

TAKING
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Brownfield prioritization at regional scale

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GreenDecision

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The problem: in Europe...

- According to JRC last survey (2018), potentially polluting activities are estimated to have occurred at nearly **3.6 million** sites in the EEA-28 member countries.
- Soil contamination requiring clean up is present at approximately **650,000 sites** in the EEA-28 member countries. About 10% of these sites have been remediated.
- Member states are progressing in identifying potentially contaminated sites, verifying if these sites are actually contaminated and implementing remediation measures where these are required
- On average, 42% of total expenditure on the management of Contaminated Sites comes from public budgets.



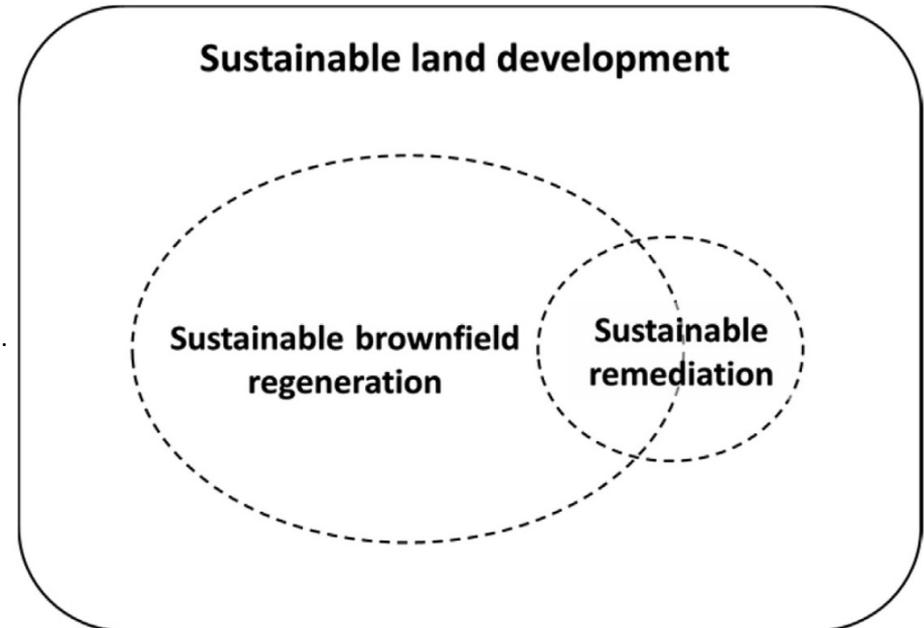


Brownfields

A brownfield site can be defined as a “site that has been affected by former uses of the site or surrounding land, is derelict or underused, is located in urban areas, requires intervention to bring it back to beneficial use; and may have real or perceived contamination problems” (CEN, 2014).

About 3 millions in Europe...

From: Erika Rizzo; Paul Bardos; [Lisa Pizzol](#); Elisa Giubilato; Andrea Critto; Antonio Marcomini; Claudio Albano; Dominique Darmendrail; Gernot Döberl; Melissa Harclerode; Nicola Harries; Paul Nathanail; Carlos Pachon; Alfonso Rodriguez; Hans Slenders; Garry Smith. COMPARISON OF INTERNATIONAL APPROACHES TO SUSTAINABLE REMEDIATION. JEMA. <https://doi.org/10.1016/j.jenvman.2016.07.062>.





Regeneration of Brownfields: The need for re-development

Challenges:

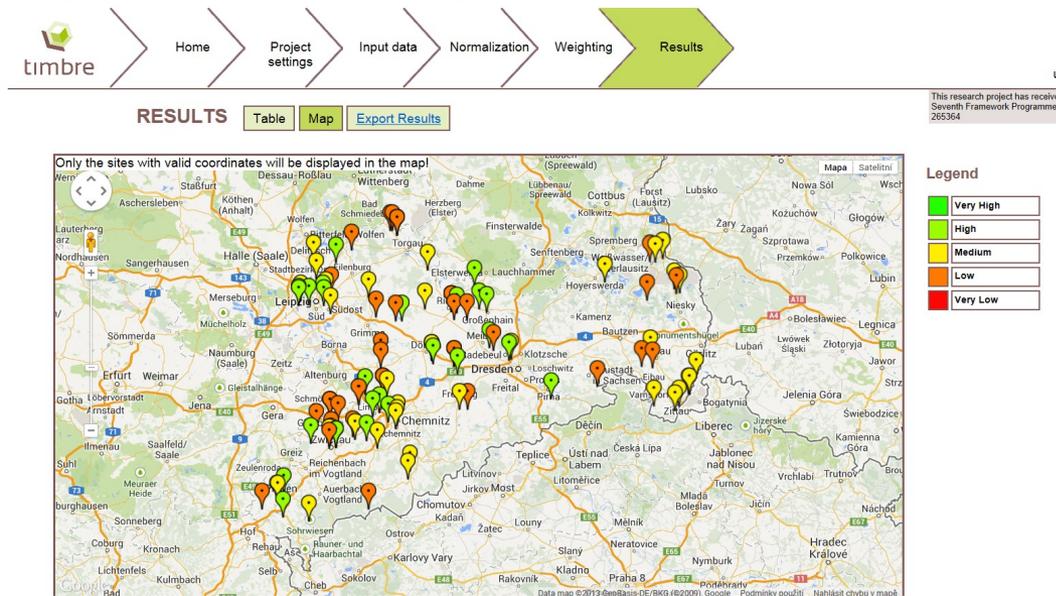
- deconstruction/revitalization of existing buildings and (infra)structures;
- the economics of the redevelopment are mainly market driven;
- site-specific risk assessment requires characterization data that need to be provided;
- the remediation could be very costly, with related uncertainties in terms of decontamination costs, high rehabilitation costs, and reduced real estate value, all preventing investments;
- the stigma of being considered non-attractive or having no market value.

BF redevelopment will be the result of an economic, environmental and social compromise (RESCUE, 2005).



How can we improve the BF's regeneration process?

- How to identify which brownfield sites should be preferably considered for further investigation and redevelopment?

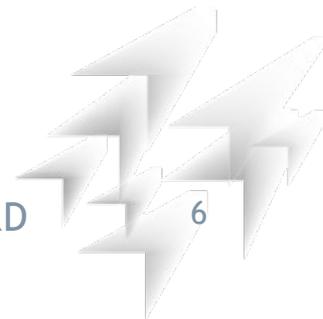


- **Who are the Actors?** Decision makers (urban planners, regional development agencies, state and regional authorities, grant agencies, etc.) who are responsible for wide territories (cities, regions or states)



How can we improve the BFs regeneration process?

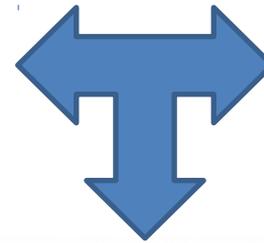
- **Need for prioritization**
- “evaluation and classification and, where appropriate, ranking of BF or CS, in order to assist the allocation of limited resources (funding, staff, time and energy) to those BF sites that turn out to be the most critical, practical or profitable to be revitalized” based on factors determining a successful BF site regeneration (so called “success factors”) (Meyer and Lyons, 2000; Thornton et al., 2007; Dixon et al., 2011; Frantal et al., 2013, 2015, Pizzol et al. 2016).





Prioritization/selection of BF

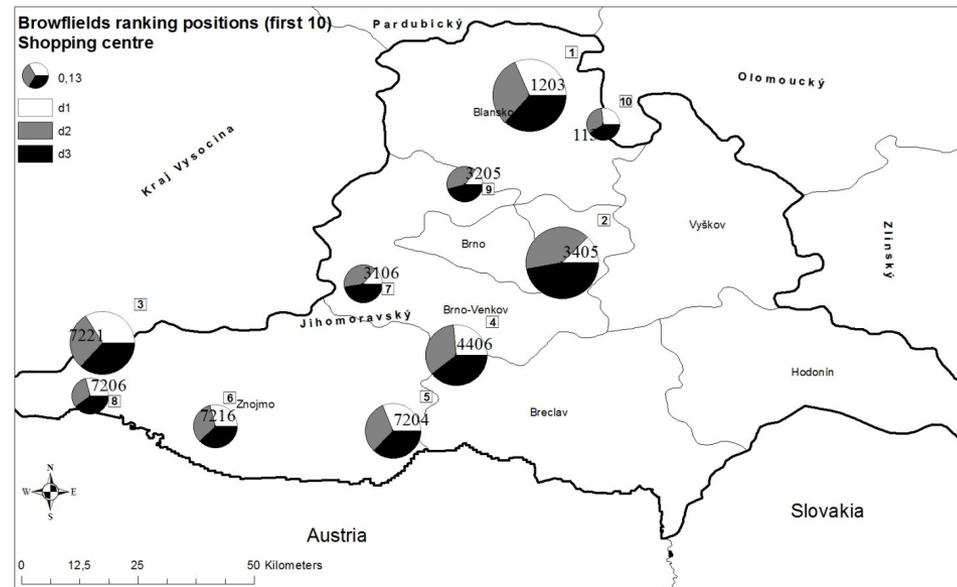
Dimension	Factor
LOCAL REDEVELOPMENT POTENTIAL	LAND VALUE
	POPULATION DENSITY
	EDUCATION INDEX
	ENTREPRENEURIAL ACTIVITY
	PERIPHERALITY
	TRANSPORT LINKS
	Total
SITE ATTRACTIVENESS AND MARKETABILITY	SPECIFIC LOCALIZATION
	PREVIOUS USE
	INFRASTRUCTURE
	REGENERATION COSTS
	OWNERSHIP
Total	
ENVIRONMENTAL RISKS	CONTAMINATION
	AREA SIZE
	ZONING
	LANDSCAPE PROTECTION LIMITS
Total	





How can we improve the BFs regeneration process?

- **Only few tools** enable a comparison of sets (clusters) of different brownfield sites with the purpose of prioritizing them in the context of large areas or institutional portfolios.
- What is the **fundamental pre-requisite** for the application of prioritisation tools?
 - You need to have the access or to develop a database collecting the BFs which need to be assessed.





How can we develop suitable tools to support local authorities in the prioritization of BFs?

- Identification of the state of the art in BF prioritisation
- We organized a special session at the AquaConSoil (ACS) conference 2017. “Prioritization strategies & tools for regional brownfield redevelopment: Perspectives & feedback on existing tools and approaches”
- We collect experts insights in order to identify points of attention that can guide local authorities in this proces





Characteristics of the approaches and tools (state of the art)

- Support the comparison of sets (clusters) of different brownfield sites with the purpose of prioritizing them
- Provide an analysis of success factors identified according to stakeholders' perceptions, needs and perspectives
- Implement appropriate methodologies for the integration of the identified success according to stakeholders' interests and viewpoints (weights)
- Include sustainability concepts, where economic, social and environmental dimensions are supposed to be balanced.
- Accessible to stakeholders, for example through web-based systems which are delivered on demand via internet.
- Communication capabilities (GIS, maps, etc.)
- Include Multi Criteria Decision Analysis (MCDA) methodologies





Some examples of BF prioritisation tools



Brownfield prioritization prototype tool

Alsace territory, France



Direction régionale
de l'Environnement,
de l'Aménagement
et du Logement Grand
Est





What problems exist → Why is a tool needed?

- ✓ Very low rate for regeneration of industrial BF sites
- ✓ Anticipating potential environmental issues is not systematic



Why are they developing a prototype tool?

So environmental issues are appropriately taken into account when assessing BF potentials for redevelopment and allocating available funding



Who is funding it?

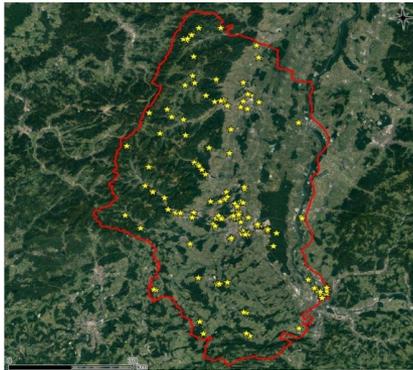


Direction régionale
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What is the prototype able to do?



- ✓ Supports the assessment of industrial BF sites with regards to best regeneration potential, attractiveness and environmental risks
- ✓ Systematic evaluation on 144 sites so far

Who is the target user?

- ✓ National/regional authorities allocating funding resources to BF regeneration projects
- ✓ local administrations (planning department)



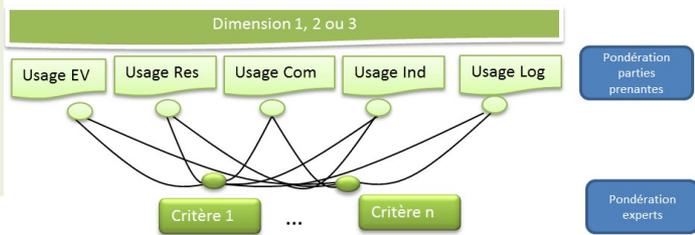
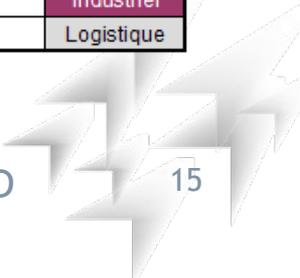


Illustration of initial prototype

Identifiant DDT68	Potentiel de redéveloppement sur la			Attractivité du site			Enjeux environnementaux			évaluation globale		
Identifiant DDT68	Note globale	note par usage possible		Note globale	note par usage possible		Note globale	note par usage possible		note moyenne globale	note moyenne par usage	usage
6800407	2,25	Espace vert	2,44	2,36	Espace vert	2,42	3,00	Espace vert	2,91	2,54	2,59	Espace vert
6800407	2,25	residential	2,50	2,36	residential	2,29	3,00	residential	2,75	2,54	2,51	residential
6800407	2,25	Commercial	1,60	2,36	Commercial	1,50	3,00	Commercial	2,42	2,54	1,84	Commercial
6800407	2,25	industriel	2,17	2,36	industriel	1,50	3,00	industriel	2,75	2,54	2,14	industriel
6800407	2,25	Logistique	1,00	2,36	Logistique	1,50	3,00	Logistique	2,75	2,54	1,75	Logistique
6800409	2,25	Espace vert	2,44	2,43	Espace vert	2,42	2,82	Espace vert	2,73	2,50	2,53	Espace vert
6800409	2,25	residential	2,50	2,43	residential	2,36	2,82	residential	2,58	2,50	2,48	residential
6800409	2,25	Commercial	1,60	2,43	Commercial	1,67	2,82	Commercial	2,25	2,50	1,84	Commercial
6800409	2,25	industriel	2,17	2,43	industriel	1,67	2,82	industriel	2,58	2,50	2,14	industriel
6800409	2,25	Logistique	1,00	2,43	Logistique	1,67	2,82	Logistique	2,58	2,50	1,75	Logistique
6800410	2,25	Espace vert	2,44	2,36	Espace vert	2,42	2,91	Espace vert	2,82	2,51	2,56	Espace vert
6800410	2,25	residential	2,50	2,36	residential	2,29	2,91	residential	2,67	2,51	2,48	residential
6800410	2,25	Commercial	1,60	2,36	Commercial	1,50	2,91	Commercial	2,33	2,51	1,81	Commercial
6800410	2,25	industriel	2,17	2,36	industriel	1,50	2,91	industriel	2,67	2,51	2,11	industriel
6800410	2,25	Logistique	1,00	2,36	Logistique	1,50	2,91	Logistique	2,67	2,51	1,72	Logistique



WEB-BASED *TIMBRE Brownfield Prioritization Tool*

TIMBRE acknowledges
co-financing from the
European Commission
Framework Programme 7
Grant number 265364

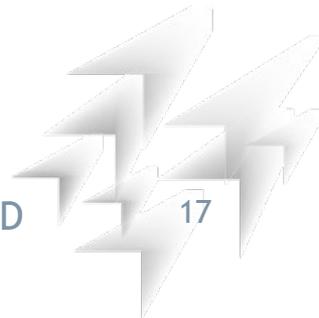
Contact persons :
Lisa Pizzol, Petr Klusáček, Stanislav Martinát, Stephan Bartke





Setting and background

- What problems exist → Why is a tool needed?
Help stakeholders responsible for wider territories (regions, districts, cities) or clusters of brownfields (portfolios) to distribute available resources to those brownfield sites that are assessed as the most critical, urgent, or profitable to regenerate.
- Who has been funding it?
The TBPT was co-funded by the European Commission within the FP 7.





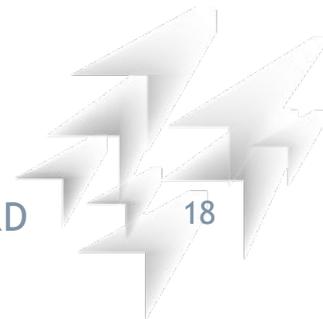
Objective

- What is the TBPT expected to do?

The tool provides a classification of sites according to sites redevelopment potential, marketability, environmental risk or other perspectives specified by end-users.

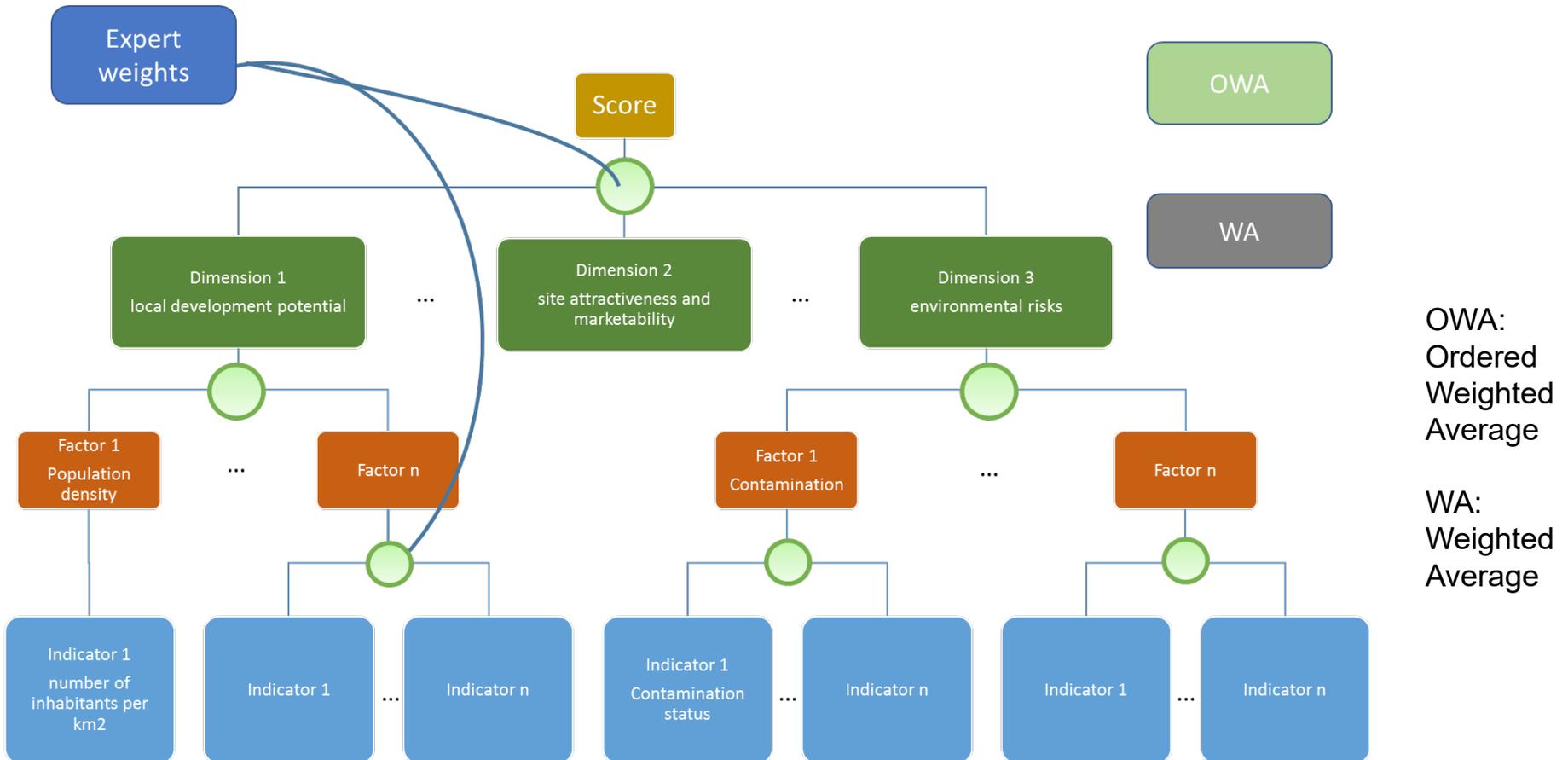
- Who is the target user?

State, regional, and local authorities; landscape and urban planners; regional development and grant agencies; other representatives of public administration; site owners, investors, and developers





Framework of available tools for BFs prioritization



From Timbre – Tailored Improvement of Brownfield Regeneration in Europe (FP7), Timbre Brownfield Prioritization Tool (Pizzol et al., 2016)



Illustration of TBPT output



test Petr  [Help!](#)

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RESULTS

[Table](#)

[Map](#)

[Export Results](#)

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



Site Id	Dimension 1: Local redevelopment potential	Dimension 2: Site attractiveness and marketability	Dimension 3: Environmental risk	Total Score
1101	0.740	0.584	0.266	0.740
1102	0.695	0.400	0.746	0.695
1103	0.695	0.400	0.400	0.695
1104	0.695	0.688	0.656	0.695
1105	0.695	0.696	0.657	0.695
1106	0.695	0.655	0.647	0.695
1107	0.695	0.678	0.651	0.695
1108	0.695	0.560	0.378	0.695
1133	0.695	0.420	0.658	0.695
1134	0.695	0.600	0.653	0.695
3506	0.689	0.729	0.829	0.689

Legend

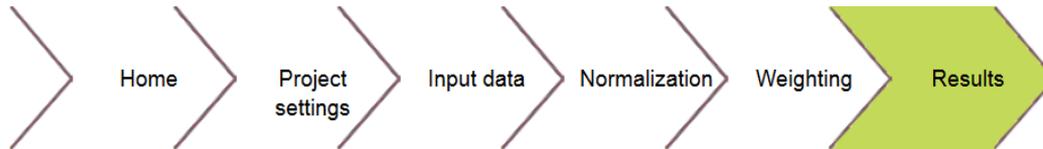
	Very High
	High
	Medium
	Low
	Very Low

Chance to undergo a successful regeneration process and allow a fruitful and permanent reuse





Illustration of TBPT output

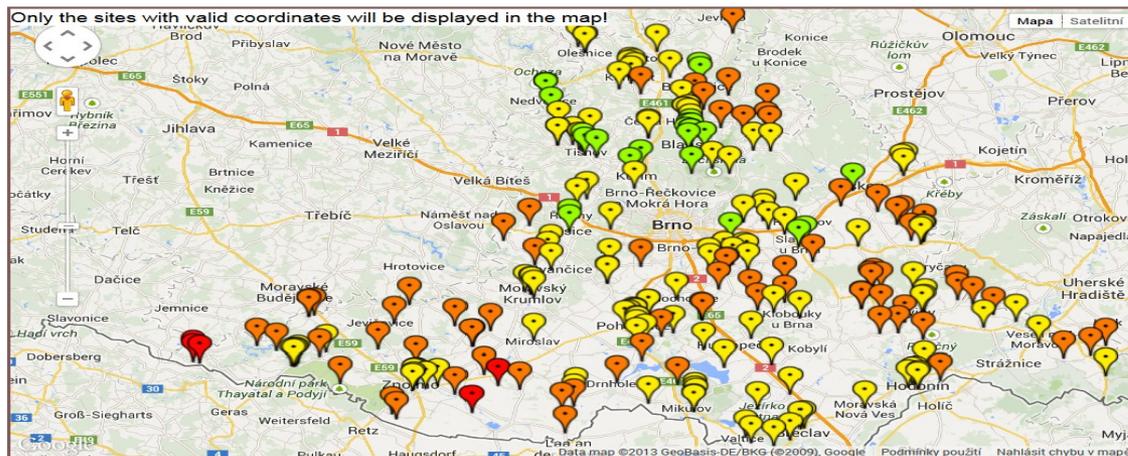


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RESULTS [Table](#) [Map](#) [Export Results](#)

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Legend

- Very High
- High
- Medium
- Low
- Very Low

Chance to undergo a successful regeneration process and allow a fruitful and permanent reuse



Conclusions and Key Recommendations





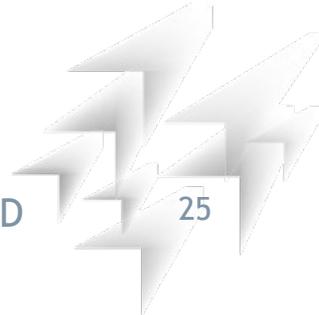
Lessons learned & Recommendations

- Universality – the tool can be used in different countries and at different hierarchical levels (national, regional, municipal) for different types of brownfield databases
- User-friendly and intuitive use, easy data collection in simple Excel template and widely used visualisation functionalities
- Openness and flexibility – end-users have opportunity to use their own factors and set their own weights according to their needs



PoA	Subtopics of the PoA
Assess end-user needs	<ul style="list-style-type: none">● Involvement of a wide range of stakeholders and potential end users● Orientation and framing of a BF prioritization tool (objectives, boundaries, scale)● Expected BF tool functionalities and data outputs (i.e., format?) to ensure product is user-friendly and accessibility...
Data availability and quality	<ul style="list-style-type: none">● Existence of BF inventory data set (understanding its characteristics/scale coverage)● Willingness of BF inventory data set owners to provide input data/participate to tool development (conditions for confidentiality/dissemination of output data)● Interoperability requirements to be considered for BF prioritization tool development (with BF inventory data sets and complementary data sets)
Effective stakeholder engagement	<ul style="list-style-type: none">● Early stakeholder engagement towards a bottom-up approach/incentive for tool development● Recognition of initiators' leadership, authority, and capacity building● Common language among stakeholders

PoA	Subtopics of the PoA
Drivers of regeneration success during the tool development	<ul style="list-style-type: none"> ● Environmental drivers to be assessed by the tool (current environmental issues at a site/territory pushing for the BF regeneration process, i.e., aiming at reducing risks to acceptable levels with new intended use) ● Economic drivers to be assessed by the tool (pushing for the BF-regeneration process, e.g., land value) ● Allocating weight to each success factor within the BF tool (once in operation)
Financing and application costs	<ul style="list-style-type: none"> ● Assessing specific added value of the tool (define tangible outcome) ● Having financial resources for tool application ● Co-funding of tool development to create ownership of the product





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- Targeted selection of brownfields from portfolios for sustainable regeneration: User experiences from five cases testing the Timbre Brownfield Prioritization Tool. Stephan Bartke, Stanislav Martinat, Petr Klusacek, Lisa Pizzol, Filip Alexandrescu, Bohumil Frantal, Andrea Critto, Alex Zabeo. *J Environ Manage*. 2016 Dec 15;184(Pt 1):94-107. doi: 10.1016/j.jenvman.2016.07.037. Epub 2016 Jul 21.
- Lisa Pizzol, Alex Zabeo, Elisa Giubilato, Andrea Critto, Petr Klusáček, Bohumil Frantál, Standa Martinát, Josef Kunc, Robert Osman, Stephan Bartke. Timbre Brownfield prioritization tool to support effective and sustainable brownfield regeneration. *JOURNAL OF ENVIRONMENTAL MANAGEMENT* Volume 166, 15 January 2016, Pages 178–192





THANK YOU FOR THE ATTENTION

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