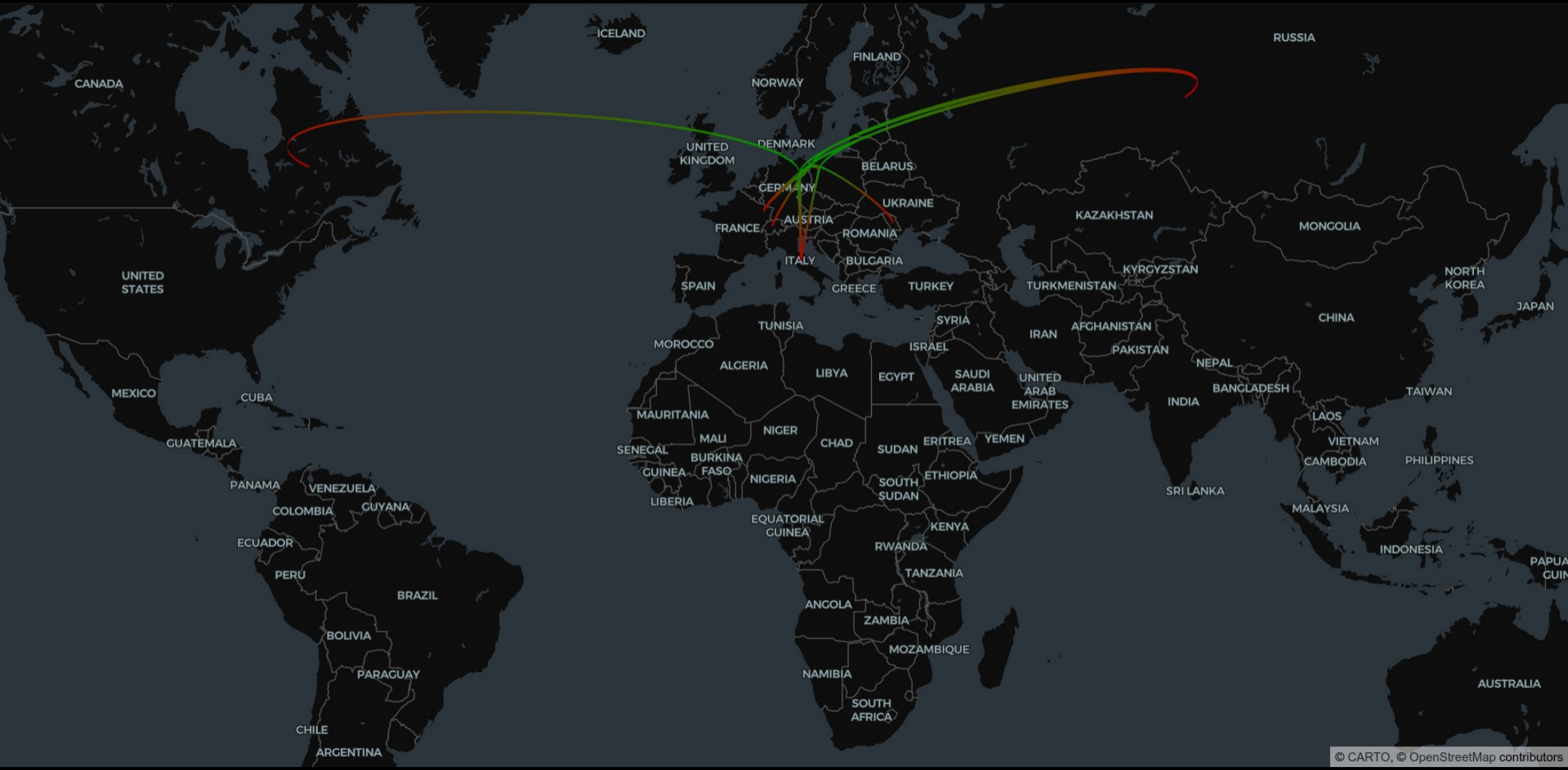
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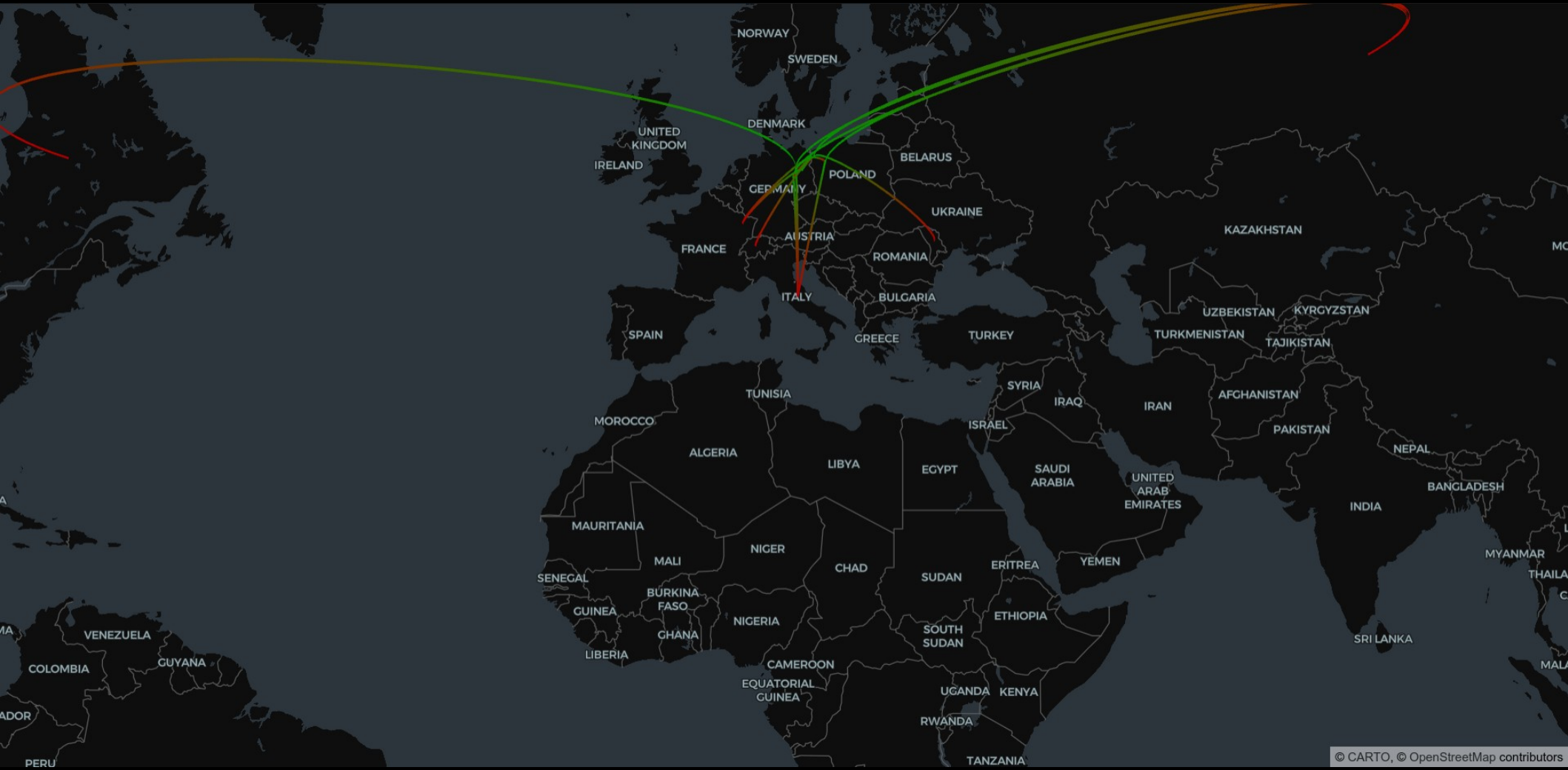
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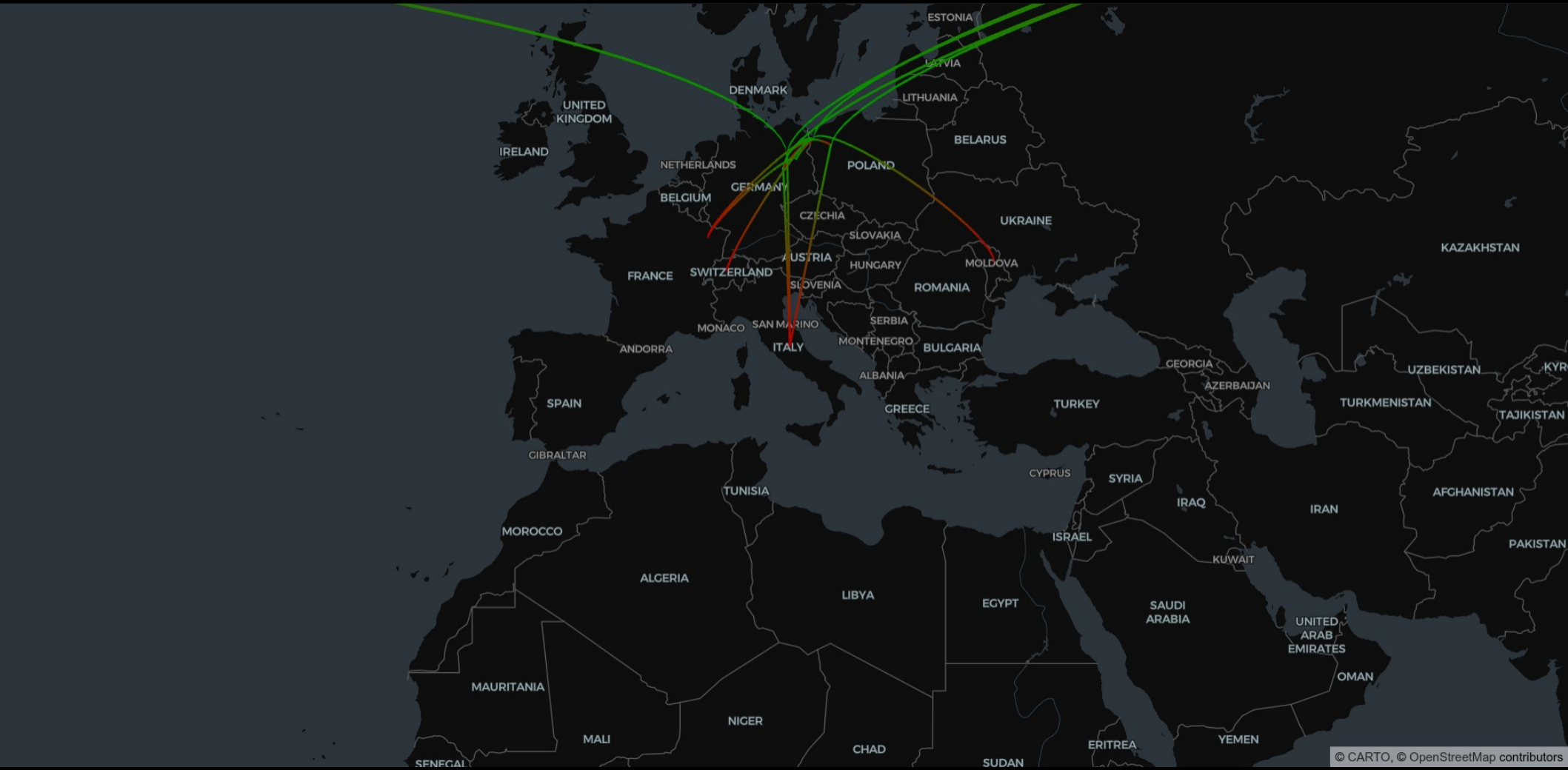
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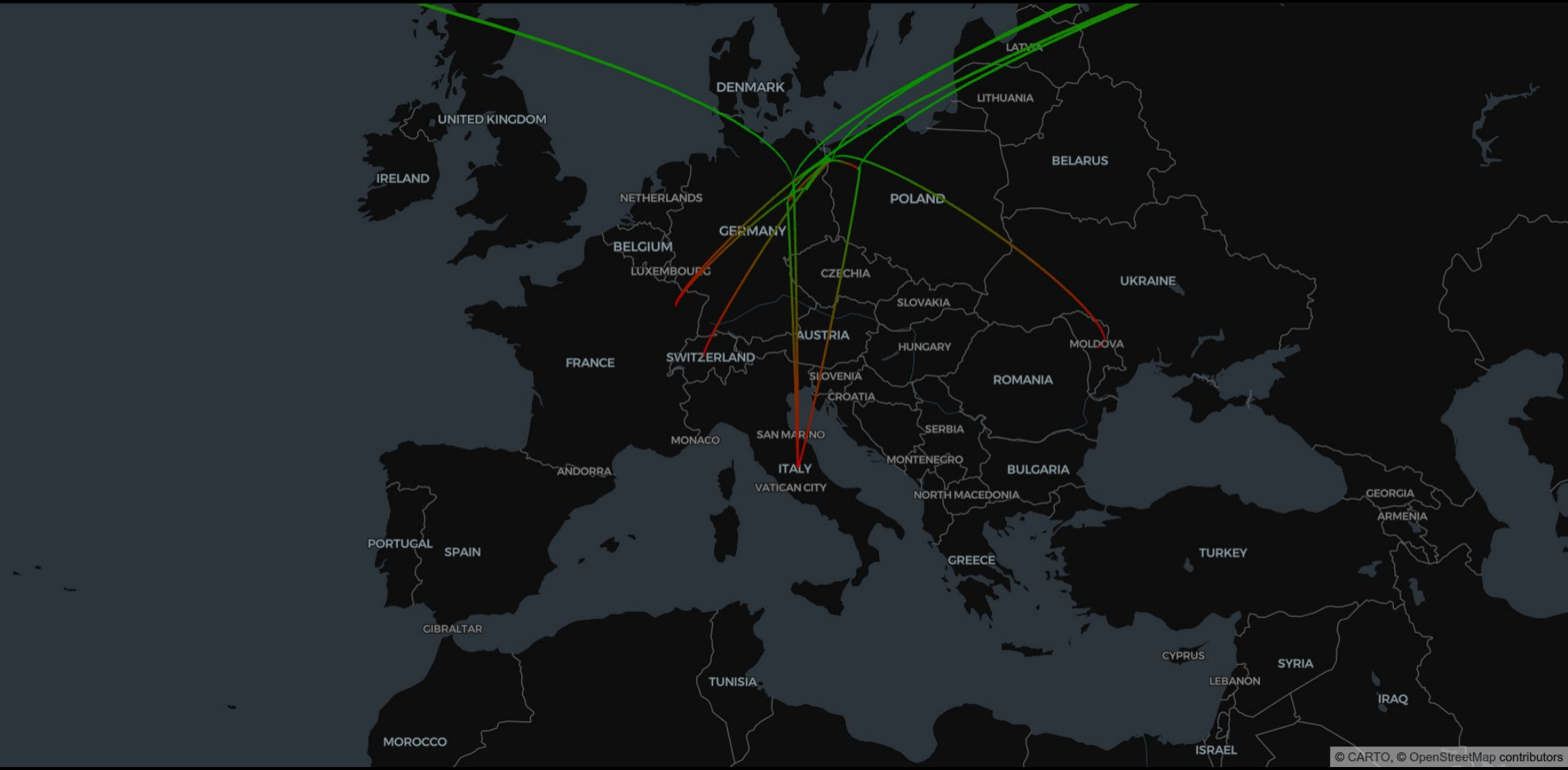
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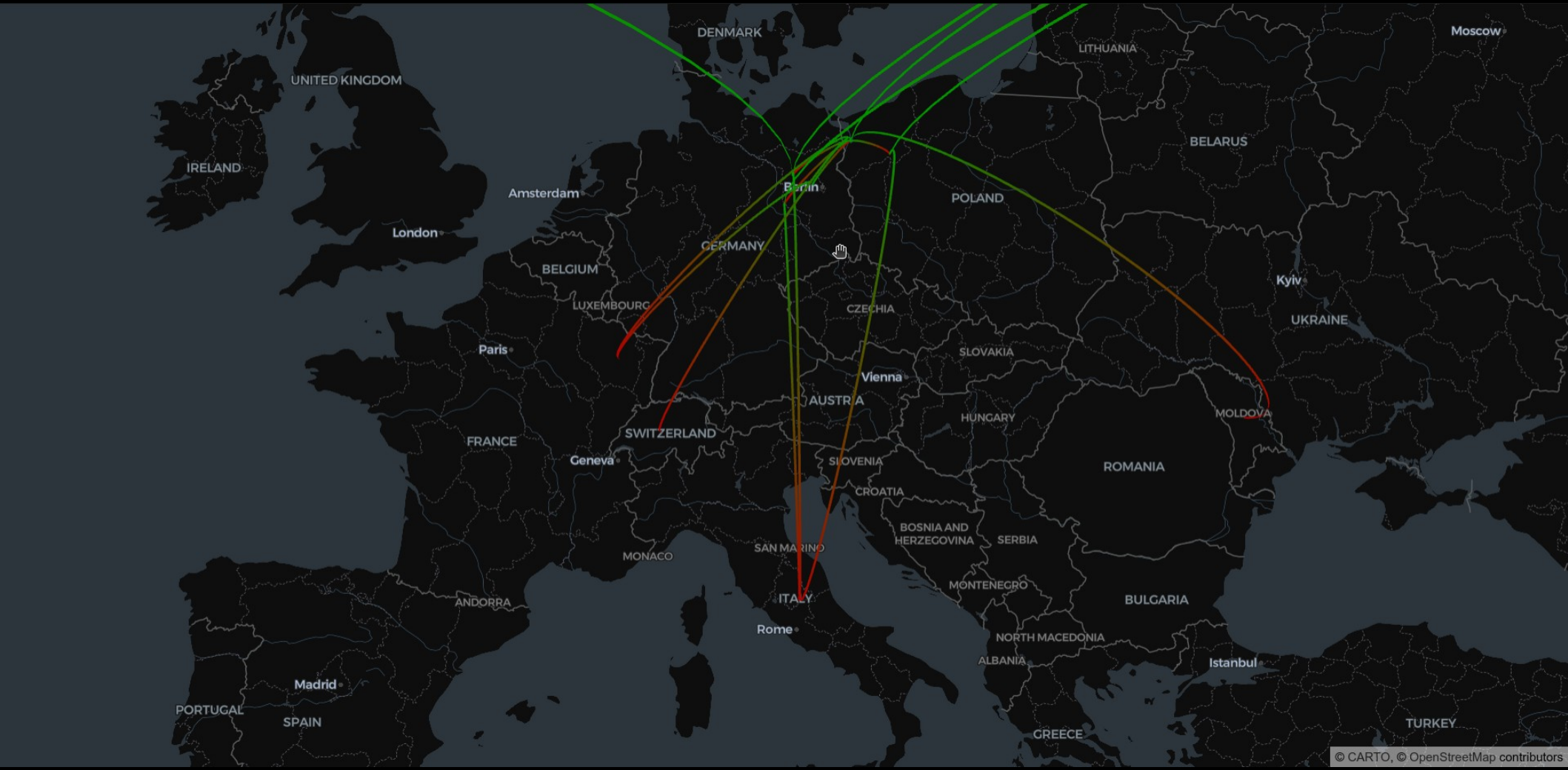
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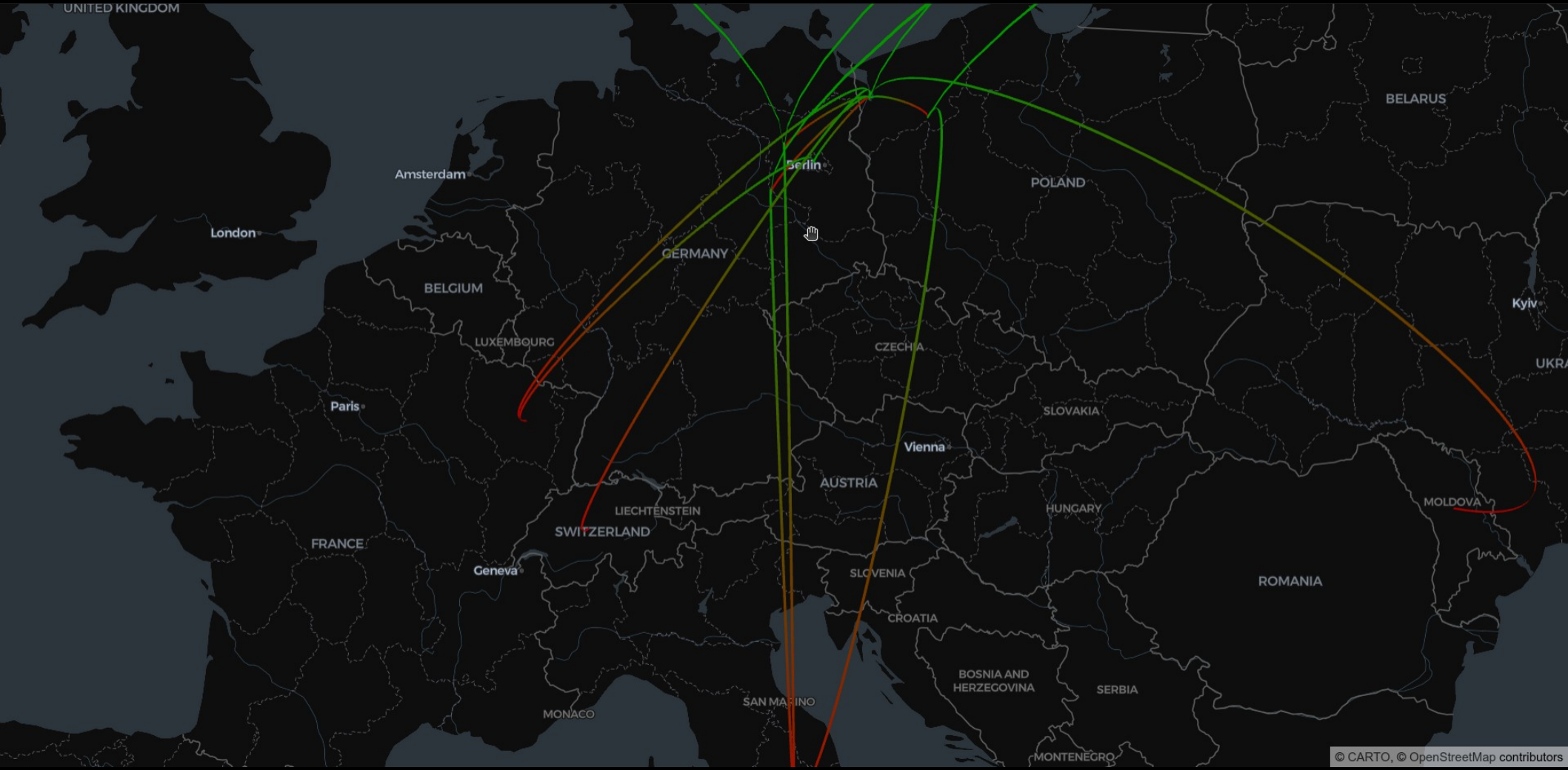
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Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (4

Yesterday
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1,Option 2
Apple juice consumption (1
Apple juice consumption

Apple juice consumption

Category
Reference process: Apple juice consumption
Flow property: Volume
Unit: m3

PROVIDER MAP

Description
First created: 2024-08-27T12:18:59 Linking approach during creation: Prefer default providers; Preferred process type: System process

CALCULATE | SAVE

Amount: 0.001

Select an allocation method: Use default allocation

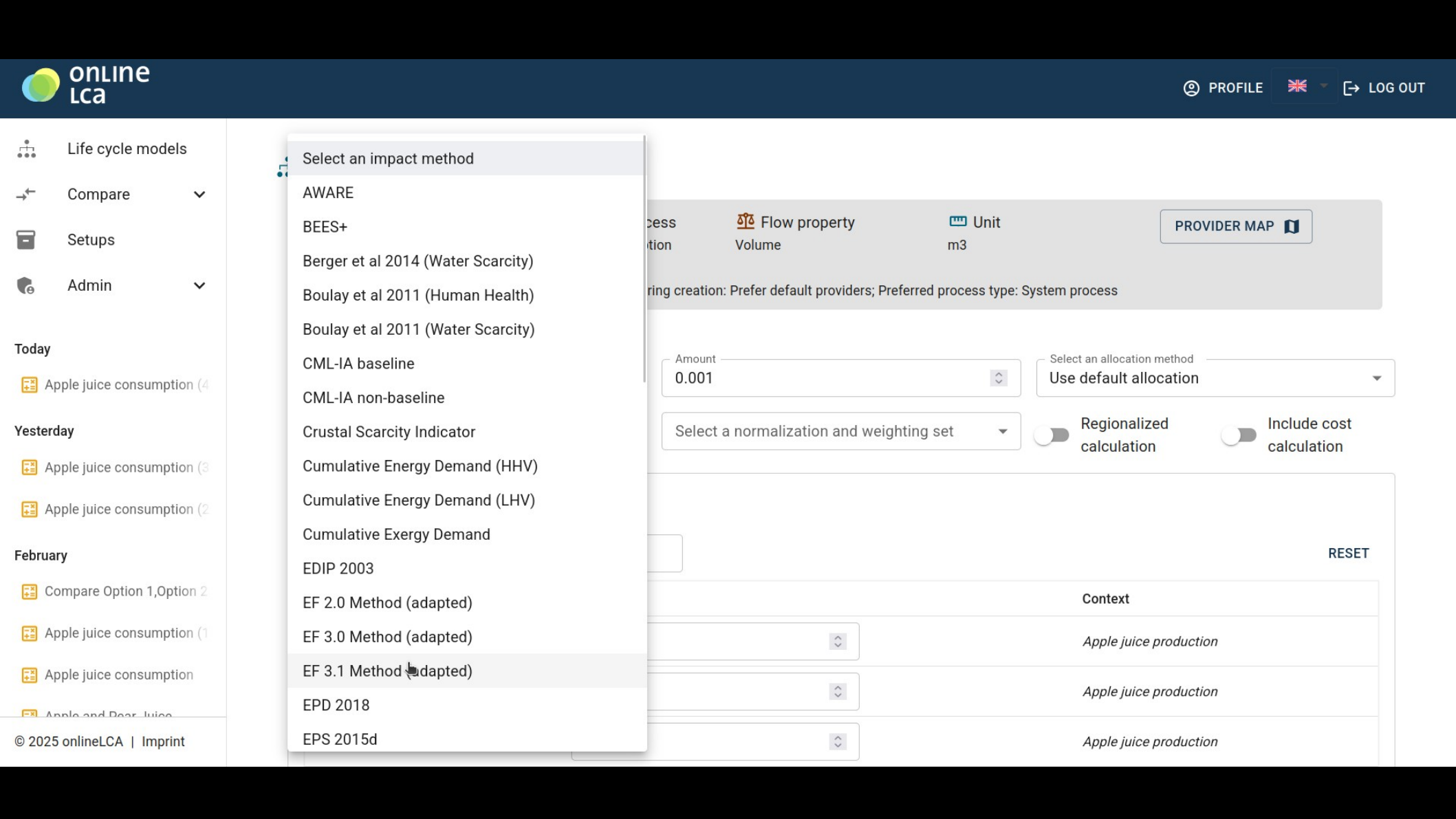
Select an impact method | Select a normalization and weighting set | Regionalized calculation | Include cost calculation

Parameters

Search parameter name or context

RESET

Name	Value	Context
distance_farm1	km 35	*Apple juice production*
distance_farm2	km 25	*Apple juice production*
distance_farm3	km 45	*Apple juice production*


online LCA
PROFILE
LOG OUT
Life cycle models
Compare
Setups
Admin
Today
Apple juice consumption (4
Yesterday
Apple juice consumption (3
Apple juice consumption (2
February
Compare Option 1,Option 2
Apple juice consumption (1
Apple juice consumption
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Select an impact method
AWARE
BEES+
Berger et al 2014 (Water Scarcity)
Boulay et al 2011 (Human Health)
Boulay et al 2011 (Water Scarcity)
CML-IA baseline
CML-IA non-baseline
Crustal Scarcity Indicator
Cumulative Energy Demand (HHV)
Cumulative Energy Demand (LHV)
Cumulative Exergy Demand
EDIP 2003
EF 2.0 Method (adapted)
EF 3.0 Method (adapted)
EF 3.1 Method (adapted)
EPD 2018
EPS 2015d
Flow property
Volume
Unit
m3
PROVIDER MAP
ring creation: Prefer default providers; Preferred process type: System process
Amount
0.001
Select an allocation method
Use default allocation
Select a normalization and weighting set
Regionalized calculation
Include cost calculation
RESET
Context
Apple juice production
Apple juice production
Apple juice production

Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (4

Yesterday
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1,Option 2
Apple juice consumption (1
Apple juice consumption

Apple juice consumption

Category	Reference process	Flow property	Unit
	Apple juice consumption	Volume	m3

PROVIDER MAP

Description
First created: 2024-08-27T12:18:59 Linking approach during creation: Prefer default providers; Preferred process type: System process

CALCULATE | SAVE

Amount: 0.001

Select an allocation method: Use default allocation

Select an impact method: EF 3.1 Method (adapted)

Select a normalization and weighting set

Regionalized calculation

Include cost calculation

Parameters

Search parameter name or context

RESET

Name	Value	Context
distance_farm1	km 35	*Apple juice production*
distance_farm2	km 25	*Apple juice production*
distance_farm3	km 45	*Apple juice production*

Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (6

Yesterday
Apple juice consumption (5
Apple juice consumption (4

This week
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1 Option 2

TOTAL IMPACTS | IMPACT CONTRIBUTION | INVENTORY | CONTRIBUTION TREE | ANALYSIS | SANKEY | REPORT

Impact name	Category	Amount	Unit
Acidification	EF 3.1 Method (adapted)	0.01825	mol H+ eq
Climate change	EF 3.1 Method (adapted)	7.888	kg CO2 eq
Climate change (biogenic)	EF 3.1 Method (adapted)	0.004384	kg CO2 eq
Climate change (fossil)	EF 3.1 Method (adapted)	7.880	kg CO2 eq
Climate change (land use)	EF 3.1 Method (adapted)	0.003849	kg CO2 eq
Ecotoxicity freshwater	EF 3.1 Method (adapted)	55.82	CTUe
Ecotoxicity freshwater (inorganics)	EF 3.1 Method (adapted)	53.37	CTUe
Ecotoxicity freshwater (organics)	EF 3.1 Method (adapted)	2.445	CTUe
Eutrophication freshwater	EF 3.1 Method (adapted)	0.0006122	kg P eq
Eutrophication marine	EF 3.1 Method (adapted)	0.004614	kg N eq
Eutrophication terrestrial	EF 3.1 Method (adapted)	0.04842	mol N eq
Human toxicity cancer	EF 3.1 Method (adapted)	3.870e-9	CTUh
Human toxicity cancer (inorganics)	EF 3.1 Method (adapted)	1.787e-9	CTUh

SAVE AS EXCEL

Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (6

Yesterday
Apple juice consumption (5
Apple juice consumption (4

This week
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1 Option 2

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SAVE AS EXCEL

Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (6

Yesterday
Apple juice consumption (5
Apple juice consumption (4

This week
Apple juice consumption (3
Apple juice consumption (2

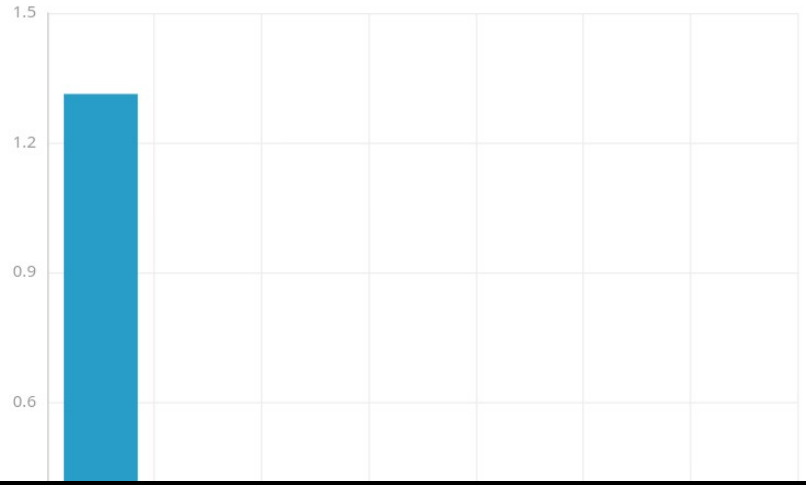
February
Compare Option 1 Option 2

TOTAL IMPACTS | IMPACT CONTRIBUTION | INVENTORY | CONTRIBUTION TREE | ANALYSIS | SANKEY | REPORT

Ecotoxicity freshwater (organics)

Top 7 impact contributions

SAVE AS IMAGE



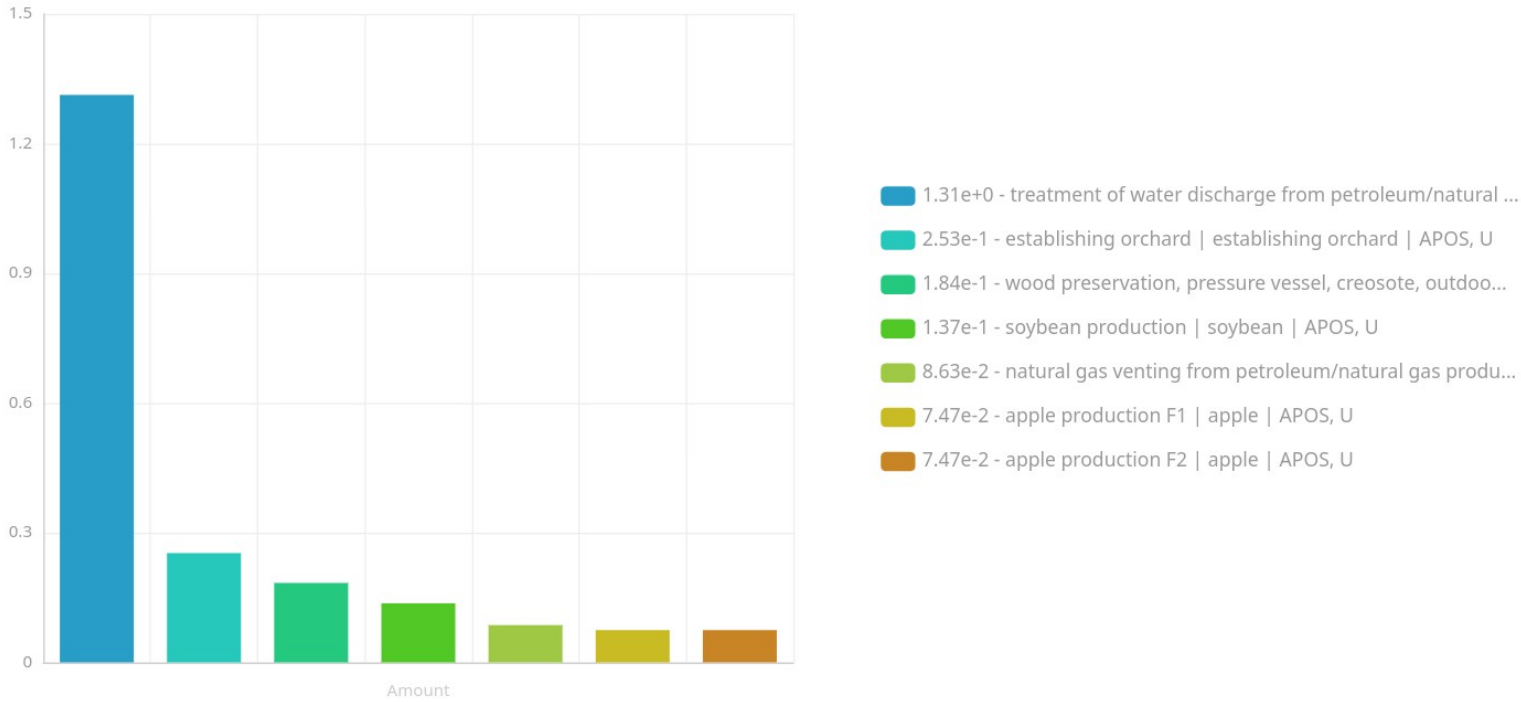
1.31e+0 - treatment of water discharge from petroleum/natural ...
2.53e-1 - establishing orchard | establishing orchard | APOS, U
1.84e-1 - wood preservation, pressure vessel, creosote, outdoo...
1.37e-1 - soybean production | soybean | APOS, U
8.63e-2 - natural gas venting from petroleum/natural gas produ...
7.47e-2 - apple production F1 | apple | APOS, U
7.47e-2 - apple production F2 | apple | APOS, U

Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (6
Yesterday
Apple juice consumption (5
Apple juice consumption (4
This week
Apple juice consumption (3
Apple juice consumption (2
February
Compare Option 1 Option 2

Top 7 impact contributions

SAVE AS IMAGE



Life cycle models
Compare
Setups
Admin

Today
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Apple juice consumption (5
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Apple juice consumption (3
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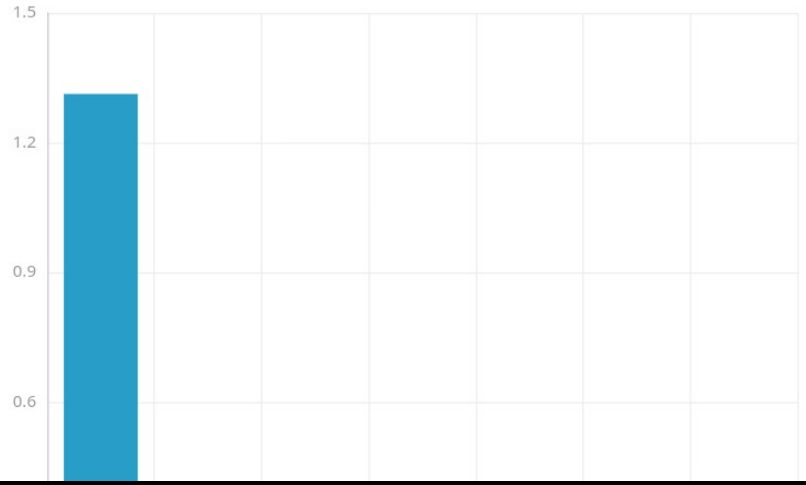
February
Compare Option 1 Option 2

TOTAL IMPACTS | IMPACT CONTRIBUTION | INVENTORY | CONTRIBUTION TREE | ANALYSIS | SANKEY | REPORT

Ecotoxicity freshwater (organics)

Top 7 impact contributions

SAVE AS IMAGE



- 1.31e+0 - treatment of water discharge from petroleum/natural ...
- 2.53e-1 - establishing orchard | establishing orchard | APOS, U
- 1.84e-1 - wood preservation, pressure vessel, creosote, outdoo...
- 1.37e-1 - soybean production | soybean | APOS, U
- 8.63e-2 - natural gas venting from petroleum/natural gas produ...
- 7.47e-2 - apple production F1 | apple | APOS, U
- 7.47e-2 - apple production F2 | apple | APOS, U

Life cycle models
Compare
Setups
Admin

Today
Apple juice consumption (6

Yesterday
Apple juice consumption (5
Apple juice consumption (4

This week
Apple juice consumption (3
Apple juice consumption (2

February
Compare Option 1 Option 2

TOTAL IMPACTS | IMPACT CONTRIBUTION | INVENTORY | CONTRIBUTION TREE | ANALYSIS | SANKEY | REPORT

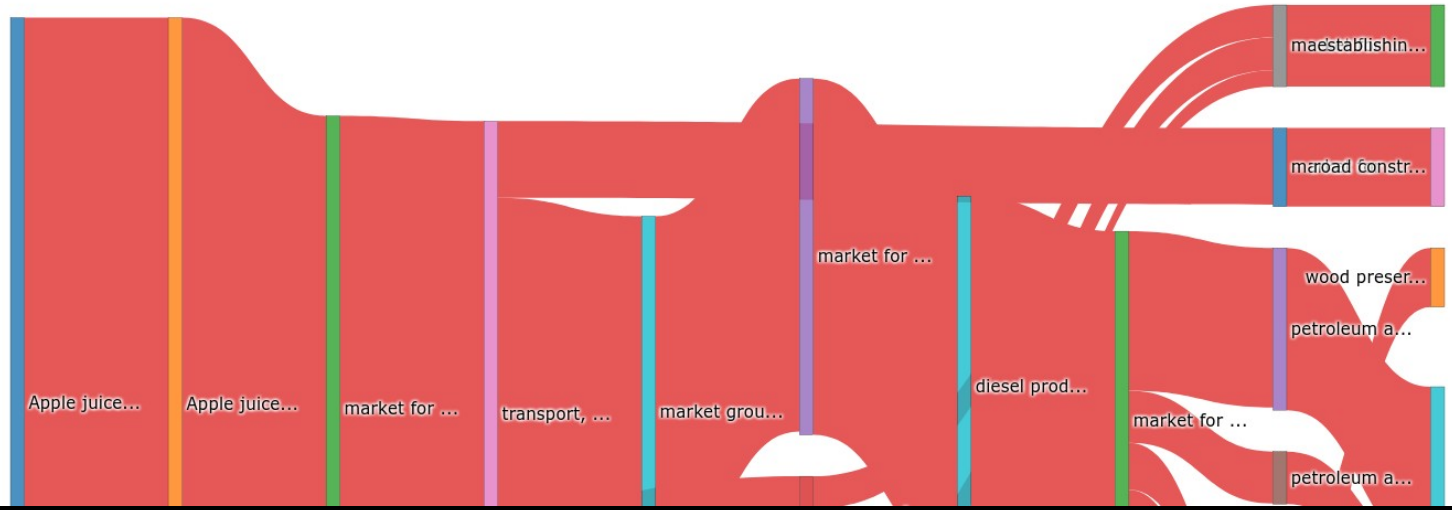
Screen size: small

Impact category: Ecotoxicity freshwater (organics)

Maximum number of nodes: 30

PROVIDER MAP

SAVE AS IMAGE



Life cycle models

Compare

Setups

Admin

Today

Apple juice consumption (6

Yesterday

Apple juice consumption (5

Apple juice consumption (4

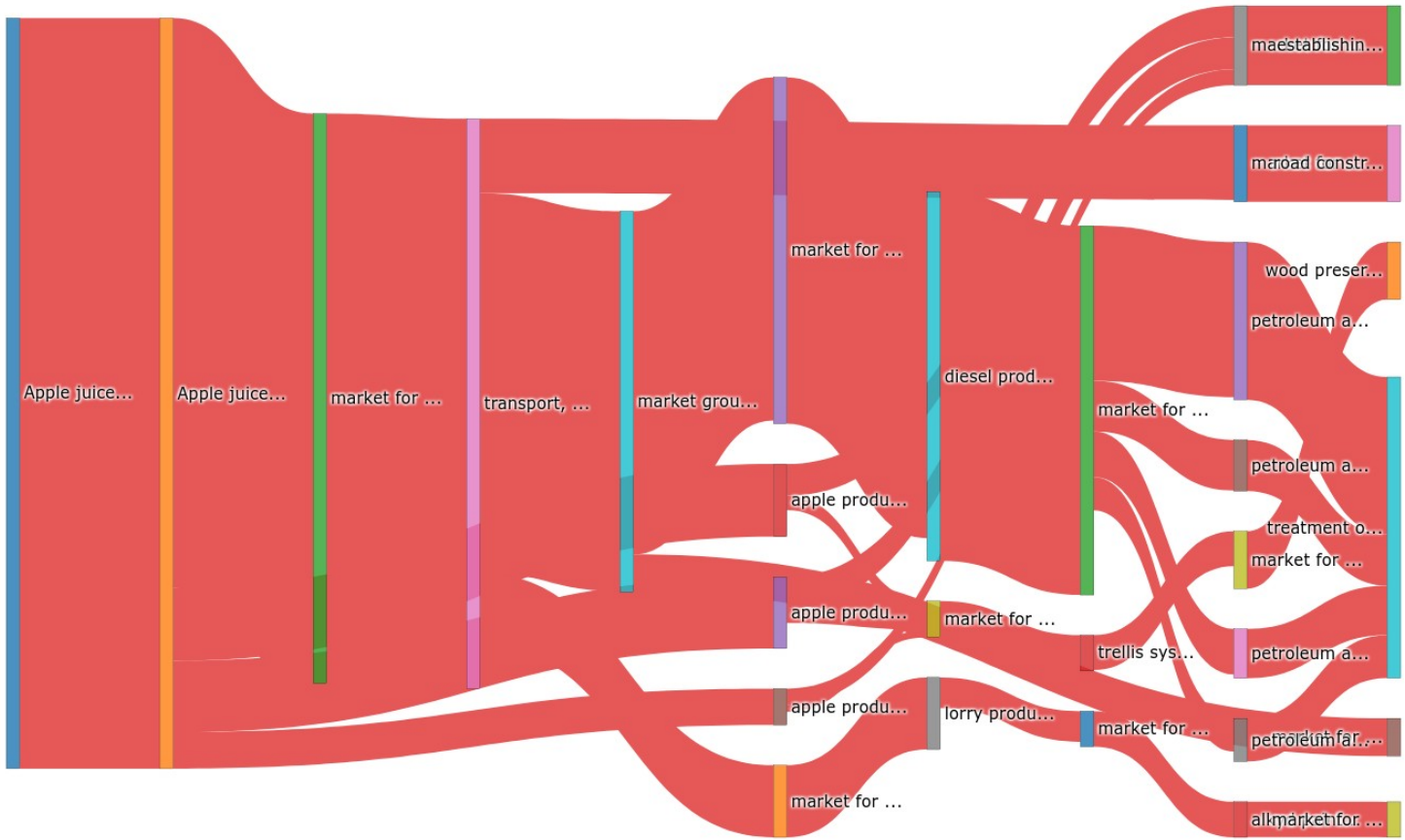
This week

Apple juice consumption (3

Apple juice consumption (2

February

Compare Option 1 Option 2



Life cycle models
Compare
Setups
Admin

Today
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Apple juice consumption (3
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February
Compare Option 1 Option 2

TOTAL IMPACTS | IMPACT CONTRIBUTION | INVENTORY | CONTRIBUTION TREE | ANALYSIS | SANKEY | REPORT

Screen size: small

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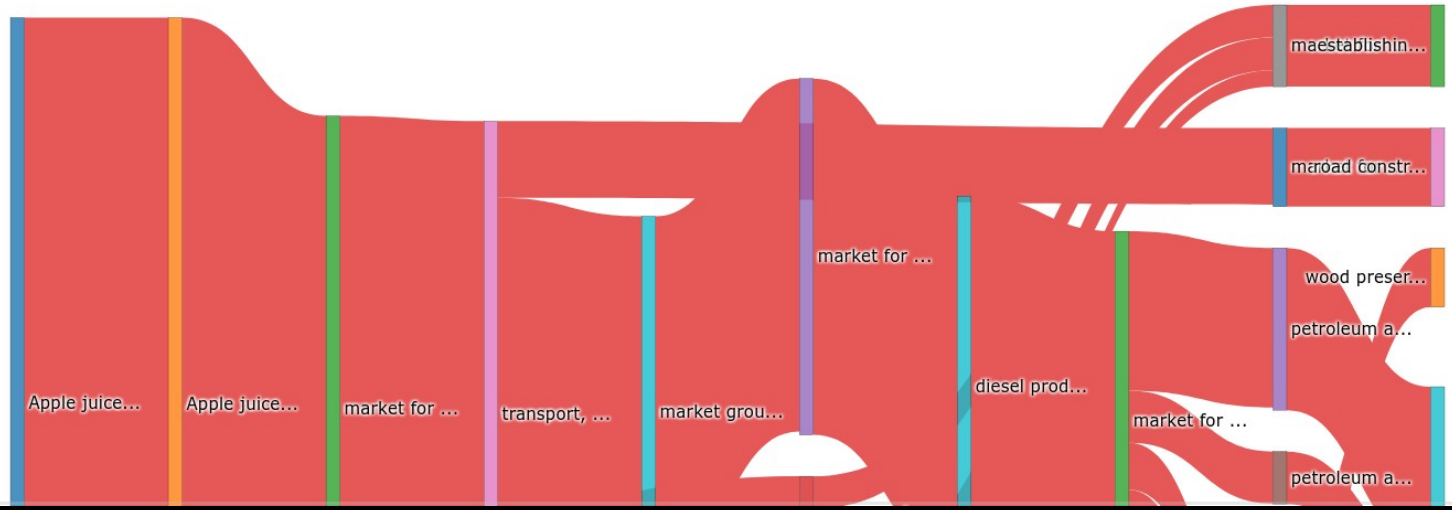
PROVIDER MAP

SAVE AS IMAGE



Life cycle models

Compare

Setups

Admin

Today

Apple juice consumption (6

Yesterday

Apple juice consumption (5

Apple juice consumption (4

This week

Apple juice consumption (3

Apple juice consumption (2

February

Compare Option 1 Option 2

TOTAL IMPACTS IMPACT CONTRIBUTION INVENTORY CONTRIBUTION TREE ANALYSIS SANKEY REPORT

DOWNLOAD REPORT

Reports

GreenDeLTa

12/03/2025

Product system : Apple juice consumption
Impact method : EF 3.1 Method (adapted)

Total impacts table:

Impact name	Category	Amount	Unit
Ecotoxicity freshwater (organics)	EF 3.1 Method (adapted)	2444650.7783879815	CTUe
Ecotoxicity freshwater (inorganics)	EF 3.1 Method (adapted)	53373007.50905302	CTUe
Ionising radiation (human health)	EF 3.1 Method (adapted)	156787.44901515543	kBq U235 eq
Ozone depletion	EF 3.1 Method (adapted)	0.170941571159975	kg CFC11 eq

GreenDeLTa

Life cycle models

Compare

Systems

Categories

Setups

Admin

Today

Apple juice consumption (6

Yesterday

Apple juice consumption (5

Apple juice consumption (4

This week

Apple juice consumption (3

TOTAL IMPACTS IMPACT CONTRIBUTION INVENTORY CONTRIBUTION TREE ANALYSIS SANKEY REPORT

DOWNLOAD REPORT

Life cycle models

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Admin

Today

Apple juice consumption (6

Yesterday

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This week

Apple juice consumption (3

TOTAL IMPACTS IMPACT CONTRIBUTION INVENTORY CONTRIBUTION TREE ANALYSIS SANKEY REPORT

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February

Compare Option 1 Option 2

Compare life cycle models

Comparison setup name: Option 1

Select a product system

Select an allocation method: Use default allocation

Target amount: 0

Comparison setup name: Option 2

Select a product system

Select an allocation method: Use default allocation

Target amount: 0

Add a product system to comparison

Select an impact method

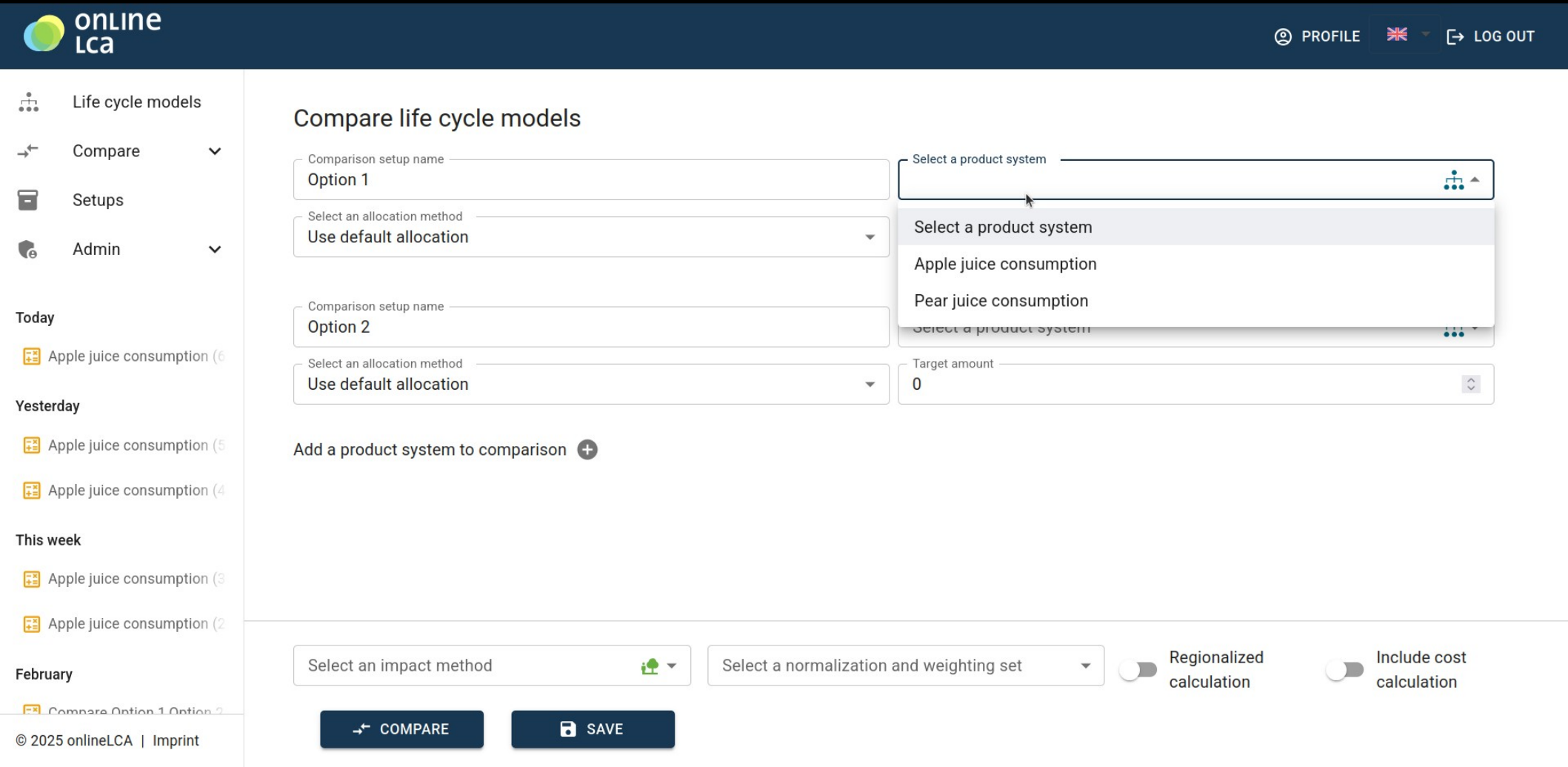
Select a normalization and weighting set

Regionalized calculation

Include cost calculation

COMPARE

SAVE


online LCA
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LOG OUT
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Apple juice consumption (4
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February
Compare Option 1 Option 2
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Compare life cycle models
Comparison setup name
Option 1
Select a product system
Select an allocation method
Use default allocation
Select a product system
Apple juice consumption
Pear juice consumption
Comparison setup name
Option 2
Select an allocation method
Use default allocation
Target amount
0
Add a product system to comparison
Select an impact method
Select a normalization and weighting set
Regionalized calculation
Include cost calculation
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Compare Option 1 Option 2

Compare life cycle models

Comparison setup name: Option 1

Select a product system: Apple juice consumption

Select an allocation method: Use default allocation

Target amount (m3): 0.001

Parameters

Search parameter name or context

RESET

Name	Value	Context
distance_farm1	km 35	*Apple juice production*
distance_farm2	km 25	*Apple juice production*
distance_farm3	km 45	*Apple juice production*
weight_prod1	kg 500	*Apple juice production*

Select an impact method

Select a normalization and weighting set

Regionalized calculation

Include cost calculation

COMPARE

SAVE

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Compare life cycle models

distance_farm2	km 25	*Apple juice production*
distance_farm3	km 45	*Apple juice production*
weight_prod1	kg 500	*Apple juice production*
weight_prod2	kg 500	*Apple juice production*

Comparison setup name: Option 2

Select a product system

Select an allocation method: Use default allocation

- Select a product system
- Apple juice consumption
- Pear juice consumption

Add a product system to comparison

Select an impact method

Select a normalization and weighting set

Regionalized calculation

Include cost calculation

COMPARE

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distance_farm2	km 25	*Apple juice production*
distance_farm3	km 45	*Apple juice production*
weight_prod1	kg 500	*Apple juice production*
weight_prod2	kg 500	*Apple juice production*

Comparison setup name: Option 2

Select a product system: Pear juice consumption

Select an allocation method: Use default allocation

Target amount (m3): 0.001

Parameters

Select an impact method

Select a normalization and weighting set

Regionalized calculation

Include cost calculation

COMPARE

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Compare life cycle models

Parameters

Search parameter name or context

RESET

Name	Value	Context
distance_farm1	km 35	*Pear juice production*
distance_farm2	km 25	*Pear juice production*
weight_prod1	kg 500	*Pear juice production*
weight_prod2	kg 500	*Pear juice production*

Add a product system to comparison

Select an impact method

Select a normalization and weighting set

Regionalized calculation

Include cost calculation

COMPARE

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Life cycle models
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Today
Compare Option 1,Option 2
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Apple juice consumption (4

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Apple juice consumption (3
Apple juice consumption (2

Compare life cycle models

Setup: Compare Option 1,Option 2 (1)

Parameters

Search parameter name or context

RESET

Name	Value	Context
distance_farm1	km 35	*Pear juice production*
* distance_farm2	km 2	*Pear juice production*
weight_prod1	kg 500	*Pear juice production*
weight_prod2	kg 500	*Pear juice production*

Add a product system to comparison

Select an impact method
EF 3.1 Method (adapted)

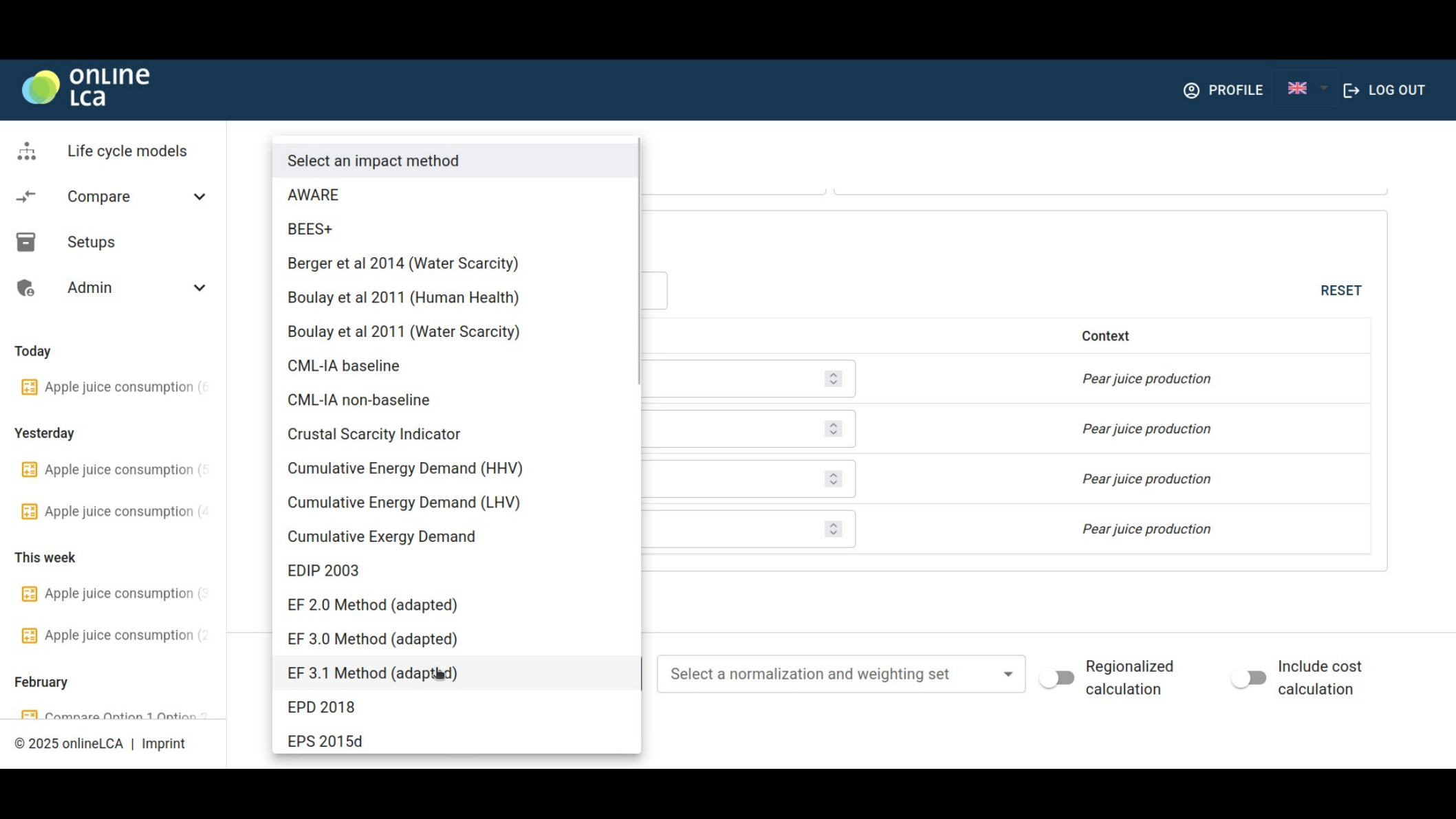
Select a normalization and weighting set

Regionalized calculation

Include cost calculation

COMPARE

SAVE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Compare Option 1 Option 2
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Select an impact method
AWARE
BEES+
Berger et al 2014 (Water Scarcity)
Boulay et al 2011 (Human Health)
Boulay et al 2011 (Water Scarcity)
CML-IA baseline
CML-IA non-baseline
Crustal Scarcity Indicator
Cumulative Energy Demand (HHV)
Cumulative Energy Demand (LHV)
Cumulative Exergy Demand
EDIP 2003
EF 2.0 Method (adapted)
EF 3.0 Method (adapted)
EF 3.1 Method (adapted)
EPD 2018
EPS 2015d
RESET
Context
Pear juice production
Pear juice production
Pear juice production
Pear juice production
Select a normalization and weighting set
Regionalized calculation
Include cost calculation

Life cycle models
Compare
Setups
Admin

Today
Compare Option 1,Option 2
Apple juice consumption (6

Yesterday
Apple juice consumption (5
Apple juice consumption (4

This week
Apple juice consumption (3
Apple juice consumption (2

Compare life cycle models

Setup: Compare Option 1,Option 2 (1)

Parameters

Search parameter name or context

RESET

Name	Value	Context
distance_farm1	km 35	*Pear juice production*
* distance_farm2	km 2	*Pear juice production*
weight_prod1	kg 500	*Pear juice production*
weight_prod2	kg 500	*Pear juice production*

Add a product system to comparison

Select an impact method: EF 3.1 Method (adapted)

Select a normalization and weighting set

Regionalized calculation

Include cost calculation

COMPARE | SAVE

Life cycle models
Compare
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Today
Compare Option 1,Option 2
Apple juice consumption (6

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Apple juice consumption (5
Apple juice consumption (4

This week
Apple juice consumption (3
Apple juice consumption (2

Apple

Apple juice consumption

0.001 m3

Pear

Pear juice consumption

0.001 m3

distance_farm2@Pear juice production: 2

Impact method: EF 3.1 Method (adapted) | Regionalized calculation: No | Include cost calculation: No

TABLE | BAR CHART | PARALLEL CHART

Impact category	Unit	Apple	Pear
Acidification	mol H+ eq	1.83e-2	1.11e-2
Climate change	kg CO2 eq	7.89e+0	3.82e+0
Climate change (biogenic)	kg CO2 eq	4.38e-3	6.29e-3
Climate change (fossil)	kg CO2 eq	7.88e+0	3.68e+0
Climate change (land use)	kg CO2 eq	3.85e-3	1.40e-1
Ecotoxicity freshwater	CTUe	5.58e+1	2.64e+1
Ecotoxicity freshwater (inorganics)	CTUe	5.34e+1	2.50e+1
Ecotoxicity freshwater (organics)	CTUe	2.44e+0	1.39e+0
Eutrophication freshwater	kg P eq	6.12e-4	3.10e-4
Eutrophication marine	kg N eq	4.61e-3	3.48e-3

Life cycle models

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Apple juice consumption (3

Apple juice consumption (2

Apple

Apple juice consumption

0.001 m3

Pear

Pear juice consumption

0.001 m3

distance_farm2@Pear juice production: 2

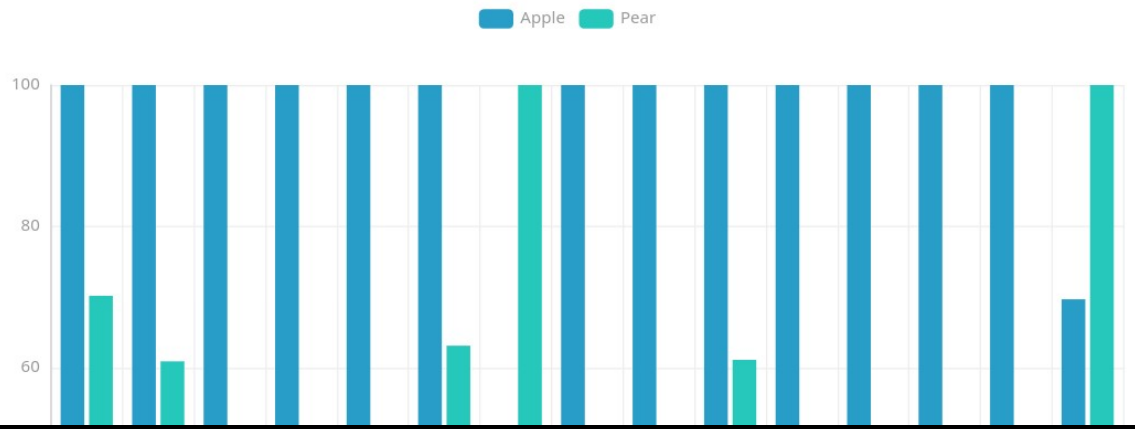
Impact method: EF 3.1 Method (adapted)

Regionalized calculation: No

Include cost calculation: No

TABLE BAR CHART PARALLEL CHART

SAVE AS IMAGE



Life cycle models
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Compare Option 1,Option 2
Apple juice consumption (6

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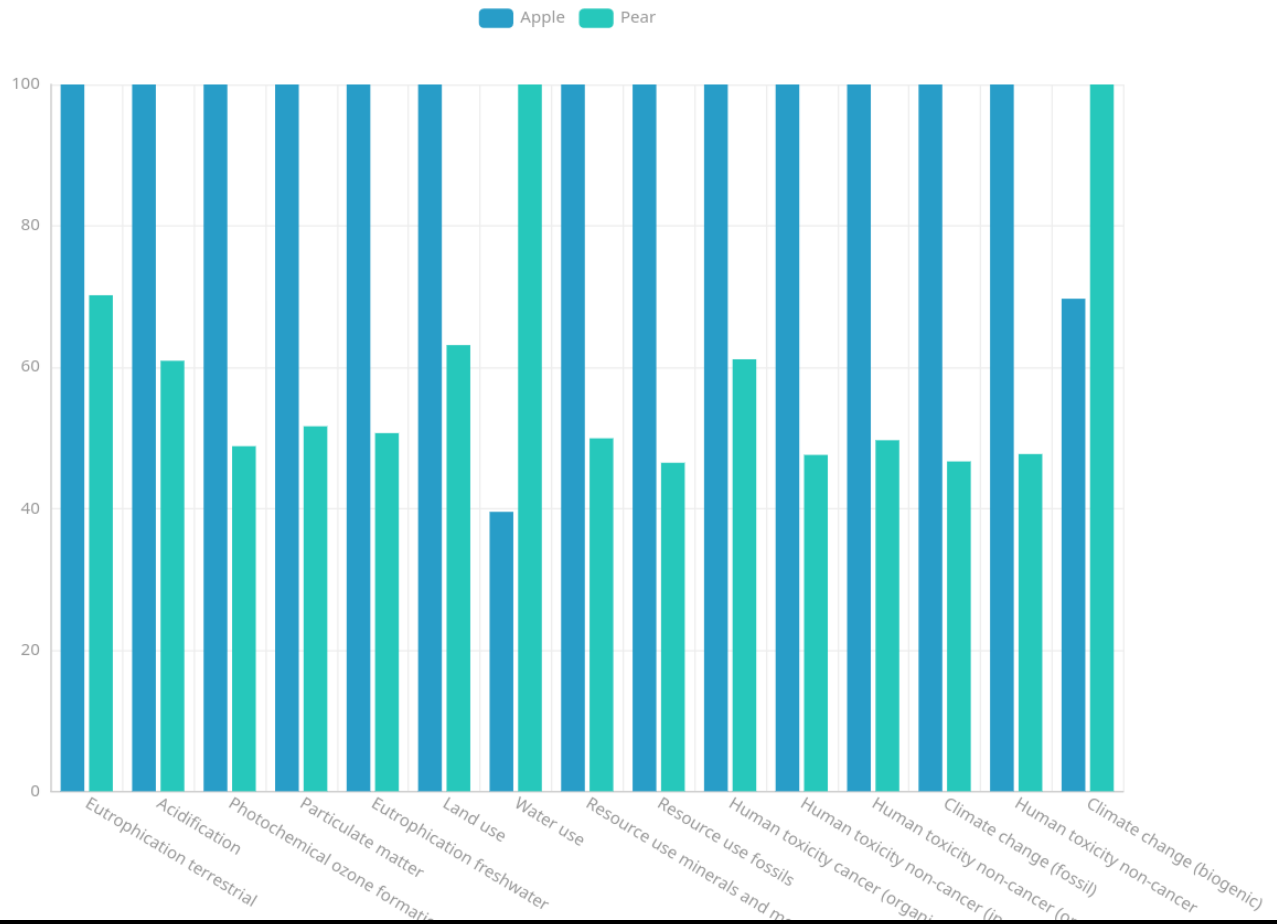

Life cycle models
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Users
Teams
Maintenance

Today
Compare Option 1,Option 2
Apple juice consumption (6

Yesterday
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Apple juice consumption (4

Users

ADD USER

User's email *

Search

	Name	Email	Team	Created	
☐	admin	admin@greendelta.com	Administrator	06/02/2025	DELETE
☐	alice	alice@new-holland.com	New Holland	09/04/2025	DELETE
☐	bob	bob@new-holland.com	New Holland	09/04/2025	DELETE
☐	lerall	lerall@greendelta.com	Administrator	06/02/2025	DELETE
☐	tom	tom@john-deer.com	John Deere	09/04/2025	DELETE

Life cycle models
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Users
Teams
Maintenance

Today
Compare Option 1,Option 2
Apple juice consumption (6

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Apple juice consumption (5
Apple juice consumption (4

Teams

ADD TEAM

Team *

Search

Name	Total members	Created	
Guest	0	06/02/2025	DELETE
John Deere	1	09/04/2025	DELETE
Kubota	0	09/04/2025	DELETE
New Holland	2	09/04/2025	DELETE

Life cycle models
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Maintenance

Today
Compare Option 1,Option 2
Apple juice consumption (6

Yesterday
Apple juice consumption (5
Apple juice consumption (4

K

Kubota

Created: 09/04/2025

Manage team access to features, life cycle models and impact methods

UPDATE TEAM

Features

- [-] Life cycle models
  - [x] Total impacts
  - [x] Impact contribution
  - [ ] Inventory
  - [ ] Contribution tree
  - [ ] Analysis
  - [x] Sankey
  - [ ] Report
- [-] Compare life cycle models
  - [x] Table
  - [x] Bar chart
  - [ ] Parallel chart
- [ ] Compare impact categories
  - [ ] Stacked bar chart
  - [ ] Parallel chart

Life cycle model

Search by name or ID

And more...

- UI *branding*
- connection to external API
- EPD and PCF collection
- more data visualization
- ...

Thank you!

François LE RALL – lerall@greendelta.com

GreenDelta
sustainability consulting + software