



timbre

Tailored Improvement of
Brownfield Regeneration
in Europe

Timbre Information System for the provision of tailored and customized information on brownfield regeneration according to users' requirements

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CABERNET 2014: Tailored & Sustainable Redevelopment towards Zero Brownfields

14/10/2014

Content



Information System: structure, Artificial Neural Network methodology and testing activities

- Timbre project
- Structure of the TIMBRE Information System for Brownfield Regeneration
- Web database
- Ranking methodology: Artificial Neural Network aims and criteria
- Information System interfaces
- Testing activities: involving partners and stakeholders from the timbre case studies
- Lesson learned

TIMBRE project tailored improvement of brownfield regeneration in Europe



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- FP7 Collaborative Project



- Duration: 01/2011 – 06/2014
- 15 Partners & International Advisory Board



Aim: to support end-users in overcoming existing barriers on brownfield regeneration by developing customised problem and target-oriented packages of technologies, approaches and tools for brownfield regeneration.

EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN



The TIMBRE Information System for Brownfield Regeneration



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The TIMBRE Information System for Brownfield Regeneration consists in a web based software

→ supporting **stakeholders** in sharing, accessing and selecting the most suitable information (**WEB LINKS**) for the different phases of the BF management process



→ taking into account **stakeholders'** specific needs, requirements and using the evaluations provided by previous users.

Information system: structure

TIMBRE WEB DATABASE



Category	Country of reference	Application	Title of the document	Description of the technical document	Original language	English version link	Other languages link	Rating
Risk assessment (qualitative/quantitative)	Italy	National	National guidelines for the application of environmental risk assessment to contaminated sites (Cir 2002)	National guidelines for the application of environmental risk assessment to contaminated sites (Cir 2002)	Italian	001001		5 stars
Remediation technologies evaluation and selection	Italy	National	Annexes to Italian national guidelines for environmental risk assessment	Annexes to Italian national guidelines for environmental risk assessment	Italian	001002		5 stars
Decision-making and communication	Italy	National	Italian Environmental Protection Agency (ISPRA) National guidelines for the application of environmental risk assessment to contaminated sites (Cir 2002)	National guidelines for the application of environmental risk assessment to contaminated sites (Cir 2002)	Italian	001003		5 stars
Building and infrastructure documents	Italy	National	Annexes to Italian national guidelines for environmental risk assessment	Annexes to Italian national guidelines for environmental risk assessment	Italian	001004		5 stars
Decontamination use of structural materials	Italy	National	Annexes to Italian national guidelines for environmental risk assessment	Annexes to Italian national guidelines for environmental risk assessment	Italian	001005		5 stars
Waste management	Italy	National	Annexes to Italian national guidelines for environmental risk assessment	Annexes to Italian national guidelines for environmental risk assessment	Italian	001006		5 stars
Requalification (plan development, implementation, control, monitoring (and back to market))	Italy	National	Annexes to Italian national guidelines for environmental risk assessment	Annexes to Italian national guidelines for environmental risk assessment	Italian	001007		5 stars

Framework for the collection of information



Partners and experts participation to include information



RANKING OF INFORMATION

- Multi-criteria methodology to rank available information/documents (Artificial Neural Networks)
- Users and experts participation to rank the information



The **TIMBRE web database**, where the web links to relevant information on brownfield regeneration are stored, and the **ranking methodology**, that allows to classify those web links according to users' characteristics and information needs, are the **two main components of the tool**.



These two components are integrated into the tool and users can benefit from their features through user friendly functionalities and interfaces.

TIMBRE Web Database



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Timbre > explore > Decision-making and communication - Technical manuals

admin - Logout



timbre web database

the timbre project: <http://www.timbre-project.eu/>

This research project has received funding from the European Community's Seventh Framework Programme (2011-2014) under grant agreement no. 265364



Help

Search

Links Control Panel

Insert new item

Start new search

All

Regulation

Technical manuals

Tools

Case studies



Country of reference:

All

All

Funding and financing

Risk assessment
(qualitative/quantitative)

Strategic planning

Investigation (preliminary/detailed)

Remediation technologies
evaluation and selection

Remediation strategies and
options

Socio-economic assessment

Decision-making and
communication

Building and infrastructure
documents

Deconstruction/re-use of
structures materials

Waste management

Requalification plan development

Implementation, control,
monitoring (land back to market)

Category: Decision-making and communication

Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English Version link	Other languages link	Rating		
None	EU	European	Better Decision Making Now - CLARINET / NICOLE Joint Statement	Better Decision Making Now: the use of Risk Assessment and Risk Management for tackling the problems of contaminated land.	English version	-	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 2		
None	United Kingdom	National	SuRF-UK: A Framework for Assessing the Sustainability of Soil and Groundwater Remediation	The framework document sets out why sustainability issues associated with remediation needs to be factored in right from the outset of a project. It identifies opportunities for considering sustainability at a number of key points in a sites redevelopment or risk management process.	English version	-	-	★★★★★ Evaluations: 2 Inappropriate: 0 Total visits: 2		
None	United Kingdom	National	Annex 1: SuRF-UK Indicator Set for Sustainable Remediation	The SuRF-UK Indicator Set for Sustainable Remediation Assessment supports the SuRF-UK framework document. The document describes 15 categories of indicators spread over environmental, social and economic factors that can be	English version	-	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 0		

Framework for the collection of information

LITERATURE REVIEW



NORISC



RESCUE



DESYRE

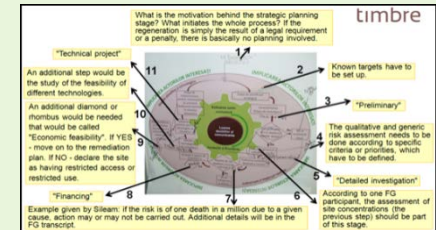


CABERNET
ETC.

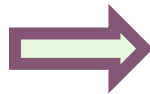
HUNEDOARA WORKSHOP



BUCHAREST FOCUS GROUP



Proposal of a
framework



Workshops with
local stakeholders
& questionnaire



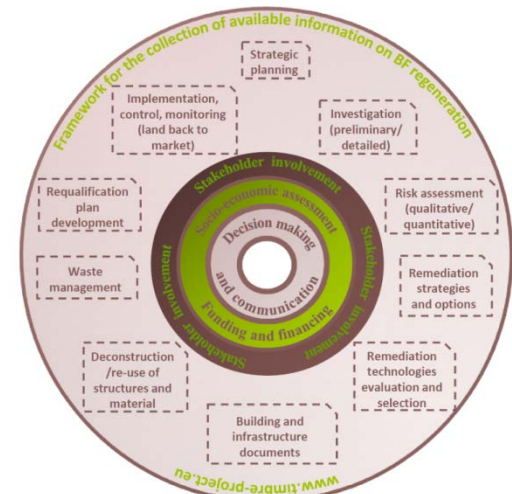
Definitive
framework

Zielona Góra (Poland), 28 March 2012

Szprotawa (Poland), 29 March 2012



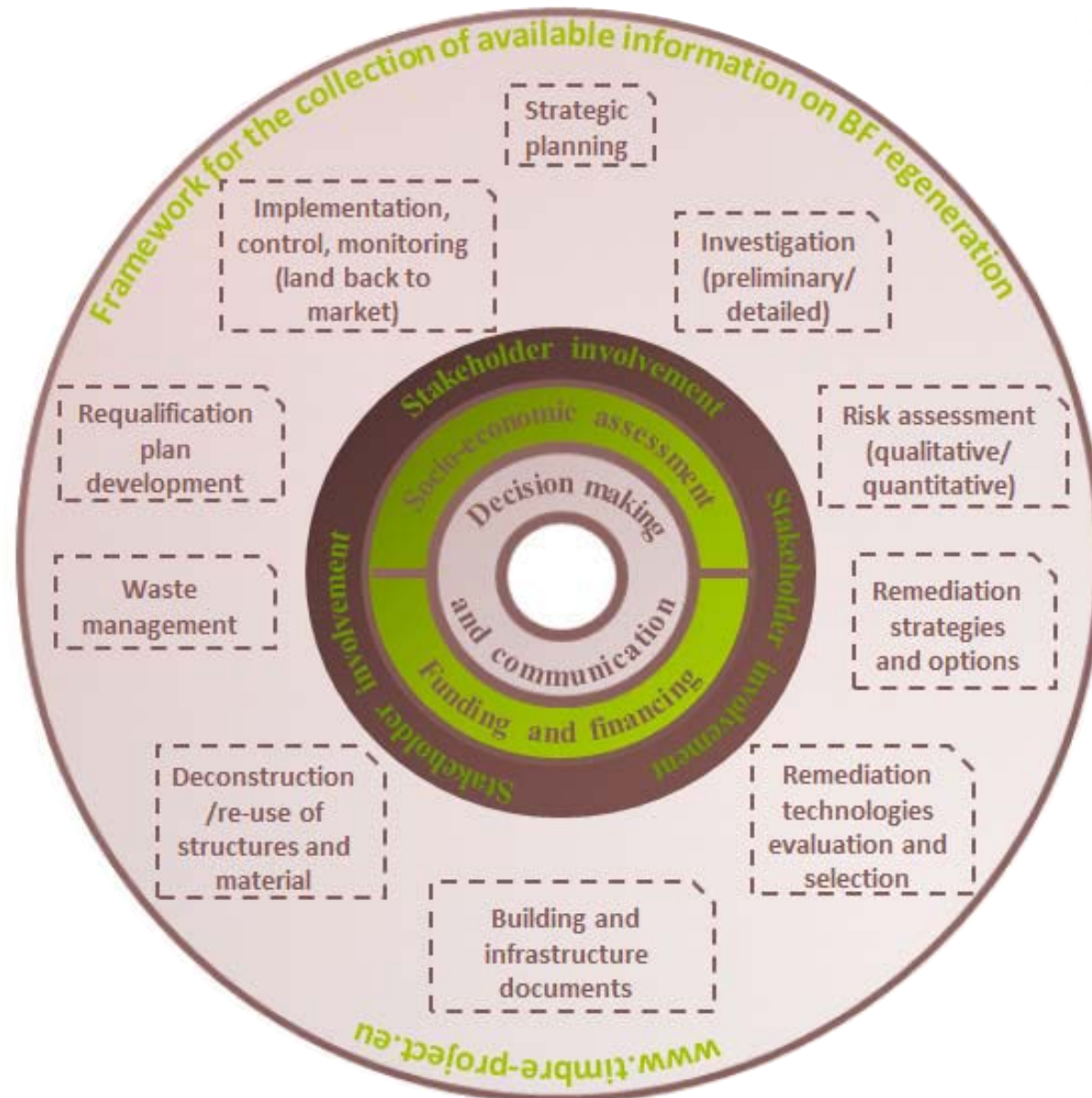
Questionnaire



Framework for the collection of information on brownfield regeneration



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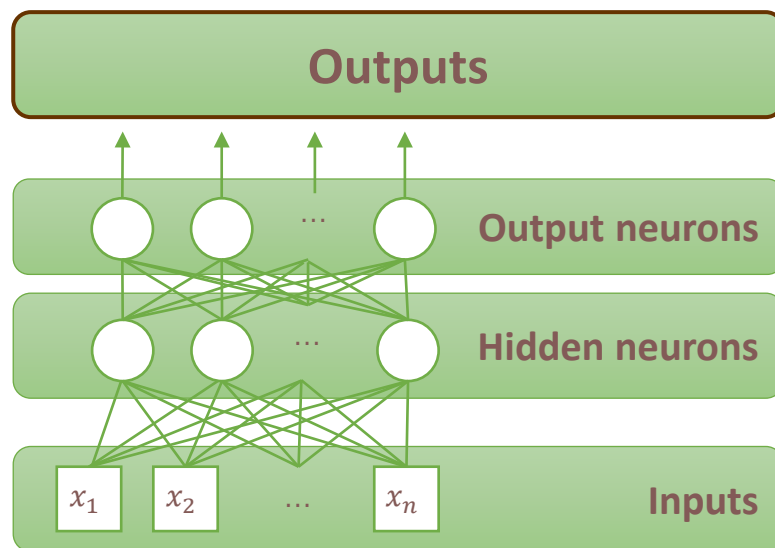


Artificial Neural Networks



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- ANN: mathematical model inspired by biological neural networks;
- interconnected group of artificial neurons;



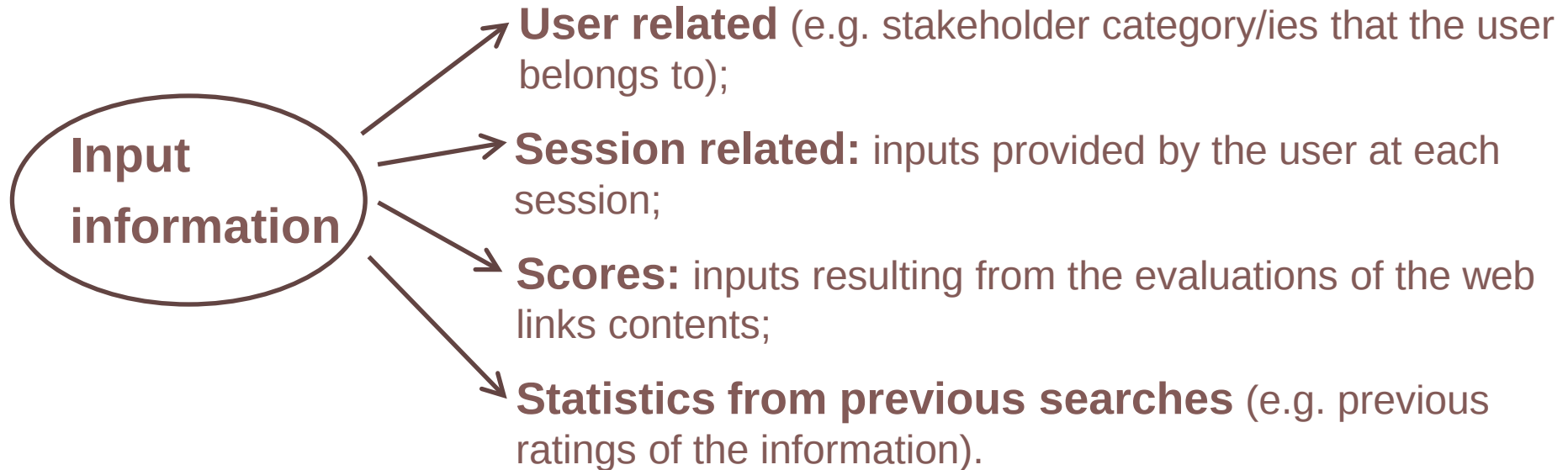
- adaptive system that changes its structure during a learning phase;
- used to model complex (e.g. non linear) relationships between inputs and outputs.

ANN methodology: aim and criteria

Aim: to rank links by importance according to user's typology, aim of search and other requisites.

Important features of the methodology:

- absence of some information shouldn't influence availability of the results;
- the ranking should improve continuously with the incorporation of new searches' statistics.



ANN methodology: focus on criteria

1. **“User related” inputs** are data provided by the users during the registration to the Information System.

They refer to specific user’ characteristics stored on his/her profile page (which can be updated/modified as needed) such as:

- **“Preferred language”**
- **“Stakeholder category/ies the user belongs to”**

ANN methodology: focus on criteria (2)



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2. “Session related” inputs are provided by the user at each session:

- **“Aim of search”;**
- **“Country of reference”;**
- **“Selected information categories”;**
- **“Scores of information categories”;**
- **“Typology of information”:** among “Regulation”, “Technical manuals”, “Tools”, “Case studies”.

ANN methodology: focus on criteria (3)



3. “**Scores**” inputs: evaluations of the web links according to the following criteria:

- ✒ “**Pertinence**”: is the web link information pertinent with the aim of search? (yes/no)
- ✒ “**Appropriateness**”: is the web link information appropriate for the selected information category/ies of the framework? (yes/no)

IF BOTH ANSWERS ARE YES THEN THE FOLLOWING QUESTIONS:



- “**Usefulness**”: was the information useful in achieving the aim of search? *;
- “**Clarity**”: was the information understandable and properly communicated? *;
- “**Reliability and accuracy**”: was the information reliable and accurate, considering the quality and the trustworthiness of the source of information? *;
- “**Updating**”: was the information compliant with the latest regulatory frameworks? *.

* Score from 1 to 5, where 1 is associated to the lowest evaluation and 5 to the highest evaluation”

ANN methodology: focus on criteria (4)



4. “Statistics” from previous searches:

- **“Number of clicks received by a web link from users belonging to the same stakeholder category”**: it indicates the level of interest from the same stakeholder category for that web link.
- **“Total number of clicks”**: it indicates the level of interest for a particular web link.

Information System interfaces



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Which is your search goal?

Looking for information* on:

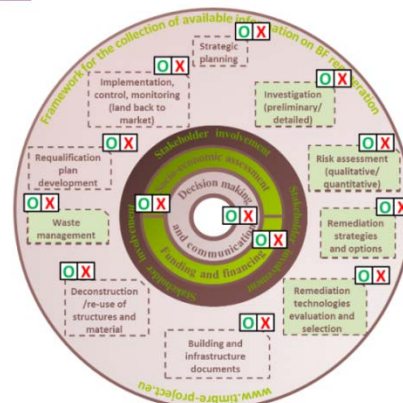
- ☐ BF's with the highest redevelopment potential
- ☐ BF's regeneration barriers;
- ☐ National strategies and guidelines for BF regeneration
- ☐ Stakeholders analysis
- ☐ Social benefits and impacts of BF's
- ☐ Economic benefits of BF's
- ☐ Rural redevelopment of BF's
- ☐ Ecological issues related to BF management (e.g., presence of biotope, type of biotope, value of biotope, protected species, red-list species)
- ☐ Residential redevelopment of BF's
- ☐ (Land regeneration) Sustainable BF regeneration
- ☐ Planning (land use information, regional/urban land use plans)
- ☐ Risk assessment
- ☐ Characterization of soil and groundwater
- ☐ Remediation
- ☐ Reuse of building rubble
- ☐ Waste management and control
- ☐ Monitoring
- ☐ Funds for BF regeneration
- ☐ BF database (lists of BF's with related data, e.g. localization, area, typology, former/historical utilization, contamination, limitations in use, etc.)
- ☐ Best practices and successful case studies of BF regeneration
- ☐ The adoption of Public Private Partnership strategies in BF management
- ☐ Other:

*i.e.: regulations/technical manuals/tools/case studies.

In which country (if any) are you going to apply th

Categories selection

[Show Instructions](#)



Sequential order	Category of information	Relevance score	Comments
1	Investigation (preliminary/detailed)	★★★★☆	
2	Risk assessment (qualitative/quantitative)	★★★★★	

Timbre > explore > All - Regulation

admin - Logout



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search into the database

All **Regulation** Technical manuals Tools Case studies



Country of reference:

All

Category: Investigation (preliminary/detailed)									
	Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the document (english)	Original language link	English version link	Other languages link	Rating
Investigation (preliminary/detailed)									
Risk assessment (qualitative/quantitative)	Preliminary and Detailed	Germany	European	Federal Soil Protection Act of 17 March 1998	German federal law for soil protection and contaminated sites	German version	English version	-	★★★★★ Evaluations: 1 Inappropriate: 1 Total visits: 2
Remediation strategies and options	Preliminary and Detailed	Italy	National	Legislative Decree nr. 152 of 3rd of April 2006.	Italian national legislative decree for environment protection.	Italian version	-	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 1
Remediation technologies evaluation and selection									
Waste management	Preliminary and Detailed	Austria	National	Federal Law on Remediation of Contaminated Sites of 7 June 1989	Legal basis for the registration of contaminated sites and the funding for their containment / remediation. Regulates the definition of terms, the contribution to the Fund for Contaminated Sites, the standard procedures for the registration and assessment of suspected contaminated sites, the basic conditions for clean-up and the responsibilities.	German version	-	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 1
Strategic planning									
Building and infrastructure documents									
Deconstruction/re-use of structures materials									
Requalification plan development	Preliminary and Detailed	Austria	National	ÖNORM S 2090: Sampling of soil gas	Norm for the sampling of soil gas regarding volatile and gaseous organic and inorganic matter. Requirements for sampling procedure, conservation and transport of the samples, as well as for sample preparation, analytical	German version	-	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 0

Search for information (1)

Timbre > search aim admin - Logout

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the timbre project: <http://www.timbre-project.eu/>

Which is your search goal?

Looking for information* on:

☐ BFs with the highest redevelopment potential	☐ Risk assessment
☐ BFs regeneration barriers;	☐ Characterization of soil and groundwater
☐ National strategies and guidelines for BF regeneration	☐ Remediation
☐ Stakeholders analysis	☐ Reuse of building rubble
☐ Social benefits and impacts of BFs	☐ Waste management and control
☐ Economic benefits of BFs	☐ Monitoring
☐ Rural redevelopment of BFs	☐ Funds for BF regeneration
☐ Ecological issues related to BF management (e.g., presence of biotope, type of biotope, value of biotope, protected species, red-list species)	☐ BF database (lists of BFs with related data, e.g. localization, area, typology, former/historical utilization, contamination, limitations in use, etc.)
☐ Residential redevelopment of BFs	☐ Best practices and successful case studies of BF regeneration
☐ (Land regeneration) Sustainable BF regeneration	☐ The adoption of Public Private Partnership strategies in BF management
☐ Planning (land use information, regional/urban land use plans)	☐ Other:

*i.e.: regulations/technical manuals/tools/case studies.

In which **country** (if any) are you going to apply the needed information?

The selection of the **search goal** will influence the delivery of specific documents

The items concerning the **country where to apply the information** will be provided as the first ones, other criteria being equal

Search for information (2)



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The selection of information categories is related with user's main aim of search.

The selection and ranking of the information categories will influence the search results.

Instructions

The users can read the definitions of the information categories by passing the cursor on the boxes

Categories selection

[Show Instructions](#)

www.timbre-project.eu

Sequential order	Category of information	Relevance score	Comments
1	Investigation (preliminary/detailed)	★★★★★	
2	Risk assessment (qualitative/quantitative)	★★★★★	
3	Remediation strategies and options	★★★★★	
4	Remediation technologies evaluation and selection	★★★★★	
5	Waste management	★★★★★	

Search for information (3)



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Typologies of documents

Timbre > explore > All - Regulation

admin - Logout

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search into the database **Search**

Links Control Panel **Insert new item**

Country of reference: **All**

Start new search **All** **Regulation** Technical manuals Tools Case studies

Category: Investigation (preliminary/detailed)

Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the document (english)	Original language link	English Version link	Other languages link	Rating
Investigation (preliminary/detailed)	Preliminary and Detailed	Germany	European	Federal Soil Protection Act of 17 March 1998	German federal law for soil protection and contaminated sites	German version	English version	★★★★★ Evaluations: 1 Inappropriate: 1 Total visits: 2
Risk assessment (qualitative/quantitative)	Preliminary and Detailed	Italy	National	Legislative Decree nr. 152 of 3rd of April 2006.	Italian national legislative decree for environment protection.	Italian version	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 1
Remediation strategies and options	Preliminary and Detailed	Austria	National	Federal Law on Remediation of Contaminated Sites of 7 June 1989	Legal basis for the registration of contaminated sites and the funding for their containment / remediation. Regulates the definition of terms, the contribution to the Fund for Contaminated Sites, the standard procedures for the registration and assessment of suspected contaminated sites, the basic conditions for clean-up and the responsibilities.	German version	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 2
Remediation technologies evaluation and selection	Preliminary and Detailed	Austria	National	ÖNORM S 2090: Sampling of soil gas	Norm for the sampling of soil gas regarding volatile and gaseous organic and inorganic matter. Requirements for sampling procedure, conservation and transport of the samples, as well as for sample preparation, analytical method and documentation. (purchase required)	German version	-	★★★★★ Evaluations: 1 Inappropriate: 0 Total visits: 1
Waste management	Preliminary	Austria	National	ÖNORM S 2091: Contaminated sites - Sampling of solids	Requirements for solid sampling (e.g. soil, subsoil) in connection with the investigation or remediation of	German	-	★★★★★

The selected information categories have a highlighted colour

The user can click on the e-link of interest and directly access to the selected e-page. When the user clicks on the e-link, the stars in the column "Rating" will start flashing. This way the user will have the possibility to provide a judgment on the information.



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admin - Logout



Help

Search

Search

Insert new item

All ▼

All Regular

Category: I

Category: I

Subcategory

Subcategory

Page 10 of 10

11/11/2019

11/11/2019

11/11/2019

11/11/2019

Page 10

Page 10

Page 10

Page 10 of 10

Was the information you found related to the search you were performing?

☒ Yes ☐ No

Do you think that the content of the link was appropriate for the category of concern?

☒ Yes ☐ No

Please, provide an explanation:

Please, rate the information you just visualised:

Usefulness

Is the information in the e-link useful to achieve your job objectives?

Clarity

Is the information in the e-link clear in the description of concepts and in the use of the specific vocabulary?

Reliability and accuracy

Are the source of information or the authors "officially" recognised (e.g., well known scientists, public authorities) and the information accurate and trustworthy?

Updating

Is the information in the e-link up to date and in line with the latest regulatory prescriptions?

Send

The Artificial Neural Network methodology integrates these scores with the other information provided by the users to rank the e-links.

The Artificial Neural Network methodology integrates these scores with the other information provided by the users to rank the e-links.

Adding new information



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Timbre > explore > All - Regulation

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e1 - Logout

Help

search into the database

Search

Insert new item

Country of reference: All

timbre information system

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Start new search

All Regulation Technical manuals Tools Case studies

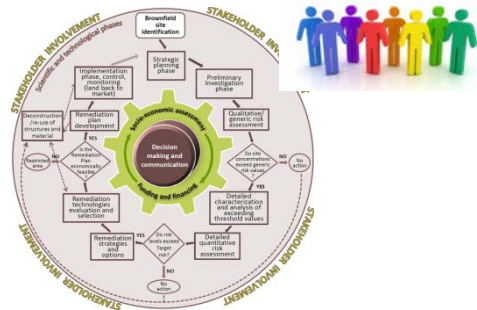
Category: Investigation (preliminary/detailed)

Subcategory	Country of reference	Application scale	Title of the document	Document description	Language	Version	Evaluations	Inappropriate	Total visits
Investigation (preliminary/detailed)	Preliminary and Detailed	Germany	European	Federal Soil Protection Act of 17 March 1998			★★★★★	0	1
Risk assessment (qualitative/quantitative)	Preliminary and Detailed	Italy	National	Legislative Decree of 3rd of April 2006			★★★★★	0	0
Remediation strategies and options	Preliminary and Detailed	Austria	National	Federal Law on the Management of Contaminated Sites of June 1989			★★★★★	0	0
Remediation technologies evaluation and selection	Preliminary and Detailed	Austria	National	ÖNORM S 2090: Sampling of soil gas	German version		★★★★★	0	1
Waste management	Preliminary and Detailed	Austria	National	ÖNORM S 2091: Contaminated sites - Sampling of solids from waste deposits and industrial sites	German version		★★★★★	0	0
Strategic planning	Preliminary and Detailed	Austria	National	ÖNORM S 2092: Contaminated sites - Sampling of groundwaters	German version		★★★★★	0	0
Building and infrastructure documents									
Deconstruction/re-use of structures materials									
Requalification plan development									
Implementation, control, monitoring (land back to market)									
Socio-economic assessment									
Funding and financing									
Decision-making and communication									

Information System: result of a participatory process



Proposal of FW
based on
Literature review,
Hunedoara workshop
& **Bucharest Focus**
group (2012)

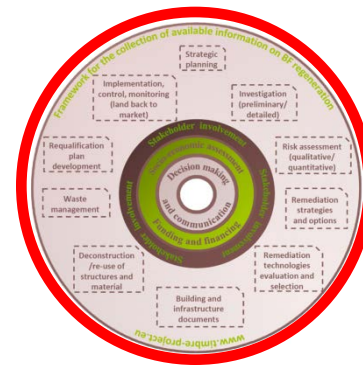


Workshops & questionnaire

- Zielona Góra (Poland)
28 March 2012
- Szprotawa (Poland)
29 March 2012



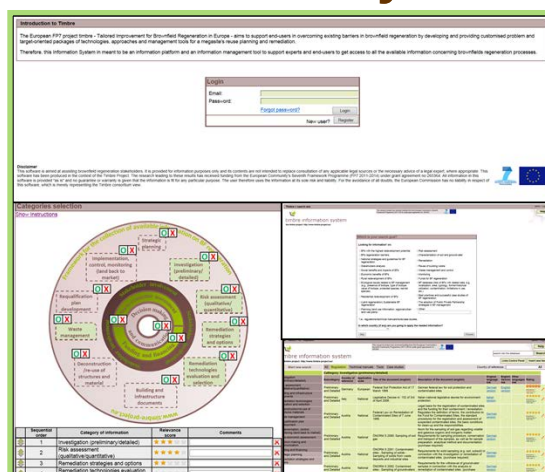
FW
Definitive
version



Web
database



Information System



Five testing activities

to collect feedbacks, inputs, and **evaluations**
according to the **ranking methodology criteria**

- TIMBRE partners testing activity
- Berlin stakeholders testing activity
- Brno stakeholders testing activity
- Bucharest stakeholders testing activity
- Katowice stakeholders testing activity.



&
preliminary
version of
IS

Testing activities: involving partners and stakeholders

Aim: to collect feedbacks on the tool functionalities, on the usability of the interfaces, and on the whole process to obtain, evaluate and upload information.

TIMBRE partners (October/November 2013)



**Berlin stakeholders
27th November 2013**



**Brno stakeholders
29th November 2013**



**Bucharest workshop
11/03/2014**



**Katowice workshop
28/05/2014**

Berlin workshop

27° November 2013

Nr of participants: 8



Stakeholder categories:

- Site owner 1
- Public interest group 1
- Developer/ investor 1
- Consultant 4
- Contractor 1
- End-user 2



Brno workshop

29° November 2013

Nr of participants: 22

Stakeholder categories:

- Site owner 2
- Site neighbor 2
- Local authorities (town or city) 7
- Region/sub-regional government 1



- Public interest group 4
- Technology provider 1
- Consultant 4
- Contractor 1
- End-user 3
- Scientific community and researcher 12



- Regional and national regulator 2
- Local community group (neighborhood, districts) 3



Bucharest workshop

11 March 2014
Nr of participants: 5

Stakeholder categories:

- Regional and national regulators **4**
- Scientific community and research **1**



Katowice workshop

28 May 2014
Nr of participants: 12

Stakeholder categories:

- Scientific community and research **8**
- Consultant **2**
- Media **1**
- Technology provider **1**



- Local community group (neighbourhood, districts) **1**
- Contractor **1**

- Local community group **1**
- Local authorities **1**
- Regional and national regulator **1**

Testing activities: lesson learned and improvements



- new functionalities that can expedite the search process;
- new functionality for web links not active anymore;
-  **new functionality to filter e-links that specifically focus on sustainability;**
- the majority of the workshops' participants could find the information they were searching for;
- commitment of TIMBRE partners in further work to increase the number of web links stored into the web database and updating them, at least for one year, after the end of the project.

Thank you for your attention!

Lisa Pizzol lisa.pizzol@unive.it

<http://www.timbre-project.eu>

<http://www.timbre-project.eu/informationssystem.html>