



Towards Circular Flow Land Use Management

The CircUse Compendium

Thomas Preuß, Maic Verbücheln (Eds.)



EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND

Editors:

Dipl.-Ing. agr. Thomas Preuß, German Institute of Urban Affairs, Berlin
Dipl.-Ing. (FH) Maic Verbücheln, German Institute of Urban Affairs, Berlin

Authors:

Dipl.-Ing. agr. Thomas Preuß, German Institute of Urban Affairs, Berlin
Dipl.-Ing. (FH) Maic Verbücheln, German Institute of Urban Affairs, Berlin
Dipl.-Verw.Wiss. Daniel Zwicker-Schwarm, German Institute of Urban Affairs, Berlin
Dr.-Ing. Uwe Ferber, Projektgruppe Stadt + Entwicklung, Leipzig
Karl Eckert, B.Sc., Bauhaus-University, Weimar

Contributions by project partners:

Institute for Ecology of Industrial Areas (IETU), Poland (Lead Partner),
City of Piekary Śląskie, Poland
German Institute of Urban Affairs (Difu), Germany
Saxon State Office for the Environment, Agriculture and Geology (LfULG), Germany
Environment Agency Austria, Austria
Telepark Bärnbach Corporation Ltd., Austria
Slovak University of Technology, SPECTRA Centre of Excellence, Slovakia
City of Trnava, Slovakia
Higher Institute on Territorial Systems for Innovation (SITI), Italy
Municipality of Asti, Italy
Institute for Sustainable Development of Settlements (IURS), Czech Republic
Usti Region, Czech Republic

English translation: Karl Eckert, B.Sc

Layout and Graphic design: Stefan Müssigbrodt

Printing: Oktoberdruck AG

Title photographers: Věra Frimlová, Thomas Preuß, Maic Verbücheln, Environment Agency Austria

ISBN 978-3-88118-523-3

This work is published in the framework of the CENTRAL EUROPE project "Circular flow land use management (CircUse)" (Project No: 2CE174P4). A CD ROM including the CircUse data management tool is part of this publication.



EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND

This project is implemented through the CENTRAL EUROPE
Programme co-financed by the ERDF.

The sole responsibility for the content of this publication lies with the authors.
It does not necessarily reflect the opinion of the European Union.

Please cite this publication as:

Preuß, Thomas, and Maic Verbücheln (Eds.): Towards Circular Flow Land Use Management.
The CircUse Compendium, Berlin 2013

© Deutsches Institut für Urbanistik gGmbH (German Institute of Urban Affairs), Berlin (Germany), August 2013



Deutsches Institut für Urbanistik gGmbH
Zimmerstraße 13-15
D-10969 Berlin
Tel.: + 49 (0) 30 39001-0
E-Mail: difu@difu.de
Internet: www.difu.de

Table of content

1. INTRODUCTION: TOWARDS CIRCULAR FLOW LAND USE MANAGEMENT	5
1.1. Preface	6
1.2. Executive Summary	7
1.3. About this Compendium	10
2. WHY IS LAND MANAGEMENT IMPORTANT?.....	11
2.1. CircUse: Purpose	12
2.2. CircUse: Concept.....	14
2.3. CircUse: In the Regions	16
3. THE APPROACH OF CIRCULAR FLOWLAND USE MANAGEMENT.....	21
3.1. Principle of Circular Flow Land Use Management	22
3.2. Targets of Circular Flow Land Use Management.....	23
3.3. Space Oriented Potentials of Circular Flow Land Use Management	24
3.4. Fields of Activity for Circular Flow Land Use Management	27
4. HOW TO IMPLEMENT	29
4.1. Information and Data Management	30
4.2. Planning	32
4.3. Financing.....	35
4.4. Marketing	37
4.5. Stakeholders and Cooperation	38
4.6. Management and Organisation	39
4.7. Awareness Raising and Training	44
4.8. Communication and Participation	48
4.9. Improving framework conditions through new economic incentives.....	51
5. CIRCUSE PILOT PROJECTS.....	53
5.1. City of Piekary.....	54
5.2. Micro-region Trnava	56
5.3. Region of Middle Saxony.....	58
5.4. Region of Voitsberg.....	60
5.5. City of Asti.....	62
5.6. Region of Usti	64
6. RECOMMENDATIONS	67
6.1. Lessons learnt from CircUse	68
6.2. Looking Forward – What has to change and what is to be done?	70
7. CD-ROM DATA MANAGEMENT TOOL	75
SOURCES	77



1.

INTRODUCTION: TOWARDS CIRCULAR FLOW LAND USE MANAGEMENT

1.1. Preface



Figure 0: Anna Starzewska-Sikorska
Source: IETU

Massive urban sprawl, the current economic crisis and the effects of demographic change in Central Europe lead to urban land use patterns that are neither competitive (e.g. in attracting viable economies, efficiently providing infrastructures) nor sustainable. Dispersed land use patterns with their high demands of land and energy accelerate the process of climate change. Furthermore, urban and planning policies in Central European cities must face social (e.g. segregation and social tension), economic (e.g. unemployment) and environmental challenges (e.g. pollution, noise, traffic congestion) related to urban development. Another distinct challenge is the ongoing, unrestrained land consumption and continual soil sealing happening all over Europe, often even in regions with shrinking populations.

Many Central European cities have been developed or are going to develop into regional agglomerations, but planning methods, institutional structures and the associated management tools have not progressed fast enough to cope with the increasing scale, interconnectivity and complexity

generated by this growth. On the other hand former industrialized regions and many rural areas are undergoing structural changes and shrinking processes that cause problems of functional losses in the urban fabric. It is claimed that the “traditional” planning visions still applied can no longer deliver integrated planning for modern cities facing accelerating demographic development and the need to react on climate change.

An integrated approach to land use management which includes public and private stakeholders in Central European regions is still missing. Existing local, regional, national and European instruments did not succeed to solve this problem in the past and have even had adverse impacts in the former accession states by dislocating public grants (ERDF) for the development of unsuitable green-field sites. The problem is of specific relevance for regional and local authorities dealing with land management and the allocation of spatially relevant European and regional funds and investments.

The project “Circular flow land use management (CircUse)” – active from March 2010 until August 2013 – aims to reduce the use of new green spaces for urban development. The pilot actions implemented during the project support the reduction of greenhouse gases emissions through limiting the amount of future transport due to circular use of areas in city centres instead of creating sprawling urban development. Biomass production solutions in pilot cases help increase the use of clean energy. These sustainable initiatives are important steps towards creating a sustainable Europe.

The CircUse project strongly supports the urban dimension of EU policies, recognizing the importance of land re-development for social and economic reasons while ensuring that compromises are not made to the natural environment. The CircUse project provides member states with a tool developed on the transnational level to improve sustainable land development. This aims to improve the governance of urban interventions

through the commitment of all parties concerned to ensure effective planning as basis for the coherent financial interventions of ERDF mainstream funding. An added value of the interregional cooperation done within the CircUse project is the progress made in making regions more competitive and regional policy more effective by creating an effective model of land management.

The CircUse compendium presented here is a concise, comprehensive compilation of a body of knowledge which was collected within the CircUse project. It summarizes all key findings and outputs of a strong co-operation between twelve project partners and three associated partners from six countries in Central Europe. Our intention is to spark incentives for realisation of the targets of the EU Strategy 2020 and for the EU funding period 2014+.

Please enjoy reading the CircUse compendium. We are sure that the information provided here will be useful for all transnational, national, regional and local stakeholders who are involved in sustainable land use related issues.



Dr Anna Starzewska-Sikorska

*Institute for Ecology of Industrial Areas (IETU),
Katowice, Poland (CircUse Lead Partner)*

1.2. Executive Summary

Background

The last 20 years in Central Europe have exhibited a high grade of land consumption both in "old" EU member countries and acceding countries. The cause of city growth can be related to demands for housing, industry, commercial purposes and transportation facilities. Another challenge is the shrinking or abandonment of former industrialized regions and rural areas which causes problems of functional losses in the urban fabric. Both trends are strongly influenced by overall dynamics of development (economic trends, demographic change, flows of migration).

Idea

Circular flow land use management – the point of origin for the Central Europe project CircUse – is an innovative approach for the reduction of land consumption through the limitation of zoning of new greenfields for development and the mobilization of potentials presented by previously used or underused land. This management approach requires action on a cross-sectoral basis and the

involvement of many stakeholders in the process. Circular flow land use management embodies a different philosophy of land use, expressed by the motto: "avoid – recycle – compensate". This management approach accepts the use of greenfield sites under specific conditions, but primarily and systematically seeks to utilise the potential of all existing built sites. Circular flow land use management also intends to provide an integrated political and governance approach which includes the entire spectrum of policy areas and fields of activity relevant for land management at both the local and regional level.

The circular flow land use management approach pursues quantitative and qualitative management goals which take the ecological, economic and social aspects of land use into account.

Potentials

There are several categories of space oriented potentials of circular flow land use management like vacant or underused land, gaps in built-up areas, brownfields and also greenfields with development

perspectives. Structures no longer fit for reuse are to be demolished or renaturalised. In addition to the type of land parcel being considered, the amount of space-oriented potentials differs from region to region, from municipality to municipality and in the cities themselves from district to district.

Paths of implementation

Implementing circular flow land use management can only be realised through the integrated application of instruments, tools and specific strategies in several different fields of activity such as information, organisation, management, planning, financing, marketing and cooperation and communication and participation.

Integrated action plans for regional circular flow land use management represent an instrument package which can be implemented or initiated locally to contribute to brownfield redevelopment and reducing land utilization. The packages of measures usually aim at reducing the zoning of undeveloped land and exploiting the potential of existing land on previously developed sites. Action plans are informal instruments to establish circular flow land use management in the short- and mid-term.

Stakeholders

A sustainable approach to land use management requires action on a cross-sectoral basis and the involvement of various public and private stakeholders. This includes municipal policymakers, the various local administrative departments (e.g. urban planning, environmental planning, business development, real estate), regional planning departments, businesses, business development associations, developers, real estate agents, large property owners, banks, planning offices, environmental and nature conservancy associations, committees made up of members of civil society.

Municipal administrations are a key actor and driving force for circular flow land use management at the urban and regional level. The ability to co-operate, appropriate co-operative structures and

facilitate communication, information dissemination and mediation services are of the utmost importance for successful land use management. The selection of a tailored institutional solution has to be done with respect to municipal or regional requirements, objectives and tasks.

Project outputs

The partners of the CircUse project developed a wide range of findings and practice oriented solutions towards implementing circular flow land use management in the six pilot regions. These are the City of Piekary (Poland), Micro-region of Trnava (Slovakia), Region of Middle Saxony (Germany), Region of Voitsberg (Austria), City of Asti (Italy) and Region of Usti (Czech Republic). The involvement of the project partners and all regional and local stakeholders enhanced this future orientated approach towards a sustainable settlement development. For this purpose the following core outputs have been realised within the CircUse project:

Circular Flow Land Use Management Strategy

- The strategy summarises the desired achievement of the project goals and has been used for an overall orientation of the project to implement circular flow land use management in Central Europe. It also communicates the progress achieved and course of actions being undertaken in the pilot regions. The strategy also reflects the project approach against the backdrop of European land use problems and relevant EU policies.

Position paper on existing and new instruments

- The paper focuses on the analysis of the framework of legal, institutional, economic, financial and planning instruments for circular flow land use management in the partner countries. It summarizes the pros and cons of using the instruments for implementing circular flow land use management in the partner countries nowadays.

Separate training materials for professionals and school children

- ▶ The training materials for professionals presents the strategic and instrumental aspects of circular flow land use management relevant to the fields of urban and regional planning, soil and land use information, cooperation (e.g. municipalities, public and private partners), funding programs and schemes and economic incentives. These training materials were tested during a pilot training course in the Region of Voitsberg and were adapted and used for training in the Czech Republic.
- ▶ On the other hand teaching materials and guidelines for a CircUse training course at a secondary school for pupils aged 15 to 18 were also developed. This training focuses on land use, dwelling and mobility issues. The aim of this course is to promote circular flow land use management by raising awareness among tomorrow's land users. These materials have been used in schools in all partner countries. Furthermore, there were trainings sessions conducted for educating teachers.

Management structures that incorporate the CircUse principles (one newly formed and another modified from its previous form)

- ▶ Based on a feasibility study, a new profile of tasks and scope of activities for an existing management structure in one pilot region (Piekary) has been developed. The objective was to strengthen the performance of the organisation to enhance circular flow land use management at the local and regional level.
- ▶ Another pilot region (Region of Voitsberg) developed a management profile for a new organisation engaged in circular flow land use management at the regional level. A land management agency has been set up to mobilize brownfields and other inner development potentials in the five municipalities of the region.

Developed action plans for six pilot regions

- ▶ Action plans for the implementation of circular flow land use management have been developed in six pilot regions. These action plans include the mission, objectives and the identification of constraints in regard to sustainable land use. Each action plan determines activities, projects, responsibilities and time schedules for the implementation of circular flow land use management. Workshops with relevant local and regional stakeholders have been part of the action plan development. Additionally, a re-greening investment fund has been realized in one pilot region (Piekary).

A Land Management Data Tool available as a software package

- ▶ A data management tool has been developed to coordinate and reduce land consumption in a sustainable and climate friendly way. The land management tool allows the user to classify the types of areas and collect data about the sites. Furthermore, the tool can be connected with a geographical information system (GIS) platform or a web based solution of Google for the easy management of information. The database is developed by using the relational database system MS ACCESS, version 2007.

A compendium summarizing the entire project, as presented here

- ▶ For more information about the content of the CircUse compendium please see the following chapter.

Finally, recommendations for ERDF funding in the period 2014–2020 have been elaborated within the CircUse project to strengthen the activities done in the frame of the EU Strategy 2020 towards resource efficiency and sustainable land management.

All CircUse outputs are available on the website **www.circuse.eu**.

1.3. About this Compendium

This compendium collects the results of the CircUse project and the book version includes a CD with the software for the CircUse data management tool (see short explanations in chapter 7). The CircUse results are herewith documented in an implementation oriented summary report. To make the compendium easy to read, an overview of the different information and products presented in this compendium is given here. This will guide the reader to find the information most relevant.

Chapter 1 "Introduction: Towards Circular Flow Land Use Management"

includes a preface of the CircUse lead partner, an executive summary and a description of the compendium.

Chapter 2 "Why is Land Management Important"

describes the reason why circular flow land use management is an object of the Central Europe project. This includes the purpose and concept of the project as well as basic project information e.g. partners and regions involved.

Chapter 3 "The Approach of Circular Flow Land Use Management"

describes the principle, targets and space oriented potentials of a circular flow land use management approach and introduces the fields of activity.

Chapter 4 "How to Implement"

describes the fields of activity in detail and highlights available and new potential instruments for implementing a circular flow land use management. This includes issues such as information, data management, planning processes, financing, marketing, organisation, management and co-operation, participation and awareness raising.

Chapter 5 "CircUse Pilot Projects"

describes the action plans for a sustainable land use in the City of Piekary (Poland), Micro-region of Trnava (Slovakia), Region of Middle Saxony (Germany), Region of Voitsberg (Austria), City of Asti (Italy) and Region of Usti (Czech Republic).

Chapter 6 "Recommendations"

includes a final conclusion and a section which summarizes the lessons learnt from the project for national and European levels of governance. This chapter also refers to the CircUse strategy including recommendations with transferable findings.

Chapter 7 "CD-ROM – Data Management Tool"

introduces into the handling of the CD-ROM to start working with the CircUse Data Management Tool in six languages.



2.

WHY IS LAND MANAGEMENT IMPORTANT?

2.1. CircUse: Purpose

Cities within Europe are developing unsustainable urban structures. This is mirrored in the fact that land consumption continues to be on the rise throughout Europe. Land take in the European Union was observed to amount to at least 920 km² per year in the period 2000 to 2006 (*European Commission 2011*). The European Environmental Agency estimates that land taken up by artificial surfaces, which includes residential, commercial and industrial sites as well as the associated infrastructure (for example for transportation) grew by 3.4% from 2000–2006 – despite the economic crisis – when averaged out for the 36 countries included in the study (*European Environmental Agency 2010*). In Germany alone, it was estimated that between the years of 2008–2011, 81 ha of undeveloped land were consumed by new development per day (*Statistisches Bundesamt 2013*). These trends exist even in European regions with population decline.

Land consumption can be related to various factors: the economics of globalization, preference for single house living, land price dynamics, increased mobility, existing national and local policies, among other factors. Unattended land consumption not only endangers the biodiversity of an area, but also affects the area's quality of life. The expansion of towns and cities into their surroundings means that people have to travel further between their homes, places of work and leisure facilities. This also increases the nuisances that occur due to noise, air pollution and a lack of local recreation areas. Furthermore, this suburbanization changes the appearance of the towns, cities and landscapes – affecting both their attractiveness for inhabitants and tourists and the ability to create strong bonds of identification between the inhabitants and their place of residence.

In the longer term, expansive development will weaken our ability to deal with the pressing trends expected in the future: climate change, demographic change, peak soil, peak oil, rising costs of infrastructure, to name a few. Land consumption also endangers the nutrition source of mankind.



Figure 1: Soil sealing for different uses: typical for the urban fabric in European agglomerations.
Source: Thomas Preuß

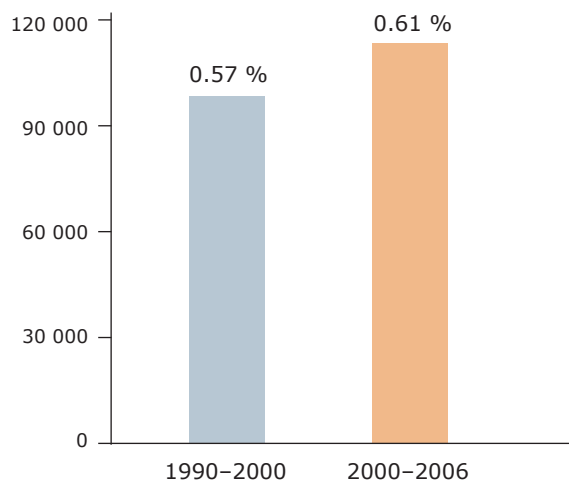


Figure 2: Annual land take by artificial surfaces (hectares/year, percentual increase in comparison to the first year) in 36 European countries (acc. to CSI-014 Land-take indicator, based on Corine Land Cover Data).

Source: European Environmental Agency (EEA), European Topic Centre Land Use and Spatial Information (ETC-LUSI), 2010



Figure 3: Soil functions: soil as a multifunctional and vulnerable system
Source: Environment Agency Austria

Fertile soil is threatened by development and its regeneration is not easy. It takes approximately 500 years to build up a humus layer from about 2,5 cm. If we do not change our current behaviour, the expansion of cities alone will seal 1,2 Mio. km² of land by 2030. This will have – also with consideration of the fact that the world population is growing to 9 billion humans on earth – dangerous effects on the world's food source.

To ignore these negative consequences of land consumption will result in an increased vulnerability of our municipalities. It becomes clear that to deal with the issue of sustainable land management, a comprehensive, holistic and interdisciplinary approach will have to be developed. Such a sustainable approach must prioritize inner development and restrict the development of de-concentrated and previously undeveloped land. In addition to this, various stakeholders from varying fields will have to be brought together to develop favourable outcomes. The need for such an approach is great, seeing that such continued trends pose a risk to the future viability of European cities to function properly.

A distinction is to be made here; land management and land use planning entail different processes. Land use planning deals with the current and expected demands of cities for growth or change by creating concepts to guide present actions. Land

management as presented in this compendium, however, is holistic in its approach. It does not only develop concepts, but also formulates action oriented principles as well as implementation measures and sets up the necessary organizational structures. Land management attempts to steer the planning process towards more overall goals which, when applied correctly, can increase the stability and sustainability of cities and the planning process.

European governments, regions and cities have taken the first steps towards realizing sustainable land use. Building upon these initiatives, the CircUse project defines a concrete approach to sustainable land use management and aims at implementing the defined concept in municipalities within Europe. This implementation requires the effective co-operation by stakeholders from the national, regional, and local levels in order to properly embed the process of circular flow land use management in terms of concept, organisation and practice. Therefore – both in the countries and regions involved in the CircUse project and in the EU in general – the existing framework and its mosaic of instruments and tools to steer land use have to be applied in a consequent manner. Furthermore there is a need for economic incentives to stimulate stakeholders and decision makers to reduce land take and to strengthen inner development.

2.2. CircUse: Concept

The concept of "Circular Flow Land Use Management" has been developed against the background of the persistence of unsustainable trends and recognition from various government levels that action must be taken. Circular flow land use management offers a philosophy of sustainability still relatively newly conceived in regards to the management of land.

This philosophy can be related to the waste management system in which materials are created, used and then thrown away. In the worst case scenario, these materials are thrown away and sit

idle in a garbage dump. However, in the best case scenario the material is used again, either for another purpose or is recycled efficiently so that the material can be reused. The CircUse project applies this logic to the use of land by imagining land in this system of usage, waste and recycling. Land is considered as a valuable resource.

Each piece of land acts like a unit of material from the previous example, the difference being that land is not created in a factory, but enters the cycle once made marketable. Once sold, the land is used by being built upon or serving some urban use.

Some pieces of land are very efficient by enjoying continual use. However, there are others that are used for a period and then abandoned, left by the owners and users. This is to be compared to the worst case scenario where material is thrown away and sits idly in the landfill. It serves little purpose and becomes waste. The CircUse project wants to take these pieces of land considered as waste and “recycle” them so they can be used again. Within this use cycle concept, sites and buildings can be identified as to their placement in the cycle by the various states of land: planning, use, cessation of use, abandonment, interim-use and reintroduction of sites and buildings.

With this land recycling concept in place, the expansion of the city into new previously undeveloped land is to be reduced, the disused and abandoned parts of the city recycled into new viable uses, and compensation made elsewhere when expansive development cannot be avoided. Here, instruments related to planning, information, data management, co-operation and organization are to be applied (see chapter 4).

Efforts must be taken to ensure ample amounts of undeveloped land be available to future generations to be used for farming, recreation, or as open space. The extra provision and conservation of open space, for example, contributes to the potential future needs for adaptation to more extreme weather spurred on by climate change, as well as providing habitat space for biodiversity to flourish. In connection with this, focus must be put upon concentrating growth in the existing city structures, using previously unattended and ignored sites as an opportunity to implement this vision. It was estimated that in 2004, Germany alone had 49,000 ha of brownfield land area that could be reactivated (*BBR 2004*). Such unused brownfields should be seen as an opportunity to build new land uses upon that help support the concentration of city structures.



Figure 4: Former industrial site at the harbour in the City of Nantes (France): now used for offices and exhibitions.

Source: Maic Verbücheln

With this guiding philosophy, the CircUse project affirms that vital European cities must be more conscious about the consumption of land. This means, firstly, the existing needs for housing and commercial purposes have to be realistically defined. This means taking into account the predicted demographic development when calculating the existing demand for construction. This is in contrast to the practice of overstating the amount of land set aside for development to attempt to attract desired expansion and investment in a specific area. Second, the municipalities need to help conserve greenfields by implementing infill measures that act upon gaps in the urban structure, densification measures and brownfield redevelopment activities. Such measures, when approached properly, will lead to compact cities.

The benefits of such a compact city structure are manifold. Compact cities are more adaptive to the challenges presented by peak soil, peak oil and climate change. Future changes in Europe’s demographics (namely the ageing of the population and decrease in population) can also be dealt with more effectively in compact city situations. Also, compact city structures lessen the need for expansive infrastructure systems which are expensive to maintain. The concept of circular flow land use management, as applied by the CircUse Project, looks towards achieving these goals to achieve future able cities.

2.3. CircUse: In the Regions



Figure 5: The CircUse Project Partners.
Source: IETU

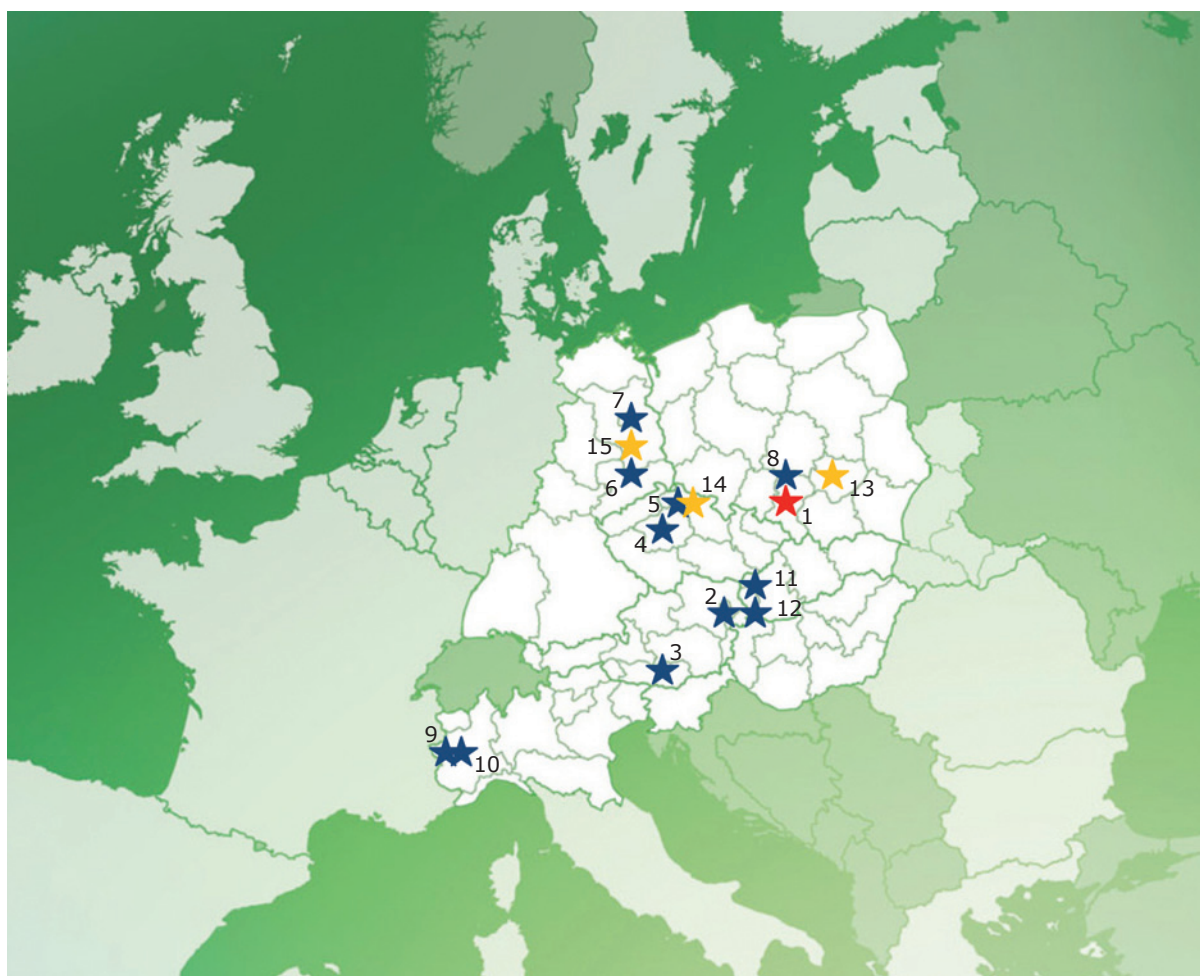
A key focus of the CircUse strategy is the recognition that strategies for sustainable land use must be adapted according to the specific urban or regional contexts and requirements of each city or region. This is done with the involvement of twelve project partners and three associated partners in six nations who have collaborated together to create noticeable change in their pilot regions. All of these regions are affected with the issues of massive urban sprawl, the current economic crisis, and mounting demographic change (both growth and shrinkage). CircUse aims to create land use patterns that are competitive and sustainable through adapting the circular flow land use management concept to the specific demands and contexts of each represented region. The project partners are located in following countries: Poland, Czech Republic, Slovakia, Italy, Austria and Germany (see map below).

The project consortium is built in a way that it gathers expertise from municipalities and organisations – involved in the development of pilot projects, scientific research and administration – to foster a sustainable land management in Europe.

Also the findings of many other projects dealing with sustainable land use principles to define its specific objectives and work programme are recognised. The design of the CircUse project was made more effective by noting what has already been done and accomplished in the field. For example, CircUse builds upon the EU FP6-project “Peri-urban Land Use Relationships – Strategies and Sustainability Assessment Tools for Urban-Rural Linkages” (PLUREL). The project addressed the issue of peri-urban land and its relationship to the core city by producing various tools for analysis purposes and also recommendations for the EU government (*PLUREL 2011*)¹. In addition, the German project REFINA (Research for the Reduction of the Consumption of Land and a Sustainable Land Management), funded by the Federal Ministry of Education and Research (BMBF) helped develop tools to make the true cost of expansive infrastructure transparent and accessible to decision makers (*Bock et al, 2011*)².

¹ See also: www.plurel.net

² See also: www.refina-info.de



LEAD PARTNER (★)

Poland (PL)

1. Institute for Ecology of Industrial Areas (IETU)

CIRCUSE PROJECT PARTNERS (★)

Austria (AT)

2. Environment Agency Austria
3. Telepark Baernbach Corporation Ltd.

Czech Republic (CZ)

4. Institute for sustainable development of settlements (IURS)
5. The Usti Region

Germany (DE)

6. Saxon State Office for the Environment, Agriculture and Geology (LfULG)
7. German Institute of Urban Affairs (Difu)

Poland (PL)

8. City of Piekary

Italy (IT)

9. Higher Institute on Innovation Territorial Systems (SiTI)
10. City of Asti

Slovakia (SK)

11. City of Trnava
12. Slovak University of Technology in Bratislava (STU), SPECTRA Centre of Excellence

ASSOCIATED PARTNERS (★)

13. Poland: Świętokrzyskie Province
14. Czech Republic: City of Usti nad Labem
15. Germany: Federal Institute for Research on Building, Urban Affairs and Spatial Development

Figure 6: Location of CircUse project Partners
Source: European Union, IETU, Difu

The CircUse project is also based upon the experience of the German ExWoSt project “Circular Flow Land Use in Urban Regions”, funded by the Federal Ministry of Transport, Building and Urban Affairs (BMVBS) which set a precedent for collaboration between various entities and levels of government to test out tools for sustainable land use management (*Federal Office for Building and Regional Planning (BBR) 2006*). Here scenarios have been simulated in which five different German planning entities were given various tools and measures to try and achieve sustainable land management (*Federal Ministry of Transport, Building and Urban Development (BMVBS), Federal Office for Building and Regional Planning (BBR) 2007*). These five entities, which ranged in their jurisdiction size

(single cities to entire regions) as well as present urban context (growing as well as shrinking population), then judged the value of potential policies that aim at promoting land recycling concepts. The results were then passed on in the form of recommendations tailored for the Federal Government of Germany. CircUse, instead of making recommendations for a national entity, has presented tools and instruments useful for the implementation of the circular flow land use management concept on the local and regional level. Eventually, these suggestions can be used to influence EU spatial development and EU program funds by applying circular flow land use management on a larger scale (please see also chapter 6 for recommendations).



CircUse Pilot Regions

To achieve the project objectives, one pilot region in each of the six CircUse countries (see map above) has been selected to participate in the project. These pilot regions tested the implementation of the CircUse principle by creating action plans and – in the case of Piekary Śląskie – also by the realisation of a pilot investment.

In general, the patterns of land consumption in the pilot regions are determined by the respective development dynamics of the region (e.g. economic trends, demographic change, flows of migration). Therefore, each of these pilot regions have their own characteristics, framework conditions and opportunities for future land use management.

The pilot regions are the following areas:

► The City of Asti, Piedmont Region, Italy

The pilot in Italy focuses on the Way Assauto property which was formally used for the manufacturing of shock absorbers. Today, the 90,000 m² site is polluted by Chromium+6. The objective of the project is to reclaim the area to make it usable for new urban functions.

► The Piekary Śląskie, Poland

Here the project focuses on the 120 hectare large Brzeziny Śląskie district, located in the southern part of the Piekary Śląskie Borough. Objectives of the project are to restore the natural value of degraded areas and to promote regional economic development. This requires the creation of favourable conditions for new projects as well as providing assistance for the implementation through the reorganization of the existing Piekary Śląskie Industrial and Technological Park EkoPark Ltd., which is active in the region, towards applying CircUse principles.

► The City of Freiberg, Middle Saxony, Germany

Here a former porcelain factory is located on the "Davidschacht" industrial site on the north-eastern outskirts of the City of Freiberg (which is between Dresden and Chemnitz). The old main building is under heritage protection and is one out of five industrial sites of Freiberg with a size of 4.5 hectares, from which about one-fourth (11,000 m²) is built on. The objective of the project in Germany is to make the factory viable again for urban use.

► The Trnava Micro-region, Slovakia

A main focus of the CircUse project in the Trnava Microregion is to encourage cooperation between the City of Trnava and twelve outlying municipalities towards establishing a CircUse concept for the whole area. The project implements this vision on two specific revitalization sites in Štrky (natural brownfield currently a forest) and Medziháj (brownfield with limited utilization due to the excessive spread of infrastructure on site which is currently a field).

► The City of Usti nad Labem, Czech Republic

Here the project addressed 17 hectares of a waterfront property with different topographic levels. Former and current uses include industrial uses (scrapyard, ship port) and an unused football pitch. A feasibility and viability study of a derelict area and many vacant plots will be completed for the project. The area could be suitable as a city waterfront and leisure area, due to its access to the Elbe River. Due to many land owners and stakeholders, revitalization may encounter challenges.

► **The Voitsberg Region, Styria, Austria**

The following aspects are pursued by the project in the Voitsberg region: an inventory of brownfields and derelict land, awareness raising activities for local planners and secondary schools, the establishment of a land management agency, and the creation of experimental biomass plantations on large brownfield sites.

All of these pilot projects will provide practical examples of the implementation of the CircUse principle. Further information on the activities of the pilot regions can be found in chapter 5.



3.

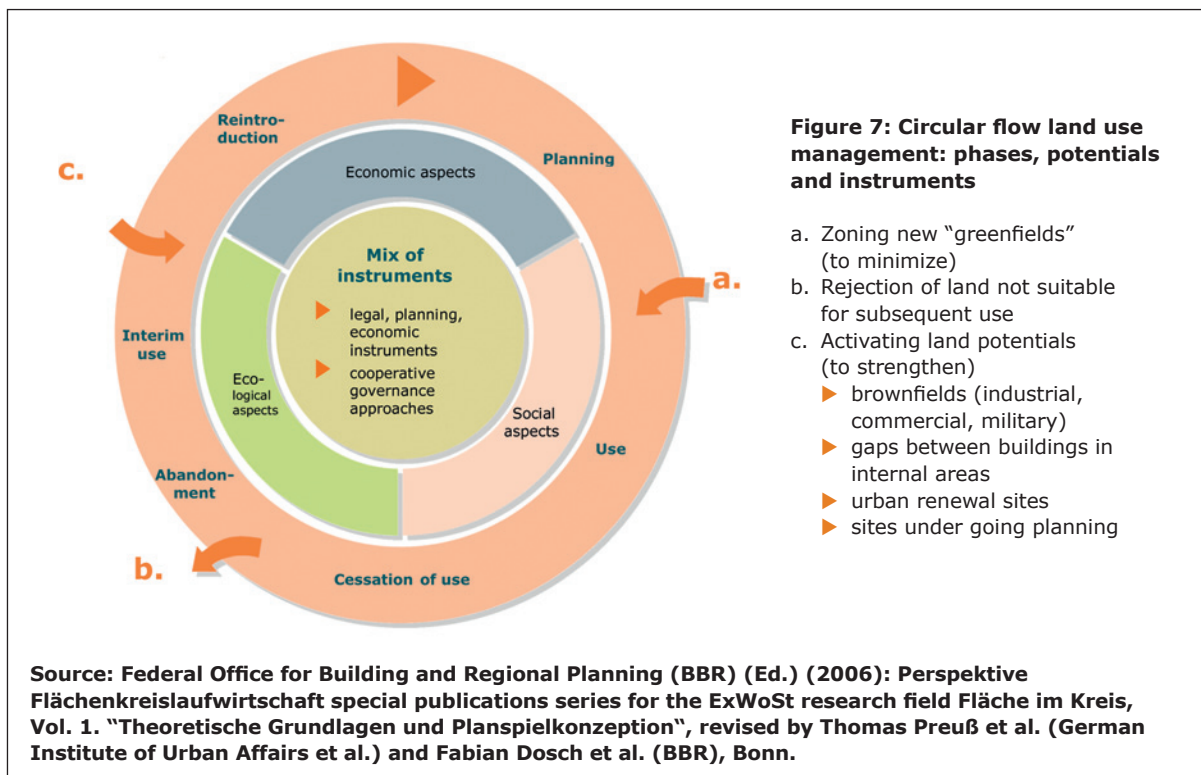
THE APPROACH OF CIRCULAR FLOW LAND USE MANAGEMENT

3.1. Principle of Circular Flow Land Use Management

The circular flow land use management concept represents an integrative policy and governance approach. Its starting point is a changed philosophy with regard to land utilization. This modified land use philosophy can be expressed with the slogan “**avoid – recycle – compensate**” (*Federal Office for Building and Regional Planning (BBR) 2006*). More specifically, these points can be expressed by the actions of:

- ▶ **Avoid** – The conversion of now un-built open space or agricultural land into new developments is to be avoided.
- ▶ **Recycle** – Areas with uses that were once active and now exhibit no viable use should be recycled by either introducing new uses or through renaturation.
- ▶ **Compensate** – Compensation should be required when construction must take place on previously unbuilt land. This can be in the form of renaturation projects or through de-sealing measures in built areas, where soil sealing is no longer necessary.

Thus, similar to the recycling-based principles which have become commonplace in recent years in areas such as waste and water management, circular flow land use management should become an established policy for sustainable land utilization. Soil has to be recognised as a scarce resource like some metals etc. Therefore material cycles serve as a model for circular land use management: the constructed city is understood as a system with a structural makeup which is subject to various usage phases and where, in certain instances, entire districts and industrial areas are dismantled and made suitable for subsequent use. During this entire process, the total area of land used should remain the same. Structures no longer fit for reuse are demolished or renaturalised. Measures for development of the existing built-up areas are suggested for all regions – regardless if they are growing, stable or shrinking. The idea of a “circular flow” of use thus seizes upon the notion of a use cycle in the allocation of building land, development, use, abandonment and reuse (cf. Fig. 7).



3.2. Targets of Circular Flow Land Use Management

Circular flow land use management aims at minimizing the zoning of “green belt” land for development and at mobilizing of existing built land for building and transportation purposes. The approach also pursues quantitative (reduction of zoning of new land) and qualitative (development of the existing built-up land, densification of the urban structure, increase of efficiency of use and economic productivity of built land) management goals which take the ecological, economic and social aspects of land use into account.

There is a need to define aims before establishing a circular flow land use management system. Activities have to be defined on a regional or local scale according to the specific area in question when dealing with the issues of inner development or land take. The setting of national aims for the reduction of land consumption and the re-use of formerly used building areas on a regional or municipal level is an ambitious task which has to be done for most municipalities and regions in the future. There are, however, existing cases of national goals to promote sustainable land use.

At the European level there are clear principles for sustainable land use. The European “Thematic Strategy for Soil Protection” defines a common and comprehensive approach, focusing on the preservation of soil functions, based on the following principles (*European Commission 2006*):

1. preventing further soil degradation and preserving its functions,
2. when soil is used and its functions are exploited, action has to be taken on soil use and management patterns,
3. when soil acts as a sink/receptor of the effects of human activities or environmental phenomena, action has to be taken at source,
4. restoring degraded soils to a level of functionality consistent at least with current and intended use, thus also considering the cost implications of the restoration of soil.



Figure 8: Result of settlement development without sustainable aims – a new but abandoned housing area on a former greenfield area close to the City of Leon (Spain).
Source: Maic Verbücheln



Figure 9: New housing estates on a former industrial brownfield in Leipzig (Germany): example for a goal-oriented re-densification and brownfield redevelopment.
Source: Thomas Preuß

With regard to the alarming trend of land take, the European Union has responded by setting up initial policy measures. A specific policy target with the goal of with “no net land take by 2050” and a reduction of the annual land take to an average of 800 km² per year in the period 2000–2020 is set in the Roadmap to a Resource Efficient Europe Map document. A considerable reduction of future land take can only be achieved by increasing the reuse of abandoned land.

Furthermore, the “Leipzig Charter on Sustainable European Cities” from 2007 promotes integrated strategies for urban development and supports the Lisbon Strategy by promoting high quality standards in urban design, architecture and environment. The charter defines integrated urban development policy as a process in which the spatial, sectoral and temporal aspects of key areas of urban policy are co-ordinated with one another.

The CircUse approach is consistent with the Gothenburg Agenda priority objective of the sustainable management of natural and environmental resources. The CircUse approach also supports the long term objectives of the EU Strategy for Sustainable Development, namely the action to limit climate change and increase the use of clean energy (*European Commission 2001*).

There are several initiatives of member states which aim at the reduction of land consumption by setting goals for sustainable land use. In Austria,

the Strategy for Sustainable Development defined key objectives of future development to be the preservation of diversity and natural foundations of the landscape and its ecosystems, as well as the cultural and economic diversity of land use. The quantitative aim of the Austrian strategy is to reduce the rate of increase of permanently sealed surfaces to a maximum of one tenth of the current growth rate (year 2002) achieved by the year 2010 (*Austrian Federal Government 2002*).

In 2002, the German Federal Government created the National Strategy for Sustainable Development (*German Federal Government 2002*). This strategy of land management and governance approach formulated the following goals:

- ▶ reducing land utilization (from about 100 hectares in 2002) to 30 ha per day by 2020 and
- ▶ realizing three times as much internal development as external development by 2020.

The circular flow land use management approach supports these goals formulated at the European and national levels. The approach recognizes that once aims on the federal or state level are determined, they must be adapted according to the specific urban or regional contexts and requirements of each city or region. It was a key focus of the CircUse project to provide suggestions for such adaptations.

3.3. Space Oriented Potentials of Circular Flow Land Use Management

To achieve the targets existing potentials have to be identified and managed. This is carried out through coordinated actions on scarcely developed lots, brownfields, vacant buildings, land which will be abandoned in the foreseeable future and through the redensification of existing housing and commercial facilities.

In order to pursue this CircUse developed “Terms of Reference” (ToR) and a comprehensive definition of land types. These definitions assist in categorizing inner development potentials and in implementing a transnational database system which maps greenfield and brownfield areas (*Otparlik, Siemer, Ferber 2010*). Land was differentiated into the following types:

Greenfields with development perspectives

A greenfield is a “green” site within the scope of the preparatory land use planning of a spatially planned area. The future perspective uses of these sites include new building zones for industrial, residential or commercial development. These areas are unique in that they were not previously developed upon. This means they are not connected to the infrastructural system of the city and also that they have soils undisturbed by sealing or building activities.



Figure 10: Greenfield on the outskirts adjacent to a new residential area. Source: Thomas Preuß

Vacant or underused land

Vacant or underused sites have been previously used before. Some of these sites were demolished after usage but some have retained their construction and are now simply underutilized. They are different to greenfields because they have already had development located on them, for example water treatment plants, waste management systems, infrastructure for electricity, gas or district heating, street access and connections for public transport facilities. These sites are located in the inner city as well as the periphery.



Figure 11: Former used land – now vacant land, connected with technical infrastructure. Source: Thomas Preuß

Gaps in built-up areas

Gaps are mostly smaller sites which are suitable for construction as found in the existing urban structure but remain underused or unused. These sites are usually included in development plans of the inner city districts or residential areas where they are usually located. These sites differ from greenfields in their size (individual site instead of numerous sites bundled together) and that they are mostly developed with technical infrastructure. Other gaps are often found in industrial parks with existing infrastructure.



Figure 12: Gap in a built-up area in the existing urban structure. Source: René Otparlik

Brownfields

Brownfield sites are sites that have been affected by the former uses on the site and within the area. They are derelict or underused, but cannot be described as a gap because of the real or potential contamination problems associated with these sites. Brownfields are mainly situated in developed urban areas and require intervention to bring them back into use.



Figure 13: Brownfield on the area of a former slaughterhouse. Source: Thomas Preuß

Brownfields can be further defined according to the previous type of use according to the following seven types:

- ▶ industrial (mining, textile, steel industry),
- ▶ military (military facilities including barracks and training areas),
- ▶ commercial (real estate) / "greyfields" (economically obsolescent or underused real estate and so called "investment ruins"),
- ▶ infrastructure and traffic systems (former railway tracks, closed airport or harbours),
- ▶ residential (old buildings or prefabricated housing areas),
- ▶ cultural and social (former school or leisure areas),
- ▶ agricultural (abandoned farms).

Each of these categories have their own characteristics and opportunities for future use. The following table illustrates the hidden potential for internal development in the region of Voitsberg.

Municipality	Brownfield sites (ha)	Building gaps (ha)
Bärnbach	28,8	6,0
Köflach	1,1	17,8
Maria Lankowitz	-	0,2
Rosental	2,8	1,7
Voitsberg	25,6	4,8
Total	58,3	30,5

Table 1: Brownfields and building gaps in the Austrian pilot region Voitsberg.
Source: Umweltbundesamt, Büro Schabl, Telepark Bärnbach (Eds.) (2012): Flächenmanagement Agentur für den Kernraum Voitsberg 2012, brochure, p. 8.

In addition to the type of land parcel being considered, the amount of space-oriented potentials differs from region to region, from municipality to municipality and in the cities themselves from district to district. Factors that influence these discrepancies are the amount of vacant land due to abandoned industrial and military areas, the structure of the urban fabric, the migration processes at work and the local demographic development. Along with these factors, the chance for reuse of inner development potentials also depends on the specific demand for housing and commercial uses in the area.

3.4. Fields of Activity for Circular Flow Land Use Management

Implementing the strategic approach of circular flow land use management is complex. It can only be realised through the integrated application of instruments, tools and specific strategies in several different fields of activity. One field of activity for circular flow land use management is in the tasks related to planning. Planning considers spatial potentials and constraints in developing decisions concerning urban development.

In order to make these decisions effectively, one must gather the information and data required for the CircUse approach, which represents another field of activity. This includes the creation and maintenance of databases, site surveys, and analysis of the existing conditions.

Organisational and management tasks have to be clearly defined for circular flow land use management and must be carried out by the correct members of the responsible organisations. Also, engagement in cooperation between the relevant stakeholders must take place to ensure that all of those affected have a voice in the process.

Important as well is the pursuing of investment options to fund the proposed changes, such as brownfield clearing or renaturalisation. This entails allocating funds and a budget for the planned actions and attracting external investors when needed. Marketing schemes are the most effective way to attract outside money for projects.

The legal framework for the implementation of activities is determined by legislation and guidelines on the level of the EU, federal governments and regions. These differ from jurisdiction to jurisdiction in their competencies, powers, and experience in dealing with land management.

Not all areas can pursue the same path of carrying out these activities because of the varying contexts of the regions and localities present in Europe. Instead, the precise arrangement of activities and measures in these fields should be pooled according to regional differences in framework conditions, land use demands, land use management targets and the regional or local development dynamics.

All of these fields of activity are further described below in chapter 4.



4.

HOW TO IMPLEMENT

Circular flow land use management means very little if it is not implemented into reality. To do so, regions and municipalities have a wide range of instruments at hand including: information databases, land use planning methods, financial tools, marketing activities as well as organisational solutions. This chapter describes the range of circular flow land use management instruments and illustrates them with examples from the CircUse project.

One experience from the CircUse pilot regions is that many instruments are already in place but must be geared more towards contributing to the concept of circular flow land use management. Conversely, new ideas are needed in other fields of action to boost internal development, minimize the consumption of “green belt” land and formulate an overall concept.

The right institutional backing from the European and national level can help local actors develop sustainable land use strategies, consistent planning laws or a financial framework that supports brownfield development. Improvements can also be made by making excessive land consumption and urban sprawl more expensive. It must be recognized, however, that there can be no single way to apply circular flow land use management.



Figure 14: Fields of activity for implementation of circular flow land use management.

Source: German Institute of Urban Affairs, 2013

Regions differ, for example, with regards to their economic profile, demographic trends or real estate markets. Each region needs a specific set of instruments and mechanisms to coordinate their unique mix of needs and relevant actors.

There are many ways to start implementing circular flow land use management right now!

4.1. Information and Data Management

Information is an important starting point to engage in circular flow land use management. Therefore a solid body of data in the form of comprehensive site information is a general requirement. Due to divergent departmental stipulations, many municipalities currently track derelict land in different administrative sections simultaneously. Often environmental departments record the sites in registers of contaminated sites. Business promotion departments store them in their trading site records and planning offices trace them through their construction land records. Integrated solutions must replace these sectoral approaches

if solid foundations for planning and decision making are to be created for land recycling and land use management.

Information is not only the basis for sustainable planning decisions but is also the first stepping stone for raising awareness to the economic, social and ecological consequences of the real estate investment decisions made by businesses and private households.

CircUse Data Management Tool

A transnational tool for land use management was developed by the CircUse project. The data management tool is an information and planning system for local authorities to coordinate and reduce land consumption in a sustainable and climate friendly way. The main product is a flexible regional land management tool to classify the types of areas and collect data concerning these sites. The tool will allow for the management of information in a geographical information system (GIS) platform or a Web-GIS. The tool acts as a land data management and monitoring system by providing a structured repository for all collected fieldwork data. The good and accurate handling of fieldwork data is based upon a common "field record sheet" developed specifically for the tool. This sheet categorises the different land types ("Terms of Reference" – ToR – see above).

The sub-categorisation of information in this early phase of data collection helps with the later practical work of the planning data.

The field record sheet designed for the tool can be used as an EXCEL sheet on-site by using a mobile computer. Alternatively, printouts of the EXCEL file can be used and the information entered in to the system back in the office. The main focus of the site analysis is to collect information about the building and sealing degree, terrain profile and to categorize the former or residual use. With the field record sheet it is possible to:

- ▶ assign defined sites and areas determined by the editor,
- ▶ record the key aspects of the existing situation and specifics on the site's characteristics based on planning or regulation data.

In the tool, the editor can also document unknown sites recognised during the fieldwork. Photos are useful to get a better impression and can be saved in the system as well.

Figure 15: Fieldwork data form of the CircUse Land Management Tool
Source: Saxon State Office for the Environment, Agriculture and Geology, LfULG

Figure 16: Protection and planning form of the CircUse Land Management Tool
Source: Saxon State Office for the Environment, Agriculture and Geology, LfULG

The data management tool is based on the program MS ACCESS 2007 in which the fieldwork data can be imported and stored. The tool has been devised to work as simply as possible yet incorporates all of the necessary information to promote inner development potential in urbanized areas. Data collection and data interaction are possible with the tool and there is a number of user friendly search functions (so sites can be found easily by investors). The tool could become part of a national or European strategy to reduce land consumption on the local level. Data collection is based on a common survey

record sheet for the fieldwork. The structure of the tool is similar to this sheet. In addition to the survey, the coordinates and documents related to the sites can be stored in the tool (such as various site limits or planning data including information regarding land use plans, protected areas, contaminated sites database, etc.). By using the tool, municipalities, other authorities or stakeholders can collect the necessary information about urban and inner city development potentials. The tool has been installed and tested in the CircUse partner regions. A manual has the dual purpose of helping in-

stalling the tool and also explaining the methodology of circular flow land use management. The tools and material presented above contribute significantly to improved land management by both teaching the principle of sustainable land use and offering a tool for to improve the management of land. Please find both products, the tool and the manual, on a CD-ROM inside the back cover of the compendium (only in book version). Furthermore it can be downloaded for free from the CircUse project webpage (see www.circuse.eu).

For example, planners at the local level need to know about the amount of brownfield sites, gaps and underused land in the area and their specific characteristics in order to use the potentials they provide. Also, planners need to know about the amount of land zoned for future development as well as the future demands on the real estate mar-

ket. Both of these help to assess the opportunities for internal development or “re-greening”. The appropriate tools for data collection and management are required to get this necessary information. CircUse partners have developed a tool for land use management linked with a geographical information system (GIS).

4.2. Planning

National planning legislation is an important instrument because it sets the framework under which regional and local action on circular flow land management can take place.³ Throughout Europe, regions and municipalities develop legally binding plans or informal plans that influence the scope, location or nature of land uses at different spatial scales, ranging from entire regions to neighbourhoods to individual development sites. The actions in the CircUse pilot regions have made clear that a certain type of these plans, the land use plan, can be a key contributing element to achieving circular flow land use management. With land use plans it is possible to regulate, for instance, the type and amount of land use in relation to the demand for development and demographic needs.

Other plans consider the aspects of soil sealing by buildings or implement measures intended to compensate for interventions. Planning instruments for urban renewal and redevelopment concepts in Germany are oriented to be integrative, implementation focused and open to participation. Redevelopment and urban renewal instruments assist in occupying vacant buildings and eliminating functional deficits in districts where such problems are particularly concentrated.

³ In federal states like Germany and Austria the state level (Bundesländer) are also important legislators for determining planning law and formulating relevant planning strategies.

Municipal council resolutions on land management policy could serve as statements of commitment on the part of a municipality or a group of municipalities. Despite the limited obligation inherent in such resolutions, they have considerable potential to influence land use management decisions and to spur activity on existing building sites.

One key element of circular flow land management is to formulate quantitative limits on land consumption coupled with qualitative standards such as minimum density requirements for new residential or commercial developments within regional (such as regional planning schemes) or local plans for land development. A regional approach to the implementation of circular flow land use management is favourable through the adoption of a land use plan agreed upon by the various municipalities involved (inter-municipal planning).

When it comes to the level of planning for individual sites, local planning procedures in various CircUse countries provide the local authorities with legal instruments (ordinances) to promote the “recycling” of land. Local building orders oblige land owners to invest on certain municipal plots to help avoid speculation. Conversely, demolition orders can remove obstacles for new uses or renaturalisation efforts.

Land use planning and management is a distinctive cross-sectoral issue that involves many stakeholders in the process. To reach a sustainable level of land use, a wide variety of instruments, including fiscal, economic, regulatory and planning tools, must be used in combination with one another. Also concepts and registers concerning soil protection issues (e.g. soil quality, soil productivity, rarity) should be considered in spatial planning to promote sustainable spatial and settlement development.

The Czech Republic has strong laws related to the protection of agricultural land uses. The conversion of agricultural land is governed by two laws. The Building law no. 183/2006 Sb., (Stavební zákon) demands economic viability when urban planning is practised and the Agricultural land protection law no. 334/1992 Sb. (Zákon o ochraně



Figure 17: Planning with the help of maps – collecting ideas towards circular flow land use measures in the Region of Voitsberg (Austria).
Source: Maic Verbücheln



Figure 18: Stakeholders planning circular flow land use measures in the Region of Voitsberg (Austria).
Source: Maic Verbücheln

zemědělského půdního fondu) demands that land take be demonstrated as being actually necessary (or if instead there is suitable brownfield land available). Agricultural land conversions for urbanised uses are also subject to conversions charges, the level of which depends on the production quality of the taken land. In practice, however, the effectiveness of these legal protections for agricultural land take are reduced by an absence of land use management on the regional and local levels and by a lack of comprehensive data related to already urbanised and planned land uses.

The German Federal Building Code has been amended in 2013 to strengthen internal development and reduce the use of new land (cf. § 1a paragraph 2 sentence 4). According to this re-

Informal Planning: Development Plan of the Municipality of Asti

Policy makers in Asti have agreed to pursue urban development policies that promote economic growth, poverty reduction and environmental sustainability. In the course of the CircUse project the Municipality of Asti has developed a strategic plan that involves all brownfield areas and abandoned buildings. The reclamation of the former "Way-Assauto" area, one of the biggest and most problematic brownfield sites in the city chosen as the CircUse pilot area, has been included in this Development Plan of the Municipality of Asti. The attention given to this

area is one of the first achievements of the participation to CircUse project, which called the administration into taking action. The Development Plan was formulated through an inclusive and participatory planning process which included a series of workshops with representatives of institutional, economic, social and cultural stakeholders.

Source: ID Card Asti and Activity Report, Feb. 2012, Output Nr. 5.1.4, Municipality of Asti/SITI]

Replacement Planting Model, Piekary

The innovative instrument of the Replacement Planting Model has been developed for the Piekary pilot project. The model proposes a procedure to be introduced by the order of the President of the town.

The idea of the procedure is to change the requirements of the national regulation that makes it obligatory for each borough to charge a subject when they cut down trees. The payment depends on the type and dimensions of a tree (precisely measured).

The Planting Model looks to replace this payment system with compensatory planting. The new model is designed to precisely indicate the required place and type of the compensation planting to take place. Such an idea is connected with ensuring environmental sustainability through the planting of trees in the CircUse pilot area of Piekary.

Source: City of Piekary Śląskie, 2012.

gulation, urban development should primarily be achieved through measures of internal development through the reuse of brownfields, gaps and underused land and by measures of redensification. Also, soil sealing has to be reduced to a minimum level. The necessity of transforming unused agricultural or forest land has to be justified within land use planning and the possibilities of internal development have to be verified in a cadastre.⁴

An analysis of the legal planning and building frameworks of the CircUse countries showed that improvements could be made. Planning law should be revised to integrate instruments for the regulation and stimulation of circular flow land management in order to reach the stated goals of land consumption.

⁴ Federal Building Code (Baugesetzbuch, BauGB), In the version from 23 September 2004 (BGBl. I S. 2414), amended by Article 1 of the law from 11 June 2013 (BGBl. I S. 1548).

4.3. Financing

One major challenge presented to circular flow land use management is securing adequate financing. At first glance, activating brownfields seems on average more expensive than developing greenfield sites. One way to overcome this problem is by developing public funds for developing such sites.⁵ Such funds already exist in some municipalities where the city or an affiliated land development organisation purchases problematic sites and invest in the site clearing, soil remediation and/or marketing of these plots.

Public programmes to fund investment on internal development opportunities, such as brownfields, unused or underdeveloped lots, are important in guiding private investors towards more sustainable investment choices. As the experiences from CircUse show, cities or regions often do not have the adequate funds to set up such funding programmes. Therefore European, national or sub-national funding plays an important role.

Another approach to achieve a higher level of efficiency with limited available public funding is by developing financial engineering mechanisms such as Urban Development Funds (UDF) as initiated within the JESSICA program by the European Commission.⁶ EU countries can choose to invest some of their allocated EU structural funds into revolving fund mechanisms to accelerate investment in Europe's urban areas. The revolving nature of the instruments means that the returns gained from investments are then reinvested in new urban development projects. Thus, public funds are recycled to continue creating more sustainable cities, increasing the impact made by EU and national public money.⁷

Microcredits for business development in Asti

The Municipality of Asti has seen a reduction in the working population (especially younger) and a general lack of human capital and innovation in recent years. Tertiary sector organizations are finding it increasingly difficult to support their activities for the lower propensity of citizens to make donations. For this reason the Municipality of Asti has chosen microcredits for social business as a main solution to stem this crisis and to realize the CircUse action plan. In 2012 a memorandum of understanding was signed between the Municipality of Asti and the Yunus Social Business Centre University of Florence (YSBCUF) about the development of social business supported by microcredits. This initiative aims to improve access to credit for small businesses and individuals who are in a situation of social exclusion: workers in vulnerable employment and younger freelancers, with a special focus on women with children, the elderly and immigrants.

Source: City of Asti

⁵ In reality the individual properties of development sites within settlement structures (e.g. soil contamination) and the local real estate market (determining the land value) will make difference.

⁶ JESSICA – Joint European Support for Sustainable Investment in City Areas

⁷ See http://ec.europa.eu/regional_policy/thefunds/instruments/jessica_en.cfm#7

ERDF – Administrative Regulation on Urban Development for revitalization of brownfields in Saxony (VwV Stadtentwicklung)

One financial option is the introduction of a brownfield program in connection with European Union regional ERDF⁸ programs. Since 2000, the ERDF program in the State of Saxony has put a particular focus on the development of inner city brownfield sites.⁹ The overall objectives here are the strengthening of the inner cities and the reduction of land use and urban sprawl in the wider regions of cities. In this program the municipalities have the option to fund the demolition of brownfields without the requirement of subsequent use. However, the development concepts for the cleared land must have adequate intended economic uses. Use of the funding is based upon the administrative regulations of the Saxon State Ministry of the Interior on the one hand while also being used for the promotion of projects for sustainable urban development and revitalization of brownfield sites (VwV Stadtentwicklung). This is based upon the Operational Program of the Free State of Saxony for use of the European Regional Development Fund in the period 2007 to 2013. Over 220 projects in 118 municipalities were funded by the end of 2012. These included various projects, ranging from commercial revitalisation to new municipal facilities such as parks and recreational facilities. Only about half of the

commercial space attended to could be used for locating subsequent use or services, potentially creating 367 new jobs. The restructuring of old industrial areas created a further 1,379 jobs. In addition to these "lighthouse" projects, including the redevelopment of industrial heritage sites, a large amount of the sites had to be demolished because of the dilapidated state of the buildings.

The program "Administrative Regulation on Urban Development" (VwV Stadtentwicklung) often succeeded in enabling local small and medium-sized cities to eliminate industrial areas completely and to begin the revitalization of entire neighborhoods. A focus of the program was the promotion of a total of about 265 hectares of brownfields for interim use and renaturalisation. This activity all took place through funding programs with a time-span of about eight years. There is, however, still work left to be done as the amount of addressed land represents only a small proportion of the approximate 7,000 hectares of inner city brownfield sites yet unaddressed in the Free State of Saxony.

⁸ ERDF: European Regional Development Fund

⁹ www.brachflächenrevitalisierung-sachsen.de

4.4. Marketing

A specific set of marketing instruments is needed to support the development of abandoned sites and for higher densities. Circular flow land use management requires information from relevant authorities, property owners and real estate companies to develop adequate marketing schemes. Such information includes site characteristics, lot size, existing connection to the circulation system, building coverage allowed on site, ownership of the property, current and potential future uses for the site as well as the determination given by planning documents. Web 2.0 offers new opportunities for the compilation of relevant information, such as through using internet-based databases. These not only inform those involved in planning land use but can also serve as a marketing tool.

Under the same topic, the activities of the public and real estate industry can help make brownfields and gaps between buildings become marketable. Such activities include clarifying property ownership issues, drafting building laws, preparing sites for building and resolving environmental contamination issues. The success of real estate marketing for the purposes of circular flow land use management depends on the marketability of existing sites in urban areas. Proper marketing makes inner development potentials easier to act upon when in competition with new land zoned for development.

Exchange platform for vacant lots in the City of Rottenburg a.N.

The City of Rottenburg (population 48,000) near Stuttgart (Germany) is one of the pioneers in marketing gaps in built up areas (Baulücken) and vacant buildings (Leerstand). Since 1981 the city's planning department has prepared a register of vacant lots (commercial as well as residential land) that is updated annually.

Detailed information on these potentials for inner development are then published on the internet with the consent of the owners.¹⁰ From 1980 to 2006, the number of vacant lots in the city could be reduced by more than one third despite competing greenfield alternatives for development. Specific information on vacant buildings has recently been included in this database since 2007.

Source: *Flächenmanagement-Plattform Baden-Württemberg*; www.mvi.baden-wuerttemberg.de

¹⁰ <http://www.rottenburg.de/sixcms/detail.php?id=44&lnav=5>

4.5. Stakeholders and Cooperation

Many different stakeholders must be involved to make circular flow land use management a reality. This includes groups such as policy makers, public administrators, property owners, investors, and many more. Many different departments have to contribute just within local administrations: departments concerned with planning land use, those issuing building permits, those responsible for the acquisition and management of municipal land, even economic developers who market locations. This calls for new integrated organisational approaches within public administration itself.

In addition, individual institutional solutions for land management can be effective on the local and regional level. Planning and land management activities of neighbouring municipalities are closely interrelated: strategies to restrict land use in one city can easily fail to meet their intended outcome



Figure 19: Experts of circular flow land use management discussing development opportunities.
Source: City of Trnava

if there is excessive land development down the road. For this reason, circular flow land use management requires inter-municipal cooperation.

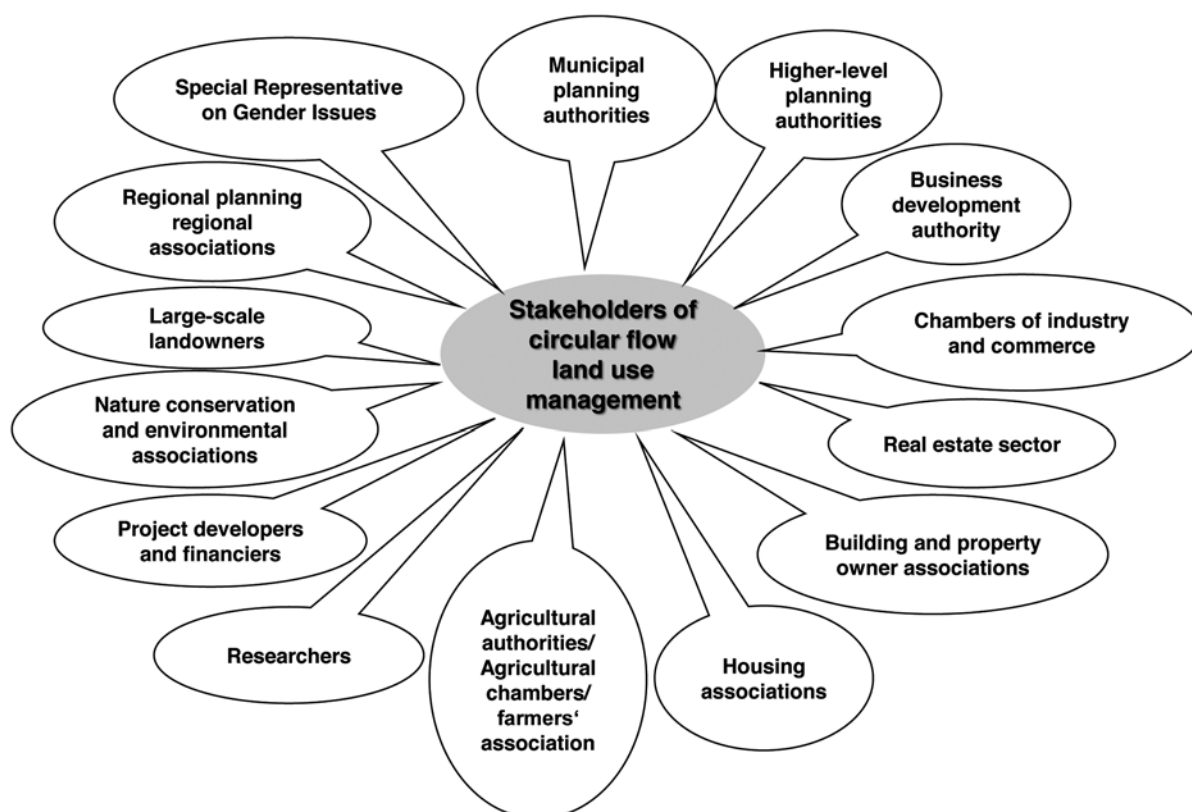


Figure 20: Stakeholders of Circular Flow Land Use Management.
Source: Difu

Intermunicipal land management in the Trnava Region

The Trnava Microregion consists of the City of Trnava and 12 other municipalities with a population total of 87,500. Many brownfields have occurred in central urban areas over the last decade due to the economic restructuring taking place in the region. The region must revitalise its urban and rural centres. Inter-municipal networking will achieve synergies and increase the

attractiveness for investors to bring new jobs and tax incentives. Activities include the preparation of a joint Structural Plan/Urban Plan and regional workshops to identify underused area potentials and joint strategy development, dissemination and support for developers.

Source: Trnava ID card.

Land use strategies should be discussed in a regional context. CircUse has developed organizational models for such collaborations.

CircUse has shown that local governments need adequate funds and resources to carry out all the activities associated with land recycling. In some countries the competencies regarding planning

and land management have formally increased on the city and regional level, but the central government has lagged behind in providing matching resources. For this reason the municipalities are required to attempt to find the proper financial and personnel resources needed through new organisation, management and cooperation structures supportive for land recycling.

4.6. Management and Organisation

Land management is a main component of local government action, but also of regional government action when the responsible authorities are present. CircUse has shown that cities and regions already advanced in terms of policy development for circular flow land use management need a management structure for implementation. This includes a management structure with defined competencies, a business agenda and a mission statement that match the strategies defined in regional circular flow land use action plans.

These tasks can be either fulfilled by an already existing or newly established organisation. Both approaches have their advantages and disadvantages and have been tested in the CircUse project. In the City of Piekary in Poland, circular flow land use management objectives will be implemented through the existing EkoPark Ltd. (Industrial and Technology Park) while a new land management agency has been established in the Austrian pilot region in the county of Styria.

The CircUse experience highlights the need of innovative institutional solutions of circular flow land use management on the inter-municipal and regional level. These are to go beyond purely marketing or project-oriented approaches. The cornerstones of such an organisation must stress that:

- ▶ The goal is to make municipalities more sustainable through applying strategic approaches to land use politics and spatial planning (prioritization of inner over external development, addressing climate change and demographic change).
- ▶ The organisation has access to the most current land data such as amounts and characteristics of undeveloped land, building land, brownfields and gaps in the urban fabric.

- ▶ All of the relevant elements that influence the decision making process (such as environmental concerns, planning, permitting and organizational considerations) are considered by the leading role of the organization.
- ▶ The organisation is interdisciplinary by involving the relevant fields in close cooperation with one another.
- ▶ The organisation is prepared to take the leading position of the actual land recycling process and can ensure the financial feasibility of the organisation's projects (for example through public funding programs).
- ▶ The organisation has access, either internally or externally, to the required technical and administrative requirements of implementing the measures that need to be taken for land recycling.
- ▶ The application of the land recycling concept is incorporated into normal routine duties to address problematic sites and not just applied to individual projects.
- ▶ The organization can develop creative ideas while also correctly analysing the market situation to develop innovative and marketable projects of site development.
- ▶ Property owners, developers, banks, and other private actors who are relevant for the process have a central contact point to approach within the organisation.
- ▶ The local authorities and general public is actively involved, for example through the appointment of district managers, in the process of land management.
- ▶ All institutions are not profit-driven and are not competing with the private real estate sector.

In many densely populated regions across Europe which are marked by structural economic changes, regional agencies should accompany land policy measures.

The implementation of sustainable land use needs to involve private real estate owners and investors since land use is in many cases determined by private investment decisions. These parties can offer not only important experience but also capital. The co-operation of private businesses and public entities through public private partnership offers the possibility for strengthening the position of sustainable land consumption in strategic decision making and real estate investments.

Land management agency in the Voitsberg Region

The CircUse project facilitated a new land management organisation in the Austrian pilot region. The Agency "Flächenmanagement Agentur für die Region Voitsberg" was established with a public opening ceremony in November 2012 on behalf of the municipalities of Köflach, Voitsberg, Bärnbach, Rosental an der Kainach and Maria Lankowitz.

- ▶ **The region:** The Austrian pilot region "Kernraum Voitsberg" used to be an open pit mining area for brown coal. In addition to the mining activities a large power plant and several very energy intensive industries settled in the region. The industrial period ceased at the turn of the century. Today only very few remainders from the industrial period are left, among them the numerous brownfield sites.
- ▶ **Land recycling potential:** The pilot region has 250 vacant sites with a total surface of 58 hectares. Among them are 12 very large sites with surface areas exceeding 5 hectares. In addition, small vacant sites were also mapped. Building gaps amount to 30 hectares in total and can ideally be used for housing or small enterprises.
- ▶ **Mission:** The agency's overall mission is to promote the reuse of the numerous local brownfield sites and to avoid new land take.
- ▶ **Innovation:** The agency operates on behalf of five municipalities, which cover a total of 100 km² of land and host 29,900 inhabitants. The co-operation of the five municipalities and the idea of jointly developing difficult sites is a very innovative approach in Austria where planning aspects are usually controlled at the (single) municipality level.
- ▶ **Areas of operation:** Key areas of operation include mapping and advertising brownfield sites, raising awareness within all concerned stakeholder groups (regional planners, entrepreneurs, developers but also the public and future land users), developing brownfield projects, evaluating existing project concepts, securing financial resources for projects, developing new avenues for co-operation, networking and general public relations.
- ▶ **Strategy:** The project partner Telepark Baernbach Corporation Ltd. produced the action plan for the land management agency which sets its goals and objectives for the near future. The agency will embed the concept of circular flow land use management in the region and aim at finding new innovative land uses for the numerous brownfield sites present. In this context two objectives are being followed. The first objective aims at creating land uses for the production of alternative energies with a special emphasis on biomass production and solar panels. The second objective is to implement the development concept "Lipizzanerheimat", which centres around the activities of the famous breeding and training centre for Lipizzan horses (Piber horse breeding farm).
- ▶ **Funding:** The agency has the status of an association with limited liability (GesmbH) and shall be jointly funded by the five concerned municipalities once the CircUse project ends. These funds will be based on the number of residents in each of the five municipalities that benefit from the agency. Additional funds for the realization of projects will be sought after from the private sector, state funding and EU sources. Furthermore, public-private-partnerships and the specific development funds of the concerned municipalities will be considered.
- ▶ **Catalyst function:** In addition to initiating redevelopment projects the agency has visibly encouraged brownfield redevelopment in the region. The five largest and most important brownfield sites were showcased in the land management brochure which

was released at the opening ceremony. Half a year later the largest brownfield site, the former coal-fired power station, is already undergoing a redevelopment process. The power plant is presently completely dismantled and the real estate will be re-used for industrial purposes. Two other sites are currently intensely considered for re-use as residential areas. However, both cases aim at receiving funding from the European Structural Funds for the required demolition and de-sealing works.

► **Co-operation:** The agency co-operates with existing regional initiatives which promote the well-being of the region and aims at finding synergies. Among them are the Regional Development Initiative, the Regional Economic Offensive, the regional EU Management Bureau, the local department of the Styrian Economic Chamber and the Styrian Business Promotion Agency.

Source: Schabl, Anton (2012): Workshop and Operational Structure of the Agency, Output Nr. 4.3.1, May 2012.

EkoPark Piekary Śląskie Ltd

In Piekary, Poland, a new organisational form was developed which integrated various existing organizations together. The Piekary Śląskie City Council, Orzeł Biały SA., Municipal Services Enterprise Ltd. and the Upper Silesian Agency for Enterprises Transformation Joint Stock Company all jointly agreed to work together. The goal set was to pursue the creation and stimulation of new economic, social and environmental functions within 120 hectares of derelict post-industrial land present in the Piekary Śląskie's Brzeziny Śląskie district. The rejuvenation of the derelict site is supportive of the principle of circular flow land use management.

After the agreement, the Industrial and Technology Park EkoPark partnership was then formed in August 2007. Since then, the Management Board of the organization has focused on formulating a development strategy for the "Piekary Śląskie Industrial Park" project while

also ensuring an environment for collaboration among partners and carrying out the associated organizational activities. A wide range of consultations were carried out resulting in the development of a concept. This specifically included the foundation for technical specifications to be made.

In January 2008, with the written agreement of the majority shareholders, the organisation acquired the areas described in first stage of the EkoPark's development. The areas listed in the mentioned agreement of intent are predominately degraded and thus require a high level of funding for their rejuvenation. A small percentage of the area is suitable for immediate market use and has been marked for sale during the 2009-2012 period.

Source: www.ekopark.piekary.pl

Saxonia Standortentwicklungs- und Verwaltungsgesellschaft mbH (Saxony)

SAXONIA is an agency responsible for economic promotion and commercial zone development of the district of Middle Saxony and the City of Freiberg. Founded in 1997, the organisation emerged from the former Mining and Metallurgical Combine and now focuses on the redevelopment of former mining brownfields. SAXONIA does this through taking ownership of such sites and then bundles technical and commercial competences together for redevelopment purposes. Specific attention is given to the management of contaminated sites with Fe in the mining area.

As the owner of the "Science and Technology Centre" DBI in Freiberg, SAXONIA also offers business development services.

One example of brownfield redevelopment is the revitalisation of the former porcelain factory

in Freiberg which is supported by the CircUse project. SAXONIA took over the ownership of the site and started planning the site for redevelopment as well as developing the first steps to safeguard the historic building on site.

SAXONIA is able to participate with private and public partners on projects and site developments in the entire district and offers municipalities the services of:

- ▶ technical consultants,
- ▶ networking between different stakeholders,
- ▶ project management,
- ▶ marketing of commercial areas in cooperation with municipalities,
- ▶ economic promotion and media activities.

Source: www.saxonia-freiberg.de

Public Land Agencies in France

The "Etablissement Public Foncier" (EPF) in France (Public Land Agencies) supports local French authorities in the revitalization of brownfields. Nowadays, a development towards a "land policy service" takes place in the field of urban redevelopment, environmental remediation and circular flow land use. EPFs are responsible exclusively for interventions on land and are not in charge of urban development projects. There currently are 12 state EPFs and 14 local EPFs in France. The financing is ensured by a regional development-related tax incurred

during the start-up phase of 10 years. Other resources come from sale proceeds and loans as well as contributions from the state, municipalities, city departments, the European Regional Development Funds ERDF and the private sector. Over 20 EPF in France provide functioning models of cooperation between management and land owners which allow for active land interventions.

Source: <http://www.epf-npdc.fr>

4.7. Awareness Raising and Training

The issue of sustainable land use management is usually not very high on the political agenda. Moreover, in the past, new industrial areas or growing residential areas were seen as an indicator for growth and prosperity. New ideas are needed to raise awareness for the necessity of more sustainable methods of regulating land use. Businesses planning expansion or prospective house owners normally do not include aspects of land consumption as a decision criterion. Instead the opposite can be expected as lower land prices in the outskirts or peripheral regions fuel the process of urban sprawl. This must be addressed through proper discussion and training.

The issue of sustainable land use first has to be an established topic. Unlike other issues of sustainability such as climate change or the ageing of society, the issue of land consumption is not a broadly discussed aspect. With a long term vision in mind, CircUse partners have developed and tested training materials on issues of circular flow land use. These materials are tailored for target groups, who are the present and future users of land: students in secondary schools and planning practitioners, professionals in the public and private sectors.

Another aspect of awareness raising for sustainable land use are the costs of undertaking and the follow-up maintenance cost presented by expansive settlement development in relation to their profit in an urban context. The players involved in urban development, namely public administrators, policy makers, real estate companies and even private households, should all be made aware about the “real costs” of different planning strategies and site selections. For example, the redevelopment of an inner city brownfield into a new residential area might be more expensive in the short run than building houses on former agricultural land in the outskirts. This is because redevelopment of a brownfield site requires the removal of existing structures and soil remediation measures to be paid for.



Figure 21: Poster presentation with results of exercise “My dream home” during the school training course in Austria.

Source: Environment Agency Austria, 2012



Figure 22: CircUse teaching material for schools available in Czech, English, German, Italian, Polish, and Slovakian language (to be downloaded for free from www.circuse.eu).

Source: Environment Agency Austria, 2012



Figure 23: Workshop within CircUse training course for stakeholders in regions and municipalities in the Voitsberg region.

Source: Thomas Preuß

CircUse training in Schools

Land consumption is a very complex issue. In order to keep the topic simple and not too academic simple exercises concerning everyday life were developed:

"Dwellings now and then" This exercise requires the analysis of living conditions. Pupils have to investigate the living conditions of former generations in terms of size and quality and compare them with their own situation today, for aspects such as the typical size of a dwelling, how many people lived there, and how the dwelling was equipped (number of bathrooms, heating system etc.). The pupils are supposed to work in groups and interview older people. Results need to be presented and discussed. This exercise is ideally complemented with another exercise called **"My dream home"** which asks the pupils to define their favourite living situation and produce posters [see also figure 18]. As a consequence of these dream houses, the total land consumption of the class can be calculated and extrapolated to the entire school. The final results need to be assessed and put into a realistic relation, for example by asking "how many hectares of soil would be lost?", and "which land uses and soil types would be lost and what are the impacts of this?" (one hectare of average grade agricultural soil can feed two people), and "what can be done about this situation?".

"My mobility". Pupils calculate the CO₂ emissions of their mobility incurred, for example from commuting to school, everyday errands, and travelling in their free time. They compare the emissions of different transport vehicles and distances and discuss possibilities for improvement.

"Soil sealing". In this exercise pupils receive an introduction to different surfaces and their functions. Afterwards they tour the neighbourhood of their school and map these surfaces around their school i.e. by showing which surfaces are sealed, which ones are green, and the presence

of any semi-sealed surfaces. At the end of the tour the teachers and pupils discuss their observations and whether surfaces could be designed differently.

The school course was tested in Austria, the Czech Republic, Slovakia, Germany and Italy with students ranging from 12 to 15 years old. The overall objective of the course is to raise awareness among future land users about the value of soil functions and the impact of their loss.

Furthermore, the CircUse training course has the ambition to involve the pupils' families. The pupils are encouraged to communicate with their families about all issues raised during the course. The teaching material includes homework requiring interviews with family members to help spread information at the pupils' homes.

The training course is ideally complemented with local information such as recent demographic developments, housing prices, local soil types, and regional land take.

The course is methodologically based on exercises in small teams, small lectures, interviews, simple research, excursions and a feedback questionnaire. The material should be used on two separate days with a considerable break in between to allow pupils to collect data and to make interviews at home with their families. A general introduction about land use and land consumption in the respective country is particularly useful during the beginning of the school course.

The CircUse teaching material is gathered as a small booklet available in six languages, namely Czech, English, German, Italian, Polish, and Slovakian and can be downloaded for free from the CircUse website (www.circuse.eu).

Source: Birli and Prokop, 2011a, 2011b

CircUse training for stakeholders in regions and municipalities

The CircUse project has realized an educational concept and tailored course materials to address municipal and regional stakeholders from the public and private sectors (such as urban and regional planning, land owners, agriculture, local politics, etc.). A two days training course for 15 to 20 participants was designed to teach the aspects of circular flow land use management. The concept of the training course is composed of three training phases:

- ▶ introduction of relevant problems in the region (Modules 1–2),
- ▶ development of land use scenarios for the respective municipality (Module 3),
- ▶ identification of stakeholders, instruments and the development of action plans (Modules 4–6).

The contents of the modules are tailored for the special land use situation of the related municipality or region. They are designed as follows:

- ▶ **Module 1** “Land use impact – Problem analysis and interactions” presents data on land consumption on the level of the country, region and municipality while also showing the negative ecological, economic and social impacts of expansive land consumption.
- ▶ **Module 2** “CircUse – Principle, aims and strategy” focuses on the principle, objectives, strategy and fields of action of circular flow land use management.
- ▶ **Module 3** “Pilot municipality – Land potentials and scenario development” includes the examination of existing land potentials in the city and the development of appropriate scenarios.
- ▶ **Module 4** focuses on the relevant “CircUse stakeholders” needed to implement the CircUse idea.

- ▶ **Module 5** “CircUse instruments” gives the participants the opportunity to identify and to assess useful instruments.
- ▶ **Module 6** is designed for beginning the development of the main features of a local “action plan” used to implement the CircUse idea.

Modules 1 and 2 serve to give all participants the basic knowledge on CircUse and the current regional situation of land use. The modules 3, 4, 5 and 6 of the training course are done in small intensive working groups where the participants apply their own knowledge and experience. Tailored learning material handouts and presentations were produced for all six modules.

Before beginning the course, it is suggested to collaborate with an experienced moderator to help carry out the CircUse training course on the local level. Also before starting the training course it is important to undertake an analysis of the current local situation and problems presented by the local land use, demographic situation, relevant stakeholders involved and the local standards of governance.

The newly developed training program has already been tested in 2011 in the Municipality of Koeflach, Austria. This training program was also adapted for use in the Czech Republic and was used for training during the years of 2012–2013 in different Czech regions. The teaching material and guideline for the CircUse course is available for free at the CircUse project website (please see www.circuse.eu).

Source: Verbücheln, Maic, Preuß, Thomas (2011): Guideline for preparation of a CircUse training course in partner countries, Berlin.

Follow-up Cost Estimator

In order to make the best location decisions known for individual actors or even city administrations, the REFINA project “Wohn-, Mobilitäts- und Infrastrukturkosten – Transparenz der Folgen der Standortwahl und Flächeninanspruchnahme am Beispiel der Metropolregion Hamburg” (Cost Transparency) developed the follow-up cost calculator websites womo-rechner.de and was-kostet-mein-baugebiet.de. These tools, each developed for different audiences, help develop an overall picture of the actual costs that occurs from development in terms of infrastructure maintenance, transportation, along with other factors within the context of the municipality.

The first of the websites, womo-rechner.de, provides information to individuals who are looking to take up residence in a new location, specifically within the region of Hamburg. The typically lower cost of purchasing a household located far from the city center are not realistic in that they do not directly represent the cost of travel and the website looks to provide this missing information. The website presents the statistical average cost of locating in an area dependent upon selected input from the website user. The user is also allowed to put in more detailed information to get more specially tailored data showing the full cost that would be incurred by moving to a specific site. It is here that the user can define if they use public transportation or a

private car, the cost of their residence, among other factors. The tool is supposed to help individuals make the best choice when choosing a new place of residence by allowing for comparisons to be made between different locations and situations.

A second website was created to provide information for politicians and city administrations, as well as the general public, about the long term cost of building new developments from infrastructure maintenance (www.was-kostet-mein-baugebiet.de). The website offers studies on the long term trends of development cost as well as a program to calculate the cost of development. The program is a type of Excel application that organizes and shows the maintenance cost of different types of developments. Different scenarios can be stimulated to better show which of the scenarios would save money and which would prove to be more expensive in the long term. The program mainly focuses upon the cost incurred from technical infrastructure systems as opposed to social infrastructure.

Source: Gutsche, Jens-Martin (2011): Der FolgekostenRechner – online unter www.was-kostet-mein-baugebiet.de, in: Bock, Stephanie, Hinzen, Ajo und Jens Libbe (Hrsg.) (2011): Nachhaltiges Flächenmanagement – Ein Handbuch für die Praxis. Ergebnisse aus der REFINA-Forschung, Berlin, S. 349.

However, the long term cost of a development located in the outskirts of the city may prove to be greater. This is because of the cost of creating and maintaining new infrastructure plus transportation cost (carried usually by the individual but is also a matter of concern for public transportation) and other factors which tend to accumulate over the years. Various tools and models for cost-benefit analysis (or follow-up cost analysis) have been developed with the stated goal of creating

cost transparency for residential and commercial development.

Appropriate tools that can be used by professionals and the interested public at large are available in Germany (LEANkom, fokosbw, www.was-kostet-mein-baugebiet.de) and Austria (NIKK).

4.8. Communication and Participation

The municipalities are an important – though not the most important – contact and communication partner in the area of sustainable land management. It is the municipalities that primarily make decisions concerning short and long-term land use.

Communication is an important aspect of circular flow land use management in two manners. On the one hand, communication between stakeholders involved in the decision and plan making processes is important on the local and regional levels. This involves individuals from the administrative, political, and general public realms. Here communication is an important component in supporting a successful implementation while applying instrumental innovations, legislative amendments and new plans and planning processes. Through communication, different interests involved in the process can better understand each other's needs and motives. Successful communication is to work under the idea is that each individual will approach the conversation process with his or her own subjective experience in mind and that shared goals and possibilities will emerge from engaging in discussions. The effectiveness of this aspect of communication is strongly associated with the participation of the relevant stakeholders.

On the other hand, communication can help expose relevant target groups to the concept of sustainable land management. Therefore, the communication strategy should not only aim at a broadly-based public campaign. The responsible players must be identified, primarily on the local and regional level of land-related decision making processes, to systematically reach all relevant target groups that affect and modify land use. Since both land and land utilization are organized and influenced by numerous players with very different interests, an effective communication strategy would therefore address these highly



Figure 24: Participation of stakeholders during a workshop in the Region of Voitsberg (Austria).
Source: Wolfgang Kusché



Figure 25: Stakeholder meeting: part of the set-up process for a CircUse action plan in the Usti region.
Source: The Usti region

diverse groups in a targeted manner. Regardless of whether the groups involved are citizens of different backgrounds, owners of smaller properties, or building owners or companies with their own approach to land use, all of them pursue highly specific interests and must therefore be addressed to and/or motivated in the respective manner.

Participation in Creating the CircUse Action Plan

The set up and participation of a CircUse action plan recommends a wider view to be taken on multi-level planning and instruments driving the land cycle. Traditional participation methods on individual project proposals or spatial planning documents need to be adopted but should also be integrated.

One adequate option are “simulation games” as a method of strategic development of action plans. Following the CircUse training course structure the simulation games starts with a review of the local and regional land development dynamics and then describes various courses of actions. Specific attention should be given to the instruments available to the players at the regional and local levels.

These courses of action can then be discussed in moderated stakeholder discussion rounds and be evaluated by their impacts on circular flow land use management. Scenarios could illustrate different development phases with consideration to the actual conditions in the regions. Multi-stakeholder participation in the simulation games is crucial to the development and implementation of the action plan. The CircUse project experience shows the success of open stakeholder meetings including private sector actors (landowners, developers). Additionally many actions need also the involvement of higher level administrations e.g. the action plan in Saxony has been set up with an inter-departmental working group on land management.

Communication Strategy of CircUse

The CircUse project was founded upon a media communication strategy developed for the project. This strategy looks to communicate the concept and methods of implementation of a circular flow land use management. This is important for the success of the project which looks to alleviate challenges being addressed by Central European cities and regions.

To do so, it is important to first determine what is to be communicated. The project identified three central messages that summarize the aim of the CircUse project:

- ▶ compact city structures save money,
- ▶ brownfield sites provide unique opportunities to build new sustainable land uses upon, and
- ▶ soil resources have to be conserved to help keep European cities vital.

These messages were to be presented in various CircUse outputs to reinforce their importance.

To determine the type of outputs generated, CircUse identified the audience groups most pertinent to the project: public administrations, policy makers, scientific community, the general public, etc. Based upon these audiences, various outputs were created that incorporated these central messages. The scientific community is addressed through conference appearances and academic papers about CircUse, the general public is addressed through newspaper articles and school course materials, whereas policy makers and public administrations have a specially tailored training course. This Compendium combines all of these results, creating an overarching output for all to use. All of these activities help spread the word about and set in motion the process of realising sustainable land use.

InViTo – Interactive Visualisation Tool

In order to aid decision makers and stimulate the collaboration among stakeholders, SiTI (Higher Institute on Innovation Territorial Systems for Innovation) developed a tool able to generate maps based upon surveys, interviews and GIS databases. This instrument, called InViTo (Interactive Visualisation Tool), offers visual communication in a real-time environment to share information and enhance spatial knowledge among the actors involved in decision processes.

InViTo can be considered a type of Spatial Decision Support System (SDSS). In fact, it aims at providing an intuitive visual outcome based on spatially relevant questions by mapping the symbolic localization of the effects of actors' choices. It can use a variety of information typologies as input data: GIS, databases, raster and also vector files. In addition, it can be applied at different scales and can be easily adapted for various spatial purposes.

Within the CircUse project, InViTo has been set to rate the desirability of some areas in the City of Asti (IT) as to understand how specific urban project can affect urban functions and, in particular, old brownfields dislocated within the city boundaries. On the basis of an initial selection of relevant data that influences the desirability

of locating certain functions, such as the present infrastructure, green areas or industries, and by conducting interviews with stakeholders and experts, InViTo has been set up to generate weighted relationships among these elements. The outcomes of InViTo are different typologies of map visualisations. These maps interactively show the desirability of the urban area in Asti and can be useful to understand how specific functions can gain more or less acceptance on the basis of actors' choices. Actors can, in real time, modify the priority of each function or urban projects and based upon that receive a unique visual configuration. In this way, actors involved in spatial decision processes can use InViTo as a platform for sharing information and enhancing discussions.

The recent upgrade of the tool has been made to improve the interaction between data and users. At present, InViTo has been moved to a web platform based on the Google-maps interface, so as to increase the accessibility of the tool for the exploration of spatial data.

For more information about CircUse and the InViTo tool please consult Melis G., Masala E., In.Vi.To – A European experience for brownfield redevelopment, Celid, Torino 2013, and visit <http://invito.urbanbox.it/>

Qualitative aspects, such as preserving the cultural landscape on the outskirts of the city or the creation of a high-quality living and residential environment on re-used land, represent important arguments for certain target groups. The economic factor, including cost transparency and costs/benefit analysis of settlement development is just as important for municipal target groups.

Participation is fundamental to all planning processes in an urban context, also for integrated action plans for city or urban region circular land use management. The involvement of concerned interests and a discursive approach are important factors in pursuing sustainable land use (to be included through workshops, expert forums, etc.).

In the stricter sense of urban development law, such as the building act in Germany, public participation means the involvement of general citizens in the administrative planning procedure, especially on the communal level (activities such as land use plan formation, legally binding land use plans, etc.). The CircUse experience shows that there is a need to go further than the formal procedures given by participation law and engage in additional informal procedures.

In general there are several levels of participation and the possibility to influence decisions:

- ▶ informative public participation means gathering the information of interested parties about a proposition and its effects, like information meetings, hotlines, public hearings or the publication of plans
- ▶ consultative public participation enables citizens to deliver their opinion on presented suggestions, plans or decisions as well as produce their ideas that have to be considered during the decision making process, such as during the development of a urban development concept
- ▶ codetermination means that the concerned and interested parties receive the possibility to take part in the decision making process during the development of a proposition, its execution and implementation

Community involvement should be appropriate to the level of planning concerned while remaining continuous, transparent, accessible and well managed. Local decision makers and administrations should perceive participation as an integral part of the process for making plans by:

- ▶ providing information to citizens and listening to citizens,
- ▶ empowering citizens by providing opportunities to influence planning decisions,
- ▶ involving the public early and continuously,
- ▶ seeking participation from a broad range of stakeholders,
- ▶ using appropriate techniques of information, communication and dialogue,
- ▶ preparing information in a clearly understood form, free of distortion and technical jargon.

4.9. Improving framework conditions through new economic incentives

The range of instruments at hand, from the legislative competencies to financial resources, are strongly determined by the European and, still more important, the respective national legal framework. The national level has an important role in determining the policy that affects the planning and tax law for regions and municipalities.

The pooling and strict appliance of existing instruments opens up a number of possibilities to make steps towards achieving circular flow land use management aims. The CircUse experience shows that the instruments available at this time, however, are insufficient to meet ambitious land utilization aims. Municipalities and regions carry the most responsibility for the management aspects of achieving life cycle concepts for land required for implementation. Therefore, new economic incentives which complement the effects of existing planning, informational instruments and which

foster circular flow land use management policies are needed from the EU and national levels. The existing instruments, which are predominantly planning related in nature, mostly do not affect a change in the zoning policies of municipal decision-makers. They are not effective in influencing the behaviour of land market players in a fashion which fosters circular flow land use management.

New economic instruments for circular flow land use management should follow the approaches of:

- ▶ influencing property prices (by reforming the property tax system for example) to roll back/decrease the incentives to build on new sites offered to public and private parties who want to build,

Duty for zoning of new building land

An example for pricing zoning is the new regulation of the Government of the Slovak Republic (Governmental Directive No. 58/2013 Z.z. to the Law 57/2013 Z.z.), in effect since April 2013. According to this new regulation a duty has been introduced for each square meter of new developed building land on former agricultural land to be paid by investors. This duty is based upon the classified quality of agricultural land into nine categories, ranging from 50 Cent per square meter for the lowest ranking (9th category) up to 15 EURO for the 2nd category and 20 EURO for the 1st category of the quality of the soil. This duty does not apply to plots

smaller than 5,000 square meters in the built-up area.

Source: 58 NARIADENIE VLÁDY Slovenskej republiky z 13. marca 2013 o odvodoch za odňatie a neoprávnený záber poľnohospodárskej pôdy, Zbierka zákonov č. 58/2013, Čiastka 16, Strana 450-566.; 57 ZÁKON z 5. februára 2013, ktorým sa mení a dopĺňa zákon č. 220/2004 Z. z. o ochrane a využívaní poľnohospodárskej pôdy a o zmene zákona č. 245/2003 Z. z. o integrovanej prevencii a kontrole znečisťovania životného prostredia a o zmene a doplnení niektorých zákonov v znení neskorších predpisov a o zmene a doplnení niektorých zákonov, Zbierka zákonov č. 57/2013, Čiastka 16, Strana 446-449.

- ▶ introducing price mechanisms for zoning new land for development (establishing tradable land-use certificates or apportionment for zoning building land) to further motivate municipalities to pursue internal development planning.

Some new economic incentives such as new adjusted property taxes are subject of discussion in various EU member states. Property taxes are seldomly used as an active instrument to support circular flow land use. The experience gained from CircUse shows that taxation can be an efficient way of encouraging land owners to activate their land. Also, special taxes can be effective in lowering the attractiveness of developing greenfields. There are various options for land tax reforms, two of them are to impose a higher taxation of designated building land to spur inner development or taxation mechanisms that encourage high building densities and discourage excessive sealing of land.

Current scientific research, such as that in Germany, deals with tradable land-use obligations. The idea of tradable land use obligations is to establish a market among municipalities for certificates that empower the holder to develop new land. This is comparable to the existing market for CO₂ certificates. Such a market regulating land use obligations would follow the quantitative and qualitative goals for land consumption set by CircUse and support cross-regional harmony of land uses.

A final field of activity where action is needed is the execution of legal and official arrangements. This means acting in full accordance to the relevant existing laws and statutes of an area, while also proposing new elements into law that would help implement circular flow land use management.



5.

CIRCUSE PILOT PROJECTS

An important main activity of the CircUse project was the discussion, development, initiation and implementation of pilot projects in the municipalities of Piekary (Poland), Trnava (Slovakia), Freiberg (Germany), Voitsberg (Austria), Asti (Italy) and Usti nad Labem (Czech Republic).

These pilot projects have been embedded in local or regional action plans for a circular flow land use management. The following chapters describe the activities of all pilot regions with regard to actions plans and pilot projects.

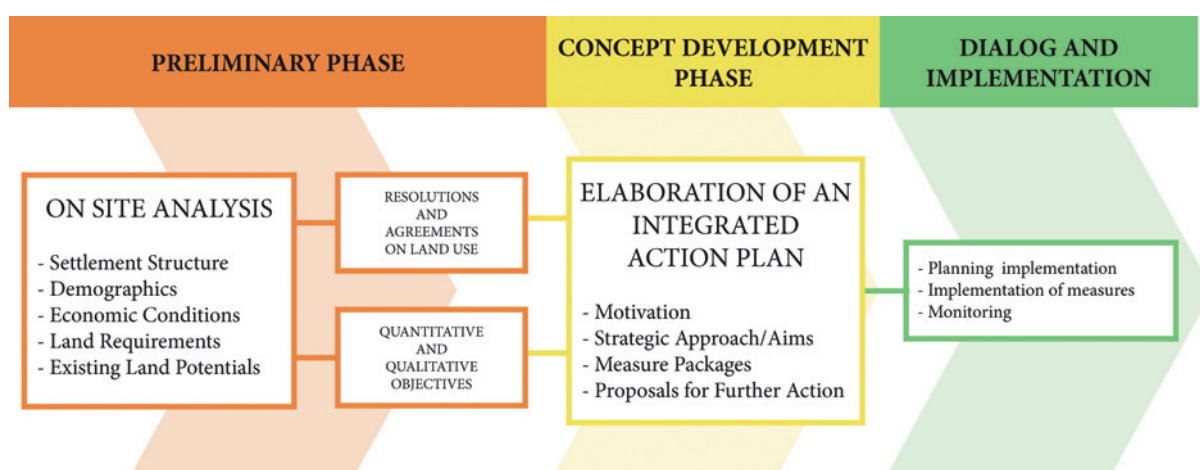


Figure 26: Flow chart for set-up of an action plan for establishment of a circular flow land use management.

Source: Difu

5.1. City of Piekary

Piekary Śląskie is a town in the Katowice agglomeration covering the area of 39,67 km² with a population of over 58,000 people. It has a rich industrial tradition as a centre of mining and metallurgic activities. Piekary Śląskie's population decreased by 14% from 1995 to 2012.

The "Local Development Plan for the Town of Piekary Śląskie" orders for the programming process to take place in the commune and is a basis for constructing even more detailed plans, such as the "Local Revitalization Program of Piekary Śląskie for the years 2008-2013 for Urban and Post-Industrial Areas" plan.

The Action Plan: Contents

The sustainable development of the Municipality of Piekary Śląskie is connected with the redevelopment of the brownfields located in the Brzeziny Śląskie district. The project management of the degraded areas entails facilitating comprehensive design measures, the supervision of regulatory processes, as well as creating the conditions for granting financial support to new investments. The following categories of activities have already been undertaken:

- ▶ information gathering (analyses, research of the ground contamination, detailed stock-takings of the ground),
- ▶ conceptual and analytical activities (undertaking analyses and creating concepts of possible land management solutions),

- ▶ project activity (technical projects relating to communication and territorial development),
- ▶ marketing operations (the preparation of offers for potential investors),
- ▶ support for the activities of investors (advisory),
- ▶ investment activities (implementation of the „incubator for the enterprise” project, realization of the pilot project regarding greenfields development),
- ▶ activities regarding social communication.

The Action Plan: Process and stakeholders

The local authorities of Piekary Śląskie are responsible for the implementation of the action plan. They are also responsible for the co-ordination of work and co-operation with the Piekary Śląskie Industrial and Technological Park EkoPark Ltd. The role of EkoPark is to implement the pilot project by being responsible for all activities related to the management of the post-industrial and degraded areas in the district of Brzeziny in Piekary Śląskie according to principles of circular flow land use management. They are also responsible for coordinating the work and the co-operation of all partners participating in the activity.

The Action Plan: Current activities and results

Currently Piekary and EkoPark are developing the pilot site by preparing ground conditions and infrastructure systems. The CircUse project specifically supports investment in green areas located in neighbourhoods close to existing housing areas. The project has been implemented in 2012 to 2013 and the commercialisation of the EkoPark area will start in 2013. In order to ensure sustainability of the investment (further greening of the pilot area) after project accomplishment a new instrument has been developed consisting in using compensation planting. Compensation planting is required by law and it is a concept of combining



Figure 27: Part of the degraded area in Piekary Śląskie.
Source: City of Piekary Śląskie



Figure 28: CircUse regreening project for revitalisation of a degraded area in Piekary Śląskie.
Source: Maic Verbücheln

this obligation with the planting on the areas indicated by the City of Piekary which in this case the area of the project investment

Lessons learnt

The organisational structures of the local administrations present in Poland are not adjusted to realize municipal policy. Frequent changes of plans and development objectives hinder a long term strategy on land management.

In addition, the financial capacities of municipalities are limited to pursue extensive change.

5.2. Micro-region Trnava

The Municipality of Trnava, with 66,000 inhabitants, is located 40 km east of Bratislava and is well known for the local religious buildings.

The city has faced the problems presented by a very dynamic development of its economic basis. This development brought thousands of new working places to the city while, however, at the same time exhausting the capacities of the social infrastructure, housing and leisure-time activity facilities as well as creating a shortage of available land for development. This led to a strong flow of the population towards the suburban areas. In addition to this development, the city and surrounding municipalities are dealing with the presence of many abandoned areas with very diverse characteristics which require new functional uses and structural refurbishment.

The Micro-region Trnava with 87,472 inhabitants consists of the City of Trnava and twelve other municipalities (Biely Kostol, Bohdanovce nad Tr-

navou, Cífer, Hrnčiarovce nad Parnou, Jaslovské Bohunice, Majcichov, Ružindol, Suchá nad Parnou, Šelpice, Voderady, Zavar and Zvončín).

The Action Plan: Contents

The action plan for micro-regional circular flow land use management in the Trnava Micro-region presents an instrument package to be implemented or initiated locally. The action plan is set-up to meet the objective of reducing land take by pursuing the following partial strategies:

- ▶ strengthening internal development,
- ▶ protecting undeveloped and recreational space,
- ▶ conversion, dismantling and reuse.

This integrated action plan cannot and should not replace current planning methods, but instead the measures depicted in the action plan should be meshed with spatially relevant formal and informal



Figure 29: Meeting with higher level administration for discussion of the action plan.
Source: City of Trnava

planning methods or existing sectorial planning and draft planning. The action plan includes the following steps represented as defined priorities:

- ▶ Inventory of information,
- ▶ Regional workshop with stakeholders,
- ▶ Identification of potential for underused areas and joint strategy development,
- ▶ Information dissemination and support to the developers.

The Action Plan: Process and stakeholders

In the case of the Trnava Micro-region, the implementation of the action plan is not connected with the creation of a new institution. Instead, implementation is based upon a participatory and proactive approach which involves different actors and representatives of different interests to formulate goals, strategies, decisions, actions and their implementation. In addition, an important precondition for the feasibility of the proposed collaborative structures is the active promotion of participation by the institutions with primary responsibility of territorial government such as local and regional government bodies.

The Action Plan: Current activities and results

In this context the realization of the action plan will be based on an agreement between the City of Trnava and participating municipalities in the suburban Micro-region of Trnava upon joint and parallel activities. The City Trnava Town Hall administration will accept the role of coordinator for this process. The main coordination instrument includes:

- ▶ regular coordination meetings and workshops with the participation of representatives from the participating municipalities,
- ▶ elaboration of a strategic development document for the micro-region defining a jointly agreed upon concept of the re-use of available underused or abandoned land and properties,



Figure 30: Former sugar factory in Trnava – part of the CircUse action plan in the Microregion Trnava.
Source: Peter Baša

- ▶ a website providing up-to-date information regarding the available underused or abandoned areas such as their general description, potentials and limits for re-use, the status of the properties in accordance with existing approved land use plans and strategic development documents and information about the demanded services or other required activities in respective area or micro-region.

Already a list of first priority brownfield interventions has been established for the area.

Lessons learnt

The regional brownfield reuse management plan is an innovative planning co-ordination tool at the micro-regional level. Networking and network platforms act as a kind of forum to collect the needed land management data to create innovations and development. They also function to serve as joint co-operation and leadership platforms for the shared processes of strategic development.

5.3. Region of Middle Saxony

The City of Freiberg (40,200 inhabitants) is characterized by a medieval historical centre and has industrial urban areas characterised by underground mining industries. Industrialised areas of the city have been successfully restructured since 1990. The city has a shrinking demographic development and a role as a regional centre with university and research facilities. Modern technologies, specifically solar panel production, have been established in the area since the change to a democratic society.

The Action Plan: Contents

In planning for demographic change, Saxony will take into consideration general issues regarding climate and soil protection.

Freiberg is one of the leading cities of innovative research in Saxony and will continue this tradition by implementing the principle of circular flow land use management. The city is the CircUse model city for the implementation of regional development targets within Saxony. Freiberg intends to pursue inner city development and revitalise large urban brownfield areas for industrial and commercial uses. The main targets of the action plan include the implementation of the CircUse data management tool to support efficient municipal land management and the implementation of the pilot project. The pilot project concerns the redevelopment of the former porcelain factory present in Freiberg which covers more than 4,5 hectares from which about one-fourth (11,000 m²) is built upon.

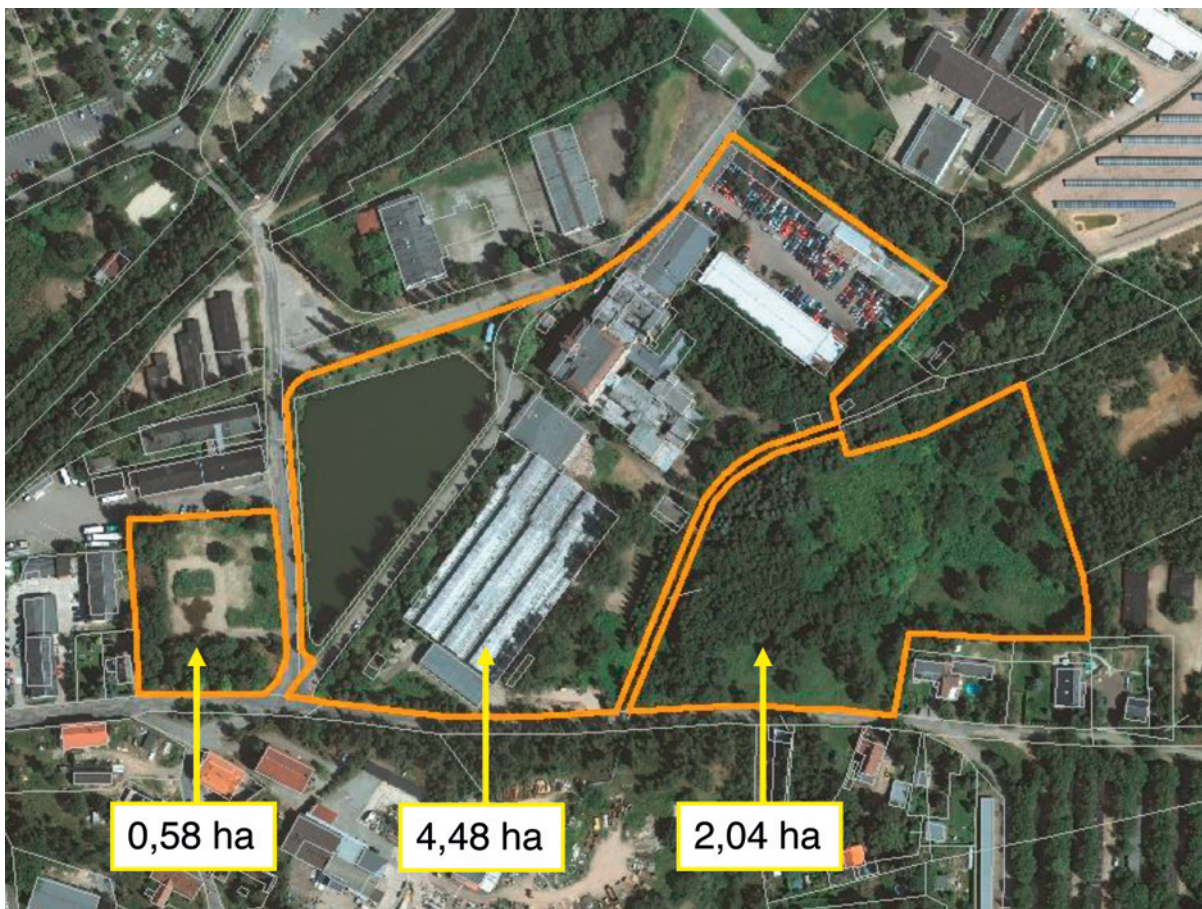


Figure 31: Former porcelain factory: Map of area under investigation.
Source: LfULG

The Action Plan: Process and stakeholders

The action plan is implemented by local stakeholders under the lead of the development agency SAXONIA GmbH which is the owner of the pilot site and is responsible for its development. Close co-operation is insured with the Municipality of Freiberg and the Saxon State Office for the Environment, Agriculture and Geology which is to act as a technical advisor for land management systems.

Ongoing projects or procedures

The current activities include the updating of local land information in the new CircUse data management tool and the preparation of funding for site work to commence on the pilot project.

Lessons learnt

In Saxony, a certain amount of support for the CircUse concept already exists. The State Development Plan includes targets relevant to achieving the principles of CircUse, allowing for regional planners to elaborate targets on the regional level. The next steps to be taken on the municipal level present challenges to be dealt with in the future i.e. covering staff costs for land management.

An important step in this process includes the identification of use options for brownfield land within regions with a shrinking population. Essential support is given by the existence of cross-sectorial management groups on the state level, the European Regional Development Fund and regional brownfield programs.



Figure 32: Former porcelain factory in Freiberg: pilot site of the model region Middle Saxony.
Source: LfULG

5.4. Region of Voitsberg

The pilot region “Kernraum Voitsberg” consists of five municipalities (Bärnbach, Rosental, Maria Lankowitz, Köflach and Voitsberg) and hosts about 29,000 inhabitants. “Kernraum Voitsberg” is a traditional former coal mining region and is facing structural transition since the 1990s. Surface mining of lignite and the central coal-fired power plant were the key employers of the region. Both were recently closed down. Besides these, Voitsberg has had a tradition of glass industry which drifted away over recent years. Today, only a few glass factories are still operating. 3,300 industry jobs were lost since the 1970s. This loss was partly compensated by new jobs generated in the service sector but resulted in a population decline of 17%.

Despite of all these facts the overall settlement area increased continually by about 5.5 m² per capita per year. The majority of working inhabitants commute to work outside the region, in particular

to the nearby City of Graz. Despite the regressive economy and population decline, land and energy consumption increased steadily over recent years. Suburbanisation has led to enormous land consumption of the retail industry outside the settlement areas and an increase of underused land in inner urban areas.

The Action Plan: Contents

Planning processes traditionally focused on the interests of individual municipalities and usually ignored the interests of the adjacent municipalities. As a consequence neighbouring municipalities competed for “new settlers” and in particular new companies. This planning style advocated unnecessary new land take.

A land management agency was established in 2012. The new land management agency follows

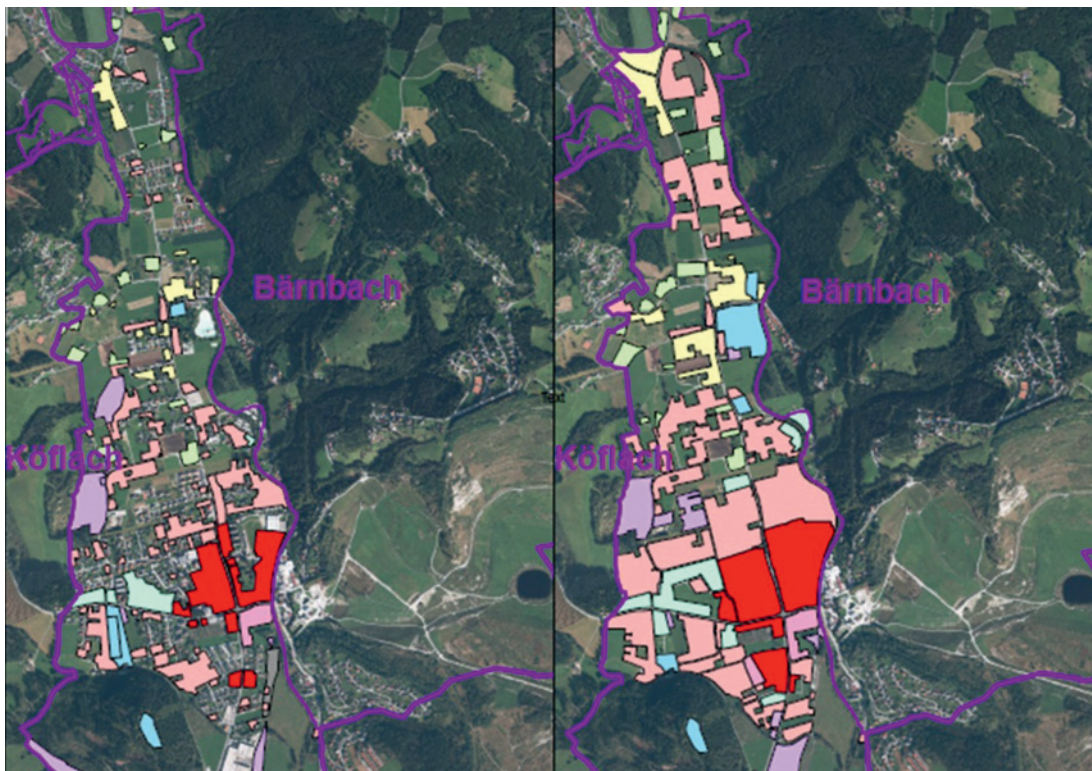


Figure 33: Maps comparing the urban sprawl in Bärnbach (Austria) in the years 1952 (left) and 2008 (right)

Source: Wolfgang Kusché, Schabl Consulting

a new innovative approach and aims at jointly managing the land of five municipalities in a sustainable way. New land take shall be avoided by reusing the numerous brownfield sites present. The development of difficult sites needs financial investments, which shall be based on collective regional funding, ideally combined with EU funding from the structural funds.

The Action Plan: Process and stakeholders

The agency co-operates with existing regional initiatives which promote the well-being of the region and aims at finding synergies. Among them are the Regional Development Initiative, the Regional Economic Offensive, the regional EU Management Bureau, the local department of the Styrian Economic Chamber and the Styrian Business Promotion Agency.

The Action Plan: Current activities and results

The implementation of the land management agency has been politically accepted by the region and the municipalities who have formally accepted the business plan, action plan and personnel plan. Financing of the agency is guaranteed until 2015 and the funding process has been started.

Networking and awareness raising activities in the region were manifold, including broadcasts on the local television, a conference with workshops open to everyone interested, a booklet and a stand at a local fair.

Land Inventory: As mentioned above land recycling potentials were mapped and advertised. Furthermore, green land and its quality was also mapped with the objective to indicate where the best soils of the region are. These areas should be protected from future building activities which instead should be steered to brownfield sites.



Figure 34: One of the abandoned sites in the pilot region Voitsberg: former brick factory "Wienerberger" in Baernbach.

Source: Thomas Preuß

Project development: The land management agency took the initiative and got in contact with two land owners of major brownfield sites (brownfield "Junior Werke" and brownfield "brick factory Wienerberger"). New development plans were drafted in both cases and site development is being pursued through making use of the LIFE+ funding scheme "environment & governance".

Lessons learnt

The Province of Styria is currently undergoing a major restructuring process with the overall objective being to merge municipal administrations, namely from 542 municipalities in 2010 to 285 by 2015. This process has considerably slowed down the formation of the land management agency.

Securing additional funding for brownfield development turned out to be extremely difficult. For example, the submission of a LIFE+ project failed twice because other project partners had difficulties in achieving the co-financing.

5.5. City of Asti

Asti in the Piedmont Region is a medium sized city with about 75,000 inhabitants. The city is the seat of the Provincial Government and is located in an area where agriculture still has a great impact upon daily life, as the local wine production has become a leading economic sector of the area. Recently, a vast part of the province has been proposed for the inclusion on the UNESCO World Heritage List as "The Vineyard landscape of Piedmont: Langhe-Roero and Monferrato", which is now under process of nomination. Asti was founded by the Romans and had an important role in the Roman Empire for commercial and strategic reasons. The area reached its peak of economic and cultural splendour in the 13th century when Asti was the most powerful city in Piedmont. The town has a rich and outstanding historical heritage.

The industrial economy of Asti is historically linked to the automobile sector, mainly for the production of electric motors and vehicles for the car industry.

Today the Municipality of Asti has to face the management of many abandoned areas that have very different locations and characteristics. The restoration of former Way-Assauto area, one of the biggest and most problematic abandoned sites (an ex shock-absorber industry), has been included in the Development Plan of the Municipality of Asti. This plan is a strategic plan that involves major brownfields areas and abandoned buildings.

The Action Plan: Contents

The aim of the action plan in Asti is to integrate multi-task actions to restore derelict areas in the city with the participation of all stakeholders. Also, reusing land is an opportunity to remake a place and should be viewed as a new chance to improve the territory of Asti. Brownfields can become the new heart of cities, creating new places for shopping, meeting, chatting, and living. In this context, the CircUse project is an essential challenge towards creating a new planning process that reorients urban planning. In this manner regeneration

is the philosophy guiding political and administrative actions in the territory.

The former Way-Assauto area is the guiding pilot project which was contaminated by a chemical leaking that has reached the underground water level. The site has a chemical reclamation plan. In general, remediation of a brownfield site is considered complete when the removal of all known contaminants to levels considered safe for human health is achieved. This applies to the Way-Assauto site in that redevelopment can only take place after all environmental health risks have been assessed and removed.

With the CircUse project, the Municipality of Asti is updating this plan along with the participation of the University of Turin.

The benefit presented by the regeneration of the former Way-Assauto factory is potentially larger at the level of municipality. However, the action could create benefits for all stakeholders involved in the actions. This potentially entails a core area where the benefits achieved are more effective and operative than as in the buffer area which would have more indirect benefits (for example more attractive boundaries, new immigrants, new businesses, etc.)

The Action Plan: Process and stakeholders

The action plan involves the mayor, town council and councilors as well as technical administrations and experts concerned with various issues such as site contamination.

The Action Plan: Current activities and results

The current ongoing activities include the mapping of abandoned and underused areas and collecting information required for building a database on the local brownfields. The model building of the Spatial Decision Support System (SDSS) database

has been finalized and successfully tested. It will be the basis of further stakeholder involvement. Laboratory tests will help determine how to best convert the chemistry of the present Cr VI to Cr III for the former Way-Assauto site. A proposal for new reclamation techniques and cost analysis have already been developed.

Lessons learnt

The participation in the Central Europe programme represents an opportunity for a small city like Asti to look at its brownfields under a new perspective. The CircUse approach invites for softer (related to the durability and environmental/social impact) and firmer solution (related to the sharing of choices) to be sought after. One outcome of the CircUse project is the realisation of a SDSS tool which allows for the sharing of information and helps enhance the discussions taken place within decision processes. Therefore, the creation of the Interactive Visualization Tool (InViTo) has provided firmer solutions to evaluate the spatial impact of urban infrastructural projects.

Sensitivity maps for the whole municipal area were produced with InViTo which were then used to visualise different planning scenarios used to propose future redevelopment schemes for brownfield sites. The comparison of scenarios has been useful to stimulate public debate. Interest and participation is getting more heated, with some first results: the most polluted of the brownfields, a former chromium plating plant, has been the subject of interest of new studies on the sustainability of environmental reclamation techniques; the choice to re-open the issue to explore new technologies allows for the re-consideration of possible interim uses, which was previously impossible until now due to high costs of brownfield reclamation.

The main qualities of the tool InViTo are its flexibility and interactivity. It is conceived to overcome the traditional assessment done by scenarios, offering instead the chance to visualize the answers to a large numbers of "What-if?" considerations, while insuring extreme freedom in switching on or off the proposed transformations.



Figure 35: The former Way-Assauto area: guiding pilot project in Asti. Source: Carola Amoruso

The CircUse database can be used effectively to involve private partners in the process of land use management due to the specific focus of the database to critical areas of the city (with data, documents, photos).

Public decisions on land use planning would benefit from the application of a SDSS because it could reduce the decision time needed and increase the accuracy and consciousness of the individual decision makers. The SDSS would enable better involvement of the population and involve more of the stakeholders of the territory.

As a matter of fact, the continual comparison with other towns with similar problems helps to depart from the normal mind-set which attempts to solve the issues presented by brownfield areas by finding a buyer.

Through the CircUse project, Asti started to assimilate some good practices: lending an ear to the requests of stakeholders and defining participation processes. This is a good practice that can be transferred to other similar cities in Europe (*Melis, Pensa, Tabasso 2012*).

5.6. Region of Usti

The City of Usti, with about 94,000 inhabitants, became heavily industrialized in the 19th century. Due to the large scale immigration that took place during this time, the number of inhabitants grew from 2,000 to over 40,000. In this manner the former Aussig grew to one of the biggest cities in the Bohemia Region. Industries such as mining, chemicals and river transportation were the city's most important economic assets. Since 1990, the economic restructuring of the city created industrial brownfields in a mixed urban context. During the last 8 years, the Usti region has been subject to high growth rates and expansion of urbanized land while the population trends can be characterized as expanding and contracting in different localities of the area.

The Action Plan: Contents

One key objective of the action plan is to place a more realistic perspective on the whole land use and development situation. Investors, politicians and administrators are becoming more receptive to new approaches. Recent legal changes and program tools make it mandatory for regions and communities to collect land use related data. Usti is implementing the CircUse project data management tool and disseminating the results with the

output „Identification and Mapping of Urban land in pilot Cities of the Usti Region“.

The objective of the pilot project in the Usti region is to look closer at the revitalization of the brown-field areas of Krásné Brezno and Neštěmice. The project aims to improve the environment of the city districts by making them more friendly, clean, green and pleasant for entrepreneurial development which is directly related with the change in perception as to how the area is seen. Regarding the fact that this is a large site of approximately 140 hectares, the objective is to present the potential of this area as clearly as possible. For this reason an urban concept of the study of the area's possibilities was drawn up. The CircUse project could be a suitable tool for progress in revitalization of these city quarters.

The Action Plan: Process and stakeholders

The Krásné Březno peninsula study has been prepared by a multidisciplinary team of consultants and university specialists in close cooperation with the Usti region. Additionally, the City of Ústí nad Labem (as a CircUse partner) and the key players in the area such as the land owners in the designated area of the Krásné Březno peninsula were also involved in the project. For the project a total of eight key players were identified (four private legal entities, one state entity, two individuals and the City of Ústí nad Labem).

The Action Plan: Current activities and results

The action plan development process included a workshop with stakeholders, where a draft action plan of presupposed pilot cities is presented. The action plan was then agreed upon in a meeting with the stakeholders. The pilot cities are taught about the CircUse mapping tools and the installation of the database tool. Mapping in the pilot cities has been carried out in the first year of the project and in addition the data gathered from the



Figure 36: Usti peninsula feasibility study demonstrating area's possibilities.
Source: The Usti region

pilot cities are monitored and compared. Mapping and subsequent monitoring and comparison are done in the pilot cities during the second and third years.

Lessons learnt

The organizational structures has been not really balanced due to inconsistencies in questions of responsibilities, capacity and finances. It is important to foster the communication between the administrative departments on all levels. CircUse offered a chance to achieve progress in this field. The principle of circular flow land use management is a perfect opportunity for a sustainable land use and should be implemented on national level. The stakeholders of the pilot region now can act in properly established planning procedures and interdisciplinary working groups. Successful instruments were e.g. the Ústí region development program, the cooperation between municipalities, taxation tools for listed buildings and grants for regeneration of housing and military sites.



Figure 37: Abandoned land along the river Elbe in Usti nad Labem: part of the action plan in the Usti region.

Source: The Usti region



„Diligent use of our soil resources and efficient use of built-up land are the key challenges for the future.“

Franz Voves (Governor of Styria in Austria)



“Our participation in the CircUse project allows the local residents to discuss issues common to all of Europe: the restoration of brownfield sites and the revitalisation of derelict lands.”

Davide Arri (Vice Mayor of the Municipality of Asti)



“With the help of CircUse a data management tool was realised which helps municipalities all over Europe to implement the idea of circular flow land use management.”

Bernd Siemer (Saxon State Office for the Environment, Agriculture and Geology)



“In addition to the internal networking inside the administration projects such as CircUse are substantial approaches for a regional policy.”

Karl Petinger (Representative of the Styrian parliament)



6.

RECOMMENDATIONS

6.1. Lessons learnt from CircUse

The CircUse approach presents a holistic adaptation of land use management that aims at enhancing social, environmental and economic sustainability. To achieve it, work has to be done in various fields of activity as described before. But the question remains, how can this best be carried out in the differing contexts of different nations, regions and municipalities?

The CircUse project was set up to answer this question. Therefore a lot of innovative solutions towards sustainable land use management have been developed in the CircUse pilot regions during the last 42 months, among others (*cf. Finka, Petříková 2013*):

- ▶ The advancement of the existing EkoPark Ltd. as a local operator for circular land use management in Piekary (PL).
- ▶ The introduction of an innovative planting compensatory model by modification of the existing procedure by means of precisely indicating the place and type of compensation planting, ensuring sustainability of re-greening measures on the pilot area in Piekary Śląskie (PL).
- ▶ The innovative approach of involvement of stakeholders in the planning procedures and the set-up of multidisciplinary working groups in the Usti region (CZ).
- ▶ The development of a regional brownfield reuse management plan for innovative planning coordination at the micro-regional level in Trnava in connection with an intensive promotion of available brownfields (websites, real estate agencies) in Trnava (SK).
- ▶ The development and testing of InViTo (Interactive Visualization Tool) providing visual interactive support to large scale planning processes in Asti (IT).
- ▶ The set-up and implementation of a new land management agency in the Voitsberg region (AT).
- ▶ The realisation of a CircUse pilot training course for local and regional professionals in the Voitsberg region (AT).
- ▶ The presence of a Saxon wide inter-ministerial working group for reduction of land consumption that supports activities on a regional level in Middle Saxony (DE).
- ▶ The combination of ERDF funds and funds of a Saxon wide brownfield programme to realise brownfield revitalisation measures in Middle Saxony (DE).
- ▶ The development of a new data base tool to support municipal land management in Middle Saxony (DE).
- ▶ The development of actions plans for a circular flow land use management in all pilot regions.
- ▶ The realisation of CircUse training courses for secondary schools in all pilot regions.

The variety of innovative approaches show that each region both developed their own adequate solution and transferable concepts and instruments. All innovations have been incorporated in the CircUse strategy. On the one side, the strategy was created to help guide with the implementation. On the other side this strategy has been an integral part of the overall orientation of the project to implement circular flow land use management in Central Europe. Furthermore, the strategy also communicated the progress achieved thus far and the course of actions being undertaken in the partnership regions. At the same time the CircUse strategy is the result of a learning process on the sound implementation of a new land use management approach in Central Europe – reflective of the project approach against the backdrop of European land use problems and relevant EU policies.

The CircUse lessons learnt can be expressed in the form of nine recommendations:

► **Recommendation 1:**

Common problems of land use and diversity of national and regional frameworks should be faced by a common strategy of circular flow land use management.

► **Recommendation 2:**

Actions towards implementation of a circular flow land use management strategy in urban regions cannot be driven by the actions of a single primary stakeholder. Instead, this can only be achieved through the coordinated efforts of the various public and private stakeholders who, as planners, property owners and land developers, influence or govern how land is used.

► **Recommendation 3:**

The setting of quantified and qualified targets is a necessary requirement for successful implementation of a management strategy according to circular flow land use management.

► **Recommendation 4:**

Circular flow land use management requires a comprehensive information based on a clear definition of land types (incl. greenfield and brownfield areas).

► **Recommendation 5:**

The development and application of informational instruments and data management tools to register and monitor space oriented potentials is of key importance.

► **Recommendation 6:**

Implementation also requires an integrated course of action which encompasses a wider spectrum of policies and activities in the form of an instrument package (policy mix). To create these action plans, established and newly developed instruments should be pooled according to regional differences in framework conditions.

► **Recommendation 7:**

The implementation of action plans need the selection of an applicable policy mix, stakeholder institutions and financing sources that meet the regional demands.

► **Recommendation 8:**

In general, new forms of organization need to be implemented by the stakeholders of a circular flow land use management strategy. For this, institutional solutions within the EU provide ample opportunities.

► **Recommendation 9:**

Permanent knowledge acquisition and awareness of circular land use management are crucial preconditions for the successful implementation of the strategy.

The CircUse project defines a new approach to sustainable land use management and aims at implementing the defined concept in municipalities within Central Europe. As outlined in this document, this implementation requires the effective co-operation of stakeholders from the national, regional, and local levels in order to properly embed the process of circular flow land use management in terms of concept, organisation and practice. Therefore the existing framework and its mosaic of instruments and tools to steer land use has to be applied in a consequent manner. Furthermore there is a need for economic incentives to stimulate stakeholders and decision makers to reduce land take and to strengthen inner development.

All in all – the strategy of the CircUse project includes the individual pilot regions' approaches to a circular flow land use management and a reflection of the project's approach against the backdrop of European land use problems and relevant EU policies.

6.2. Looking Forward – What has to change and what is to be done?

Poorly integrated and unsystematic land use, a high level of land take – also induced by development policies – increase land-related conflicts and remains a challenge for cities and regions in Central Europe. Therefore, future EU and national policies and funding schemes should support a rerouting of land use patterns on a regional and municipal level.

On the **European level** the importance to reduce urban sprawl and to defend the compact model of urban development in Europe have been highlighted by the European Union „Cities of tomorrow“ strategy paper in perspective of the discussion on ERDF priorities in the period 2014–2020 (*European Union 2011*). It refers to reducing urban sprawl by recycling land and implementing compact city planning as one of the main challenges for policy and practice in European cities. One of the targets of the EU Strategy 2020 is to decouple economic growth from the use of resources. Therefore one of the EU Commission's tasks is to develop a strategic research agenda focused on challenges related to resource efficiency and land management, among others.

The Roadmap to a Resource Efficient Europe Map sets a specific policy target to reduce the future land take the European with “no net land take by 2050”, and a reduction of annual land take to an average of 800 km² per year in the period 2000–2020. This is a very important step towards a considerable reduction of future land take and prior reuse of abandoned land.

The new targets and strategies need now to be integrated in the European structural funding policies from 2014–2020 e.g. by including land management in the programs that influence the urban dimension. Furthermore, regional operation programs can directly contribute to urban investment and brownfield redevelopment as shown by the Saxonian practice of tackling inadequate land consumption.

On the **national and regional level** governments have taken the first steps towards realizing sustainable land use. Circular flow land use management can contribute to an integrated approach to urban development and governance. Even if national frameworks are different in the EU, member states need to revise the traditional planning system by including elements of land cycle management (*cf. URBACT 2013*).

The regional level should play an important role in the integration of European and national policies with municipal land strategies. Regarding national, regional and local land management frameworks in CENTRAL EUROPE, the CircUse experiences confirmed that one of the major obstacles in achieving circular flow land use management is the complexity and the multitude of forces and factors that influence the decision-making process in all countries. Planning and permission procedures result in being long and complex, many stakeholders have to participate in the process and lack of co-operation and co-ordination among different competent authorities is slowing down the process significantly. This long process has a negative impact on the global image of brownfield redevelopment and drives many developers towards greenfield development.

For sustainable land management it is essential to improve this decision-making process in order to make brownfield redevelopment competitive to greenfield development. This comprises of the simplification of relevant planning and permission procedures, better co-operation and co-ordination between the different competent authorities and a pro-active attitude of the public sector in order to attract investors and developers to brownfield sites.

Actions within the scope of modernisation of the public sector and the delivery of better governance need to be undertaken.

The CircUse partner experiences highlight the general need for new institutional solutions of land management either by formal or informal structures.

Finally the transnational exchange of experiences and cooperation on these topics is strongly needed in the future. Transnational cooperation will create synergies between actors with different experience of land use management and who are influenced by different local/regional and national

frameworks and government strategies. The CircUse partnership has developed strong and ongoing links between scientific and technical institutions responsible to local and regional/ national institutions involved in the implementation of the project results e.g. under ERDF mainstream funding 2014–2020. The CircUse partners are committed to supporting sustainable land use change through the further development of the CircUse concepts and informational tools and will continue to promote the CircUse concept in the future.

Interview with Dr Thomas Strassburger, European Commission, Directorate-General for the Environment, Unit ENV.B.1 – Agriculture, Forests and Soil.



Source: European Union

Dear Mr Strassburger, what are in your opinion the great challenges of the Europe 2020 strategy in the context of urban and environmental problems?

Europe 2020, the strategy for smart, sustainable and inclusive growth, has been the Commission's reply to the economic downpour in Europe. It is about job creation and better lives. At the heart of the strategy there is a plea for promoting a more resource efficient, greener and more competitive economy.

To achieve a sustainable future in a resource constrained world, we must look beyond the short term. Intensive use of limited resources

– be it at the global or EU level – threatens the security of supply. We are only too well aware that continuing our current patterns of resource use is not an option.

The 2011 flagship initiative „A resource-efficient Europe“ – part of Europe 2020 – aims to help decouple economic growth from the use of resources. Despite all our knowledge, we tend to be rather careless with valuable land resources. Urban development often competes with land use for food production or renewables or impacts on land which supports biodiversity or provides ecosystem services such as acting as a carbon sink.

A strategy to make the EU a ‚circular economy‘, based on a recycling society with the aim of reducing waste generation and using waste as a resource should include land; unfortunately, our economic systems still encourages the rather inefficient use of resources by inappropriate pricing. Again this is true for our way of how we dispose on limited land and soil resources.

Overall, stricter environmental targets and standards which establish challenging objectives and ensure long-term predictability, will not only provide a direct boost for eco-innovation, efficient use of resources more efficiently will help us achieve our objectives on climate change, biodiversity, food security etc.

Luckily, as stated within the last year's outcome document of the Rio+20 Conference the strategic importance of avoiding risks to the supply of land resources seems to receive more attention today – for the first time Heads of States have articulated the demand for a 'land degradation neutral world'.

What is the role of land management to ensure sustainable development of cities and regions?

Poorly integrated and unsystematic land use policies will increase land-related conflicts in densely urbanized regions. This could undermine the social coherence and competitiveness of all European cities and regions. At the European level, the Roadmap to a Resource Efficient Europe (2011) – one of the deliverables under the flagship initiative mentioned above – addresses the permanent land take in the EU: more than 1,000 km² annually. About half of this surface is actually sealed and has lost most of its functions.

Often we witness some kind of cutthroat regional competition for local tax base and access to jobs, and some laissez faire within the institutions favouring new development on greenfields, preferably on the urban periphery and not on brownfield land. And often there are derelict sites available, waiting for re-use and smart investment.

We can assume that there is a substantial potential for land recycling in the Union. For example the estimated surface area of brownfields in England is some 637 km², in Germany some 1,300 km². According to a study, more than a third of the German sites offered a realistic development potential.

The Commission has proposed the concept of no net land take, advocating that by 2020, EU policies take into account their direct and indirect impact on land use in the EU and globally, and the rate of land take is on track with an aim to achieve no net land take by 2050.

The CircUse concept is supporting this ambitious but necessary milestone, through its intelligent planning approach. It is reflecting the concept 'reduce, reuse, recycle'. Better planning and regeneration of land shall become promoters of the zero net approach.

To support cities and regions on sustainable land management the Commission has recently published Guidelines on best practice to limit, mitigate or compensate soil sealing.

How could the European Union support cities and region to face this challenge?

The loss of land and soil resources through urbanisation and the conversion of our landscape is one of the major environmental challenges Europe is facing. There is an urgent need to use this valuable resource more wisely, in order to secure its many vital services for future generations.

Land management including brownfield problems have been one of the major concerns of European policies since the 80s, first with the targeting of the Western European regions of industrial tradition and since the 90s to the new Central European member states.

The current economic and financial crisis led to considerable new problems in many European countries including the appearance of new brownfields from commerce, housing, infrastructures and tourist sector. On top of that we will be facing the challenges of the accelerated demographic change in many parts of Europe, resulting in shrinking cities and partly, the creation of a new "brownfield generation".

This will become a major challenge for policy and practice. Current estimates suggest that 40% of all European cities with more than 200,000 inhabitants have lost significant parts of their population in recent years and that many smaller towns and cities are also affected. Overall we do foresee a shrinking population of working age and a growing population of 65 years and older.

The European Commission supports integrated land management through mainstream funding 2014–2020, e.g. for the improvement of the urban environment, including regeneration of brownfield sites and the exchange of experience and best practice shown by the example of the CircUse project.

From land use planning towards circular land management – do we need a new approach?

One reason for selling off land cheaply instead of aiming at maximum efficiency and multipurpose land management is because the information about the true costs to society of land consumption is either ignored or not available – with the result that businesses and individuals cannot adapt their behaviour accordingly. Policy measures to improve resource efficiency and

overall economic competitiveness must place greater emphasis on ‚getting prices right‘ and making them transparent, not only in transport, energy and water usage but on land and soil consumption as well, so that prices reflect the full costs of resource use to society.

Land management and brownfields are highly relevant cross cutting topics for European policies but are always seen from the point of view of other spatial or sectorial aspects. In consequence an integrated approach to a European strategy is still missing.

Circular land management should become a pillar of spatial planning. It surely qualifies as a suitable new way towards the sustainable handling of our precious land resources – in close and fruitful cooperation with the relevant public and private stakeholders.



7.

CD-ROM DATA MANAGEMENT TOOL

The "Land use data management tool" (available on CD-ROM in the book version, also available on: www.circuse.eu) is one of the final results and core outputs of CircUse. In general the "Land Use management Database" will concern application of the data and information management tool in the pilot regions and can be used as English version in all regions of Europe.

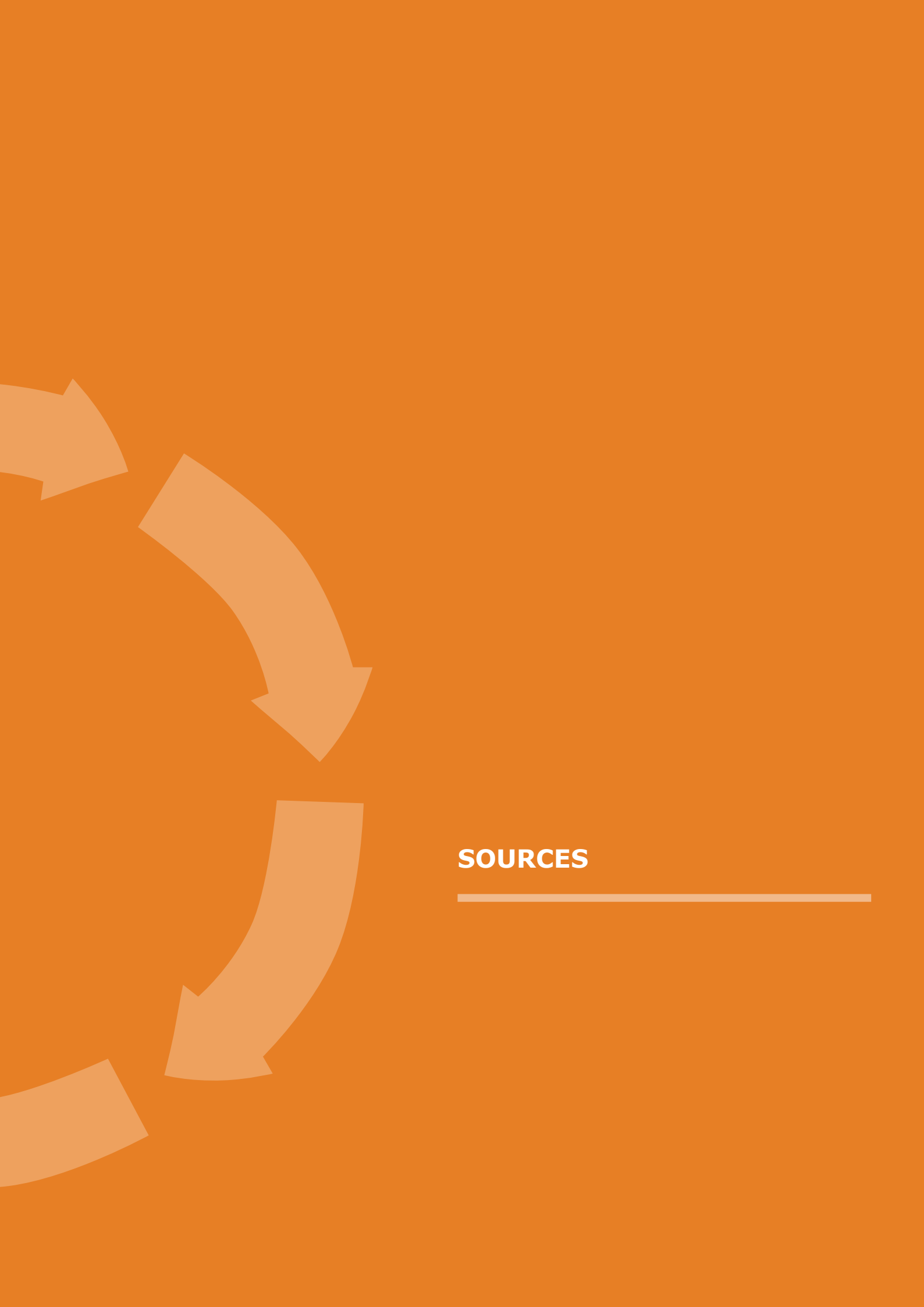
This Manual as the guideline of the tool is divided into two parts:

- **the guideline** for collecting the fieldwork data and integration into the tool and
- **the technical instructions** for installation of the Land use management tool.

The common parameters for fieldwork (terms of reference) are described as well. The tool provides a structured repository for all collected fieldwork-data and is a flexible interregional land management tool for the classification of types of potential development sites (ToRs), data collections and GIS visualization. The tool can be installed with or without the associated GIS-viewer.



Figure 38: Start menu with country-specific database options
Source: Saxon State Office for the Environment, Agriculture and Geology, LfULG



SOURCES

- ▶ Austrian Federal Government (2002): The Austrian Strategy for Sustainable Development. An Initiative of the Federal Government, Vienna.
- ▶ Birli, Barbara and Prokop, Gundula (2011a): Documentation of a CircUse training course for secondary schools in partner countries, CircUse Output Nr. 2.4.1.
- ▶ Birli, Barbara and Prokop, Gundula (2011b): Guideline for preparation of a CircUse training course for secondary schools in partner countries, CircUse Output Nr. 2.4.2.
- ▶ Bock, Stephanie, Hinzen, Ajo und Jens Libbe (Hrsg.) (2011): Nachhaltiges Flächenmanagement – Ein Handbuch für die Praxis. Ergebnisse aus der REFINA-Forschung, Berlin.
- ▶ European Environmental Agency (EEA) (2010): The European Environment State and Outlook 2010: Land Use. Copenhagen.
- ▶ European Commission (2001): A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development (Commission's proposal to the Gothenburg European Council) /* COM/2001/0264 final.
- ▶ European Commission (2006): Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – Thematic Strategy for Soil Protection [SEC(2006)620] [SEC(2006)1165]/* COM/2006/0231 final.
- ▶ European Commission (2010): Communication from the Commission – EUROPE 2020. A strategy for smart, sustainable and inclusive growth, Brussels, COM(2010) 2020 final 3.3.2010.
- ▶ European Commission (2011): Roadmap to a Resource Efficient Europe. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2011) 571 final.
- ▶ European Union (2011): Cities of tomorrow. Challenges, visions, ways forward, October 2011.
- ▶ Federal Ministry of Transport, Building and Urban Development (BMVBS), Federal Office for Building and Regional Planning (BBR) (Eds.) (2007): Kreislaufwirtschaft in der städtischen/ stadtreionalen Flächennutzung. Bearb.: Deutsches Institut für Urbanistik u.a., Preuß, Thomas u.a.; BBR, Dosch, Fabian u.a., Schriftenreihe „Werkstatt: Praxis“ Heft 51, Bonn.
- ▶ Federal Office for Building and Regional Planning (BBR) (Ed.) (2006): Perspektive Flächenkreislaufwirtschaft. Theoretische Grundlagen und Planspielkonzeption. Band 1 der Sonderveröffentlichungsreihe zum ExWoSt-Forschungsfeld „Fläche im Kreis“, Bearb.: Deutsches Institut für Urbanistik u.a., Preuß, Thomas u.a.; BBR, Dosch, Fabian u.a., Bonn.
- ▶ Federal Office for Building and Regional Planning (BBR) (2004): Bauland- und Immobilienmärkte, Ausgabe 2004, Bonn.
- ▶ Finka, Maroš, Petříková, Dagmar: Lessons learnt, report on output 5.2.13, Bratislava 02/2013.
- ▶ German Federal Government (2002): Perspectives for Germany: Our Strategy for Sustainable Development, Berlin.
- ▶ Gutsche, Jens-Martin (2011): Der FolgekostenRechner – online unter www.was-kostet-mein-baugebiet.de, in: Bock, Stephanie, Hinzen, Ajo und Jens Libbe (Hrsg.) (2011): Nachhaltiges Flächenmanagement – Ein Handbuch für die Praxis. Ergebnisse aus der REFINA-Forschung, Berlin, S. 349.

- ▶ Leipzig Charter on Sustainable European Cities, informal ministerial meeting on urban development, Leipzig, 24 and 25 May 2007.
- ▶ Melis, Giulia, Masala, Elena (2013): In.Vi.To - A European experience for brownfield redevelopment, Celid, Torino (forthcoming).
- ▶ Melis, Giulia, Pensa, Stefano, Tabasso, Matteo (2012): Planning Support prototype instrument for brownfield regeneration. In M. Campagna, A. De Montis, F. Isola, S. Lai, C. Pira, & C. Zoppi (Ed.), Planning Support Tools: Policy Analysis, Implementation and Evaluation: Seventh International Conference on Informatics and Urban and Regional Planning INPUT 2012, Milano, pp. 707-718.
- ▶ Otparlik, René, Siemer, Bernd, Ferber, Uwe (2010): Terms of Reference and Land typologies for Circular Flow Land Use Management, Dresden, Freiberg.
- ▶ Rural-Urban Regions and Peri-urbanisation in Europe: Towards a European Policy to Sustain Urban-Rural Futures. PLUREL. Retrieved June 18th from: <http://www.plurel.net/images/PLUREL%20synthesis%20report%20-%20SUMMARY.pdf>
- ▶ Schabl, Anton (2012): Workshop and Operational Structure of the Agency, Output Nr. 4.3.1, May 2012.
- ▶ Statistisches Bundesamt (2013): Indikatoren zu Umwelt und Ökonomie, Wiesbaden.
- ▶ URBACT (Ed.) (2013): Cities of Tomorrow – Action Today. URBACT II Capitalisation. From crisis to choice: re-imagining the future in shrinking cities, report, authors: Schlappa, Hans, Neill, William J V., Saint-Denis.
- ▶ Verbücheln, Maic, Preuß, Thomas (2011): Guideline for preparation of a CircUse training course in partner countries, Berlin.
- ▶ 57 ZÁKON z 5. februára 2013, ktorým sa mení a dopĺňa zákon č. 220/2004 Z. z. o ochrane a využívaní poľnohospodárskej pôdy a o zmene zákona č. 245/2003 Z. z. o integrovanej prevencii a kontrole znečisťovania životného prostredia a o zmene a doplnení niektorých zákonov v znení neskorších predpisov a o zmene a doplnení niektorých zákonov, Zbierka zákonov č. 57/2013, Čiastka 16, Strana 446-449.
- ▶ 58 NARIADENIE VLÁDY Slovenskej republiky z 13. marca 2013 o odvodoch za odňatie a neoprávnený záber poľnohospodárskej pôdy, Zbierka zákonov č. 58/2013, Čiastka 16, Strana 450-566.



Figure 39: Popular illustration of circular flow land use management
Source: Environment Agency Austria



Institute for Ecology of
Industrial Areas



Asti's Municipality



City of Trnava



City of Piekary Śląskie



Ústecký kraj

The Usti Region

ENVIRONMENT
AGENCY AUSTRIA **umweltbundesamt**^U

LANDESAMT FÜR UMWELT,
LANDWIRTSCHAFT
UND GEOLOGIE



Freistaat
SACHSEN

Saxon State Office for the
Environment, Agriculture and Geology



telepark

Telepark Baernbach
Corporation Ltd.



Slovak University of Technology
SPECTRA Centre of Excellence



German Institute
of Urban Affairs



Institute for Sustainable
Development of Settlements



Istituto Superiore sui
Sistemi Territoriali per l'Innovazione

Higher Institute on Territorial
Systems for Innovation



**CENTRAL
EUROPE**
COOPERATING FOR SUCCESS.



EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND

This project is implemented through the
CENTRAL EUROPE programme co-financed by the ERDF