

## EDITORIAL

Land is a finite resource, therefore Society needs to become keen to protect unspoiled habitats and ensure sustainable use of land. Over the last 50 years there has been significant increase in land uptake for buildings and roads, and this process will accelerate if no action is taken. According to the latest publication from the European Court of Auditors about regeneration of industrial and military brownfield sites, the number of brownfields in Europe is estimated to range from a few hundred in small Member States to a few hundred thousand in larger Member States with a rich industrial past. These sites are often located and well connected within urban boundaries. However, their effective and sustainable regeneration will require the full support of planners as well as innovative and integrated approaches.

This newsletter highlights the regeneration process of brownfields in the municipality Solec Kujawski (Poland). In Poland the area of brownfields is estimated to be higher than 8,000 km<sup>2</sup>.

The municipality of Solec Kujawski has been progressive and active in regenerating brownfields in their urban area. HOMBRE and the municipality of Solec Kujawski have collaborated on two workshops about brownfield regeneration for stakeholders in the region of Solec Kujawski.

In other news a summary of the contributions of HOMBRE at AquaConsoil conference in Barcelona this year is given, and there is a peep behind the project, introducing four HOMBRES and their work in the project.

Finally, a key concern of HOMBRE has been to establish a common working language for brownfield regeneration internationally. You are all cordially invited to join the CEN Workshop kick-off meeting “Glossary of Terms for Holistic Management of Brownfield Regeneration” 28 of August 2013 in Frankfurt am Main, Germany. We hope to welcome you there after the nice summer holiday!

## AquaConSoil: Session on „Sustainable Brownfield Regeneration – synergies with the land cycle and the role of new tools and technologies“ (April 2013)

AquaConSoil is the major contaminated land and water event that takes place in Europe. Its most recent meeting was held on 16<sup>th</sup>-19<sup>th</sup> April 2013 in Barcelona, Spain. HOMBRE contributed several papers and made a number of workshop inputs to the conference. Copies of these can be downloaded from the HOMBRE web site at <http://www.zerobrownfields.eu/Displaynews.aspx?ID=559>.

HOMBRE also collaborated with its sister project TIMBRE to host a special session on “Sustainable Brownfield Regeneration – synergies with the land cycle and the role of new tools and technologies”.

The aim of the session was to make the audience aware of potential synergies and services that can be delivered during brownfield regeneration processes and to find out which are the most

important demands and the policies needed to realise Brownfield regeneration.

The session started with an introduction to the projects “HOMBRE” and “TIMBRE” and their focus with regard to the land use cycle. Both projects see the importance of involving stakeholders to better understand and integrate their requirements of any regeneration process. This means that any measures developed by HOMBRE or TIMBRE must meet the needs of a wide range of stakeholder needs to gain acceptance. While HOMBRE and the tools developed in its work packages address and try to support stakeholders in all phases of the land use cycle, TIMBRE has a more specific focus on a certain phase of the land cycle where brownfields have already emerged.



Figure 1: During the session on „Sustainable Brownfield Regeneration – synergies with the land cycle and the role of new tools and technologies“ (Photo: DECHEMA e.V)

### Policy needs to implement new ways of Brownfield regeneration

Dominique Darmendrail (Common Forum) gave an overview of the wide range of policy sectors that affect brownfield management at a European level. Together with other national and regional requirements and directives they form the regulatory environment for brownfields in Europe. Thus decision makers have to deal with a complex regulatory and policy environment.

The discussion that followed the presentation made clear that it is important for sustainable regeneration projects not only to consider the technical or economical side of the brownfield regeneration, but also take into account site specific social aspects, e.g. in former mining areas where people have to think of new ideas and ways of using the land.

Brownfield sites need an image change within the land use cycle – the focus needs to shift to opportunities from a site rather than its.

### Decision support tools in the two projects

Linda Maring (Deltares) introduced to the “Brownfield Navigator” (BFN), a decision support tool being developed in HOMBRE which

aims to support stakeholders visualize their project and its location in a geographical sense, to help the guide the stakeholder towards successful brownfield regeneration. Its steps and the proposed tools are related to the phases of the land use cycle. A key innovation in the BFN is avoidance of the emergence of brownfields and keep the land in the use cycle. The BFN will be an online tool that will be freely available at the end of the HOMBRE project.

Michael Finkel (University of Tübingen) introduced the audience to the Megasite Management Toolsuite (MMT) which has been enhanced within the TIMBRE project. The MMT is a web based decision support tool for the integrated planning and assessment of revitalisation options for brownfields.

The BFN and the MMT have different approaches, but both aim to show reuse options.

Both the MMT and the BFN are decision support tools. The decision is still in the hand of the customer, but the tools will aim to help make the decision easier; more transparent and more communicable; and to widen the range of ideas about how a site could be used.

## Case studies in HOMBRE: The site in Solec Kujawski, Poland

### What is the case about?

The urban and postindustrial case study Solec Kujawski is located in Northern Poland on the Vistula River. It is approx. 15 km away from Bydgoszcz – the main city of Kujavia-Pomeranian Voivodship. The HOMBRE case study site is located inside the city limits, near the city center of Solec Kujawski. The abandoned, triangle-shaped terrain of the former manufacture for wood impregnation with a surface area of approximately 16,44 ha forms the main part of the HOMBRE case study.

This brownfield is located between housing estates (high-rise blocks, school, shops etc.) in the North and North-East, the railway

line between Bydgoszcz and Toruń in the South and the city forest in the West where a leisure and sports centre is located, as well as a local touristic attraction named “Jura Park”. (see Figure 2).

Several other brownfields are located on the other side of the railway line: old multi using buildings and storages as well as a small complex of shoe industry on the former tannery area. In this part there were detected places which were used in the past as spill ponds (waste water from tannery and from metal industry). These days these are used as small private gardens, a young forest and also a communal heating plant is located there.

The whole area dedicated for HOMBRE expertise is ca. 80 ha (incl. the heavily contaminated area of the former wood impregnation plant with a size of the 16,44 ha).

### How did the case become a brownfield?

The land was degraded as a result of more than one hundred years of use for wood impregnation between 1876 – 2001. This was followed by a period of unregulated use for several years. The area was finally bought by the Municipality of Solec Kujawski in 2009. Its buildings were demolished subsequently, but the ground and groundwater are still heavily polluted by creosote, detected in in-



Figure 2: Location of the HOMBRE case study site (A) in Solec Kujawski, Poland:

- A – brownfield: former wood impregnation manufacture,
- B – cityforest with regional attraction: Jura Park,
- C – housing estates (blocks),
- D – forest area,
- E – shoe industry, former tannery and its spill ponds,
- F – metal, car industry, heating plant and railway area.

vestigations made for private (2001) and public (2009) plans of investments. In addition to the creosote, mineral oil and PCBs were used as additions. Many creosote components are toxic and carcinogenic (e.g. Naphthalene, Benzo(a)pirene, Benzene). The heavy pollution of ground and groundwater makes remediation difficult and expensive, so the area is abandoned as brownfield.



Figure 3: Contaminated underground installation found during excavation works (done during the preparation for the soil washing field tests within the TIMBRE project) (Photo: Geo-Logik)

## Redevelopment of the site so far

Investigations were carried out in 2010 to investigate the feasibility of bioremediation. This study found that bioremediation combined with another in situ method (such as in situ separation of the most contaminated old "ground material") might be the best option for rehabilitation due to the large area of the brownfield.

Now the owner – Municipality of Solec Kujawski – is trying to start the rehabilitation using a Remediation Action Plan (RAP) prepared in 2012. According to this plan the postindustrial area will be redeveloped as a zone for service, education, recreation and sport.



Figure 4: View of parts of the brownfield site (Photo: Geo-Logik)

The main reasons for remediation and redevelopment are:

- The location of the area, which is situated in the city centre, next to sports facilities (arena, swimming pool, sports hall) and the leisure centre "Jura Park" which makes the area a good place for big public investment;
- The intention to stop the uncontrolled development of the area which is highly contaminated by incompetent private investors interested only in financial profits.
- The heavy contamination both in the ground and the groundwater of the area of the former wood impregnation plant as well as on the adjacent areas, situated along groundwater flow direction to the Vistula river.
- The negative influence of contamination on the environment – contamination of soil, underground and groundwater is especially dangerous for people's health as it contains carcinogenic compounds.
- The social environment and safety – this uncontrolled, completely devastated site is a place for informal meetings of young people and for risky youth and children games.

In November 2012 the Municipality of Solec Kujawski received financing support from the EU within the "Regional Operational Programme" redistributed by the Regional Fund for Environmental Protection and Water Management. Now the Remediation Action Plan prepared in 2012 will be executed and needs adequate technologies and performance, quality control and social acceptance. The remediation (e.g. in situ biodegradation) is not a quick process and needs time as well as a smart redevelopment plan for future use of this area.

## What are the most important benefits of the redevelopment of the area?

The redevelopment of the postindustrial area will result in:

- improvement of natural environment's condition and thereby as well improvement of general health condition of city inhabitants;
- improvement of children's and youth's safety as at the moment it is dangerous for the health of the children to play at the brownfield site;
- gaining area in the city centre purposed at leisure, service, education and sport, which will improve the quality of life of the city inhabitants and might also lead to tourism growth in the region (together with existing Jura Park in the city forest);
- financial profits from commercial hire of sports' venue for non-public events (shooting range, arena, playing fields)

## 1<sup>st</sup> Stakeholder Workshop at Solec-Kujawski, Poland (April 2013)

On 8-9<sup>th</sup> April 2013 HOMBRE organised its first stakeholder workshop for the Solec Kujawski case study in Poland. This involved representatives of the municipality of Solec Kujawski and members of the HOMBRE project. The aim of the meeting was to exchange ideas and information about the case study site and to make the representatives of Solec Kujawski more familiar with the outputs HOMBRE is producing. Its goals were to see where HOMBRE might be able to provide methodological support for the redevelopment of the case study brownfield site and to begin preparation of a second stakeholder workshop scheduled for 6-7<sup>th</sup> June 2013 for a larger group of regional stakeholders.

Pauline van Gaans from Deltares introduced to the HOMBRE project and the “zero brownfield” concept. The philosophy of “Zero brownfields” aims to avoid the emergence of brownfields or accel-

of this project supporting a vote in favour of this development.

Discussions focused on the planned future use of the brownfield site of the former wood impregnation plant, and its linkage to Solec Kujawski’s spatial planning for the period 2012-2020. Historically the area has always been known for sport and recreation, being surrounded by large forests. Thus the municipal development strategy follows the two approaches to strengthen: 1. the industrial/commercial activities (e.g. by tax benefits) and 2. Providing sport and recreation services at a national and international level.

A range of HOMBRE concepts were tested. The case study aims and site situation were placed in a land cycle concept (see figure 6) and the participants exchanged on the future use plans for the Solec Kujawski case site.



Figure 5: Introduction to the situation in Solec Kujawski, given by the mayor, Teresa Substyk

erate their regeneration once they have formed. Pauline van Gaans described strategies for avoiding the evolution of brownfields by improving the monitoring and assessment of different “early indicators” during the phase when the land is being used. “Service indicators” help to assess if a completed management step/action was successful. HOMBRE’s “Brownfield Navigator” provides a map-based online instrument to support stakeholders in navigate towards successful brownfield regeneration. HOMBRE pays special attention to exploiting possible synergies during the regeneration and re-use of brownfield sites.

The mayor of Solec Kujawski, Teresa Substyk, gave an introduction to Solec Kujawski. This is a small town with an increasing population of approximately 16.000 inhabitants. The local authority wishes to develop the town in a sustainable way. In order to strengthen the economy of the area infrastructure is being developed to attract especially young companies.

The municipality already organises local consultations on the development of the areas in close cooperation with affected stakeholders as “bottom-up planning”. One example for the good cooperation between the authority and the inhabitants was the development of a former military area into a radio broadcasting facility. Here the municipality provided good information services and thus was able to convince the majority of the inhabitants on the benefits

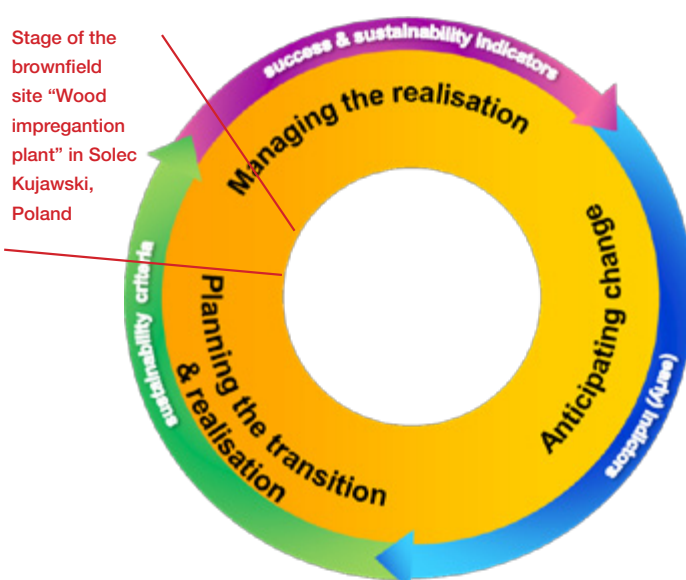


Figure 6: Stage of the HOMBRE case study site “Former wood preservation plant” of Solec Kujawski in the land management cycle. The blue, green and purple parts of the cycle are management tools that could be used to forecast and assess changes in the land use.

## 2<sup>nd</sup> Stakeholder Workshop in Solec-Kujawski, Poland (June 2013)

Approximately 30 participants joined the 2nd stakeholder workshop that was held in Solec Kujawski, Poland on 6-7<sup>th</sup> June 2013. The workshop was organized as a joint event of the EU FP7 project HOMBRE and the municipality of Solec Kujawski, with participation of the EU FP7 project TIMBRE and regional stakeholders. The target of the event was to exchange on the management of the regeneration of brownfields by discussing possible policy options and technical solutions, pointing at the local and regional benefit and barriers.

After the welcome by Barbara Białkowska (vice mayor of Solec Kujawski) and an introduction to the city of Solec Kujawski, its historical and present situation, the participants got an overview on the different brownfields in and around the city. The municipality is very active in advancing the remediation of contaminated brownfields and trying to find new solutions for the abandoned areas in order to make the city attractive for its inhabitants. A good example is the “Jura Park”, a theme park built in parts of the town park with approximately ½ million visitors per year. In order to attract new investors an industrial park was founded – here the industries can make use of the benefits of the Solec Kujawski’s location between two big cities Bydgoszcz and Torun, close to a big road and Wisla river.

After a general introduction to the problem of urban sprawl Grzegorz Malina (University of Science and Technology in Cracow) gave an overview on the background and targets of the HOMBRE project, its framework and tools (such as the “Brownfield Navigator” and the monitoring and assessment of “early indicators”). Inspirations how synergies can be used during the regeneration process are developed within the research and work on “technology trains”, which aim to provide a solution to a problem and at the same time offer added value/services.

In the following, the participants exchanged on the situation in Solec Kujawski and on ways how to apply outcomes/products of HOMBRE at their brownfields. The discussion also addressed financial issues, which are always important for regeneration projects, but of course should not be the only driver for actions related to soil.

Grzegorz Boron (Municipality of Bydgoszcz) introduced to some brownfields in the region and from all over Poland and showed how some of them were successfully redeveloped, e.g. the “Explo-seum” in Bydgoszcz, a former nitroglycerine plant that is now used as a museum. He also reported on the experiences from the EU

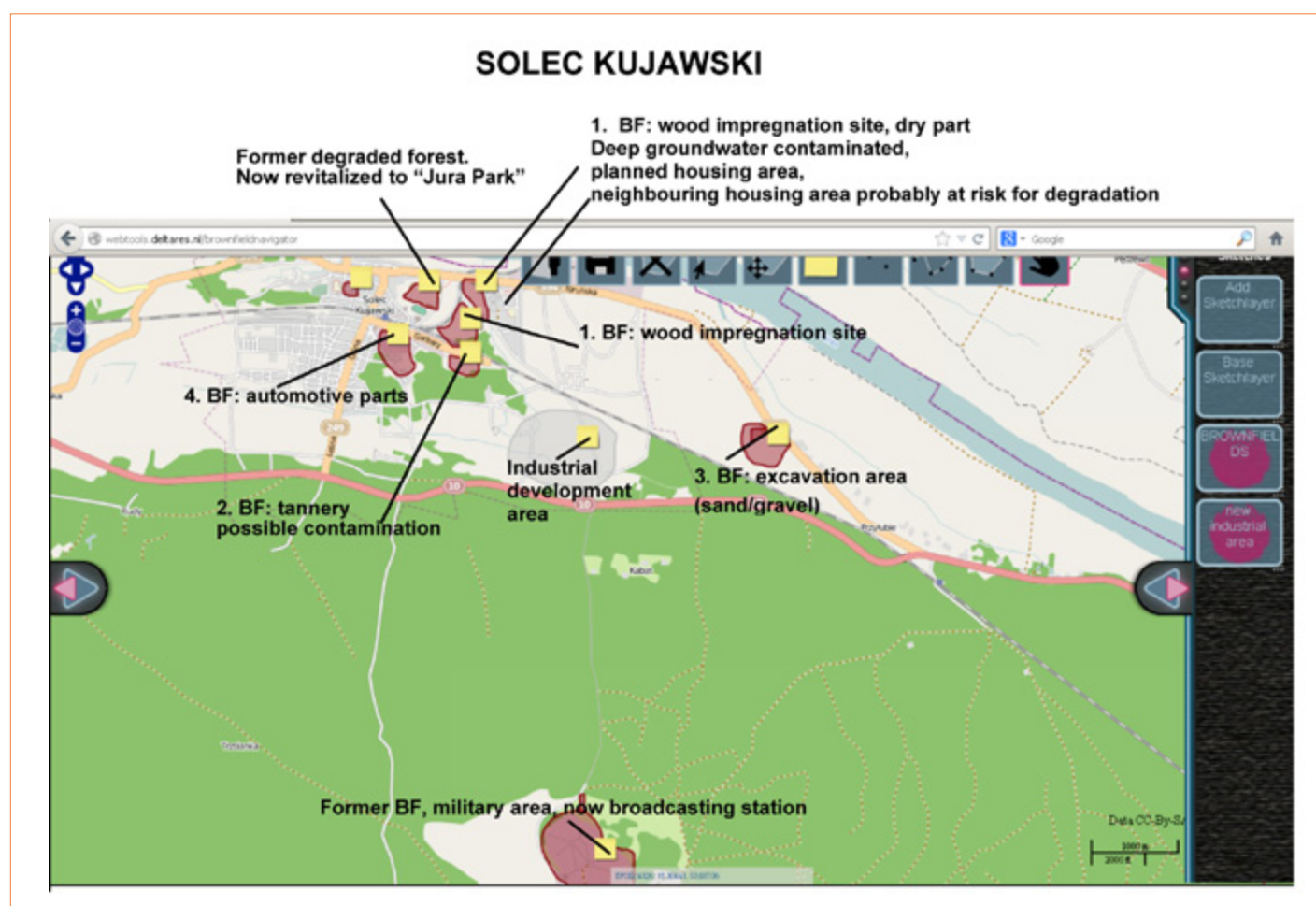


Figure 7: Location of the different current and former brownfield (BF) sites in Solec Kujawski (shown on the HOMBRE Brownfield Navigator)



Figure 8: During the “world café” discussions (Photo: DECHEMA e.V.)

project “COBRAMAN” where a database was developed as well as materials for courses to train brownfield managers.

In the afternoon the workshop participants went on a field trip to the former and current brownfields in and around Solec Kujawski (see figure 7) and got a better idea on what is currently under development there and which redevelopments already have been accomplished successfully.

The second day of the workshop started with an introduction to the TIMBRE project given by Janusz Krupanek (IETU). Targets of TIMBRE are to support the redevelopment of brownfields and especially the transformation of megasites with complex environmental and social problems.

Afterwards Nicolas Fatin-Rouge (Université de Franche-Comté) presented the results of the in-situ soil flushing tests with re-used fluids for the remediation of creosote-contaminated soil that were run within the TIMBRE project for 5 weeks on the former wood preservation site in Solec Kujawski.

The idea of the world café discussion that followed was to think of new ideas and points of view for Solec Kujawski to be used in the spatial planning for 2013 – 2020 (Figure 8). In small groups the participants exchanged lively on the question “what are useful environmental, economic and social indicators that point towards brownfield emergence?” In a second round the participants discussed on pros and cons of possible scenarios for future developments in Solec Kujawski taking into account social, environmental and economic issues.

## Interviews with the “HOMBRES”

With this section we would like to introduce you to people working with and for HOMBRE – and their very different tasks and challenges.



My name is **Oriana Capobianco** and I am PhD student under the supervision of Prof. Renato Baciocchi at the University of Rome “Tor Vergata” – Group of Sanitary Engineering, Department of Civil Engineering and Computer Science Engineering.

### What is your role in HOMBRE?

In a number of cases, abandoned or underused industrial sites could be also affected by a certain kind and extent of contamination. In these cases, remediation activities are mandatory prior to reintroduce the site into the land cycle.

My role in the project mainly deals with the application at lab scale of different combination of technologies on contaminated soil and other solid material as well as groundwater.

Specifically, the two alternative scenarios ex situ and in situ treatment have been considered.

The aim is to assess the possibility to combine technologies in order to improve the environmental and mechanical properties of the treated material and to get multiple benefits (e.g. groundwater remediation + subsoil structural improvement + industrial alkaline residues stabilization with CO<sub>2</sub>).

### What is your HOMBRE challenge?

The real challenge is to exploit material and resources already present at the brownfield site, or generated by remediation/regeneration activities, in order to achieve two major goals:

- get a “product” which can be used in the site itself, for example as construction material;
- keep the material in situ, without any need of excavation, transport and landfilling.

In both cases a better resource optimization and lower environmental, social and economic impacts from land management could be achieved.

### What is your special HOMBRE moment?

Visit at the small village of Papigno, Terni (Italy) where a brownfield site is located (one of the HOMBRE case studies, see issue 02/2012 of this newsletter). It was a great opportunity to better understand the problems and opportunities related to the specific site and also to come in contact with the local stakeholders.



My name is **Lourens Dijk** and I work at the User Interface Software Department within the Deltares Software Centre. Usually I do my job in a .NET environment, sometimes I take a trip to JavaScript or Python. I mainly work in a team of varying colleagues, trying to close the gap between the clients requirements and the technical software challenges.

### What is your role in HOMBRE?

My role within HOMBRE is mainly as a JavaScript and C# programmer for the Brownfield Navigator. I focussed on the GIS (Geographical Information System) aspect of the application.

### What is your HOMBRE challenge?

The Brownfield Navigator can be called a success when it can be used independent of the location you are at and with minimal hardware requirements; when useful outcomes can be retrieved from processed input. When users experience the application and philosophy behind it as natural and pleasant, I’m satisfied.

### What is your special HOMBRE moment?

Working with a team with diversity of skills. The different views of the team members contribute to the success of the project. The project period as a whole is inspiring to me.



My name is **Matthijs Schaap**, visualisation expert and creator of serious games. I work within the Deltares Software Centre together with a variable group of colleagues on the Brownfield Navigator.

### What is your role in HOMBRE?

Thinking about the workflow and interface for the Brownfield Navigator web application. This includes design and implementation. Me and my colleagues try to find and embed the workflow for recognising brownfields and reintegration planning of said workflow within a browser. My personal role is designing an interface that not only looks nice but also helps the user getting to their goals as best as possible.

### What is your HOMBRE challenge?

The only time I am happy is when the user is happy. My challenge within Hombre is making something that is useable and “real”, while the process that needs to be fitted is still evolving. Also we are trying to be platform independent and the web application should work on all browsers, which is really something that will get you a headache from time to time... but when you solve the problem, all is forgiven.

### What is your special HOMBRE moment?

This project made a real name for itself within Deltares and the techniques used for the Brownfield Navigator are now widely asked for. My HOMBRE moment is that I could show our own people that thinking about interface and workflow is something that is very much needed for every software product.



My name is **Rens van den Bergh**, for over six years I have been working on serious games and game based technologies. The goal is to use these technologies to support the transfer of knowledge.

**What is your role in HOMBRE?**

My role is to support the building and designing of the Brownfield Navigator. I'm also trying to bridge the gap between the software development world with the world of the experts.

**What is your HOMBRE challenge?**

To end with a product that will be used in practice. In order to achieve this, the product will need to be practical and user friendly. The challenge is to fit all the complex expert knowledge and procedures in the product and still make it easy to use.

**What is your special HOMBRE moment?**

I love to see the product slowly grow and take shape. With new insight and experience the product is developing more and more to its final stage.

## UPCOMING ACTIVITIES

### Kick-off Meeting for CEN Workshop 74 “Glossary of Terms for Holistic management of Brownfield Regeneration (GoT-HOMBRE)” on 28<sup>th</sup> August 2013 in Frankfurt am Main, Germany

A CEN Workshop is a platform offered by the European Committee for Standardization (CEN) to elaborate a consensus document with agreed positions concerning a certain defined issue, the “CEN Workshop Agreement”.

As announced in the previous issue of the HOMBRE newsletter the HOMBRE project partners have decided to run a CEN Workshop – **CEN Workshop 74 “Glossary of Terms for Holistic Management of Brownfield Regeneration (GoT-HOMBRE)”**. The idea of elaborating a shared glossary of terms for dealing with brownfield regeneration and land use planning is to provide a common terminology in order to facilitate communication, discussion and also the dissemination of project results. Wherever applicable HOMBRE will make use of existing definitions from related CEN and ISO Technical Committees. HOMBRE will also try to go further and link this terminology to equivalent or comparative definitions from related communities, such as spatial planners to ease the mutual understanding. Participation in the CEN Workshop is open to stakeholders from all institutions inside and outside Europe who are interested and willing to contribute to this particular topic.

The **kick-off meeting** for the HOMBRE CEN Workshop 74 “Glossary of Terms for Holistic Management of Brownfield Regeneration (GoT-HOMBRE)” will be held on **28<sup>th</sup> August 2013** in Frankfurt am Main, Germany.

More details on the HOMBRE CEN Workshop, the draft *business plan*, the *agenda* and the details regarding the *registration* are available on the **CEN website** ([www.cen.eu/cen/Sectors/Techni-](http://www.cen.eu/cen/Sectors/Techni-)

[calCommitteesWorkshops/Workshops/Pages/WS74.aspx](http://www.cen.eu/cen/Sectors/TechnicalCommitteesWorkshops/Workshops/Pages/WS74.aspx)).

As a first step the concept of “**circular land use management**” (<http://edoc.difu.de/edoc.php?id=8K2TRD63>) developed based on a study of the national research programme “Experimental Housing and Urban Development” (Ex-WoSt) between 2003 and 2007 will provide a frame and the background for the glossary. It is an integrative, strategic and governance approach that aims to primarily and systematically seek to exploit the potential to develop existing building sites and reuse derelict land. In addition findings developed in the different HOMBRE work packages will be integrated.

For further information on the kick-off meeting and the participation in the HOMBRE CEN Workshop in general please contact Katja Wendler, [wendler@dechema.de](mailto:wendler@dechema.de).

**Do not miss the opportunity to contribute and bring in your ideas and views to the CEN Workshop Agreement, as the terminology developed in this CEN Workshop 74 might also be used as input to the work of ISO Technical Committee ISO/TC 190/SC1 “Evaluation of criteria, terminology and codification”. Your perspective is very much appreciated and very valuable for the development of this common glossary of terms!**



**UPCOMING ACTIVITIES****SAVE THE DATE:**

## **HOMBRE Final Conference** **(14 – 16<sup>th</sup> October 2014 in Frankfurt am Main, Germany)**

The HOMBRE Final Conference will be held on 14-16<sup>th</sup> October 2014 in Frankfurt am Main, Germany as a joint conference with CABERNET ([www.cabernet.org.uk](http://www.cabernet.org.uk)) and the EU FP7 projects “TIMBRE” ([www.timbre-project.eu](http://www.timbre-project.eu)) and “Greenland” ([www.greenland-project.eu](http://www.greenland-project.eu)) as

**CABERNET 2014:****Tailored & Sustainable Redevelopment towards Zero Brownfields****4<sup>th</sup> International Conference on Managing Urban Land****In Association with the Final Conferences of the  
EU FP 7 Projects “Greenland”, “HOMBRE” and “TIMBRE”**

The event will cover the following key topics:

- Integrated urban land management and European funding programmes
- Innovative technologies and management tools for land redevelopment
- Economic, social and environmental instruments for sustainable land use management
- Land demand for renewable energy production on brownfields

- European and national policies and regulation
- Best practice case studies
- Communication, training, education and professionalism
- Sustainable land use and grand challenges

**More information on the conference and the call for papers will follow in autumn 2013.**



**Brief facts about HOMBRE****Objectives:**

HOMBRE seeks to create a paradigm shift in sustainable brownfield land management practice to “Zero Brownfields” where brownfields become areas of opportunity that deliver useful services for society, economy and the environment, instead of derelict areas that are considered useless. This ambition will be met by looking at how synergies between different types of services might leverage change where none was possible before.

The HOMBRE shift in thinking relates not only to the redevelopment itself, but also to gaining better understanding in early recognition and prevention of land that might become a brownfield in the future, and how to monitor this as part of the land use cycle.

The goal is to enable better communication between stakeholders about opportunities and inspire them to find better solutions with higher benefit. HOMBRE will illustrate what might be possible with a number of case studies where implementing suites of ‘hard’ and ‘soft’ technologies, has facilitated cost-effective, timely, and sustainable brownfield regeneration along with broader services.

**Approach:**

HOMBRE will develop practical, science based guidance to deliver the concept of a land cycle as a working system for planners and land managers – the “**Brownfield Roadmap**”. The strategy will be based on indicators for early recognition of why, how, and when brownfields come into existence, as well as on indicators that signal potential for sustainable, cost-effective and timely site renewal. By monitoring these indicators, timely intervention may avoid brownfield formation or at least mitigate the negative effects. It will ensure that scarce resources are focused on solving genuine problems, e.g. by avoiding unnecessary remediation, and on creating long lasting opportunities. The final “**Framework for Zero Brownfields**” will also incorporate the experiences obtained from the HOMBRE case studies, market and stakeholder guidance on all methodologies and technologies developed, and a policy brief on Brownfield regeneration.

Furthermore HOMBRE will develop integrated stakeholder communication and decision support technology for the optimal selection of brownfield regeneration options, approaches and technologies of decision making, the “**Brownfield Navigator**”. This will apply a set of common principles, but support their use at different geographical scales and different stages in land management decision-making. The Brownfield Navigator will enable to assess the key environmental, economic and social aspects of brownfield regeneration scenarios in both local and regional contexts. It will integrate a set of rules and principles from HOMBRE’s strategic guidance; modelling and GIS technologies using the ‘design table’ visualization approach to support interactive and cross sectoral decision-making.

A “**Technology Train**” is a term to describe how different technical approaches can be combined to offer an enhanced benefit. HOMBRE will explore Technology Trains in two contexts: the ‘hard’ built environment context, and a ‘soft’ re-use context linked to urban greening and/or bio-energy production. The following combinations are being investigated:

- Train 1: Energy re-use and contaminated water restoration
- Train 2: Resource efficiency (e.g. of building materials) and contaminated soil management.
- Train 3: Remediation, sustainable urban drainage and soil capacity building.
- Train 4: The benefits of remediation and urban green space
- Train 5: Remediation, organic matter recycling and bio-energy production to provide a solution and revenue for abandoned land.

**Project References:**

*Contract number:* 256097;

*Theme:* FP7 ENV.2010.3.1.5-2: Environmental technologies for brownfield regeneration;

*Duration:* 12/2010 to 11/2014

**Organisations:**

**ACCIONA Infraestructuras** – Spain  
(www.accion.es)

**BRGM – Bureau de Recherches Géologiques et Minières** – France  
(www.brgm.fr)

**DECHEMA e. V. – Society for Chemical Engineering and Biotechnology** – Germany  
(www.dechema.de)

**Deltares** – The Netherlands  
(www.deltares.nl)

**Geo-Logik** – Poland  
(www.geo-logik.pl)

**PN-Studio/Italy**  
(www.pnstudio.net)

**Projektgruppe Stadt + Entwicklung** – Germany  
(www.projektstadt.de)

**r<sup>3</sup> environmental technology ltd.** – UK  
(www.r3environmental.com)

**Tecnalia** – Spain  
(www.tecnalia.com)

**TNO – Netherlands Organisation for Applied Scientific Research** – The Netherlands  
(www.tno.nl)

**University of Nottingham** – UK  
(www.nottingham.ac.uk)

**University of Rome “Tor Vergata”** – Italy  
(www.uniroma2.it)

**University of Science and Technology in Cracow** – Poland  
(www.agh.edu.pl/en)

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