SPIonWeb

Advanced Sustainable Process Index calculation software

Step-by-step Guide

1 Introduction

SPIonWeb is free software calculating the ecological pressure of a technical process along the whole life cycle, including raw materials as well as all emissions and wastes. It rates the ecological impact with the Ecological Footprint according to the Sustainable Process Index (SPI) method as well as regarding to carbon dioxide emission and Global Warming Potential (GWP).

This quick reference guide is intended to give a quick overview for handling and features of SPIonWeb. For a more detailed description and background information the reader is kindly referred to the manual. This quick reference guide should help you to have an easy start with SPIonWeb. The use of the software is explained using a simple example.

2 Step-by-step introduction

SPIonWeb may be started following the link <u>spionweb.tugraz.at</u>, leading to a homepage which contains some methodological background information, references, links and contact information and of course the SPIonWeb calculator. To start calculating the ecological impact of processes you have to create an account by signing up with a valid email address. This is necessary because every user has its own project database containing previously generated processes, which are stored on the server for easy access and management. After a successful sign up procedure and logging in, a navigation bar is shown on the top, which grants access to all important option within SPIonWeb (Figure 1).

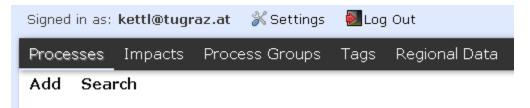


Figure 1: Personal environment

This guide focuses on the red highlighted *Processes* option, which is used to show an overview of user defined processes for this account and create new processes.

2.1 Process description

According Figure 2 a click on *Add* will start the procedure to calculate the ecological impact of processes and lead you to Figure 3, defining general process information.

	Signed in as: kettl@tug	raz.at 🛛 💥 Settin	igs 🛛 💹 Log out		
	Dashboard Tags	Regional Data	Processes		
1	Add Search				
					Proces
	Filter by Proce	isses 💌			
	Name	\$	Regi	ion +	

Figure 2: Adding Processes

Search allows browsing your previously defined user processes or core processes which are provided already by SPIonWeb.

Back Save		New SPI Process		
Process Data			Regional Da	ta
Core Process	_		Region:	Europe 💌
Name	Process 1		Water	y _w : 983.000 [mm/a]
Description	Test pracess for the quick reference guide		Soil	r: 0.300 Rw: 294.900 [kg/m ² .a] ys: 0.750 [kg/m ² .a]
Reference	Literature Source #1			1: 0.560
Restricted?				R _s : 0.420 [kg/m ² .a]
		Impressum		

Figure 3: Process description

The following items may be defined to create a new process (bold letters indicate required fields):

- <u>Name:</u> The process name which is unique for this process. (Try to use a nomenclature for yourself, which is helpful to keep an overview)
- <u>Description</u>: Here you can place some relevant information for this specific process
- <u>Reference:</u> Data sources should be mentioned here
- <u>Regional Data</u>: For every process a different location can be chosen, which influences the calculation of the SPI value. The dropdown box gives you a list of predefined locations. This list can be extended through the tab *Regional Data* on the navigation bar

A click on *Save* will complete the general process information part and guides directly to the Inventory definition. Figure 4 shows the inventory definition for processes in the *Process Details* sheet.

First define at least one tag (red box). This makes categorization of processes easier (e.g. transportation, energy production, agriculture). Users are also able to create their own tags which can be accessed through the navigation bar on the top.

In the next step (green box) one primary product/service must be defined which is provided by the process. All product names must be unique to the process in order to avoid compromising existing processes!!

An appropriate reference unit has to be chosen (e.g. kg, km, m³). Please be aware that every input to the inventory of this process has to be related to 1 unit of the primary product. It is also possible to add more products, thinking of side or waste streams. Again all secondary product names must be unique to the process! Please be aware that every secondary product of this process has to be related to 1 unit of the primary product.

Back Copy Delete	Results							
			Process	Details 🚥				
Process Data					R	egional [Data	
SPI Index	0.000				F	egion:	Europe 🔽	
Name	Process 1					Vater		0 [mm/a]
Description	Test process for the quick re	ference guide					r: 0.30	
							Rw: 294.900	
							294.900	[Kg/III .d]
					/ S	oil	ys: 0.75	0 [kg/m ² .a]
Reference	Literature Source #1						l: 0.56	0
Restricted?							Rs: 0.420 [kg]/m².a]
	12/18/2012 12:02							
Tags	Add X Test processes							
Footprint SPI Cate	gories				uts			
Q Zoom				Q Zoom				
Outputs								
🐈 New Product								
Products								
Name		♦ Main ♦ product3	, Unit	Inventory + a	a _{tot} [m².a/Unit] ♦ a	_{part} [m².a/Ur	nit] ¢ K	¢
				• 1.0	1			Save 🗙 Clos
Included in 0 other proce	sses.							
Inputs					1			
💠 Add Sub-Process 🗧	Add Sub-Process (Advanced	Search) 🌳 Add	Impact 🛛 🌳 Add In	npact (Advanced Search)				
Sub-Processes								
Name		¢ Unit	Inventory	\$ \$\mathbf{y}_{spec} [m^2.a/q]\$	¢ a _{part} [m ² .a/Unit]	¢ Share	¢
Impacts								
Name		♦ Unit	Inventory	♦ ¥ _{spec} [m ² .a/q]	♦ a _{part} (m ² .a/Unit]	¢ Share	

Figure 4: Process definition

If more than one product has been defined (Figure 5) the option *Allocation type* pops up. There are three different allocation methods:

Process Data			Regional Da	Regional Data				
SPI Index	0.000				Region:	Eur	rope 💌	
Name	Process 1				Water	yw:	983.000 [mm/a]	
Description	Test process for the quick reference	guide				r:	0.300	
						R _W :	294.900 [kq/m ² .a]	
						1.200	294.900 [kg/m=.a]	
					/ Soil	y _s :	0.750 [kg/m ² .a]	
Reference	Literature Source #1					В	0.560	
Allocation Type	primary 💌					R _S :	0.420 [kg/m ² .a]	
Restricted?								
-	12/12/2012 12:53							
Tags	Add							
	X Test processes							
- Footprint SPI Categor	ies			Footprint Inputs				
🔍 Zoom				Q Zoom				
Outputs								
🛉 New Product								
Products								
Name		Main product?	Unit	Inventory \$ a_{tot} [m ² .a/U	a _{part} hit]¢ [m ² .a/Unit	¢	К \$	
Test product 1	/	۲	kg 💌	1.0	0.0	0.0	1.000	X Delete
Test product 2	/	0	kg 💌	0.500	0.0	0.0	0.0	X Delete
Included in 0 other proce	esses.							

Figure 5: Allocation methods

- <u>Primary:</u> Regardless how much products are defined, the whole footprint will be assigned to the primary product
- <u>Output:</u> the ecological pressure will be shared between the products according to the ratio of output of all products (Green box, Figure 5),. (Be aware that this allocation method is only available if all products are within the same group of units e.g. g, kg, t or cm³, dm³, m³ or KJ, kWh)
- <u>Price:</u> For every product a *price per unit* [\$/unit, €/unit,...] has to be defined. The ecological pressure is then shared according to the profit which can be gained for each.

2.2 Process inventory definition

After defining the products of the process inputs and emissions can be added step by step. There are two major inventory types: *Sub-Processes*, which are already existing processes providing input to the process. This **allows linking processes to process chains and creating the life cycle**. *Impacts* are emissions into the compartments air, water and soil.

Through Add Sub-Process or Add Impact both inventory types can be added to the process. Dynamically the SPI value will be calculated whenever an inventory constituent is added. Both options are adequate if the user is already familiar with the process names. For newbies the Add Sub-Process (Advanced Search) or Add Sub-Process (Advanced Search) option may be more useful, because of extended search functions along multiple criteria (e.g. previously mentioned tags).

Figure 6 shows a simple example of a Process 1 with two test products as output and two sub-processes as input. Additionally one emission into every compartment has been defined. (Remember: Every value along the column *Inventory* is related to 1 kg of Test product 1).

Area A shows two sub-processes which are inputs to produce Test product 1 and 2. y_{spec} shows the SPI footprint for 1 unit of the sub-process (e.g. 1 kWh of Net electricity, EU-27, medium voltage has a SPI value of 260.4 m²). a_{part} gives the result of the multiplication of inventory and y_{spec} . Additionally the actual contribution to the whole SPI value is shown in percent. The sign on the very left side (CORE or USER) indicates if the sub-process is a core process given by the program or a user defined process.

Area B shows three different emissions (*impacts*) caused by the process. The color on the left hand side indicates the compartment in which the emission is going to. Having a close look at Figure 6, reveals that some impacts are ignored for the calculation (grey) of the dissipation area. The reason is the evaluation method of the key emission area explained in more detail in the manual.

Area C gives instant information about the 7 SPI categories along the whole life cycle chain (left) and the share of contribution to the SPI value between sub-processes and impacts.

Area D shows the absolute footprint depending on the allocation method chosen above. a_{tot} gives the ecological footprint per unit for each product, whereas a_{part} gives the footprint for the given amount of each product within the process.

Area E provides information if this process is included already as sub-process to another one. A click shows the linkage information and gives the possibility to follow the chain of life cycle towards the next higher level. Clicking on sub-processes, the life cycle chain can be followed towards the opposite direction.

Area F shows some action options. *Back* will bring the processes page, where all user defined processes are listed. *Copy* allows copying the whole process, which can be useful if many similar processes have to be added. Please note that during the copy action, tags, process name and products have to be adjusted to avoid multiple entries to the database. *Delete* removes the given process from the database under the condition that it is not part of any other life cycle chain. If there are any links to other processes, these links have to be removed to be able to delete processes. *Results* opens up a new page which gives detailed information about the process.

Area G provides information about the linkage of this specific process to other processes. Showing a process within a process chain is like zooming into one chain link. Sub-Processes giving backward linking information, whereas forward linking information can be seen from **Area G**.

Dashboard Tags R	egional Data Processes				Admin: U	nits Imp	acts Core Proce	sses	Tags Regional	Data Settings
Back Copy Delete	Results									
F				Process	Details 🔤	R				
Process Data							Regional	Data		
SPI Index	0.103						Region:	Eu	rope 🔽	
Name	Process 1						Water	yw:	983.000 [mm	/a]
Description	Test process for the quick r	eferen	ice guide					r		
								R _w :	294.900 [kg/m	² .a]
							Soil	y _s :	0.750 [kg/i	m ² .a]
Reference	Literature Source #1							Ь	0.560	
Allocation Type	primary 💌							R _s :	0.420 [kg/m ² .	a]
Restricted?										
Last Update Tags	12/18/2012 12:25									
1392	X Test processes									
Footprint SPI Cate					Footprint I	anute				
	egones				Q Zoom	iputs				
		Air							Water	
	13.8%	Foss Soil	sil-C				15.5%		Net electricity medium volta	EU-27,
		Wat							Sodium Hydro (NaOH)	
		Oth	er						(HaOH)	
	39.9%									
Outputs New Product										
Products										
Name			Main product?	Unit	Inventory (a _{tot} [m².	[m².a/Un	a) •	к •	
Test product 1		1	۲	kg 🔽] 1.0	D 344	8.795 3448	.795	1.000	💥 Delete
Test product 2		1	0	kg 💌	0.500		0.0	0.0	0.0	💢 Delete
Included in 0 other pr	ocesses.									
Inputs										
💠 Add Sub-Process	🛉 Add Sub-Process (Advanc	ed Se	arch) 🔶	Add Impact 🝦	Add Impact (Adv	anced Sea	irch)			
Sub-Processes										
Name	•		Unit	Inventory	• y _{spec} [m ² .a	ı/q] ∳	a _{part} [m ² .a/Unit]	•	Share ø	
	U-27, medium voltage	kWł		10.0000	-	260.390	2603		75.5%	💥 Delete
CORE Sodium Hydrox	-	kg	*	2.00000	-	86.662		.324	5.0%	💥 Delete
Impacts										
	•		Unit	Invontore	• y_{spec} [m².	ı/q] ∳	a _{part} [m ² .a/Unit]	•	Share ø	
tisme D.	•	kg		Inventory 2.000000	-	222,000	-	.000	Share •	💥 Delete
Hg (water)		mg	*	150.0000	-			.647	14.7%	X Delete
Zn (soil)		mg	~	65.0000	-			.516	0.0%	X Delete
		ı — Ś			-1				-	

Figure 6: Inventory definition

2.3 Process results

Every process can be viewed in detail through a click on *Results* at Area F in Figure 6.

2.3.1 Process Graph

Process Results	
Process Data	Regional Data
Name Process 1 Description Test process for the quick reference guide Reference Literature Source #1	Water y _W : 983.000 mm/a r: 0.300 Rw: 294.900 kg/m ² .a
	Soil Ys: 0.750 kg/m ² .a I: 0.560 R _s : 0.420 kg/m ² .a
Process Graph	
Preview: Cd (soil) 65.00 [mg/kg] CH4 2.00 [kg/kg] Hg (water) Base Unit: [kg] Allocation Type: primary Vet electricity EU-27, medium voltage 10.00 [kWh/kg] Sodium Hydroxide (NaOH)	Configuration: Format: svg V 0 Algorithm: dot V 0 Font Size: 10 V 0 Show: O No Impacts 0 Everything 0 Level: All 0 Up to: 1 V 0 Submit

Figure 7: Process Results - Process Graph

A process graph is generated automatically, depending on the process structure. This may however take some calculation time.

Zoom always opens up a separate window, where the graph can be viewed as standalone graphics. Through the configuration box on the right part of the screen, adjustments can be made to trigger changes in the way the graph is generated.

Format allows choosing between SVG (Scalable Vector Graphics), PNG (Portable Network Graphics) and JPEG (Joint Photographic Experts Group). If a manipulation of the process graph in a 3rd party program is needed, SVG is the recommended format. If many sub-processes are involved the amount of boxes increases and makes it difficult to draw an automated graph.

7

Algorithm offers 3 different methods (dot, circo and neato) to draw a process graph. Depending on the process structure the best drawing algorithm can be one of these.

Font size allows adjusting the size of the text labeling the processes within the process graph.

Show offers two different options. By default, impacts are only displayed for this actual process (within the process graph). If *Show - Everything* is selected, for every sub-process impacts will be included. This leads quite often to excessive huge graphs.

Level allows adjusting the depth of the graph. Level 1 represents the actual process. Sub-processes to this process are Level 2 and sub-processes to level 2 processes are Level 3 and so on.

2.3.2 Hot-Spot Graph

The second part of the results is focused on visualization of the 7 SPI categories. Level 1 and 2 is shown in the diagram, to get a picture about the relation between subprocesses contributing to the final footprint of the Level 1 process.

lotSp Zoon	n						6
	8.	000					
							Soil
	6,	000					Renewable
							Non-Renewa.
	4,	000					Fossil-C
							Area
	2	000					Air
	2,						
			m Hydroxide (N	JaOH) 2.1 N	et electricity EU-27	, 1.1 Test produc	t 2
		Hydroxide Production			nedium voltage	,	
Detail .evel:	O All	6 to: 2 6					≡ Show
.evel:	O All	0 to: 2 0			CO ₂	GWP	
.evel: Level	○ All ⊙ Up	to: 2 0	Unit	Inventory	CO2 [kg]	GWP [kg]	æsher [m².a]
	○ All	to: 2 0 Process			[kg]	[kg]	ā _{part} [m ² .a]
.evel: Level	 ○ All ⊙ Up 1.1 F II T 	to: 2 0 Process Process 1 Fest product 2	kg 💌	1.0			a _{part} (m ² .a) 6897.590
.evel: Level	 ○ All ⊙ Up 1.1 F III T 	To: 2 0 Process Process 1 Test product 2 Cd (soil)	kg 💌	1.0	[kg]	[kg]	a _{part} (m ² .a) 6897.590 309.523
.evel: Level	 ○ All ⊙ Up 1.1 F ■ T ■ T 	to: 2 0 Process Process 1 Test product 2 Cd (soil) CH4	kg 💌 mg kg	1.0 130.0000 4.0000	[kg]	[kg]	a _{part} (m ² .a) 6897.590 309.523 888.000
.evel: Level	 ○ All ○ Up 1.1 F ■ T 	to: 2 0 Process Process 1 Test product 2 Cd (soil) CH4 H (water)	kg 💌	1.0	[kg]	[kg]	a _{part} (m ² .a) 6897.590 309.523 888.000
.evel: Level	 ○ All ○ Up 1.1 F ■ T ■ All □ Up 	to: 2 0 Process Process 1 Test product 2 Cd (soll) CH4 Hg (water) Vet electricity EU-27, medium voltage	kg v mg kg mg	1.0 130.0000 4.0000 300.0000	[kg] 20.1743 - - - -	[kg] 104.1743 - - - -	a _{part} (m ² .a) 6897.590 309.523 888.000 1017.294
.evel: Level	 ○ All ⊙ Up 1.1 F III F III T III F III T III F III T III F III T IIII T III T <li< td=""><td>to: 2 0 Process Process 1 Fest product 2 Cd (soil) CH4 Hg (water) Net electricity EU-27, medium voltage Vet electricity EU-27, medium voltage</td><td>kg 💌 mg kg</td><td>1.0 130.0000 4.0000</td><td>[kg]</td><td>[kg] </td><td>a_{part} [m².a] 6897.590 309.521 888.000 1017.294</td></li<>	to: 2 0 Process Process 1 Fest product 2 Cd (soil) CH4 Hg (water) Net electricity EU-27, medium voltage Vet electricity EU-27, medium voltage	kg 💌 mg kg	1.0 130.0000 4.0000	[kg]	[kg] 	a _{part} [m ² .a] 6897.590 309.521 888.000 1017.294
.evel: Level	 ○ All ⊙ Up 1.1 F III F III T III F III T III F III T III F IIII F III F <li< td=""><td>to: 2 0 Process Process Process 1 Test product 2 Cd (soil) CH4 Hg (water) Het electricity EU-27, medium voltage Sedium Hydroxide (NaOH)</td><td>kg Mg kg mg kWh</td><td>1.0 130,0000 4.0000 300,0000 20,0000</td><td>[k9] 20.1743 - - - - 19.1803</td><td>[kg] 104.1743 - - - 19.1803</td><td>a_{part} (m².a) 6897.590 309.523 888.000 1017.294 5207.812</td></li<>	to: 2 0 Process Process Process 1 Test product 2 Cd (soil) CH4 Hg (water) Het electricity EU-27, medium voltage Sedium Hydroxide (NaOH)	kg Mg kg mg kWh	1.0 130,0000 4.0000 300,0000 20,0000	[k9] 20.1743 - - - - 19.1803	[kg] 104.1743 - - - 19.1803	a _{part} (m ² .a) 6897.590 309.523 888.000 1017.294 5207.812
.evel: Level	 ○ All ○ Up 1.1 F ■ T ■ Z.1 N 2.2 S ■ S 	to: 2 0 Process Process Process 1 Test product 2 Cd (soil) CH4 Hg (water) Vet electricity EU-27, medium voltage Vet electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH)	kg v mg kg mg kwh	1.0 130.0000 4.0000 300.0000 20.0000 4.0000	[k9] 20.1743 - - - 19.1803 0.9941	[kg] 104.1743 - - - - - - - - - - - - -	a _{part} (m ² .a) 6897.590 309.523 888.000 1017.294 5207.812 346.647
.evel: Level	 ○ All ⊙ Up 1.1 F ■ T 2.1 N 2.2 S ■ S ■ C 	to: 2 0 Process Process 1 Calculation Calc	kg V mg kg kWh kWh	1.0 130,000 4.000 300,000 20,0000 4.0000 3.5600	[ks] 20.1743 - - - - 19.1803 0.9941 0.8847	[kg] 104.1743 - - - - - - - - - - - - -	a _{part} (m ² .a) 6897.590 309.523 888.000 1017.294 5207.812 346.647 308.516
.evel: Level	 ○ All ⊙ Up 1.1 F Ξ T 2.1 N 2.2 S Ξ C Ξ C Ξ F 	to: 2 Process Process Process 1 Fest product 2 Cd (soil) CH4 Hg (water) Net electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Sodium Hydroxide Production Hydroxide Production	kg mg mg kg kWh kg kg kg kg	1.0 130,0000 4.0000 300,0000 20,0000 4.0000 3.5500 0.2000	[k9] 20.1743 - - - 19.1803 0.9941	[kg] 104.1743 - - - - - - - - - - - - -	a _{part} [m ² .a) 6897.590 309.523 888.000 1017.294 5207.812 346.647 308.516 17.322
.evel: Level	 ○ All ○ Up 1.1 F ■ T ■ T ■ All ■ T ■	to: 2 0 Process Process Process 1 Fest product 2 Cd (soll) CH4 Hg (water) Vet electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Schorine (Cl2) from Sodium Hydroxide Production Hydrogen (H2) from Sodium Hydroxide Production CH4 (air)	kg mg kg mg kWh kWh kg kg kg g	1.0 130,0000 4,0000 300,0000 20,0000 4,0000 3,5600 0,2000 0,0012	[ks] 20.1743 - - - - 19.1803 0.9941 0.8847	[kg] 104.1743 - - - - - - - - - - - - -	6897.590 309.52 888.000 1017.294 5207.812 346.647 308.516 17.332 2.265
.evel: Level	 ○ All ○ Up 1.1 F ■ T 2.1 N 2.2 S ■ S ■ C ■ F 	to: 2 0 Process Process 1 Test product 2 Cd (soil) CH4 Hg (water) Wet electricity EU-27, medium voltage Wet electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Chlorine (Cl2) from Sodium Hydroxide Production Hydroxide (NaOH) Chlorine (Cl2) from Sodium Hydroxide Production CCl4 (air) Chlorides (water)	kg mg kg mg kWh kWh kg kg kg g g	1.0 130.0000 4.0000 300.0000 20.0000 4.0000 3.5600 0.2000 0.0012 0.0795	[ks] 20.1743 - - - - 19.1803 0.9941 0.8847	[kg] 104.1743 - - - - - - - - - - - - -	a _{part} (m ² .a) 6897.590 309.523 888.000 1017.294 5207.812 346.647 308.516 17.322 2.265 0.002 0.002
.evel: Level	 ○ All ⊙ Up 1.1 F ■ T ■ T ■ N 2.2 S ■ C ■ F ■	to: 2 0 Process Process Process 1 Fest product 2 Cd (soil) CH4 Hg (water) Net electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Chlorine (Cl2) from Sodium Hydroxide Production CCH (air) Chlorides (water) Dichloro methane	kg ♥ mg kg kwh kg kg g g g g g g g g g g g g g	1.0 130.0000 4.0000 300.0000 20.0000 355.000 0.2000 0.0012 0.0012 0.0012 0.0012 0.0012 0.00795 0.0074	(ks) 20.1743 - - - - - - - - - - - - -	[kg] 104.1743 - - - 19.1803 0.5159 0.4087 0.0013 - - - - - - - - - - - - -	a _{part} (m ²) 6897.590 309.523 888.000 1017.294 5207.812 346.647 308.516 (17.332 2.266 0.000 0.001
.evel: Level	 ○ All ⊙ Up 1.1 F Ξ T 2.1 N 2.2 S Ξ 0 Ξ + 0 0 	to: 2 0 Process Process Process 1 Fest product 2 Cd (soil) CH4 Hg (water) Vet electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) CH4 Hg (water) Uchloro methane Dichloro methane Dichloro methane Clar)	kg v mg kQ kWh kg kg kg g g g g g	1.0 130.0000 4.0000 300.0000 20.0000 4.0000 3.5600 0.2000 0.0012 0.0795 0.0074 0.0105	[ks] 20.1743 - - - - 19.1803 0.9941 0.8847	[kg] 104.1743 - - - - - - - - - - - - -	a _{part} (m ² .a) 6697.590 309.523 888.000 1017.294 5207.812 346.647 308.516 17.332 2.266 0.000 0.001 113.810
.evel: Level	 ○ All ⊙ Up 1.1 F ■ T ■ T<	to: 2 0 Process Process Process 1 Fest product 2 Cd (soll) CH4 Hq (water) Vet electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Clohorine (cl2) from Sodium Hydroxide Production Hydrogen (H2) from Sodium Hydroxide Production CCl4 (air) Chlorides (water) Dichloro methane Dichloro methane Dichloro methane ICI	kg mage of the second	1.0 130.0000 4.0000 300.0000 20.0000 0.0000 0.0000 0.0012 0.0012 0.0074 0.015 0.0114	(ks) 20.1743 - - - - - - - - - - - - -	[kg] 104.1743 - - - 19.1803 0.5159 0.4087 0.0013 - - - - - - - - - - - - -	a _{part} (m ² .a) 6897.590 309.523 888.000 1017.294 5207.812 346.647 308.516 17.332 2.265 0.002 0.001 113.810 0.146
.evel: Level	 ○ All ⊙ Up 1.1 F III IIII IIII IIII I	to: 2 0 Process Process Process 1 Fest product 2 Cd (soil) CH4 Hg (water) Vet electricity EU-27, medium voltage Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) Sodium Hydroxide (NaOH) CH4 Hg (water) Uchloro methane Dichloro methane Dichloro methane Clar)	kg v mg kQ kWh kg kg kg g g g g g	1.0 130.0000 4.0000 300.0000 20.0000 4.0000 3.5600 0.2000 0.0012 0.0795 0.0074 0.0105	(ks) 20.1743 - - - - - - - - - - - - -	[kg] 104.1743 - - - 19.1803 0.5159 0.4087 0.0013 - - - - - - - - - - - - -	a _{part} (m ² .a) 6897.590 309.523 888.000 1017.294 5207.812 346.647 308.516 17.332 2.266 0.000 0.001 113.810

Figure 8: Hot-Spot Graph

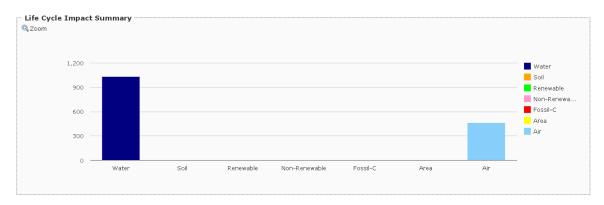
Detailed *SPI Overview* shows table consisting sub-processes and impacts, including their share of footprint to the final product. Additionally CO₂ emissions and GWP (Global Warming Potential) are calculated on a life cycle base. Similar to the process graph, *Level* can be used to choose the amount of displayed sub-processes within the table.

The amount of the main product and its unit may be chosen by the user, resulting in the recalculation of the ecological pressures. This option allows adjusting to real production values if a particular plant shall be evaluated. Material and energy balances are then related to the given amount of the product.

= Hide

2.3.3 Impacts overview

Whereas impacts of level 2 processes can be seen at the hot spot graph, life cycle impact information is part of the Impacts Overview section. A diagram shows the SPI share between all 7 SPI categories for the whole life cycle of the viewed process. A table shows with every specific impact along the life cycle and its inventory and GWP amount. By default the second part is hiden because of the typically long list.



					E Show
Impact	Input for	Unit	Inventory	GWP [kg]	a _{part} [m².a]
CH4	E Show	kg	4.0000	84.0000	0.000
CCl4 (air)	📰 Show	kg	< 0.0001	0.0068	9.04
Dichloro methane	🔚 Show	kg	< 0.0001	0.0	0.00
Dichloro monofluoro methane (air)	E Show	kg	< 0.0001	0.0	455.24
HCI	E show	kg	< 0.0001	0.0	0.58
Waste heat into air	📰 Show	L	< 0.0001	0.0	
со	E Show	kg	< 0.0001	0.0	0.00
NMVOC	E Show	kg	< 0.0001	0.0	0.00
NO×	E Show	kg	< 0.0001	0.0057	0.14
SOx as SO2	E Show	kg	< 0.0001	0.0	0.00
N20	E Show	kg	< 0.0001	0.0001	0.00
Particles	E Show	kg	< 0.0001	0.0	0.00
NH3	E Show	kg	< 0.0001	0.0	< 0.00
Acetone	E Show	kg	< 0.0001	0.0	< 0.00
Alkanes (air)	I Show	kg	< 0.0001	0.0	< 0.00
Alkenes (air)	E Show	kg	< 0.0001	0.0	< 0.00
Butane	E Show	kg	< 0.0001	0.0	< 0.00
Cd (air)	I Show	kg	< 0.0001	0.0	< 0.00
Ethanol	Show	kg	< 0.0001	0.0	< 0.00
HF	I Show	ka	< 0.0001	0.0	< 0.00

Figure 9: Impacts Overview

Clicking on *Show* gives more detailed information about the impacts and where they participate on the life cycle chain of production.