

Ecocity

Book I A better place to live



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Ecocity

Book I

A better place to live

Deliverable of the Project

ECOCITY 'Urban Development towards Appropriate Structures for Sustainable Transport' (2002 - 2005)

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Contents

1	Introduction and definitions	7
1.1	Introduction	7
1.2	Definitions	10
2	ECOCITY – objectives	13
2.1	Overall ECOCITY goals	13
2.2	The ECOCITY vision	14
2.3	Elements of ECOCITY planning and development	18
2.4	ECOCITY objectives	19
3	The process of planning an ECOCITY	35
3.1	Urban development as a cyclical process	36
3.2	Creating an ECOCITY: the integrated planning approach	37
3.3	Creating an ECOCITY: participation	38
3.4	Creating an ECOCITY: monitoring and evaluation	40
4	Concepts for ECOCITY model settlements	41
4.1	ECOCITY Bad Ischl	41
4.2	ECOCITY Barcelona - Trinitat Nova	49
4.3	ECOCITY Győr	55
4.4	ECOCITY Tampere - Vuores	60
4.5	ECOCITY Trnava	67
4.6	ECOCITY Tübingen - Derendingen	73
4.7	ECOCITY Umbertide	79
5	Results of the ECOCITY project: what did we learn?	87
5.1	ECOCITIES as a better place to live – visions and challenges	87
5.2	The ex ante assessment of the ECOCITY site concepts	89
5.3	Sectoral conclusions	92
5.4	Obstacles and success factors for urban sustainable development	97
	References	101
	ECOCITY Project Team	104

I Introduction and definitions

I.1 Introduction

According to the Communication from the Commission, ‘Sustainable urban development in the European Union: a framework for action’, “around 20% of the EU population live in large conurbations of more than 250,000 inhabitants, a further 20% in medium-sized cities of 50,000 to 250,000 inhabitants, and 40% in smaller towns of 10,000 to 50,000 people” [Commission of the European Communities, 1998, p.2]. This means that 80% of the European population live in urban areas and the majority of these people live in small to medium-sized towns and cities. This handbook – based on the EU-funded **ECOCITY project** – looks at the sustainable development of just such urban areas with a strong ecological component. The challenges in urban development differ somewhat with the size of the settlement (in small towns it can be more difficult to establish an attractive public transport system, for example), but one problem is common to all:

During recent decades, urban growth usually happened in ways contradictory to the concept of sustainable settlement development, although this concept is theoretically agreed on in many of the relevant policies. Suburbanisation produced spatially diffused and functionally segregated settlement structures – sprawl – in belts around cities and towns, while the population of the generally more compact historic parts declined. This continuing trend causes growth in traffic volumes, resulting in increased pressures on the environment (such as pollution from exhaust fumes or climate problems due to carbon dioxide). It also compromises the effects of many measures aimed at promoting sustainable transport modes.

As a result of these growth patterns, resources such as land and energy, which should be preserved for future generations, are used excessively. Large areas are occupied by the structures of sprawl and the consumption of limited fossil fuels continues to increase, especially for transport. The environment, which should provide a basis for the life of future generations, as well as human health and overall quality of life are impaired by the effects of this excessive use of resources.

In contrast to these trends, the objectives of the European Union for the development of sustainable settlements and for the improvement of urban environments specifically call for “support [for] a polycentric, balanced urban system and promot[ion of] resource-efficient settlement patterns that minimise land-take and urban sprawl” [Commission of the European Communities, 1998, pp. 6 and 15].

Such patterns are further described in the Communication from the Commission ‘Towards a thematic strategy on the urban environment’ (and in other EU policy documents on this topic) as, “*the favoured vision of high-density, mixed-use settlements with reuse of brownfield land and empty property, and planned expansions of urban areas rather than ad hoc urban sprawl...*” [Commission of the European Communities 2004, p. 30].

High density and mixed use are characteristic for pedestrian-oriented settlement patterns. The need to design urban patterns which are favourable for sustainable transport is emphasised in many recent concepts and also in the Key Action ‘City of Tomorrow and Cultural Heritage’ (under which the ECOCITY project was realised). The objective for the projects within this Key Action was “to reduce radically urban pollution and congestion, while ensuring safe, accessible and affordable mobility, through long-term strategic approaches towards land-use patterns favourable to the development of alternatives to the private car” [European Commission, 1998-2002].

The need for such strategic and long-term approaches is particularly crucial because of the long lifespan of buildings and the resulting slow rate of change in existing building stock. The effects of today's land-use and urban planning measures on travel demand are therefore long-term, meaning "*that land-use planning measures set the urban patterns upon which mobility patterns are based for generations*". Thus unsustainable developments cause long-term problems, "*but if we can 'build in' sustainability-oriented (e.g. travel-minimising) features into new development, we could expect these to be a worthwhile investment prevailing over decades to come*" [PLUME, Cluster LUTR ¹⁾, 2003].

The EU-funded **ECOCITY project** (entitled 'Urban Development towards Appropriate Structures for Sustainable Transport') was conceived to contribute to the implementation of such sustainability objectives by designing model settlements for specific sites in seven communities (see Chapter 4). The aim was to demonstrate the feasibility and desirability of future urban living compatible with sustainability requirements. Settlement patterns for the future need to be sustainable in the sense that future generations should also be able to organise their lives in these settlements at a high-quality level.

Responding to the 'favoured vision' of the European Commission and the EU objectives cited above, the core focus of the ECOCITY project was the development of a compact, space-saving settlement structure enabling an environmentally compatible transport system. This involves giving priority in urban planning to the requirements of sustainable transport modes by designing structures convenient for pedestrians, cyclists and public transportation as well as providing for efficient distribution logistics.

There are also some structures which are definitely not compatible with an ECOCITY and must be avoided. Most of these could be summed up as 'elements of (urban) sprawl': for example, detached, single-family houses or large shopping and leisure centres on greenfield sites. Their impact on the ecological quality of an urban structure is immense.

As changes in existing urban structures and new urban development (mainly on greenfield sites) are currently occurring in parallel, strategies are needed to direct both towards sustainable solutions, to avoid future problems. An ECOCITY can be realised in new urban quarters or by adapting existing ones. New quarters are advantageous for the development of 'model settlements', because they allow optimised structures to be designed. However, considering the slow rate of change in the existing building stock, the main challenge to urban planning will be to adapt existing quarters to an ECOCITY concept. In this context, the example of the model settlements should help to achieve greater acceptance for the necessary regeneration of existing settlements.

Alongside positive examples, a framework of incentives and legal/administrative instruments is also needed to encourage, support and promote sustainable urban development and design, while discouraging the development of sprawl, which in itself is not really 'urban'. Possible incentives could include restricting private development subsidies and applying them only to residential buildings in an urban pattern of higher density, thus also discouraging detached, single-family houses. An example of a useful legal instrument to promote the implementation of new urban developments in parts of a town is the "urban development measure" (*Städtebauliche Entwicklungsmaßnahme*) in Germany, which helps to regulate the prices for buying and selling plots of land.

¹⁾ The ECOCITY project was a component of the Land Use and Transportation Research (LUTR) cluster, which linked 12 synergetic projects looking at sustainable urban mobility in conjunction with land use and environmental issues. The common objective was to develop strategic approaches and methodologies in urban planning which contribute to the promotion of sustainable urban development. This includes the connections between transportation demand and land-use planning, the design and provision of efficient and innovative transportation services, including alternative means of transportation, and the minimisation of negative environmental and socio-economic impacts (more information at: <http://www.lutr.net>).

What are the characteristics of an ECOCITY?

The idea of an ECOCITY is that it should be in balance with nature. This can be achieved through space-saving and energy-efficient settlement patterns, combined with transport patterns, material flows, water cycles and habitat structures that correspond to the overall objectives for sustainability (see Definitions, Section 1.2).

An ECOCITY is composed of compact, pedestrian-oriented, mixed-use quarters or neighbourhoods, which are integrated into a polycentric urban system in public-transport-oriented locations. In combination with attractively designed public spaces, integrating green areas and objects of cultural heritage to create varied surroundings, an ECOCITY should be an attractive place to live and work. Such sustainable and liveable structures contribute to the health, safety and well-being of the inhabitants and their identification with the ECOCITY.

How does an ECOCITY differ from other exemplary developments projects on the one hand and the currently common urban developments on the other?

Compared to the most comprehensive model projects, the main difference is a more intensive adaptation of the urban structure to the requirements of pedestrians, cyclists and public transport. However, compared to currently common new urban development (including sprawl), there are additional differences comprising more efficient use of energy, reduced impairment of nature and more attractive environments for the inhabitants.

The ECOCITY offers many benefits, ranging from personal convenience to global sustainability. All the actors involved – individuals, groups and institutions – can gain: an ECOCITY offers more space for people in an attractive, safe and quiet environment and also has lower life cycle costs and is less costly in relation to repairing negative impacts on human health and the environment²⁾.

²⁾ See also Chapter 2 in Book II for a more detailed discussion of these benefits.

What disadvantages can be identified for the different actors?

The answer to this question must be framed differently for the actors responsible for planning and implementation, the people living in the direct neighbourhood of the planned ECOCITY and its future inhabitants:

- The more complex planning and implementation process (consideration of many different, sometimes diverging requirements and achieving agreement between many actors and stakeholders) is a challenge for planners, developers and the community. Accordingly, more time may be necessary for this process.
- Neighbours are affected by an ECOCITY only to a minor extent. They can generally continue their way of life as usual – in contrast to new conventional settlements, the increased impairment to be expected from car traffic is small. However, there may be some negative impacts during the construction phase (noise, construction traffic).
- The future inhabitants know about the circumstances of living in an ECOCITY (such as reduced car traffic, but also fewer facilities for motorists) before they decide to move there and should not consider them a disadvantage. Investment costs may be higher, but life cycle costs are lower.

Thus most of the potential disadvantages of an ECOCITY are either the same as or, mostly, considerably reduced compared to a conventional development. The greatest problems are generally related to the fact that ECOCITIES challenge established views, routines and patterns. The resulting task for those wanting to establish an ECOCITY is thus to communicate the advantages clearly and convincingly and to dispel the worries and fears often associated with the new and the unknown.

However, the nature of an ECOCITY as an urban development project makes it impossible for the stakeholders to test the 'product' before deciding about it. All the parties involved must therefore imagine the 'functioning' of the ECOCITY and all the benefits of living there. The description and visualisation of the ECOCITY concept in this handbook should form a valuable aid in this.

The concepts for the seven model settlements were developed for different sites (brownfield, greenfield and existing structures) in communities of different sizes and in different climate zones. These concepts are an attempt to advance the vision for ECOCITIES (see Chapter 2), visualise their urban patterns in plans and promote their implementation as examples of good practice, supporting urban stakeholders in the decisions they make towards urban sustainability.

The ECOCITY handbook consists of two parts:

'ECOCITY Book I - A better place to live', includes general information on the ECOCITY approach: the vision of an ECOCITY is developed and translated into objectives for the planning of model settlements; the seven settlements planned as part of the ECOCITY project are introduced and the main conclusions drawn from the experiences made during the project are presented.

'ECOCITY Book II - How to make it happen', includes general guidelines for the development of an ECOCITY, explaining the objectives in Book I in more detail. It also provides techniques and tools for the planning process. Book II is mostly aimed at planners and other decision-makers who are involved in the development of urban settlements.

Additional information: 'Public reading' section of the project website: <http://www.ecocityprojects.net>.

1.2 Definitions

The overall concepts of sustainable development and sustainable mobility at the heart of the ECOCITY project have been stated and defined elsewhere in different contexts. The following sections clarify the understanding of what these terms mean within the ECOCITY project.

1.2.1 Sustainable development

Sustainable Development was defined as follows in the report entitled 'Our common future', published by the World Commission on Environment and Development (also known as the 'Brundtland Report'): *"Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."* [1987, p.24].

There are many things people may want to sustain: an activity, an institution, economic transactions or, as in the context of this book, a human settlement. These things are all part of, or in fact constitute, a system, and thus what we want to sustain is these systems and their operability. The **main requirement** for making human activity sustainable in the original sense is to focus on the **(external) relationships** of the system (e.g. the human settlement) with its natural environment, which ultimately provides the basis for all our activities. To achieve sustainability, the input into and the output from the system must fulfil the following requirements:

- The rate of resource use (inputs: materials and energy) must not be greater than the rate of their regeneration
- The rate of emission (outputs) must not be greater than the rate at which the pollutants generated by the system can be absorbed.

But to meet these requirements, one must consider the **internal relationships** between different elements within the system, as these processes determine the steps which need to be taken towards

greater sustainability. To deal with the complexity of the overall system of human society, it has been divided into different subsystems by various authors. In the most frequently cited approaches [e.g. Camagni, R. et al., 1998; Castells, M., 2000] the original focus on environmental/ecological issues was complemented by emphasising social and economic matters as well which should be brought into balance (the ‘three pillars/dimensions model’). Achieving this balance necessitates compromise, as the requirements of the three dimensions at times contradict each other. Since we might be able to learn, for example, to use natural resources more efficiently but ultimately have no way of changing the laws of nature to meet excessive human demands, human systems must be adapted to the capacities of the natural environment if we want to survive and thrive.

To deal with the complexity of the urban system, it is helpful to consider the main sectors of urban development as subsystems. For the ECOCITY project, the following main sectors were chosen: urban structure, transport, energy and material flows and socio-economic aspects. These subsystems must be sustained and need to interact in the overall ‘urban settlement’ system to meet the above-mentioned two main requirements for sustainability.

Fulfilling these requirements can be achieved by meeting the following goals:

- Minimising use of land, energy and materials
- Minimising the impairment of the natural environment.

These goals have been extended by additional sector-focused ones to produce a list of ‘Overall ECOCITY Goals’ (they are stated in more detail in Chapter 2), including:

- Maximising human well-being (quality of life)
Although meeting the overall objectives for sustainable settlements contributes to a higher quality of life, other contributions are also necessary, especially in the social sector.
- Minimising total lifecycle costs (for production, utilisation and disposal)
Costs are an important factor in deciding on the implementation of a project, but priority should be given to its quality in relation to sustainability.
- Minimising transport demand
Appropriateness for sustainable transport is an essential requirement for the sustainability of an urban system. The achievement of the main objective for this sector is closely linked to achieving the other ‘Overall ECOCITY Goals’

The sectoral objectives derived from these goals are also presented in Chapter 2.

1.2.2 Sustainable mobility and accessibility

Mobility

A general definition of ‘mobility’ is to be found in the Glossary of the European Environment Agency [EEA multilingual environmental glossary³⁾]: “*The ability of groups or individuals to relocate or change jobs or to physically move from one place to another*”.

³⁾ <http://glossary.eea.eu.int/EEAGlossary>
[accessed January 2005].

However, in recent decades, mobility has become a value in itself. Travel distances have increased along with travel speeds and people generally now have to cover greater distances than they used to in order to fulfil the same needs as before: getting to school and to work, doing the shopping, visiting friends and family, etc. In the context of the ECOCITY, therefore, a more specific definition of mobility is used. High mobility – as a characteristic of people – is determined by the ability to reach a great number of destinations within the shortest possible time while covering the shortest possible distance. Short travel times are thus not a function of high travel speeds but mostly of short distances. This kind of mobility can only be achieved within ECOCITY types of urban structures.

Accessibility

⁴⁾ <http://www.m-w.com>
[accessed January
2005].

A general definition of 'accessible' is to be found in the Merriam-Webster Online Dictionary⁴⁾: "*Accessible means to be capable of being reached (being within reach) or capable of being used (being available)*". In urban planning accessibility is defined by the time necessary to reach a desired destination. This time depends mainly on the physical distances between origin and destination but also on travel velocity. Maximising accessibility could thus in theory be achieved by increasing velocities. Since the inherent problems of the transport system (e.g. congestion) as well as the uneven availability of private cars and general sustainability requirements (including minimising pollution and energy consumption) set very definite limits to this option, the preferred alternative is to decrease the distances that people need to cover.

Thus, in the context of the ECOCITY, good accessibility is understood as the close provision of necessary facilities in space and time, complemented by the availability of high-quality, environmentally compatible transport links (direct, barrier-free pedestrian and cycle routes and attractive public transport routes).

In an ECOCITY, therefore, **good accessibility** (as a characteristic of urban structures) **is the basic requirement for high mobility** (as a characteristic of people). Both together can be achieved in a sustainable way by creating a city of short distances.

1.2.3 ECOCITY

There are different approaches to sustainable urban development which focus partly on adapting existing settlements in small, gradual stages and partly on developing completely new solutions. While some approaches concentrate on developing theories of urban development as frameworks for action, others focus on implementing alternatives.

The term *Ecocity* has so far been used mainly by movements which were aiming to realise new, consistent urban solutions as alternatives to current developments. A pioneer in disseminating the Ecocity idea is the Ecocity Builders organisation in the USA⁵⁾, which is dedicated to reshaping cities, towns and villages for the long-term health of human and natural systems, by organising a series of 'International Ecocity Conferences'. Ecocity Builders and similar organisations describe an Ecocity through a number of principles, as for instance in the declaration of the 5th Ecocity conference in Shenzhen, China (August 2002). One of the core tenets is to build cities for people and not for cars. A further example, in Germany, is the Förderverein Ökostadt e. V.⁶⁾, which is trying to find a site for an Ecocity just outside Berlin.

⁵⁾ Ecocity Builders, Berkeley, California, USA, <http://www.ecocitybuilders.org>
[accessed March 2004].

The approach of the ECOCITY project is a step towards combining theory with practice, including both the development of a vision and the planning of concrete model settlements. For this project, an ECOCITY was defined as a **vision** of a **sustainable** and **liveable city or town** to be implemented in a smaller settlement unit, i.e. a model quarter or neighbourhood as an example for the community as a whole.

⁶⁾ Förderverein Ökostadt e. V., Berlin/Lychen, <http://www.oekostadt-online.de>
[accessed March 2004].

In the ECOCITY project, **an urban quarter** was defined as part of a city with identifiable functional or spatial borders and a small-scale mixture of functions. An urban quarter is usually composed of more than one neighbourhood.

The following chapters will explain in more detail the objectives for the different aspects of ECOCITY planning (Chapter 2), the ECOCITY planning process (Chapter 3) and the concepts developed for the seven different ECOCITY sites (Chapter 4). Chapter 5 summarises the experiences gathered during the planning and evaluation of the ECOCITY concepts.