

Meso-level eco-efficiency indicators to assess technologies and their uptake in water use sectors Collaborative project, Grant Agreement No: 282882

Deliverable 5.3 Functional design of the meso-scale eco-efficiency toolbox

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# Abstract

Based on the developed methods and tools from EcoWater WP1, 'Framework and tools for meso-level ecoefficiency analysis and technology assessment', an integrated (suite of) online, web-based tools and resources will be built for the assessment of the eco-efficiency of innovative technologies. The purpose is amongst others to facilitate technology benchmarks in water systems. The suite of tools will thus provide a mechanism for developers of new technologies to demonstrate the effect of their technology on meso-level eco-efficiency and allow policy-makers to assess possible impacts of regulations..

Deliverable 5.3 provides the 'Functional design of the meso-level eco-efficiency toolbox'. The deliverable concerns the internal design and functionalities of the aforementioned web-based toolbox and its knowledge bases. The overall architecture of the toolbox is divided into three layers (the Web-Based Graphical User Interface, the data manipulation tools and the data storage) and the two stand-alone tools that have been developed (SEAT and EVAT). The report emphasizes the functionalities that can be included, providing numerous mock-ups of user screens and options. Functionalities of the different buttons are provided. Special attention is given to the various types of users of the system.

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# **1** Introduction

# **1.1 General introduction to the Task**

The overall aim of Work Package (WP) 5 is to integrate the developed analytical framework, indicators and Case Study results, into different outputs to ensure their application beyond the EcoWater Project, in terms of analysing the dynamics of water systems and sectors of water use. More specifically, WP5 is tasked amongst others with the development of a publicly available suite of tools and resources for meso-level eco-efficiency assessments in different systems, and technology benchmarking, providing access to an integrated environment for the undertaking of similar analyses. The main output from this WP will be an integrated, web-based toolbox, which will contain the resources and tools necessary for developing meso-scale eco-efficiency assessments of different technologies. In addition, the WP will produce consolidated, step-wise guidelines for future assessments, as well as policy recommendations, based on Case Study results and cross-case comparison (EcoWater Description of Work, 2011). Table 1 below provides information stated in the EcoWater Description of Work, with respect to the toolbox-task.

 Table 1: The description of Task 5.3: Development of toolbox for meso-level eco-efficiency of systems/products (EcoWater Description of Work, 2011, Part A, p. 22)

Based on the developed methods and tools from WP1, an integrated (suite of) on-line, webbased tools and resources will be built for the assessment of the eco-efficiency of innovative technologies, to facilitate technology benchmarks in water systems.

The indicator computational tools will be fed amongst others by an information database on eco-efficiency of technologies and materials, as developed through the WP 1.2 Technology Inventory. The suite of tools will thus provide a mechanism for developers of new technologies to demonstrate the effect of their technology on eco-efficiency and allow policy-makers to assess impacts of regulations.

Where applicable, integration will be performed in such a way that potential extensions (post-EcoWater) to other systems and products are supported. The task will be based on a functional requirements analysis (all partners), followed by a technical design (Deltares, NTUA), preliminary integration of the tools developed within the framework of T1.3 (Deltares, NTUA), followed by testing by all participants. Two testing iterations and subsequent improvements of the toolbox will be carried out. Guidelines for use and future adaptation will also be developed.

The development of the Toolbox will start in parallel to the activities of T1.3-2 and T1.3-3, with the definition of its functional design. Throughout the course of the Project, the Toolbox will be constantly fed with information, data and resources from T1.2 and from the Case Studies of WPs 2, 3 and 4, and will be tested and adapted according to feedback received (in addition to the two "formal" testing processes foreseen). The final version, including guide-lines for use, will be released in M30.

This report concerns the Deliverable 5.3 (Functional design of the meso-scale eco-efficiency toolbox) and will provide a description of the internal design and functionalities of the webbased toolbox and its knowledge bases.

# 1.2 Definitions of the user requirements document, functional design and technical design

The **user requirement(s) document** (URD) or **user requirement(s) specification** is a document, usually used in software engineering, which specifies the requirements the user expects from software to be constructed in a software project. Once the required information is completely gathered, it is documented in a URD, which is meant to spell out exactly what the software must do and becomes part of the contractual agreement.

In this document, the functional design is synonymous to a first deepening of user requirements into mock-ups and narrative functions. The technical design will further detail the functional specifications and requirements, such that implementation becomes straightforward.

# 1.3 SEAT and EVAT

In the development of the proposal, a few key decisions were taken, which provide boundary conditions for the design. The most important decision was that two stand-alone tools would provide key functionalities required to calculate eco-efficiency indicators. The tools are the SEAT (Systemic Environmental Analysis Tool) and EVAT (Economic Value chain Analysis Tool). This document does not include the design of these tools. However, it will concern the interaction of the toolbox with the tools.

# 1.4 Reading guide

Chapter 2 (User requirements) focuses on the User Groups and the corresponding permissions for each group. Chapter 3 provides preliminary information on functionalities that may be included in the toolbox for each distinct step of the Case Study development. Finally, Chapter 4 contains some first screen mock-ups and narrative text on the functional design.

# **2** User requirements

# 2.1 User groups

User groups are used by the toolbox to control the access to the functionalities provided. There are six **system-wide** user groups, presented in Table 2, and three **Case Study-specific** user groups, presented in Table 3.

User Group	Description / Role
	All users that visit the web site. They are able to view basis
Dublic (all users)	All users that visit the web site. They are able to view basic
Public (all users)	
	tion to the system.
	The users that have been registered and logged into the sys-
Registered Users	tem. They are able to view general as well as Case Study-
	specific information. They are not allowed to enter any infor-
	mation other than comments.
	The users who are responsible for setting up and maintaining
System Administrators	the system. They are responsible for managing user accounts
	and authorizing users to enter/edit information to the system.
	The users that have the right to create a new Case Study. Af-
Case Study Providers	ter creating a Case Study, the user is characterised as the
	"creator" of the Case Study and has full control on it.
	The users that have the right to create a new technology. After
Technology Providers	creating a technology, the user is characterised as the "crea-
	tor" of the technology and has full control on it.
	The users that have the right to create a new indicator. After
Indicator Providers	creating an indicator, the user is characterised as the "creator"
	of the indicator and has full control on it.

Table 2: System-wide user groups

#### Table 3: Case Study-specific user groups

User Group	Description / Role
Case Study Stakeholders	The users that are allowed to view all (public and private) Case Study-specific information.
Case Study Collaborators	The users able to enter and edit Case Study-specific infor- mation.
Case Study Administrators	The users responsible for authorizing users to enter/edit Case Study-specific information.

# 2.2 Permissions

Table 4 below provides mainly user permissions and requirements. Some system functionalities are also listed, as this helps understanding. An 'x' indicates that a user has some rights to take an action. The 'x' marks are indicative, as detailed use-cases with all actor interaction go beyond the scope of this document. In chapter 4 'Functional design specifications'a bold A implies that the user type will be able to view more information.

ltem	Description	Public	Registered Users	Technology Providers	Indicator Pro- viders	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Ad- mins
1	General access				-		-			
1.1	The toolbox will be accessed via PC-based browsers (IE, Firefox, Safari)	х								
1.2	Information can be viewed and exported in printable and storable form		х							
1.3	The Providers can enter new information to the system			х	х	х				
2	User registration management				-		-			
2.1	Public Users shall be able to request a registration to the system	х								
2.2	The Registered Users shall be able to unregister themselves (delete account)		х							
2.3	The System Administrators shall be able to accept a request for registration									х
2.4	The System Administrators shall be able to delete accounts of other Users									х
		•				•		•	•	
3	Access to technology database									
3.1	There shall be a technology database that contains information on technologies. The repository will follow the "Excel" design provided within the Task 1.2.									
3.2	The registered users may request to add a technology		х							
3.3	The System Administrators shall be able to accept or deny requests for adding a technology									х

#### Table 4: User permissions and requirements<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> If x is between brackets, i.e. '(x)', this implies that the functionality is available if special rights have been granted.

ltem	Description	Public	Registered Users	Technology Providers	Indicator Pro- viders	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Ad- mins
3.4	Technology Providers shall be able to create a new technology			х						
3.5	The System Administrators and the creator of a technology entry may delete the item			х						х
3.6	The System Administrators and the creator of a technology entry may alter the technology information			х						х
3.7	The Registered Users shall be able to view the technology information		х							
3.8	The Registered Users can propose alterations to technologies via 'commenting'		х							
3.9	The System Administrators, the creator of a technology entry and the commenter (previous point) can delete a comment			х						х
4	Access to indicator database									
4.1	There shall be an indicator database that contains definitions of indicators, associated parameters and generic examples to combine parameters to indicators, and indicators to calculate indices	eters, s.								
4.2	The Registered Users may request to add an indicator		Х							
4.3	The System Administrators shall be able to accept or deny requests for adding an indicator									Х
4.4	Indicator providers shall be able to create a new indicator				х					
4.5	The System Administrators and the creator of an indicator entry may delete the item				х					Х
4.6	The System Administrators and the creator of an indicator entry may alter the indicator in- formation				x					х
4.7	The Registered Users shall be able to view the indicator information		х							
4.8	The Registered Users can propose alterations to indicators via 'commenting'		х							
4.9	The System Administrators, the creator of an indicator entry and the commenter (previous point) can delete a comment				х					х
5	Access to general information									
5.1	These Users shall be able to access a variety of the following documents									
5.1.1	EcoWater public Deliverables	х								
5.1.2	Case Study public reports	х								

ltem	Description	Public	Registered Users	Technology Providers	Indicator Pro- viders	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Ad- mins
5.1.3	Guidelines for assessing eco-efficiency	х								
5.1.4	Links to external initiatives	х								
5.1.5	Case Study private reports and information						х	х	х	х
6	Access to SEAT and EVAT									
6.1	The tools (SEAT, EVAT and the toolbox) are developed in such a way that IDs of nodes and processes are stable (they should be consistent in all tools). They should not change if the system changes; only new nodes and processes should get new IDs. IDs of deleted items should not be re-used.									
6.2	The Users shall be able to download SEAT and EVAT	х								
6.3	The Users shall be able to download SEAT and EVAT manuals	х								
7	Case Study authorization									
7.1	The Registered Users may request to add a Case Study		х							
7.2	The System Administrators shall be able to accept / deny requests for adding a Case Study									х
7.3	The Case Study Providers are allowed to start a Case Study					х				
7.4	The Case Study Administrator and the creator of the Case Study may invite others to con- tribute								х	
7.5	The Case Study Administrators and the creator of the Case Study can withdraw rights from the Case Study Collaborators								х	
7.6	The Case Study Administrators and the creator of the Case Study can publish parts of the Case Study to be viewed by all registered users								х	
7.7	(Upon request of the Case Study Administrators) the System Administrators are able to ar- chive the Case Study, making it inaccessible to all users									x
7.8	(Upon request of the Case Study Administrators) the System Administrators are able to re- store an archived the Case Study, making it accessible to all users									x

ltem	Description	Public	Registered Users	Technology Providers	Indicator Pro- viders	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Ad- mins
8	Interactions with EVAT and SEAT									
8.1	Case Study Collaborators can upload and visualize a Case Study model developed in SEAT and EVAT							х	(x)	
8.2	The system will provide version numbering									
8.3	The system will allow only one model to be the baseline technology scenario									
8.4	The system will allow to upload 'alternative' technology scenarios, e.g. altered models due to the implementation of measures							х	(x)	
8.5	Numerical results of EVAT and SEAT runs can be easily uploaded into the tool							х	(x)	
8.6	Values within the toolbox that should be used within SEAT and or EVAT will be made availa- ble in such a way that manual transfer is supported.									
9	Exporting Case Studies and results									
91	Selected text can be exported							x	(x)	
9.2	Selected numbers can be exported in appropriate format							x	(x)	
9.3	Figures can be exported							X	(x)	
		1	1			1	1	I	( )	
10	Development of scenarios									
10.1	For the local Case Study, a PESTEL analysis can be carried out							х	(x)	
10.2	Scenarios can be created, stored, retrieved, altered, copied and deleted							х	(x)	
11	Indicator calculation and visualisation tool									
11.1	There shall be an indicator calculation and visualisation tool							-		
11.2	Case Study Collaborators can select indicators and parameter description and aggregation methods from the indicator database							х	(x)	
11.3	Case Study Collaborators can use the tools							х	(x)	
11.4	Case Study Collaborators can alter selected aggregation parameters to meet Case Study demands							х	(x)	

# 3 Functionalities for each step of the Case Study development

The development of the EcoWater Case Studies has been divided into seventeen distinct steps, grouped into four Phases (Figure 1). Table 5 provides information on indicative functionalities that may be supported for each step. It should be highlighted that all these functionalities will be available only for the Case Study Collaborators.



Figure 1: Phases and steps in the Case Study development (Kourentzis, 2012)

# Table 5: Preliminary list of functionalities that will be supported for each step of the Case Study development

Step	Step Indicative functionalities						
	General						
Text forma	tting of narrative input should be possible (bold, underlined, hyperlinks).						
Copy and	paste of text developed externally should be possible.						
Attaching	detaching documents shall be possible.						
The system	m will provide to the Case Study Administrators and Collaborators support to carry out the						
different st	eps as described in Task 1.5 (see Figure 1).						
	Phase A: Case Study Framing						
	The user can upload narrative text on system boundaries.						
Step 1	The user can upload narrative text on actors.						
	The user can upload narrative text on technologies.						
	The user can graphically map stages and processes.						
01 0	The user is able to associate distinct processes, corresponding to the input and output re-						
Step 2	quirements, with each process and stage. These processes should be identified and charac-						
	evaluation of the performance of different technologies applicable to these processes						
Step 3	The toolbox can support the identification of directly and indirectly involved actors.						
Step 4	The toolbox can support the mapping of the interactions of all actors involved.						
	The toolbox can support the identification of the environmental impact categories, with both						
Step 5	technology and actor relevance. The system allows the definition of parameters underlying the						
	indicators and the methods to calculate an indicator from parameters.						
Step 6	The toolbox can support the selection of environmental impact indicators, with both technology						
	and actor relevance (see also van vilet er. al., 2012).						
	PHASE B: BASELINE ECO-EFFICIENCY ASSESSMENT						
Sten 7	allow time relevant variation (daily, seasonal, annual)						
	Data / information on currently applied technologies can be inserted in a Case Study-specific database.						
Step 8	The user will be able to access a tool to calculate Environmental Impact Indicators (Ells). This tool is SEAT (Systemic Environmental Analysis Tool).						
	The user will be able to access a tool to develop the economic analysis. This tool is EVAT (Economic Value chain Analysis Tool).						
Step 9	Specific data required for the calculation of the Total Value Added (TVA) can be inserted in a						
	Case Study-specific database. If appropriate, the database will allow time relevant variations						
01 40	(daily, seasonal, annual).						
Step 10	The toolbox shall support the "definition of weighting and normalization parameters".						
Step 11	scenario.						
	PHASE C: IDENTIFICATION OF TECHNOLOGIES AND PRACTICES						
Step 12	The user is able to reuse descriptions of potential technologies, originating from the technology database, and tailor them to the local situation, in order to improve the eco-efficiency of a Case						
	Study. The year is able to store views of estars on technologies. This is always i) The employed lith and						
Step 13	usefulness of the identified technologies; ii) Prospects for their implementation and uptake; iii) Suggestions on additional technologies that could be assessed through the Project.						
Step 14	The user is able to label a selection of the most suitable technologies.						
	PHASE D: TECHNOLOGY ASSESSMENT AND SCENARIO ANALYSIS						
	The user is able to carry out a quantitative assessment of alternative technology scenarios in SEAT and EVAT						
Step 15	The user is able to import the derived numerical results into the toolbox.						
	The user is able to compare different technology scenarios, e.g. via spider diagrams.						
Step 16	The user is able to define future scenarios by carrying out a PESTEL analysis.						
Step 17	Analysis of future scenarios.						

# 4 Functional design specifications

The requirements in the previous sections have been detailed to a level almost reaching functional specifications. In this section, first mock-ups of functionalities are provided. It should be noted that purple squares indicate buttons that can be clicked. In addition, a bold '**X**' highlights the focus user, whereas a bold '**A**' implies that this user will be able to view more information.

# 4.1 Look and feel

The mock-ups in this document are not an indication of the look and feel (colours, location of buttons) of the final version of the toolbox. While SEAT and EVAT are more or less independent tools, it is recommended to use the tools' look and feel and the EcoWater website's look and feel as the basis for the toolbox.



# 4.2 Mock-up and functionality of the opening page

#### Figure 2: Mock-up of the start up screen

Pur- pose	<ul> <li>The purpose of the opening screen of the web-based toolbox is to provide the users with:</li> <li>Some basic information about the toolbox (not about the Project), including the purpose and an explanation of the use of the website.</li> <li>An inviting picture.</li> <li>The main navigation tools.</li> </ul>									
Func- tionality	The main functionality of this page concerns the tabs in the top. Hovering over the tabs will provide a small text on what to find when clicking on the tab. Clicking on the tab will lead the user to other pages / tools. As a general principle, the horizontal navigation tool will remain stable in content and position on all pages of the tool. The tab of the active page should be highlighted or otherwise a connection between the tab and the main body of the page should be established.									
Intend- ed Us-	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins	
ers	X	х	х	Х	х	х	х	х	х	

Table 6 provides an overview of the various functionalities below the tabs.

Tab	Main functions	Other functions
Home	Introduction to the toolbox	-
Case Studies	<ul> <li>Create, edit and view Case Studies</li> <li>Comment</li> </ul>	<ul> <li>Import data to the Case Study from:</li> <li>Technology database</li> <li>Indicator database</li> <li>SEAT</li> <li>EVAT</li> <li>Create / edit PESTEL analysis</li> <li>Print</li> </ul>
Technologies	<ul> <li>Create, edit and view gener- ic technology information</li> </ul>	<ul><li>✤ Print</li></ul>
Indicators	<ul> <li>Create, edit and view indicators</li> <li>Create, edit and view parameters</li> </ul>	♦ Print
Resources	<ul> <li>Links to (other) tools and resources</li> </ul>	<ul><li>✤ Print</li></ul>
Login	<ul> <li>✤ Login</li> </ul>	*
Register	<ul><li>Register</li><li>Authorisations</li></ul>	*
Help	✤ Help	✤ Print

Table 6	Overview	of the	various	functions	helow	the	tahs
Table 0.	Overview	or the	various	Tunctions	DEIOW	uie	เลมอ

# 4.3 Tab 'home'

Purpose	The pu	The purpose of the tab is to go back to the opening screen (4.2)							
Func- tionality	✤ Oi	<ul> <li>On 'Click', the opening screen reappears.</li> <li>In case of leaving a page with forms, the user will be promoted to save the data.</li> </ul>							
Intend-	Public	Registered	Technology	Indicator	Case Study	Case Study	Case Study	Case	System
ed Us- ers	X	Users	Providers	Providers	Providers	Stakeholders X	Collaborators	Admins	Admins

# 4.4 Tab 'Case Studies'

Home Case studies	Technologies Indicators Resources Login Register About	Help
Back to case studies start page	Introduction to the Case Studies:	
Agricultural Case Studies	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam enim nisl, gravida non vestibulum quis, tincidunt sed velit. Praesent vel tortor eget ligula elementum molestie. Aenean vestibulum ultrices mauris, id tempor orci porttitor	
Urban Case Studies	ac. Praesent faucibus pulvinar magna, ut porta tortor euismod in. Vestibulum at hendrerit tortor. Curabitur rutrum, turpis id porta dictum, orci metus vehicula arcu, nec cursus nisl orci et leo. Nulla et dignissim risus. In at ante et diam	
Industrial Case Studies	laoreet interdum.	

# Figure 3: Case Studies start screen

Purpose	The p the C	ourpose of ase Studie	the Case S s.	Studies' w	elcoming s	creen is to	provide a firs	st introduc	ction to
	In the select	In the left hand navigation bar, clusters of Case Studies are presented, which can be selected to see more information about the corresponding Case Studies.							
Function- ality	✤ C ir	On 'Click' on a Case Study, more information on the Case Study appears. Depending on the rights and login status, this follow-up may be limited.							
	The clustering of the Case Studies should be automated, and new Case Studies (beyond EcoWater) should be visible. In case of leaving a page with forms, the user will be prompted to save the data.								
	The button 'Back to Case Studies start page' should do what is says. Alternatively, the use of breadcrumbs may be very useful.								
Intended Users	nded Providers Providers Providers Case Study Case Study Case Study Collaborators Study Admins							System Admins	
		X	х	х	х	х	х	х	х

# 4.4.1 Left hand-tab Case Study 'X'

	Home Case studies Technologies	Indicators Resources	Login Register	Ab	out	Help
	Introduction					
min	1.Definition of System Boundaries 2.Mapping of stages and processes	Case study 'x				
Ē	3.Definition of actors involved 4.Mapping of Actor Interrelations	, D	Contant	Comm	View	Edit
	5.Identification of environmental impact indicators		Content	ent	commen ts	2011
	6.Selection of environmental impact parameters	Introduction	Public content (+ restricted	Com.	Reply	Edit
e	7.Collection of data on resource flows and currently applied technologies		content when depending on			
selir	8.Calculation of Environmental Impact	Definition of System Roundaries	user)	Com	Poph	Edit
â	9. Development of the economic analysis	Demitton of System Doundaries		Com.	Reply	Luit
	weighting parameters	Mapping of stages and processes		Com.	Reply	Edit
	assessment	Definition of actors involved		Com	Penh	Edit
	12.Description of the potential technologies to improve eco-emiciency	Demitton of actors involved		Com.	Reply	Luit
(Bo	13 Assessment of vies of actors on technologies	Mapping of Actor Interrelations		Com.	Reply	Edit
Ê	14.Selection of the most suitable	Identification of environmental		Com	Reply	Edit
Lec.	15.Quantitative assessment of alternative	impact indicators		Com.	Reply	Luit
œ	16.Definition of scenario's	Selection of environmental		Com.	Reply	Edit
rio,	17 Analysis of scenario's Conclusions	impact parameters				
ette		Collection of data on resource		Com.	Reply	Edit
જ		technologies				
	Printer friendly version			Com.	Reply	Edit

# Figure 4: Opening screen of a Case Study

		X	х	х	x	Α	Α	Α	Х	
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins	
	<b>∻</b> T	he button	comment' ۱	will allow o	commenting	g (depending	g on authoris	ation).		
	*	ne button	edit will op	en an edi	tor window.					
					ion a printe	r menaly rep	Son is create	u.		
	♥ V	vnat is visi	bie depends	s on the ic	ogin status a		rights of the	user.		
	S	hould not r	need to go b	back.						
ality	S	ection. Th	e left hand	l navigati	on panel r	emains visil	ble at all tir	nes – the	e user	
Function-	* C	<ul> <li>On 'Click' on a step in the left hand navigation panel, the user jumps to the relevant</li> </ul>								
	In the when	the left hand navigation bar, the different chapters or steps are presented which, when completed, should lead to the conclusions.								
	Case	Study.								
Purpose	The p	ourpose of	this screer	is to pro	vide an ove	erview of the	e available i	nformatio	n on a	

# 4.4.1.1 Button 'Printer friendly version' (pop-up)

Purpose	The p	The purpose this button is to create a printer friendly version of the Case Study.							
Function- ality	<ul> <li>On 'Click', a printer friendly version should appear (e.g. either a pdf or an html file) in a formatting appropriate for printing.</li> <li>Optionally, relevant sections desired for printing could be selected.</li> </ul>								
Intended Users	d Public Registered Users Technology Providers Indicator Providers Case Study Providers Case Study Stakeholders Case Study Collaborators Admins						System Admins		
		Х	Х	Х	Х	х	х	Х	х

# 4.4.1.2 Button "edit" (pop-up)

E	dit sec	tion 'Y'			
		Content	Comment	View comments	
Pu	blic text	(old text available here)	Save	Cancel	
Pu	blic figures and tables		Upload	RemoveReply	
Pu	blic attachments		Upload	RemoveReply	
Re	stricted text		Save	Cancel	
Res	stricted figures and bles		Upload	RemoveReply	
Re	stricted attachments		Upload	RemoveReply	
		Publish?	Cancel	Save	Save & Close

#### Figure 5: Editing information of a Case Study

Purpose	When the edit button is pressed the above editor appears ('Y' stands for a specific field). It allows changing both public and private information.								
	At this stage differentiation should be included to shield information or draft text from the								
	public.								
Func-	🔹 In	<ul> <li>In the large grey fields plain text can be edited.</li> </ul>							
tionality	✤ 0	ptionally, ac	vanced for	matting ca	an be allow	ed.			
	✤ In	the smaller	grey fields	, a list of ι	uploaded file	es will be pr	esented.		
	🔅 Tł	ne purple bi	utton 'Publis	sh' enquir	es if the int	formation sh	nould be inde	eed publis	shed. It
	sh	ould be the	Case Stud	y Adminis	strators prer	ogative to p	ublish the in	formation	
Intend- ed Us-	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
ers							X	Х	Х

#### 4.4.1.3 Button 'comment' (pop-up)

Comment			
Username	(autotext)		0
Date-Time	(autotext)		
Comment			
		Cancel Publish Close	

#### Figure 6: Comment pop-up

Purpose	The p	urpose of	this pop-up	is to com	ment to spe	ecific section	IS.		
Function- ality	✤ Ir ♣ C	n the large optionally a	grey fields dvanced fo	plain text rmatting c	can be edit can be allov	ed. ved.			
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
		Х	х	х	х	х	х	х	х

# 4.4.1.4 Button 'view comments' (pop-up)

Com	ments	6		ø	
ID	Date and time	Username	Comment	Remove	Reply
(auto)	(auto)	(auto)		Remove	Reply
				Remove	Reply
				Remove	Reply
				Remove	Reply



Purpose	The pu may be	he purpose of this pop-up is to view the comments. Optionally, replying to comments nay be allowed.								
Function- ality	♦ At ♦ Itn	A table with comments. It may be possible for the Case Study Administrators to remove comments.								
Intended	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins	
03013		X	x	Х	x	x	x	х	x	

#### 4.4.2 Linking Case Studies and other information sources

Case Study Collaborators will need to insert knowledge from the indicator, parameter and technology databases into certain steps of the Case Study development. In the next section, the functionality of this insertion is visualized.

It is important that, once information is imported, changes in the indicators, parameters and technologies will not affect the information within the Case Studies.



	-			
A	SSO	ciate indicator and ca	ase study	
10	Vame	Fadaldan J Short Fa rarindan of the Jadim tor	Vacilia	
	Maine		IDWNU	
1			cheditiox	
2			cheditiox	
			cheddox	
			Sar 8	
			Capital Capital Contract	

#### Figure 8: Associate an indicator with a specific Case Study

Purpose	The put tation. Once tor dat	The purpose of the page is to select indicators to be added to the Case Study documen- ation. In a Case Study, generic information of an indicator of interest can be stored. Once stored, the information does not change when the information in the parent indica- tor database changes.								
Func- tionality	<ul> <li>✤ In</li> <li>✤ Tu</li> <li>✤ Sa</li> </ul>	<ul> <li>In the grey fields, information is displayed (non-editable).</li> <li>Turning the checkbox will select the indicator to be added to the Case Study.</li> <li>Save and close will lead to the actual adding of the indicator to the Case Study.</li> </ul>								
Intend- ed Us-	PublicRegistered UsersTechnology ProvidersIndicator ProvidersCase Study ProvidersCase Study StakeholdersCase Study CollaboratorsCase Study AdminsSystem Admins									
ers							х	х	Х	



#### 4.4.2.2 Button 'Associate parameter to Case Study indicator' (pop-up)

#### Figure 9: Associate a parameter with a specific Case Study indicator

Purpose	Simila addeo ramet matio	Similarly to the previous page, the purpose of this page is to select parameters to be added to the Case Study documentation. In a Case Study, generic information of parameters can be stored. Once stored, the information does not change when the information in the parent parameter database changes.									
Function- ality	<ul> <li>✤ Ir</li> <li>✤ T</li> <li>✤ S</li> <li>� A</li> </ul>	<ul> <li>In the grey fields information is displayed (non-editable).</li> <li>Turning the checkbox will select the parameter to be added to the Case Study.</li> <li>Save and close will lead to actual adding of the parameter to the Case Study.</li> <li>As the list of parameters can be guite long, filtering tools should be implemented</li> </ul>									
Intended Users	Public	PublicRegistered UsersTechnology ProvidersIndicator ProvidersCase Study ProvidersCase Study Case Study StakeholdersCase Study CollaboratorsCase Study AdminsSystem Admins									
							х	х	Х		

		ata taabnalagu ta aaga	otudu
D	Name	Definition / Short Description of the technology	Yes/No
1			checkbox
2			checkbox
			checkbox
			Save & Close

### 4.4.2.3 Button 'Associate technology to Case Study' (pop-up)

## Figure 10: Associate a technology to a Case Study

Purpose	Simila ed to t nology matior	Similarly to the previous tab, the purpose of this page is to select technologies to be add- ed to the Case Study documentation. In a Case Study, generic information about a tech- nology can be stored. Once stored, the information does not change when the infor- mation in the parent technology database changes.								
Func- tionality	<ul> <li>✤ In</li> <li>♥ Us</li> <li>𝔤 𝔅</li> <li>𝔅</li> <li>𝔅</li></ul>	the grey fie sing the che to a Case ave and clos otionally, filt ng.	elds informa eck box a te Study. se will lead tering tools	tion is dis echnology to actual a could be i	played (nor will (after u adding of th implemente	n-editable). using save) ne technolog nd, as the lis	lead to addir ly to the Cas t of technolo	ng the tec e Study. gy may be	hnolo- e quite	
Intend- ed Us- ers	Public     Registered Users     Technology Providers     Indicator Providers     Case Study Providers     Case Study Stakeholders     Case Study Collaborators     Case Study Admins     System Admins									

# 4.4.2.4 Button 'Case Study actors' (pop-up)



#### Figure 11: Defining the actors of a Case Study

Purpose	The praint of the analysis of the second sec	he purpose of this screen is to provide an overview and develop the Case Study actor nalysis.								
Func- tionality	<ul><li>Ec</li><li>Ac</li></ul>	Edit will open an editor similar to the previously presented editors. Adding an actor will add a new line to the table.								
Intend- ed Us-	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins	
ers						Х	х	Х	Х	





#### Figure 12: Normalisation of parameters

Purpose	In orde param param sents norma	In order to elicit a single environmental pressure value from multiple parameters, these parameters need to be combined. Various possibilities exist, one being normalisation per parameter, followed by aggregation over parameters. The mock-up screen above presents an example of a normalization method that may be used, which facilitates linear normalisation between two boundaries.									
Func- tionality	<ul> <li>In</li> <li>Th</li> <li>Th</li> <li>ef</li> <li>No</li> </ul>	<ul> <li>In the longer purple box, the user is prompted to select the parameter.</li> <li>The user is then prompted to provide the relevant numbers.</li> <li>The graph should adjust itself, based on the numbers, to immediately visualize the effect of the figures.</li> <li>Note: This functionality may need to be extended to fit in the detailed process.</li> </ul>									
Intended Users	Public         Registered Users         Technology Providers         Indicator Providers         Case Study Providers         Case Study Stakeholders         Case Study Collaborators         Case Study Admins         System										
							x	Х	х		

			er 23
Parameter agg	regation	values for indicator 'l'	
Drop-down ' Select I	ndicator'		
Name	Value		
Parameter 1	Edit		
2	Edit		
Sum	(Auto)		
	Cancel	Publish Close	

#### 4.4.2.6 Button 'Set parameter aggregation parameters' (pop-up)

#### Figure 13: Parameter aggregation

Purpose	In orc paran paran sents grega	In order to elicit a single environmental pressure value from multiple parameters, these parameters need to be combined. Various possibilities exist, one being normalisation per parameter, followed by aggregation over parameters. The mock-up screen above presents an example of an aggregation method that may be used, which facilitates the aggregation over parameters.									
Func- tionality	<ul> <li>✤ Ir</li> <li>✤ T</li> <li>✤ T</li> <li>✤ N</li> </ul>	<ul> <li>In the purple box, the user is prompted to select the indicator.</li> <li>The user is then prompted to provide the relevant numbers.</li> <li>The sum should be equal to '1'; otherwise, the result cannot be published.</li> <li>Note: This functionality may need to be extended to fit in the detailed process.</li> </ul>									
Intended Users	Public	Public         Registered Users         Technology Providers         Indicator Providers         Case Study Providers         Case Study Stakeholders         Case Study Collaborators         Case Study Admins         System Admins           V									

#### 4.4.2.7 Button 'Set parameter combination parameters' (pop-up)

Parameter combination fo	ormulas for indicator 'l'	
Select / create aggregation formula	Cancel Publish Close	



Purpose	For some indicators, formulas to combine different parameters into a single value may have been developed. This button should launch a tool, which would allow developing or reusing such a formula.								
Func- tionality	<ul> <li>♦ Ir</li> <li>♦ T</li> <li>♦ N</li> </ul>	<ul> <li>In the purple box, the user is prompted to select the indicator.</li> <li>The user is then prompted to provide the formula.</li> <li>Note: This functionality may need to be extended to fit in the detailed process.</li> </ul>							
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins X

# 4.4.2.8 Button 'Edit technology Case Study details' (pop-up)

Edit case stu	idv specific details of technology 't'			
ltem	Content	Edit	Save	
Name	fixed			
Sector	fixed			
Category	fixed			
Description	Open for edit	Edit	Save	
Field 1	Open for edit	Edit	Save	
	Open for edit	Edit	Save	
Field N	Open for edit	Edit	Save	
Local parameter 1	Open for edit	Edit	Save	
Local parameter	Open for edit			
Attachments		Edit	Save	

#### Figure 15: Case Study specificities of a technology

Purpose	The lo techn an ex	The local technology application may need additional data, such as the node to which the technology is applied, specific (efficiency) parameters, etc. The mock-up screen above is an example that can be followed.							
Func- tionality	♦ E	<ul> <li>Edit / save buttons allow that action.</li> <li>In some cases, validation rules may be required.</li> </ul>							
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
							х	х	х

#### 4.4.2.9 Button 'Import SEAT, EVAT'

		전 등 -
Import EVAT a	nd SEAT files, including results of ru	ns -
Description:	Longer narrative	*
Author:		
Version:		
- Upload New -	Browse	*

#### Figure 16: Importing SEAT and EVAT files

Purpose	The purpose of this screen is to be able to upload a new version of the EVAT and SEAT model of a Case Study, including the associated results. <i>Attention: The EVAT / SEAT sections may need to be adjusted to meet demands of the tools.</i>								
Function- ality	<ul> <li>The description should make clear what is different from an earlier version.</li> <li>Time should be recorded automatically with the upload</li> </ul>								
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
							х	Х	Х

#### 4.4.2.10 Button 'Export SEAT and EVAT files'

					- # X
E	xport	SEAT	/ EVAT files		
ID	SEAT/EVAT	Date of upload	Description	Yes/No	•
1				export	
2				export	
				export	

#### Figure 17: Exporting SEAT and EVAT files for local use

Pur-	The	The purpose of this pop-up is to export the SEAT and EVAT files, to be used locally (SEAT						
pose	and	and EVAT are stand-alone tools).						
Func-	*	In the grey box, the user will see the different versions of a Case Study.						
tionality	*	Clicking export will allow exporting the files, such that the locally installed tools can use them without further actions of the user.						

Intend- ed Us-	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
ers							х	Х	Х

#### 4.4.3 Analysis of SEAT and EVAT results

#### 4.4.3.1 Button 'View content of SEAT and EVAT files'

1	iona.	eura na	anitra	sulte S	EAT	2 E	VAT	Floe
v	ICW	summe	ary/re:	suits .		QL	VAL	nes
SEA LE YAL	Use c- upt et	Ukarreten	Sunniery	Enviranmens 21 Pietamianiae Campariyan	Cevanice Specord De Velan Accornidag	Financial Coverant Salaw of Produce	t es Economic Organizat Actory	Eco- efficienc; Compurkan
			şvin	yh	yin	ser	yıh	yh
			yh	ያከ	yin	yh	yih	y'n
			<b>3</b> 0 i	y0 i	30.1	261	20 i	yû i

#### Figure 18: View content of SEAT and EVAT files

Purpose	The p Case	ourpose of Study, inc	this pop-up luding the c	is to viev	v, and poss ding results	ibly export t	o a file, data	and figur	es of a
Function- ality	<ul> <li>↓</li> <li>↓</li></ul>	he user wi xample, in > The sys > Simple > Results > Total re Jsers will the Environmend ag', 'Finand Eco-efficier Eco-efficier ected. The Clicking 'Vie	Il be able to the case of stem decom statistics (e per node; a sults. be able to g ntal Perforn cial Costs a ncy compar ncy Compa user will be ew results' v	c check in f 'summar position / .g. the nu and generate nance Co and values ison', resp rison' will e prompted will generate	the purple y', this may boundaries mber of noc Figures (Fi mparison', s of product bectively). only be po d, if the pres	fields what include: ;; des); (gure 19 to 'Resource i ts', 'Net Eco ossible if mo sentation is res and sum	Figure 23, of nput and En nomic Outpo pre than one not possible mary results	d like to so correspon- nission Ac ut of Acto e results a	ding to ccount- rs' and are se-
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
						x	х	х	Х



Figure 19: Environmental Performance Comparison



Figure 20: Resource Input and Emission Accounting



Figure 21: Financial Costs and Values of Products



Figure 22: Net Economic Ouput of Actors



Figure 23: Eco-efficiency comparison

#### 4.4.4 Scenario tools

#### 4.4.4.1 Button 'Create a PESTLE'

	۲ الله ت

# **PESTLE-table**

PESTLE	ID	Current or expected Driver/Barriers	Cluster	Exected development (2020)	Exected development (2050)	Edit	Comment	View comments
Political	Po-1		ljlljllljlV	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
	Po2		∨ا <sub>ن</sub> ااا <sub>ن</sub> اازا	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
Economic	Ec-1		Vi;III;III;IV	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
Social	So-1		Vi;III;III;ال	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
Technological	Te-1		√ازااازا	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
Environmental	En-1		l;ll;lll;lV	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
	En-2		√ازااازا	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
	En-3		ا;اا;اا	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
Legal	Le-1		۷۱٫۱۱۱٫۱۱۱	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
					Г	Cancel	Add new o	lriver / barrier

# Figure 24: The PESTLE table

Purpose	The p ysis.	ourpose of th	nis pop-up is	s to insert	, in a struct	ured manne	er, a narrative	e PESTLE	anal-		
Func- tionality	<ul> <li>✓ V</li> <li>to</li> <li>tic</li> <li>✓ T</li> </ul>	Vhen clicking b edit the test he driver or bn'. he numberir More eco More eco	g 'edit', the kt, and the barrier beco ng in the fie nomic deve nomic deve	Case Stud expected omes less Id 'cluster elopment,	dy Administ developme s () or mo ' correspon- more enviro less enviro	trators and C ent. The mea ore (++) imp ds to (for ex- onmental inten nmental inten	Collaborators aning of t ortant; '0' de ample): erest erest	s should b o ++ is w enotes 'no	e able hether ) opin-		
		<ul> <li>Less econ</li> <li>Less econ</li> </ul>	nomic deve nomic deve	lopment, lopment,	more enviro	onmental inte	erest rest		<b>_</b> .		
	* V	Vhen clicking	g comment,	the user	should be	led to a scr	een similar t	o that of	Figure		
	♦ ×	<ul> <li>When clicking view comments, the user should be led to a screen similar to that of Figure 7. (Figure 7: View comments pop-up)</li> </ul>									
Intended Users	Public	Public Registered Users Technology Providers Indicator Providers Case Study Providers Case Study Stakeholders Case Study Collaborators Study Admins									
						х	х	х	х		

#### 4.4.4.2 Case specific scenario narratives

					- ē
Case s	specific scenari	io narrati	ves		
Cluster	Narrative (Case specific)	Edit	Comment	View comments	View drivers and barriers
I		Edit	Comment	View com-s	View d's and b's
II		Edit	Comment	View com-s	View d's and b's
111		Edit	Comment	View com-s	View d's and b's
IV		Edit	Comment	View com-s	View d's and b's
					Cancel

# Figure 25: Case Study-specific scenario narratives

Purpose	Once the drivers and barriers are identified and clustered, it is useful to create an overall narrative of the future per cluster of drivers and barriers.								
Func- tionality	<ul> <li>W al</li> <li>C</li> <li>A</li> <li>A</li> <li>A</li> <li>fu</li> </ul>	/hen clickir ble to edit th ase Study \$ Il authorized Il authorized Inctionality)	ng 'edit', the ne text, and Stakeholder d Users are d Users are .(Figure 7: \	e Case S the expense s are able able to vi e able to v view com	Study Admin cted develo to comme ew the com view the dri ments pop-	nistrators an pment. nt. nments. vers and ba up)	nd Collabora rriers (a pop	ators shou	uld be vering
Intended Users	Public Registered Users Technology Providers Indicator Providers Case Study Stakeholders Case Study Collaborators Case Study Admins Adminis							Sys- tem Ad- mins	

Technology mate	ching	with	driver	s and	l barr	iers
Driver	Tech 1	Tech 2	Tech 	Edit	Comment	View comments
	/-/0/+/++	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
	/-/0/+/++	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
	/-/0/+/++	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
	/-/0/+/++	/-/0/+/++	/-/0/+/++	Edit	Comment	View com-s
						Cancel

#### 4.4.4.3 Technology matching with drivers and barriers

#### Figure 26: Technology matching with drivers and barriers

Purpose	Once th ual driv	Once the drivers and barriers are identified, it is useful to assess the effect of the individ- ual drivers and barriers on the uptake of a technology.								
Func- tionality	<ul><li>✤ The bar</li><li>♦ Wh</li></ul>	e table is rriers. nen clickin	created ba	ised on th Case St	ne selected udy Collabo	l technologi	es and sele	cted drive	ers and g tech-	
	nol Ca All up)	<ul> <li>nologies.</li> <li>Case Study Stakeholders are able to comment.</li> <li>All authorized Users are able to view the comments. (Figure 7: View comments popula)</li> </ul>								
Intended Users	Public         Registered Users         Technology Providers         Indicator Providers         Case Study Providers         Case Study Stakeholders         Case Study Collaborators         Case Study Admins         System									
						х	х	Х	х	

#### 4.4.5 Matching of Case Study development with the functionalities presented in Chapter 4.4

Many functionalities have been described and visualized in the paragraphs above. The aim of this section is to provide an overview of the different functionalities within the framework of the Case Study development steps, as defined in the Deliverable 1.8 (Roadmap for Case Study Development).

Step 1. Definition of system boundaries, requires:

- a. Several narrative fields;
- b. Attachments; and
- c. Importing of the Case Study schematisation.
- Step 2. Mapping of stages and processes, requires:
  - a. Several narrative fields;
  - b. attachments; and

- c. Importing of the improved Case Study schematisation.
- Step 3. Identification of actors involved, requires:
  - a. Actor tool; and
  - b. Narrative fields.
- Step 4. Mapping of actor interrelations, requires:
  - a. Graphical tool (not yet foreseen); and
  - b. Narrative fields.
- Step 5. Identification of environmental impact indicators, requires:
  - a. The association of indicators to the Case Study tool (requires the existence of generic indicator database); and
  - b. Narrative fields.
- Step 6. Selection of environmental impact parameters, requires:
  - a. The association of parameters to the Case Study tool (requires the existence of generic parameter database); and
  - b. Narrative fields.
- Step 7. Collection of data on resource flows and currently applied technologies, requires (optionally):
  - a. Data-storage (primary data are mainly stored within SEAT and EVAT).
- Step 8. Calculation of Environmental Impact Indicators
  - a. Aggregation of parameters to the indicators tool.
- Step 9. Development of the economic analysis, requires:
  - a. Narrative fields; and
  - b. Importing of the EVAT results.
- Step 10. Identification of normalization and weighting parameters, requires (optionally):
  - a. The aggregation of the indicators to the index tool.
- Step 11. Baseline scenario eco-efficiency-assessment, requires:
  - a. Narrative fields; and
  - b. Importing of the SEAT/EVAT results.
- Step 12. Description of potential technologies to improve eco-efficiency, requires:
  - a. Associate indicator to the Case Study tool; and
  - b. Narrative fields.
- Step 13. Views of actors on technologies, requires:
  - a. Narrative fields.
- Step 14. Selection of the most suitable technologies, requires:
  - a. Narrative fields.
- Step 15. Quantitative assessment of alternative technology configurations, requires:
  - a. Narrative fields;
  - b. Importing of the SEAT/EVAT results; and
  - c. Various graphs.

- Step 16. Definition of scenarios, requires:
  - a. PESTLE tool; and
  - b. Narrative fields.
- Step 17. Analysis of scenarios, requires:
  - a. Actor views; and
  - b. Technology assessment with respect to scenarios.

The development of these steps is an evolving process and the order of activities may change. In addition, more functionalities than those presented in this coarse overview may be required. The reader may notice that not all the previous and following functionality screen shots are included in this table. The rest of the functionality examples are secondary to the required functionalities listed here.

## 4.5 Tab 'Technologies'



#### Figure 27: Introduction to technologies

Purpose	This t	This tab concerns the opening screen of technologies.								
Function- ality	* T * T	<ul> <li>The user receives general information about the issue of technologies.</li> <li>The user can view the technologies. (Figure 7: View comments pop-up)</li> </ul>								
Intended Users	Public	Public Registered Users Providers Providers Providers Case Study Case Study Case Study Case Study Collaborators Study Admins								
	X	х	х	х	х	х	х	х	х	

# 4.5.1 Left-hand tab 'Overview of technologies'

								_ @	1 23
Home Case st	udies Tech	nologies	Indicators	Resources	Login	Register	About	Help	
Introduction to technologies						(	te	Add new chnology	
Overview of technologies	ID	Name	Sector	Category	Owner / editor	Short description		View Details	
Optional tabs	(auto)	(auto)	(auto)					View	
								View	
								View	
								View	

# Figure 28: Overview of technologies

Pur-	The p	The purpose of this page is to show the listed technologies.									
pose											
Func-	✤ A	<ul> <li>A table with technologies.</li> </ul>									
tionality	✤ T	The user should be able to sort the table by the green fields.									
	✤ C	<ul> <li>Clicking details will open a pop up window.</li> </ul>									
	<b>∻</b> T	echnology F	Providers ca	an add ne	w technolog	gies.					
Intend- ed Us-	Public	ublic Registered Users Providers Providers Providers Case Study Case Study Case Study Case Study Admins Admins									
ers	Х	х	х	Х	х	х	х	Х	х		

# 4.5.2 Button 'View details' (pop-up)

				_		
					C	⊐ @ X
Introduction &	Details f	or Technology 'T'				
Eackground Field 1	ltem	Content	View comments	Comment	Edit	
	Name		View comments	Comment	Edit	
	Sector		View comments	Comment	Edit	
	Category		View comments	Comment	Edit	
Field N	Description		View comments	Comment	Edit	
Applications	Field 1		View comments	Comment	Edit	
FcoWater			View comments	Comment	Edit	
Applications	Field N		View comments	Comment	Edit	
Printer friendly version	Application Examples		View comments	Comment	Edit	
	Application in Case Studies		View comments	Comment	Edit	
	Attachments		View comments	Comment	Edit	

# Figure 29: Detailed description of technologies

Purpose	The pu hand should outcor	urpose of th navigation I lead to th ne of the Ta	iis screen is bar present e conclusic ask 1.2 (Teo	to provic ts the diff ons. The chnology i	le an overv ferent chap fields ment inventory fo	iew of the a ters or step ioned will b r eco-efficie	vailable infor os, which (w e determine nt water sys	mation. T hen comp d based of tems and	he left bleted) on the use).
Func- tionality	<ul> <li>OI</li> <li>Sp</li> <li>Sh</li> <li>OI</li> <li>Th</li> <li>T</li></ul>	n 'Click' on bonding sec hould not ne n 'Click' on he button 'c he button 'v nks to the o levant resul	a step in the tion. The le eed to go ba the printer f dit' will oper omment' wi iew comme Case Studie Its may be p	ne left han ft hand na ack). friendly ve n an edito Il allow co nts' will al es where provided in	nd navigatio avigation pa ersion, a prin or window (co ommenting. low viewing the techno n the 'Applie	n panel, the inel remains nter friendly only available comments. logy has be cation in Ca	e user will jui visible at al report will be e to the tech een impleme se Studies' f	mp to the l times (th e created. nology cre nted and ield.	corre- e user eator). to the
Intend- ed Us-	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
ers	X	х	Х	х	х	х	x	х	x

# 4.5.3 Button 'New technology' pop-up

			- @ X
Name		Edit	save
Sector		Edit	save
Category		Edit	save
Introduction & Background		Edit	save
Field 1		Edit	save
		Edit	save
Field N		Edit	save
Application Examples		Edit	save
Applications in Case studies		Edit	save
Attachements		Edit	save
	Cancel	ublish Close	

#### Figure 30: Adding and editing a technology

Purpose	The probased on tec above the use	The purpose of this pop-up is to enter a new technology. The fields will be determined based on the needs of the technology inventory. Adding and editing generic information on technologies is restricted to Technology Providers only. The grey area in the mock-up above will be filled with existing information, if the technology already exists. Otherwise, the user will fill in these fields.							
Func- tionality	<ul> <li>OI</li> <li>US</li> <li>OI</li> <li>Th</li> <li>Th</li> <li>Th</li> </ul>	<ul> <li>On 'Edit', the user will be able to edit the corresponding field. This will likely be by using a pop-up window.</li> <li>On 'Click' on printer friendly version a printer friendly report will be created.</li> <li>The button 'edit' will open an editor window (only available to the technology creator).</li> <li>The button 'comment' will allow commenting (depending on authorisation).</li> <li>The button 'view comments' will allow viewing comments.</li> </ul>							
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
			X						х

# 4.6 Tab 'Indicators'

Home Case st	udies Technologies	Indicators	Resources	Login	Register	About	Help
Introduction to indicators and parmeters Overview of Indicators Overview of Parameters Optional tabs	Introduction Lorem ips Etiam enir velit. Praes Aenean vo ac. Praese euismod in turpis id p nisl orci et laoreet int	on to indica um dolor s n nisl, gra sent vel to estibulum ent faucibu n. Vestibul orta dictun ; leo. Nulla erdum.	ators and p sit amet, co vida non ve ortor eget lig ultrices ma us pulvinar lum at henc n, orci metu a et dignissi	arameters nsectetur a estibulum c gula eleme uris, id tem magna, ut Irerit tortor is vehicula m risus. In	adipiscing o quis, tincidu entum mole porta torto c Curabitur arcu, nec at ante et	elit. unt sed estie. orttitor r rutrum, cursus diam	

#### 4.6.1 Left-hand tab 'Introduction to Indicators and parameters'

#### **Figure 31: Introduction to indicators**

Purpose	This ta	ab concerns	the openin	g screen	of indicator	S.			
Func-	🔹 Th	The User receives general information on indicators.							
tionality	🔹 Th	The User can view the lists of indicators and parameters.							
Intend- ed Us-	Public	PublicRegistered UsersTechnology ProvidersIndicator ProvidersCase Study 							
ers	Х	X x x x x x x x x x							

#### 4.6.2 Left-hand tab 'Overview of indicators'

Home Case stu	dies	Technologies	Indicators	Resources	Login	Register	Abou	t	Help
Introduction to indicators and parmeters	Ove	erview of	indicators:						
Overview of	ID	Name	Definition / Shor	t Description	Potential Par (1n)	ameters			
Overview of								Edit	
Parameters								Edit	
Optional tabs								Edit	
								New	]

Figure 32: Overview of indicators

Purpose	The put typical	urpose of th underlying	nis page is parameters	to show tl s.	he listed ind	dicators and	provide son	ne insight	in the
Func- tionality	<ul><li>✤ A</li><li>♦ Th</li></ul>	table with ir ne User sho	ndicators. Juld be able	to sort th	e table by t	he green fie	lds.		
Intend- ed Us-	Public	Public         Registered Users         Technology Providers         Indicator Providers         Case Study Providers         Case Study Stakeholders         Case Study Collaborators         Case Study Admins         System Admins							
ers	X	Х	Х	Х	Х	Х	х	Х	х

#### 4.6.3 Button 'new/edit indicator' (Pop-up)

New / Edit india	cator				đΣ
ltem	Content	Edit	Save		
ID	(autotext)	-	-		
Name	(in case of 'edit', existing text should show in this column, in case of 'new' this column is empty)	Edit	Save		
Definition / Short Description	dito	Edit	Save		
Parameters	A narrative text on possible parameters. (Parameters and indicators are only linked on the case study level)				
		Cancel	Publish Close		

# Figure 33: Editing an indicator / creating a new indicator

Purpose	This se	This screen provides an example, if 'edit' indicator or 'new indicator' is selected.							
Func- tionality	<ul> <li>✤ Th ing</li> <li>♦ Th</li> </ul>	<ul> <li>The screen allows editing existing information, if 'edit' has been selected. The existing information is then already visible.</li> <li>The screen allows adding new information, if the entry point is 'add new indicator'.</li> </ul>							
Intended Users	Public	PublicRegistered UsersTechnology ProvidersIndicator ProvidersCase Study ProvidersCase Study StakeholdersCase Study CollaboratorsCase Study Admins							
				Х					х

#### 4.6.4 Left-hand tab 'Overview of parameters'

 (	Dve	erview of Par	ameters		
ID	Name	Definition / Short Description	unit		
				Edit	
				Edit	
				Edit	
				New	

#### Figure 34: Overview of parameters

Purpose	This se	creen provi	des an over	view of pa	arameters (	underlying i	ndicators).		
Func- tionality	<ul><li>✤ A</li><li>♦ Th</li></ul>	<ul> <li>A table with indicators.</li> <li>The User should be able to sort the table by the green fields.</li> </ul>							
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
	Х	Х	Х	Х	Х	х	х	Х	х

#### 4.6.4.1 Button 'Add/edit parameters' (pop-up)

				- 6 X
New / Edit para	meter			
Item	Content	Edit	Save	
ID	(autotext)	-	-	
Name	(in case of 'edit', existing text should show in this column, in case of 'new' this column is empty)	Edit	Save	
Unit	dito	Edit	Save	
		Cancel	Publish Close	

#### Figure 35: Editing a parameter / create new parameter

Purpose	This se	creen provi	des an exar	nple, if 'eo	dit' indicator	r or 'new par	ameter' is se	elected.	
Func- tionality	<ul> <li>Therefore</li> <li>Therefore</li> <li>Therefore</li> </ul>	<ul> <li>The screen allows editing existing information, if 'edit' has been selected. The existing information is then already visible.</li> <li>The screen allows adding new information, if the entry point is 'add new indicator'.</li> </ul>							
Intended Users	Public	Public Registered Users Providers Providers Case Study Case Study Case Study Case Study Collaborators Study Admins					System Admins		
				Х					х

# 4.7 Tab 'Resources'

Home Case studies	Technologies Indicators Resources Login Register About Help
Software	
Dete	Software
	[ SEAT, EVAT]
Projects	
Miscellaneous	Data
	[LCA?]
	Projects
	[]
	Miscellaneous
	[]

# Figure 36: Resources

Purpose	This s ward p	This screen provides a view on the 'resources' tab. The 'resources' tab is a straightfor- ward page listing (and linking to) other relevant tools and information repositories.											
Func- tionality	<ul><li>Th</li><li>Th</li></ul>	<ul> <li>The buttons on the left-hand side allow jumping to the right section.</li> <li>These buttons will always remain visible.</li> </ul>											
Intended Users	Public	ublic Registered Users Technology Indicator Case Study Case Study Stakeholders Case Study Collaborators Study Admins											
	X	х	х	Х	х	х	х	Х	х				

# 4.8 Tab 'Login'

Home Case studies	Technologies	Indicators	Resources	Login	Register	About	Help
Login	Username						
Forgot	Password						
username/password?						_	
Change account details							
Register							
Deguest sutherisetien							
Request authorisation							
Manage							
autionsations							

# Figure 37: Tab 'Login'

Purpose	This so	This screen provides a view on the login screen.											
Func-	Th	<ul> <li>The buttons on the left-hand side allow jumping to a specific right section.</li> </ul>											
tionality	🛠 Th	These buttons will always remain visible.											
	🛠 Th	<ul> <li>The screen starts by default with the login fields.</li> </ul>											
Intended Users	Public	ublic Registered Users Providers Providers Providers Case Study Case Study Case Study Case Study Collaborators Study Admins Admins											
		х											

# 4.8.1 Left hand tab 'Login'

Figure 37 also applies to this section.

Purpose	Clickin would	Clicking this tab will lead the User back to Figure 37. It will thus do the same as if one would click on the login tab in the top level.											
Func- tionality	∻ Ju	Jump to the login screen.											
Intended Users	Public	blic Registered Users Technology Providers Providers Case Study Providers Stakeholders Case Study Case Study Collaborators Study Admins											
		Х											

Home Case studies	Technologies	Indicators	Resources	Login	Register	About	Неір
Login	email						
Forgot username/password?							
Register							
Request authorisation							
authorisations							

# 4.8.2 Left hand tab 'Forgot username or password'

#### Figure 38: Left hand tab 'Forgot username or password'

Purpose	Clickin	Clicking this tab will lead to a screen where the user can request a new password.											
Func- tionality	Er FL A A	<ul> <li>Entry field for an email-address.</li> <li>Further functionalities will depend on available security technologies, but could be:</li> <li>Setting of a new password and sending this new password.</li> <li>Sending a temporary link.</li> </ul>											
Intended Users	Public	ublic Registered Users Providers Providers Case Study Providers Case Study Stakeholders Case Study Collaborators Study Admins											
		х											

							_		
Home Ca	ise studies	Technologies	Indicators	Resources	Login	Register	About		Help
Login Forgot username/password Change account details	1?	First name* Family name* Email* Telephone						save save save save	
Register		Occupation / Employer URL						save save	
Request authorisation	on	Access rights	(auto)						
Manage authorisations						Са	* = manda ncel	tory fields Jpdate	I

# 4.8.3 Left hand tab 'Change account details'

# Figure 39: Left-hand tab 'Change account settings'

Purpose	Clicki	Clicking this tab will lead to a screen where the user can alter their registration details.											
Func- tionality	♦ E	<ul> <li>Existing information is presented.</li> <li>Editing and saving existing information.</li> </ul>											
Intend- ed Us-	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins				
ers		х											

# 4.8.4 Left hand tab 'Register'

Home Case studies	Technologies	Indicators	Resources	Login	Register	About	Help
Login	First name*						
Forgot username/password?	Family name*						
Change account	Email*						
	Telephone						
Register	Occupation / Employer						
Request authorisation	URL						
	Access rights	(auto)					
Manage authorisations						* = mandatory	fields
					Ca	ncel Regi	ster

# Figure 40: Left-hand tab 'Register'

Purpose	Clickin	licking this tab will lead to a screen where the user can register.											
Func- tionality	✤ In:	Inserting and saving user account information.											
Intended Users	Public	Public Registered Users Providers Providers Providers Case Study Providers Case Study Case Study Case Study Collaborators Study Admins											
	Х												

#### 4.8.5 Left hand tab 'Request Authorisation'



#### Figure 41: Left-hand tab 'Request authorisation'

Purpose	To ke Case buttor to the	To keep the system easy to maintain from a User authorisation perspective, System and Case Study Administrators will be in charge of providing access. This screen provides buttons which will send notifications to the Case Study Administrators or, alternatively, o the System Administrators (add a Case Study, add a technology and add indicators).												
Function- ality	✤ P	<ul> <li>Provide access to specific functionalities.</li> </ul>												
Intended Users	Public	blic Begistered Users Technology Providers Indicator Providers Case Study Case Study Stakeholders Case Study Collaborators Study Admins												
		Х												

Home Case studies	Tech	Indicators	Resources		Login	F	Register		About	Help
Login	First name	Last name	CS1	CS2		Tech	Indic ators			
Forgot			y/n	y/n	y/n	y/n	y/n	y/n		
username/password?			y/n	y/n	y/n	y/n	y/n	y/n		
Change account details			y/n	y/n	y/n	y/n	y/n	y/n		
Register			y/n	y/n	y/n	y/n	y/n	y/n		
			y/n	y/n	y/n	y/n	y/n	y/n		
Request authorisation										
Manage authorisations										
						(	Cancel	ι ι	Jpdate	]

# 4.8.6 Left hand tab 'Manage authorisations''

# Figure 42: Left-hand tab 'Manage authorisations'

Purpose	On this screen, the System Administrators and Case Study Administrators can set the authorisations.									
Func- tionality	<ul><li>Ca</li><li>Ye</li></ul>	<ul> <li>Case Study Administrators will see only the section of their Case Study.</li> <li>Yes / No (y/n) check boxes will toggle authorisations.</li> </ul>								
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins	
								Х	х	

# 4.9 Tab 'About'

		- # X
Home	Case studies         Technologies         Indicators         Resources         Login         Register         About	Help
	About: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam enim nisl, gravida non vestibulum quis, tincidunt sed velit. Praesent vel tortor eget ligula elementum molestie. Aenean vestibulum ultrices mauris, id tempor orci portitor ac. Praesent faucibus pulvinar magna, ut porta tortor euismod in. Vestibulum at hendrerit tortor. Curabitur rutrum, turpis id porta dictum, orci metus vehicula arcu, nec cursus nisl orci et leo. Nulla et dignissim risus. In at ante et diam laoreet interdum. Version: Contact:	

#### Figure 43: Tab 'About'

Purpose	The purpose of this screen is to provide Users with basic information.								
Func- tionality	<ul> <li>None, besides basic information.</li> </ul>								
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
	Х								

# 4.10 Tab 'Help'



Figure 44: Tab 'Help'

Purpose	The purpose of this screen is to provide User with help.								
Func-	<ul> <li>On the left hand navigation tabs the user is guided through the different chapters.</li> </ul>								
tionality	The help document will be developed based on small chapters, which will be associ-								
	ated with different screens of the tools.								
	◆ The help function should start with an introduction in which the following issues								
	should be addressed (raised by the reviewers):								
	How to make sure the software survives the Project?								
	What is the added value of this toolbox?								
	Who does the software target (both currently and after Project completion)?								
	Who will maintain and adapt the software effort in the future?								
Intended Users	Public	Registered Users	Technology Providers	Indicator Providers	Case Study Providers	Case Study Stakeholders	Case Study Collaborators	Case Study Admins	System Admins
	Х								

# 5 Overall architecture

The overall architecture of the toolbox is depicted in Figure 45 below.



Figure 45: Overall architecture

The left hand part is a traditional three-tier architecture. The Web-Based Graphical User Interface is the part that the users see and work with. This layer is commonly referred to as GUI layer (or Presentation logic layer). From this layer, users are able to carry out a number of tasks. Many of those tasks require retrieval, manipulation and storing of information and data. The data manipulation layer is commonly referred to as object layer (or Business rules), whereas the database layer is also referred to as the Business data layer.

In the lower right hand section, the EVAT and SEAT are presented. These are stand-alone tools. In this functional design, two functionalities have been presented with respect to these tools:

- 1. Downloading the tools from the tab 'resources'; and
- 2. Importing models and results from the different tools. This is depicted by the arrow in the architecture. Data are imported via a command given in the graphical user interface. Results are stored in the database layer.

# 6 Conclusions and next steps

This functional design provides numerous example screens and example functionalities that are required to implement the software. The functional design heavily builds on the EcoWater Deliverable 1.8 (Roadmap for Case Study Development). Ongoing work, and hence new insight, may require alterations and additions to this design.

The functional design in this shape provides sufficient information for the next step, the development of the technical design, especially with regard to the design of the underlying databases and tool interrelationships. This functional design could be further extended to provide detailed information for incorporating further functionalities. During the implementation phase, this information may be added on demand.

# 7 Literature

- EcoWater Description of Work, 2011, EcoWater Project, Meso-level eco-efficiency indicators to assess technologies and their uptake in water use sectors, 7th Framework Programme, Grant Agreement No: 282882 (restricted access).
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