



# **REGIS - EcoPerformance DF69: Regionalisation in LCA**

**13<sup>th</sup> September 2018**

## ➔ Regionalization in REGIS

- Introduction
- Concept
- Implementation: Background data, LCIA-methods

## ➔ Rice case study

- Modelling
- Results – AWARE (unknown)
- Conclusion



## REGIS

Since its market launch in 1993 REGIS enables companies to analyse and control their Corporate EcoPerformance. With the REGIS version including ecoinvent 3 users can perform LCA - with special focus on Company-LCA - with regionalised LCI/LCIA.

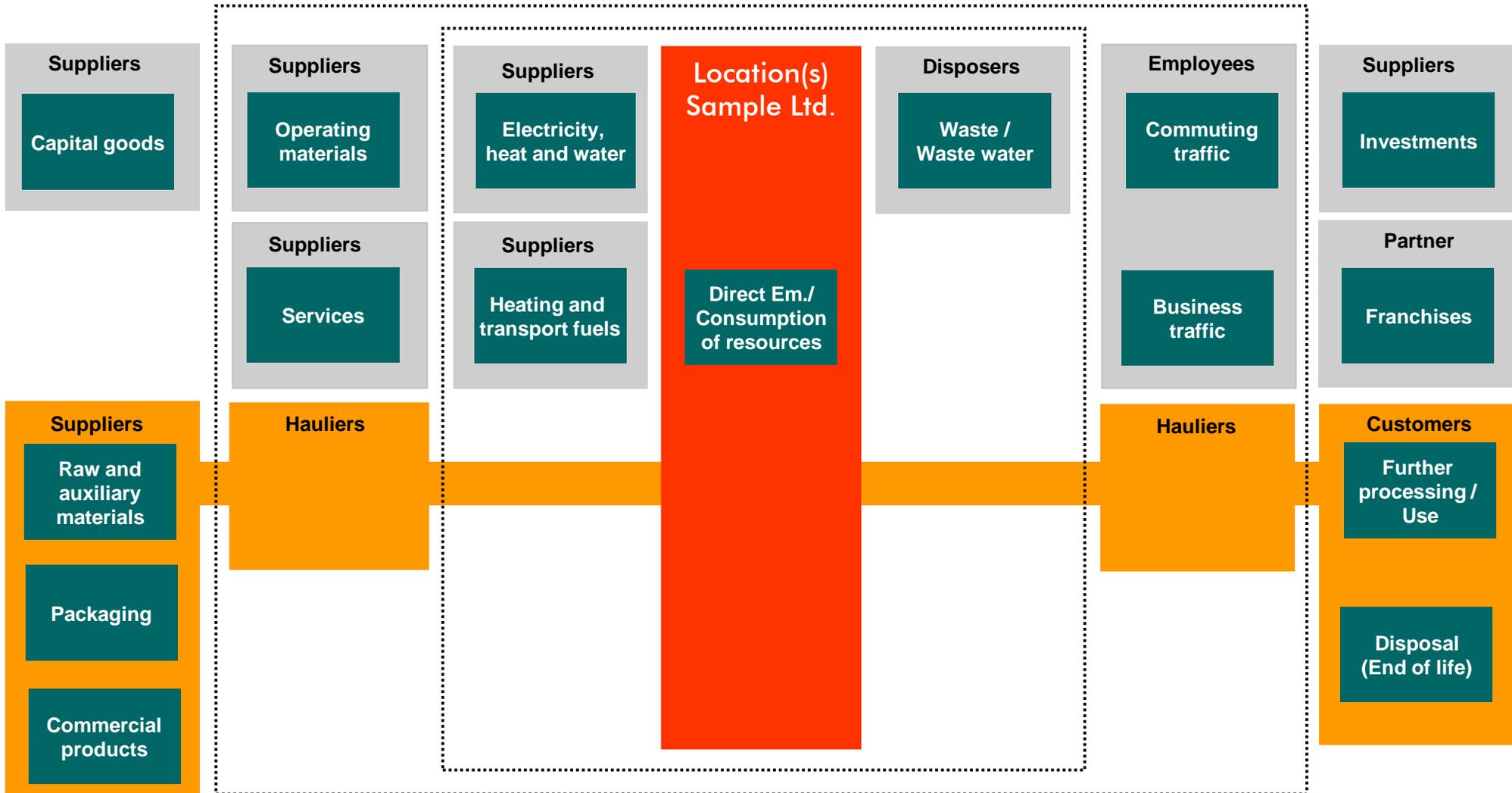
### Provider

→ [sinum](#)

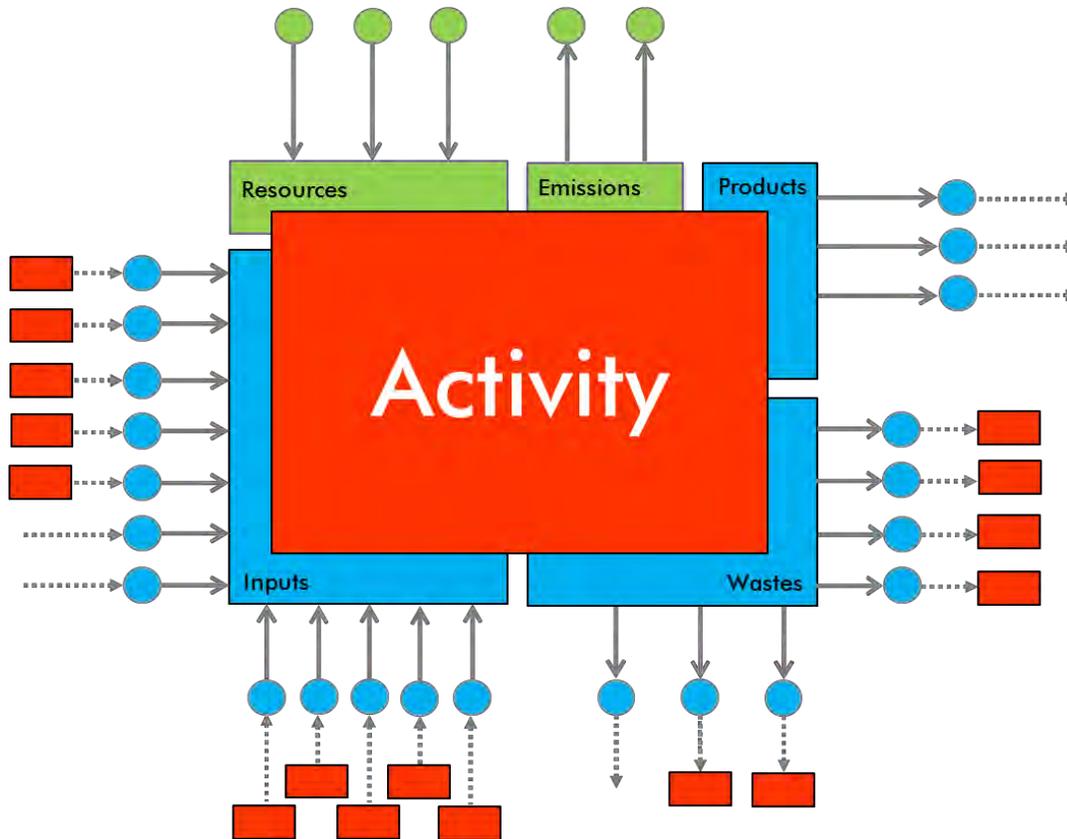
✉ [contact sinum](#)

Quelle: <https://www.ecoinvent.org/partners/resellers/resellers.html>

# REGIS – Corporate Ecoperformance

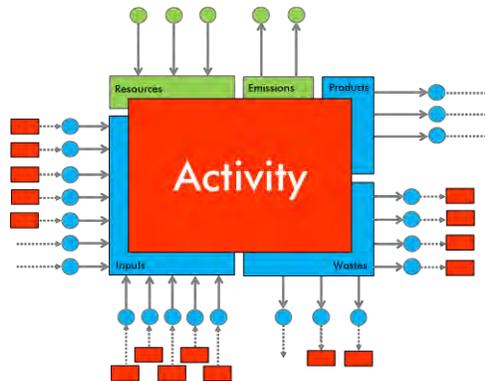


## Concept: Starting point



- Intermediate Exchange
- Elementary Exchange
- Inventory

## Concept: An Activity has a Geography...

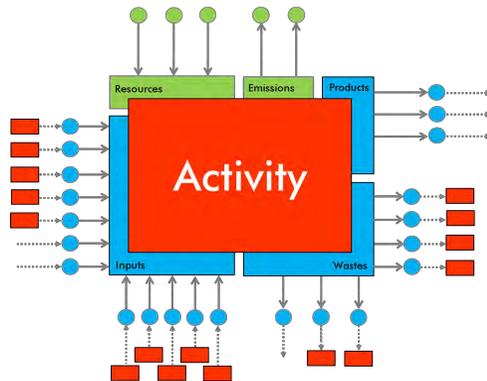


● Elementary Exchange

- Geography
- Time (start and end)
- ....

An Elementary Exchange has a Geography from its Activity.

## Concept: ... and REGIS?



- Geography
- Time (start and end)
- ....

### Modell structures

- Geography

### Production structures

- Geography (Modell structure)
- Time Period

# Implementation: Background data e.g. ecoinvent v35

The screenshot shows the REGIS Expert ECOPRO interface. The main window displays the 'rice production' process with a 'Unit Process Record' table. The table lists various inputs and outputs, including 'water' and 'China'. A red arrow points from the 'China' entry in the table to a detailed view of the background data for 'China'.

Unit Process Record	Menge	Einheit	IPCC2013 R33	UBP2013 R32
Total			0.8053	2159
Inputs			0.4145	590.9
irrigation	0.0225	m3	0.2781	332.2
packaging, for fertilisers or pesticides	0.0384	kg	0.0151	19.64
rice seed, for sowing	0.0256	kg	0.0256	59.54
urea, as N	0.0197	kg	0.0196	43.35
potassium chloride, as K2O	0.0039	kg	0.0179	2.78
phosphate fertilizer, as P2O5	0.0033	kg	0.0065	32.72
transport, tractor and trailer, agricultural	0.0019	metric ton/km	7.153e-4	1.295
application of plant protection product, by field tip	5.85e-4	ha	0.00728	12.37
fertilising, by broadcast	2.94e-4	ha	0.00799	12.80
acetamide-oxidic-compound, unspecified	2.72e-4	kg	0.00187	8.343
(thio)carbamate-compound	1.601e-4	kg	0.00170	3.58
combine harvesting	1.482e-4	ha	0.0242	41.40
tilage, rotary cultivator	1.482e-4	ha	0.0123	19.24
phenoxo-compound	2.61e-5	kg	1.764e-4	0.2446
cyclic-N-compound	1.955e-5	kg	2.990e-4	0.583
glyphosate	1.420e-5	kg	1.804e-4	0.392
organophosphorus-compound, unspecified	1.318e-5	kg	1.066e-4	0.3048
dithioamide-compound	9.680e-6	kg	6.688e-5	0.1872
benzothiazole-compound	3.961e-6	kg	4.586e-5	0.0833
(sulfonyl)urea-compound	3.513e-7	kg	3.964e-6	0.00044
bipyridium-compound	1.789e-7	kg	1.886e-6	0.00072
Resources			0.0	484.3
material resource			0.0	484.3
in air			0.0	0.0
Carbon dioxide, in air	1.465	kg	0.0	0.0
land			0.0	467.5
Transformation, from arable land, unspecified	1.482	m2	0.0	0.0
Transformation, to arable land, unspecified	1.482	m2	0.0	0.0
Occupation, annual crop	1.112	m2/year	0.0	0.0
bottle			0.0	17.08
Energy, gross calorific value, in biomass	15.52	MJ	0.0	17.08
Emissions			0.2907	1393
soil			0.0	29.84
agricultural			0.0	29.84
water			0.0	583.8
ground-			0.0	583.8
surface water			0.0	13.41
Water	0.2623	m3	0.0	0.0
China	0.2623	m3	0.0	0.0
Phosphorus	6.647e-8	kg	0.0	5.813

The detailed view of the background data for 'China' shows the following values:

Category	Value	Unit
Water	0.2623	m3
China	0.2623	m3

Bilanzstoff	Menge	Unit
Water	2.544	m3
water/ocean	4.636e-6	m3
air/non-urban air or from high stacks	0.2977	m3
air/urban air close to ground	3.338e-6	m3
air/low population density, long-term	1.138e-21	m3
air/lower stratosphere + upper troposphere	2.249e-8	m3
air/unspecified	0.008454	m3
water/ground-	0.06791	m3
water/unspecified	1.904	m3
water/surface water	0.2655	m3
<b>China</b>	<b>0.2636</b>	<b>m3</b>
India	0.001433	m3
Rest-of-World	4.011e-4	m3
Canada, Ontario	5.931e-5	m3
United States	1.256e-5	m3
Korea, Republic of	1.054e-5	m3
Romania	9.889e-6	m3
Canada, New Brunswick	3.061e-6	m3
Canada, Québec	4.691e-7	m3
IAI Area, Russia & Europe outside EU27 & EFTA	4.129e-7	m3
IAI Area, EU27 & EFTA	2.624e-7	m3
Northern America	1.198e-7	m3
Philippines	1.075e-7	m3
Switzerland	9.332e-8	m3
IAI Area, South America	8.942e-8	m3
South Africa	6.192e-8	m3
IAI Area, Asia, without China and GCC	5.346e-8	m3
Malaysia	4.761e-8	m3
Oceania	3.758e-8	m3
IAI Area, Africa	3.238e-8	m3
Indonesia	3.196e-8	m3
Europe without Switzerland	1.497e-8	m3
Global	1.439e-8	m3
Europe	3.003e-9	m3
Germany	1.672e-9	m3
France	1.242e-9	m3
United Kingdom	1.054e-9	m3
Brazil	1.035e-9	m3
Colombia	7.326e-10	m3
Italy	6.940e-10	m3
Netherlands	3.387e-10	m3

# Implementation: LCIA-Methods

REGIS Expert ECOPRO

Home rice production AWARE/Waterfootprint/unknown

unknown

- Waterfootprint
- AWARE
- m3

Bilanzstoff	Geo...	Bewert...	Einh...
Water	---	---	m3/m3
Water, cooling, unspecified natural origin	---	---	m3/m3
Water, lake	---	---	m3/m3
Water, river	---	---	m3/m3
Water, turbine use, unspecified natural origin	---	---	m3/m3
Water, unspecified natural origin	---	---	m3/m3
Water, well, in ground	---	---	m3/m3

Bilanzstoff	Geo...	Bewertung	Einh
Water	---	---	m3/m3
Water, cooling, unspecified natural origin	---	---	m3/m3
Water, lake	---	---	m3/m3
Water, river	---	---	m3/m3
natural resource/in water	Afghanistan	57.19815380214224	m3/m3
natural resource/in water	Africa	73.93975049997519	m3/m3
natural resource/in water	Albania	23.118636597356407	m3/m3
natural resource/in water	Algeria	64.45158539058153	m3/m3
natural resource/in water	American ...	4.417533	m3/m3
natural resource/in water	Andorra	74.67043486122297	m3/m3
natural resource/in water	Angola	7.986447695678611	m3/m3
natural resource/in water	Anguilla	22.372088	m3/m3
natural resource/in water	Antigua a...	13.658406832930615	m3/m3
natural resource/in water	Argentina	47.10165372758489	m3/m3
natural resource/in water	Armenia	85.44755126653533	m3/m3
natural resource/in water	Aruba	100.0	m3/m3
natural resource/in water	Asia	43.53393222801793	m3/m3
natural resource/in water	Australia	72.11205683317277	m3/m3
natural resource/in water	Austria	1.2673673120569744	m3/m3
natural resource/in water	Azerbaijan	85.9414943375866	m3/m3
natural resource/in water	Bahamas	24.87966115346229	m3/m3
natural resource/in water	Bahrain	9.930860502024208	m3/m3
natural resource/in water	Bangladesh	2.4319314107312677	m3/m3
natural resource/in water	Barbados	10.519734306570873	m3/m3
natural resource/in water	Belarus	3.3860353411172137	m3/m3
natural resource/in water	Belgium	1.3743537961955457	m3/m3
natural resource/in water	Belize	2.1259026203762375	m3/m3
natural resource/in water	Benin	7.294904621505558	m3/m3
natural resource/in water	Bhutan	1.0283833520111327	m3/m3
natural resource/in water	Bolivia, Pl...	6.623155075573199	m3/m3
natural resource/in water	Bosnia an...	1.1563758215045172	m3/m3
natural resource/in water	Botswana	22.529133883979657	m3/m3
natural resource/in water	Brazil	2.1682711116528424	m3/m3
natural resource/in water	Brunei Dar...	0.22106380243754323	m3/m3
natural resource/in water	Bulgaria	25.628777393557712	m3/m3
natural resource/in water	Burkina Fa...	15.87154179261758	m3/m3
natural resource/in water	Burundi	76.86812959610452	m3/m3
natural resource/in water	Cambodia	6.533328164289387	m3/m3
natural resource/in water	Cameron	8.50741454787697	m3/m3

## ⇒ Regionalization in REGIS

- Introduction
- Concept
- Implementation: Background data, LCIA-methods

## ⇒ Rice case study

- Modelling
- Results – AWARE (unknown)
- Conclusion

# Rice case study – Modelling: Modell structure

REGIS Expert ECOPRO

Home Rice case study

ABC Rice case study

LCA Forum DF69#Rice case study

LCA Forum DF69

Global

2018

Szenario US-CH 2018

Szenario CN 2018

Modellstruktur	Beginn	Ende	Geographie
▲ Rice case study	01.01.2018	---	Global
▲ Consumption Household	01.01.2018	---	Global
▲ Household	01.01.2018	---	China
Input / Materials / Fuels	01.01.2018	---	(China)
white rice cooked, at household			
▲ Household	01.01.2018	---	Switzerland
Input / Materials / Fuels	01.01.2018	---	(Switzerland)
white rice cooked, at household			
▲ Rice production	01.01.2018	---	Global
▲ SupplyChain China	01.01.2018	---	China
▶ Mill	01.01.2018	---	China
▶ Packaging	01.01.2018	---	China
▲ Supermarket	01.01.2018	---	China
Input / Materials / Fuels	01.01.2018	---	(China)
white rice, at supermarket			
▲ SupplyChain US-CH	01.01.2018	---	United States
▶ Mill	01.01.2018	---	United States
▶ Packaging	01.01.2018	---	United States
▲ Supermarket	01.01.2018	---	Switzerland
Input / Materials / Fuels	01.01.2018	---	(Switzerland)
white rice, at supermarket			

# Rice case study – Modelling: Production structure

REGIS Expert ECOPRO

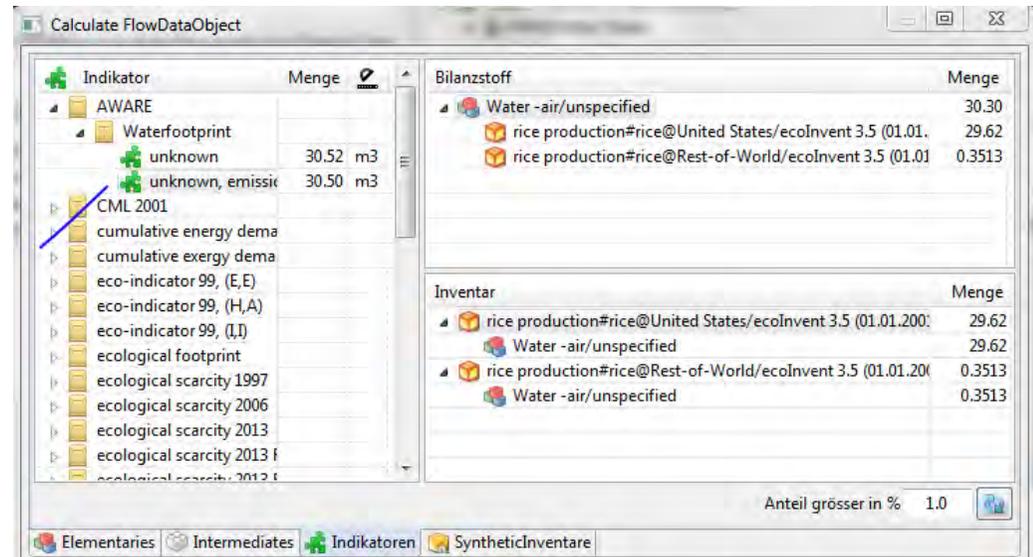
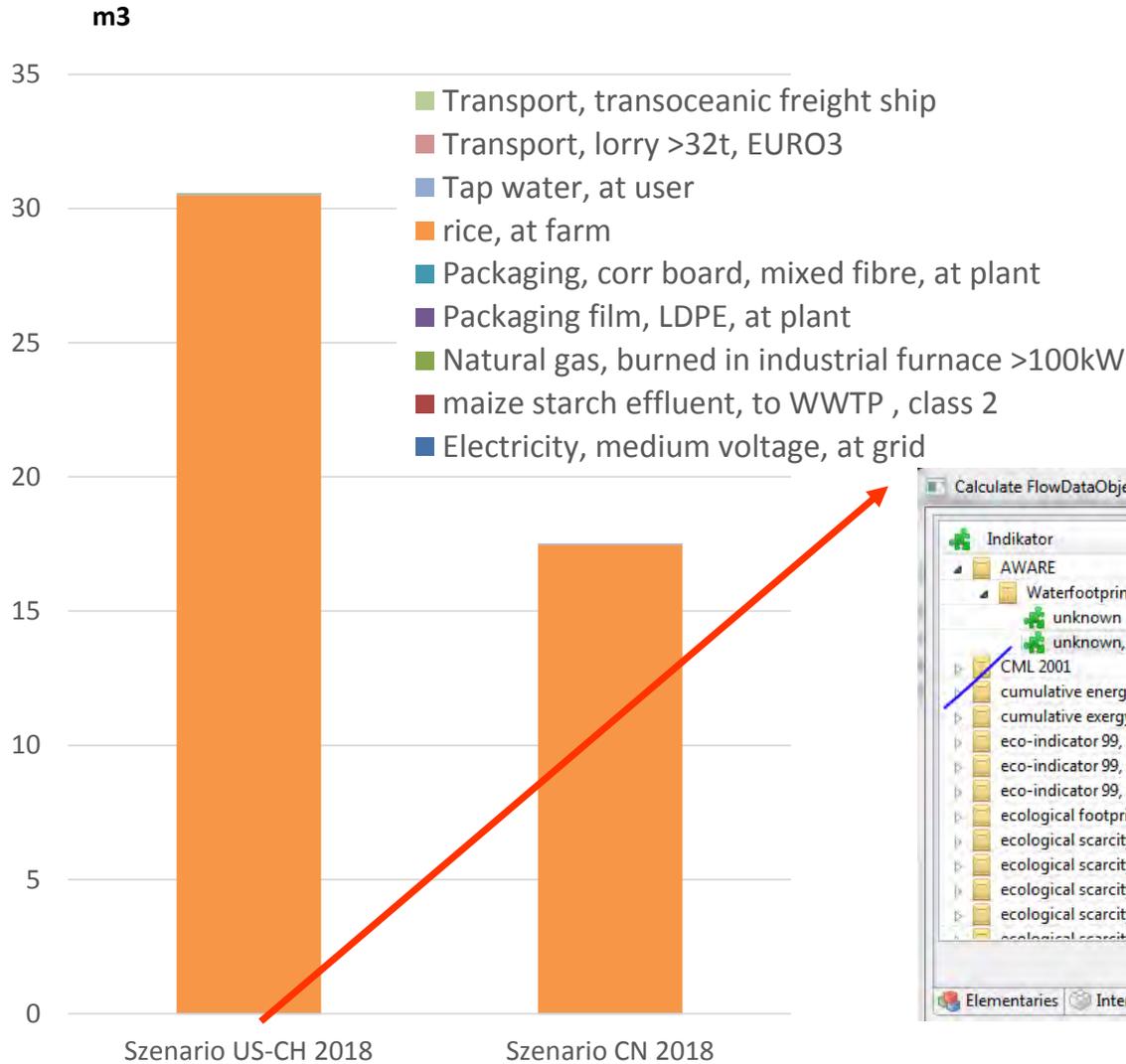
Home Rice case study Rice case study@GLO/2018

Rice case study

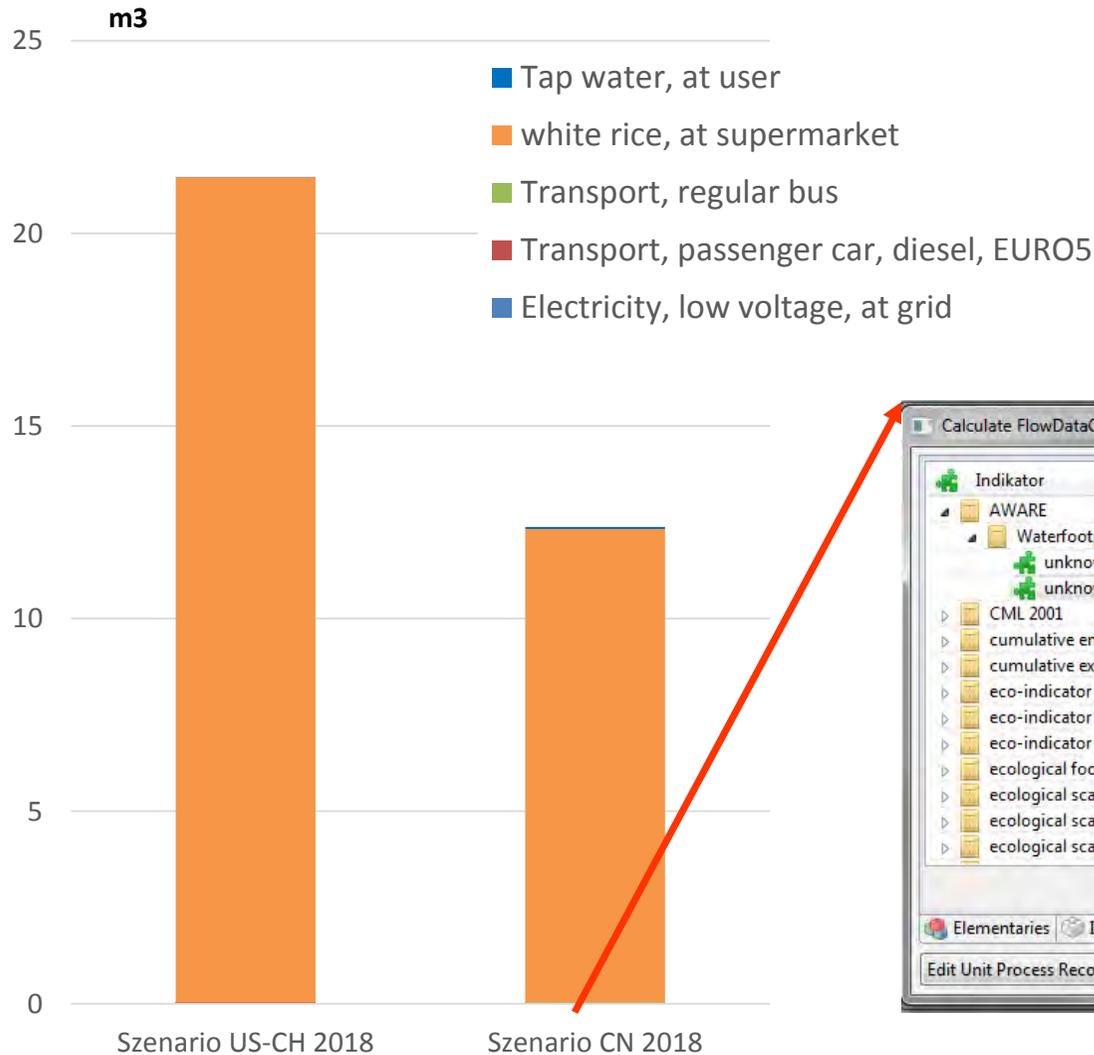
- Global
- LCA Forum DF69#Rice
- 2018
- LCA Forum DF69

Struktur	Eingabe-Wert	Eingabe-Einheit
<ul style="list-style-type: none"> <li>Rice case study@Global           <ul style="list-style-type: none"> <li>Consumption Household@Global               <ul style="list-style-type: none"> <li>Household@China                   <ul style="list-style-type: none"> <li>Input / Materials / Fuels                       <ul style="list-style-type: none"> <li>white rice, at supermarket: 0.7 kg</li> <li>Tap water, at user: 1.1 kg</li> <li>Electricity, low voltage, at grid: 0.3 kWh</li> <li>Transport, regular bus: 0.42 person*km</li> </ul> </li> <li>white rice cooked, at household: 1.0 kg</li> </ul> </li> <li>Household@Switzerland                   <ul style="list-style-type: none"> <li>Input / Materials / Fuels                       <ul style="list-style-type: none"> <li>white rice, at supermarket: 0.7 kg</li> <li>Tap water, at user: 1.1 kg</li> <li>Electricity, low voltage, at grid: 0.3 kWh</li> <li>Transport, passenger car, diesel, EURO5: 0.42 km</li> </ul> </li> <li>white rice cooked, at household: 1.0 kg</li> </ul> </li> </ul> </li> </ul> </li> <li>Rice production@Global           <ul style="list-style-type: none"> <li>SupplyChain China@China               <ul style="list-style-type: none"> <li>Mill@China                   <ul style="list-style-type: none"> <li>Input / Materials / Fuels                       <ul style="list-style-type: none"> <li>Electricity, medium voltage, at grid: 0.1737 kWh</li> <li>rice, at farm: 1.3441 kg</li> <li>Transport, lorry &gt;32t, EURO3: 0.06720 metric ton*km</li> <li>Tap water, at user: 0.9744 kg</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul>		

# Results, AWARE (unknown) - Rice production: white rice@supermarket



# Results, AWARE (unknown) - Consumption: white rice, cooked@household



Calculate FlowDataObject

Indikator	Menge	Einheit
AWARE		
Waterfootprint		
unknown	12.37	m3
unknown, emis	12.27	m3
CML 2001		
cumulative energy den		
cumulative exergy den		
eco-indicator 99, (E,E)		
eco-indicator 99, (H,A)		
eco-indicator 99, (I,I)		
ecological footprint		
ecological scarcity 199:		
ecological scarcity 200:		
ecological scarcity 201:		

Bilanzstoff	Menge
Water -air/non-urban air or from high stacks	11.86
rice production#rice@China/ecoInvent 3.5 (01.01.2009 - 3	11.82
Water -air/unspecified	0.4113
rice production#rice@Rest-of-World/ecoInvent 3.5 (01.01	0.1871

Inventar	Menge
rice production#rice@China/ecoInvent 3.5 (01.01.2009 - 31.12	11.82
Water -air/non-urban air or from high stacks	11.82
rice production#rice@Rest-of-World/ecoInvent 3.5 (01.01.200	0.1871
Water -air/unspecified	0.1871

Anteil grösser in % 1

Elementaries Intermediates Indikatoren Syntheticinventare

Edit Unit Process Record

- ➔ LCI: Regionalization is given via the Geography of the Activity/UPR
- ➔ LCIA: Fall back to GLO for unknown Geography



Thank you for your attention

sinum AG  
**Martin Kilga**



Redingstrasse 6  
CH-9000 St. Gallen  
+41 71 223 81 81  
[martin.kilga@sinum.com](mailto:martin.kilga@sinum.com)