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Integrated Management of Housing Stocks:

Asking the right questions to ensure the sustainable development of housing stocks

Working paper de l'IDHEAP 7/2011

Chaire Politiques publiques et durabilité

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PART I: INTRODUCTION AND CONCEPTS

1 Introduction

1.1 Why this handbook

This handbook addresses the question of housing sustainability from an institutional perspective and presents a new framework for understanding and evaluating the sustainability of housing stocks.

The need for a new approach stems from two main observations regarding the current state of housing sustainability. First, although the concept of sustainable development is a recent one, housing research and initiatives that by today's definition would qualify as being grounded in sustainability have been numerous over the last 100 years, both here in Switzerland and abroad. However, aside from various small-scale initiatives, the vast repository of knowledge we have acquired regarding housing sustainability has not yet been translated into practice at a mass housing scale. Although there are undoubtedly many reasons why this is the case, regulatory and institutional issues have been insufficiently accounted for when dealing with the challenges of implementing management strategies for the sustainable development of housing stocks.

Second, housing sustainability studies tend to address sustainability only at the housing sector level. But such analyses fail to account for all of the actors of the built environment that use some aspect of housing to conduct their activities. To comprehensively address sustainability, it is imperative that housing be considered in this larger context of the built environment in which it is situated.

This handbook focuses on both of these issues.

1.2 Target audience and application

The purpose of this handbook and accompanying checklist is to provide housing stock owners and managers with the knowledge and tools to be able to address the regulatory obstacles to achieve their sustainability goals within the context of the larger built environment.

Instead of prescribing how individual housing stocks should be managed—something that owners and managers are best suited to do—the handbook provides questions to which answers are required if housing stocks should have a chance of developing sustainably.

1.3 How this handbook was developed

This handbook is based on the results of a doctoral thesis (Nicol 2009a) that was the culmination of a three year international comparative research project conducted by the Swiss Graduate School of Public Administration (IDHEAP), Switzerland, the Institute for Industrial Building Production (IFIB) at the University of Karlsruhe, Germany, the Institute of Government and Public Policies (IGOP) at the Autonomous University of Barcelona, Spain and the Institute of Historic Building Research and Conservation (IDB) at the Swiss Federal Institute of Technology in Zurich, Switzerland. It was funded through the Swiss National Science

Foundation's National Research Programme 54 on Sustainable Development of the Built Environment and was directed by Prof. Dr. Peter Knoepfel (IDHEAP, Switzerland), Prof. Dr. Niklaus Kohler (IFIB, Germany), Prof. Dr. Joan Subirats (IGOP, Spain) and Prof. Dr. Uta Hassler (IDB, Switzerland).

The international project concluded with the publication of a series of IDHEAP working papers (Hassler et al. 2009, Nicol 2009b, Nicol 2009c, Subirats et al. 2009) that present the results, analysis and conclusions of individual case studies conducted throughout the research. The users of this handbook are encouraged to consult these working papers (downloadable from the IDHEAP website at www.idheap.ch) for more detail on the case study examples that are found throughout this document.

1.4 Outline of the guide

This handbook is divided into four parts, three of which are found in this document and a fourth on the accompanying CD.

Part one describes the new approach for evaluating housing sustainability that forms the basis of this handbook: the institutional regime. The purpose of this part is to clearly explain the relationship between the institutional regime and housing sustainability and to describe how this approach can assist housing stock owners and managers to understand and find solutions to the sustainability challenges that arise from the use of their stock.

Part two consists of concrete examples taken from the Swiss, German and Spanish case studies. The examples assist the users of the handbook to understand how the institutional regimes framework was practically applied during research and how housing stock owners and managers can use it to evaluate the housing sustainability of their own stocks.

Part three consists of summaries of each of the 23 goods and services offered by the housing stock. These summaries contain condensed accounts of the results obtained during the international research project. The objective is to provide a template containing information that could be applicable to the evaluation of other housing stocks for the checklists in part 4

Part four of the handbook is found on the accompanying CD and consists of the sustainability checklists that are to be completed by individual housing stock owners or managers. The structure of the checklists mirrors that of the summaries in part 3. The input, however, will reflect the evaluation of the specific housing stock under consideration and will therefore contain sometimes similar but often different information than in the summaries.

2 A new approach for evaluating housing sustainability

2.1 Housing stocks as part of the built environment

The housing stock is one element of the built environment, which encompasses the buildings, spaces and products that are created or modified by people. Although the provision of shelter is the primary function of housing within this complex system, housing also has important implications for many other sectors such as energy supply, water provision, planning, immigration and investment. In fact, housing stocks are used by many actors whose primary activities are non-residential in nature and thus have little to do with shelter. For example:

- pension funds use housing stocks as investment vehicles;
- electric utilities view housing stocks as markets for the electricity they sell;
- urban designers and architects see the physical buildings of the housing stock as elements for urban design;

To thoroughly address the question of housing sustainability, the entire function of housing within the built environment—and not just its role as a provider of shelter—must be considered.

One approach that allows for such a comprehensive evaluation of housing sustainability is that of the institutional regimes framework. This approach allows us to identify all the actors across different sectors—pension funds, electric utilities and urban designers amongst many others—that have an interest in housing, to analyse how they use housing and to observe what effects their uses have on the sustainability of housing within the built environment. This approach is described below.

2.2 The institutional regime framework

Overview

The institutional regimes framework is an approach that is valuable for analysing the uses and sustainability of a single resource, in this case the artificial resource 'the housing stock'. Like natural resources, artificial resources contain a limited number of goods and services that can be used by various actors (Table 1).

Table 1: Examples of goods and services and their users of 1) the natural resource water and 2) the artificial resource housing stock

Natural resource – water		Artificial resource – housing stock	
Goods and services	**User**	**Goods and services**	**User**
Drinking water	Water utility	Capital investment	Investors
Industrial cooling	Industries	Demand for energy	Electric and gas utilities
Recreation	Swimmers, boaters	Design of urban space	Urban designers

In most cases, regulations describe who is eligible to use which goods and services and the conditions under which they can be used. For example

- a tenant has the right to use an apartment under the conditions described in the tenancy contract;
- a municipal water service has the right to use the demand for potable water generated by the tenants of the stock under the conditions described in public policies on water protection and the distribution of water; and
- a pension foundation can use the investment potential of a housing stock as long as it adheres to the stipulations of its property rights as a foundation and public policies on occupational pensions.

The use of all of a housing stock's goods and services are governed by a vast collection of regulations —composed of public policies, property rights and contracts—that are more or less coordinated and that, as we have seen, originate in diverse sectors like investment, energy, and regional planning. This entire set of regulations is the institutional regime.

The composition and characteristics of an institutional regime are critical for four key determining factors of housing sustainability:

1. A regime can create conflict or synergy, which has negative or positive repercussions, respectively, on sustainability.
2. A regime can promote or stifle certain goods or services to the detriment or benefit of others.
3. A regime provides the boundaries of allowable uses of goods and services made by users.
4. A regime shapes the way owners and managers develop and establish their management strategies.

The schematic representation of the institutional regime in Figure 1 is useful for describing the different parts of the regime presented in the following sections.

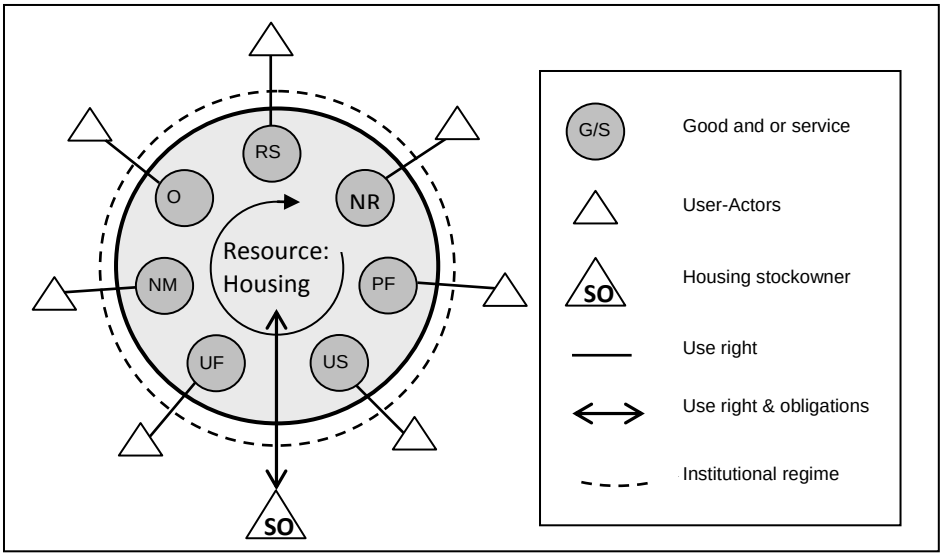
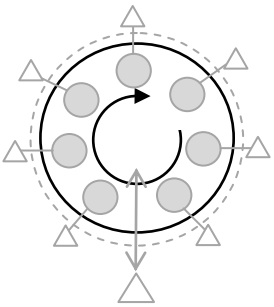


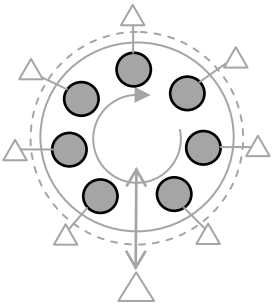
Figure 1. The institutional regime of the housing stock. User-actors are granted use rights to the goods and services of a housing stock through regulations found in public policies, property rights and contracts. The stock owner is a special type of actor who not only has use-rights to the stock but also obligations. The ensemble of regulations related to the use of all goods and services as well as any coordinating mechanism between the regulations in the institutional regime. The labels RS, NR, PF, etc. refer to the different categories of goods and services offered by the stock.

The resource: the housing stock



The "housing stock" is an artificial resource composed of all collective housing buildings belonging to a single owner, regardless of whether the buildings are located in a single neighbourhood or throughout a region. Management strategies and decisions at the housing stock level (such as contracting with a single service provider or coordinating timing of renovation plans) mean that buildings in different neighbourhoods likely have similar characteristics in terms of sustainability evolution. Consequently, it is this characteristic of common ownership and not shared geographical location that is the critical criterion for this definition of a stock.

Goods and services of the housing stock



The housing stock contains twenty three goods and services that can be divided into six categories:

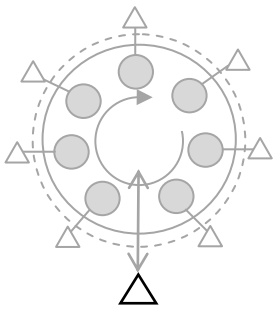
- **RS Residential:** include goods and services used by tenants to allow them to live in their own apartment and enjoy an acceptable level of indoor environmental comfort.
- **NR Non-Residential:** are composed of all indoor and outdoor spaces that are not used exclusively by individual tenants for living.

- **PF Production Factor:** consist of goods and services that allow investors to perceive some economic benefit.
- **US Utility Services:** include everything associated with flows into and out of the housing stock, such as energy, materials and water.
- **UF Urban Function:** describe goods and services that connect the housing stock and its tenants to its immediate environment.
- **NM Non-Material:** encompass goods and services that are intangible and serve social, cultural, political or historical purposes.

The full list of goods and services are listed in Table 2

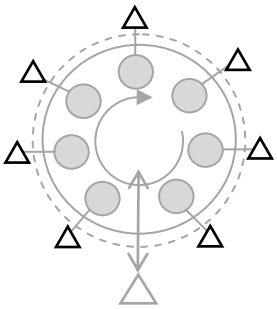
Actors of the housing stock institutional regime

The two main categories of actors are the housing stock owners (or managers) and the actors who use the goods and services of the stock.



Housing stock owners have a central role in the institutional regime framework since they are the holders of the formal property rights of the stock. Not only do their management decisions determine at least in part the makeup of the goods and services, but they also have the power to directly or indirectly select which users have the right to use them.

Many stockowners rely heavily on intermediary actors such as property management or facility management companies that not only deal with day-to-day tenant issues but also make key decisions regarding building maintenance and renovation. For this reason, this handbook uses the terms owner and manager interchangeably.



User-actors (or **users**) are those actors that use the goods and services offered by the housing stock, such as the pension fund, the electric utility and the urban designers mentioned previously in Table 1. A user-actor either has a regulated right to use a good or service (such as when a tenant's right to use *RS 1 Living Space* is described in the rental lease) or he or she simply appropriates a good and service whose use is unregulated (such as when a squatter with no rights to *RS 1 Living Space* moves into an abandoned apartment).

Most of the actors who use housing's goods and services are in fact active primarily within non-residential domains of the built environment. The identification of these actors in an analysis of the sustainability of housing in the context of its built environment is critical since:

- the use of goods and services by non-residential actors can significantly influence whether a housing stock develops sustainably or not; and
- the sustainability of non-residential actors' primary activity (e.g., pension management, electricity provision, urban design) can depend on how the regime regulates their use of housing's goods and services.

Table 2. Goods and services of the institutional regime

RS. Residential

RS 1 Living space: the private space in which tenants live

RS 2 Indoor climate and technical services: what tenants use in order to enjoy an acceptable level of indoor environmental comfort within their apartments (e.g. heating, water and wastewater equipment such as showers, toilets, and sinks, and electrical outlets)

NR. Non-Residential

NR 1 Commercial space: spaces not used by tenants that can be rented by third parties, such as businesses, associations, and restaurants.

NR 2 Collective indoor space: all spaces that are used for particular activities by tenants and building caretakers, including laundry rooms, storage areas, meeting and activity rooms, and underground parking.

NR 3 Functional indoor space: all spaces that have a functional purpose and without which the buildings of the stock could not exist, such as hallways, stairwells, entranceway, elevators

NR 4 Collective outdoor space: outdoor space located on the building property that is typically used for parking, play areas, green space, outdoor storage and building access

PF. Production factor

PF 1 Capital investment: potential for financial gain through capital investment

PF 2 Land investment: potential for financial gain through the sale or lease of land

PF 3 Labour investment: potential for financial gain through labour services such as construction, design, and cleaning

US. Utility

US 1 Demand for energy: demand for heating and electricity

US 2 Material storage and sink: demand for materials for the construction, maintenance, operation, and renovation of the stock

US 3 Material discharge: demand for household waste, recyclable materials and construction waste

US 4 Water sink: demand for drinking water

US 5 Water discharge: demand for wastewater discharge

UF. Urban Function

UF 1 Design of urban space: demand to use buildings as part of an overall urban design

UF 2 Demand for traffic related infrastructure: demand for roads and parking surfaces, but also infrastructure for public transit and non-motorised modes of transportation

UF 3 Demand for institutional services: demand for hospitals, schools, day care, etc.

UF 4 Demand for goods and services: demand for products and services within close proximity, e.g., groceries, banks

NM. Nonmaterial

NM 1 Solving general housing needs: using the stock to address housing problems of a general nature (e.g., overall housing shortage) or of a specific nature (e.g., resolving housing problems of specific groups such as low income households or of cooperative members)

NM 2 Solving non-housing needs: using the stock to address non-housing issues, such as job-creation, immigration, and income from taxes.

NM 3 Shaping the characteristic landscape: using the buildings of a stock to create a landscape

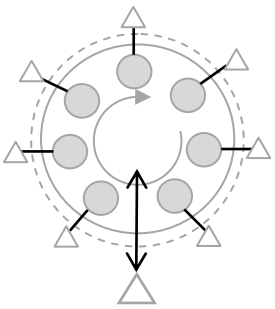
NM 4 Social and cultural complexity: using the stock to create social and cultural complexity

NM 5 Conservation and transmission of social and historical values: buildings as the physical means of representing social and historical values of a region.

Regulations of the housing stock institutional regime

The management strategy developed and applied to the stock and the use of housing's goods and services are constrained by the institutional regime, an extensive set of regulations found in public policy, civil law (namely property rights) and contracts.

The housing stock is a resource that is governed by diverse sectoral **public policies.** For instance:



- pension foundation investment in housing is regulated in part by the Occupational Pensions Act (BVG);
- electricity provision is governed in part by policies on environmental protection, energy, CO2, and energy supply;
- federal and cantonal policies on land use planning govern urban planning.

Civil law defines the legal rights and relationships of natural and moral persons as defined by the civil code and the code of obligations. Under civil law, a housing stock owner is granted **property rights** and thus is subject to rights and obligations under private law. These rights vary in accordance with the type of housing ownership. Thus rights and obligations differ between, for instance, housing cooperatives, pension foundations, investment funds and public housing.

Finally, **contracts** are legally enforceable agreements between two or more parties to perform or to refrain from performing some specified act. As long as contracts conform to the law, they can contain any number of stipulations. It is the effects of these stipulations on the behaviour of the different actors that are of concern in the evaluation of housing sustainability.

2.3 Conclusion: institutional regimes for sustainable resources

The analytical approach of the institutional regime was developed to help improve the sustainability of resources. Developed at the Swiss Graduate School of Public Administration (IDHEAP), it was originally intended for the analysis of natural resources and has been applied successfully to resources such as water, forests and land (Knoepfel *et al.* 2001; Varone *et al.* 2002; Knoepfel *et al.* 2003; Nahrath 2003). Recently, the application of the institutional regimes analytical framework has expanded beyond natural resources and is being or has been used for the analysis of non-material resources such as landscape (Gerber 2005; Knoepfel & Gerber 2008), and artificial resources such as roads (Savary 2008), housing (Nicol & Knoepfel 2008), urban utilities (Nahrath & Csikos 2007), railways (Nahrath *et al.* 2008) and documented public information (Olgiati 2010). An in-depth presentation of this analytical framework can be found in Gerber et al. 2009.

As we shall see in the next section, the characteristics of an institutional regime influence the physical condition of the stock (i.e., whether it is well maintained or disintegrating) and the sustainability of the various uses of its goods and services.

3 Using the institutional regime to understand housing sustainability

3.1 Defining housing sustainability

Before describing how an institutional regimes analysis can assist housing stock owners to manage their stock to be a more sustainable element of the built environment, we present a distinction between the more traditional perspective on sustainable housing and the more comprehensive one that forms the basis of this handbook.

Traditionally, the sustainability of housing has been evaluated in terms of its effects on the environment, the economy and society. Environmental sustainability concerns include energy efficiency, water consumption, material selection and construction site damage. Social sustainability issues include integration, comfort, social diversity and desirable communities. Economic sustainability concerns often overlap those of social sustainability, such as affordable housing, but also include models for housing subsidization, the costs and benefits of 'green' building, and the housing construction sector as a catalyst and driver of regional or national economies. Success in meeting sustainability objectives for housing is often measured using sustainability indicators, which allow us to evaluate whether we are heading in the right direction.

The traditional approach to sustainable housing is important and certainly valid, but also incomplete since it rarely, if ever, considers the full range of uses made of housing. We therefore take a wider perspective of housing sustainability: for a housing stock to be part of a sustainable built environment

1. the uses of its goods and services must not threaten the physical condition of the stock;
2. one actor's use of a good or service should not conflict with the sustainable use of another actor's good or service;
3. the uses of its goods and services must not prevent other sectors of the built environment from achieving their sustainability goals; and
4. the uses of its goods and services should not have unsustainable repercussions on the use of other resources.

All four points are critical; without such considerations, there exists a risk that housing stocks that are locally sustainable contribute to unsustainable situations in other domains at the city-wide, regional or global level. This situation is demonstrated in the examples in the text box below.

1. A public actor uses subsidized housing to house populations at risk (use of *NM 1 Solving General Housing Needs*) but does not insist on the payment of rent by tenants (for the use of *RS 1 Living Space*) for fear of generating conflict and being forced to evict them. Consequently the buildings deteriorate since there is insufficient revenue for reinvestment in renovation and maintenance.
2. The use of rainwater harvesting for flushing toilets, gardening etc. (use of *RS 2 Indoor Climate & Technical Services*) is viewed by many as a sustainable housing initiative. But how could this use affect the operation of the wastewater treatment plant (user of *US 5 Water Discharge*)? Wastewater collection, treatment and discharge infrastructure is designed for specific 'quantities and qualities' of wastewater. Changes in these resulting from alternative uses of rainwater could negatively affect operations if the plant is not designed for them.
3. Some investors choose to use housing as a short-term investment vehicle (use of *PF 1 Capital Investment*) but their management decisions could compromise the quality of the apartments *(RS 1 Living Space)* used by tenants.
4. A waste collector provides household waste *(US 3 Waste Discharge)* to an incinerator who burns it as fuel for the production of district heating. Unlike the previous examples, this represents an improvement in sustainability.

A comprehensive analysis of sustainable housing must evaluate two different consequences of the use of housing: the effect of the use of its goods and services on the environment, society, and the economy (i.e., the traditional sustainability approach), and the effect of the use of a good or service on the use of all other goods and services of the stock.

3.2 The relationship between the institutional regime and sustainability

Section 2.2 described the four key factors that relate the institutional regime to stock sustainability (conflict or synergy of use, promotion or stifling of goods and services, allowable uses of goods and services and management strategies). These four factors are important for understanding the summaries of goods and services presented in part 3 as well as the checklists on the CD. They are presented in greater detail below.

1. The institutional regime as a producer of conflict and synergy

Conflicts occur when rivalries—which occur when the use of a good or service by one actor interferes with the use of a good or service by another actor—are insufficiently managed by the regulations of the regime.

Rivalry, in and of itself, is not necessarily bad: it can promote innovation and efficiency in resource use and can foster cooperation between actors to achieve optimal use of their respective goods or services. The institutional regime of a sustainably used housing stock regulates rivalries so that user-actors can continue to use their goods and services. If rivalries are not at all or not adequately regulated by the regime, they can develop into conflicts that may pro-

duce uses of goods and services that cripple other uses or even cause the housing stock to physically decay.

How does a poor institutional regime push rivalry into conflict? Two important descriptors of a regime provide us some insight: extent and coherence.

The **extent** of the institutional regime describes whether regulations exist for all of the uses of a resource. Low extent allows a good and service to be appropriated in an undesirable way, such as when spaces are squatted (appropriated use of *RS 1 Living Space*).

The **coherence** of a regime refers to the degree of coordination between all of the regulations that constitute the regime. Incoherence in the regulation of the use of housing goods and services occurs in three ways.

First, no coordinating mechanisms exist between the regulations governing one good and service and the regulations governing other goods and services. In this scenario, regulations promote conflicting uses of goods and services. For example, regulations governing household waste may allow pick up, which can be a noisy activity, as early as 6 am (regulation on the use of *NR 4 Collective Outdoor Space*); however, a tenant's rental lease may have restrictions designating quiet time before 7 am (regulation on the use of *RS 1 Living Space*). This incoherence in regulations can lead to the disruption of the tenant's early morning peaceful enjoyment of *RS 1 Living Space*.

Second, the design of a public policy targets the wrong group and the effect desired by the regulation does not occur. For instance, a law on eco-taxes may actually have very little influence on the energy consumption patterns of tenants (use of *RS 2 Indoor Climate & Technical Services*).

Third, an existing regulation is simply not implemented or enforced. For instance, regulations may exist for the proper use of laundry rooms (use of *NR 2 Collective Indoor Space*) but if they are not enforced users are likely to use them as they see fit and the chances of conflict between tenants increase.

Thus, a regime with low extent and low coherence often results in 1) conflicts between the users of goods and services, 2) a decline in the physical condition of the stock, and 3) a decrease in the overall sustainability of the housing stock.

An integrated regime—that is, one with high extent and high coherence—is a necessary, although not sufficient, condition for the sustainable use of a housing stock. Furthermore, an integrated regime also provides the framework for synergy, which occurs when a user-actor's use of a good or service helps others use theirs and can encourage the sustainable use of the resource. The more a regime lacks regulation of its goods and services or is incoherently regulated, the greater the probability that there exist unwanted effects from the use of the housing stocks' goods and services.

2. Promoting and stifling the use of goods and services

Although housing stocks provide goods and services to a wide range of non-residential actors, the primary purpose of housing is to provide shelter. The 23 goods and services of the housing stock fall into two categories (Table 3). The first, those directly associated with housing for shelter, include goods and services that make up the actual physical structure of the stock as well as the goods and services that relate to living in that space. The second group of goods and services are not used with the intention of providing shelter.

Research indicates that when the regulations of a regime allow shelter related goods and services to be treated as secondary to the use of non-shelter ones, the physical condition of the stock as well as the overall sustainability of the stock are compromised. For instance, using housing construction as a means to jump-start the economy (i.e., using *NM 2 Solving Non-Housing Needs*) has in some cases resulted in a housing glut, whereby buildings remain empty since the demand for apartments does not exist. The stock quickly decays with poor consequences on sustainability.

Table 3. Shelter and non-shelter related goods and services

Shelter related goods and services	Non-shelter related goods and services	
RS 1 Living Space	NR 1 Non-Residential Space	UF 1 Urban Design
RS 2 Indoor Climate and Technical Services	PF 1 Capital Investment	UF 2 Demand for Traffic Related Infrastructure
NR 2 Collective Indoor Space	PF 2 Land Investment	UF 3 Demand for Institutional Services
NR 3 Functional Space	PF 3 Labour Investment	UF 4 Demand for Goods and Services
NR 4 Collective Outdoor Space	US 1 Demand for Energy	NM 2 Solving Non-Housing Needs
NM 1 Solving Housing Needs	US 2 Material Sink	NM 3 Shaping the Characteristic Landscape
	US 3 Material Source	NM 4 Social and Cultural Complexity
	US 4 Water Sink	NM 5 Transmission of Social and Historical Values
	US 5 Water Source	

This observation—that shelter should not be treated as secondary to other functions of housing—does not imply that housing for shelter should trump all other uses. In fact, research also indicates that when the use rights to non-shelter goods and services are completely stifled, sustainability problems also arise, as when all use of *PF 1 Capital Investment* is curtailed to keep rents for low-income families very low (use of *NM 1 Solving General Housing Needs*).

Therefore, the sustainability and the physical condition of the stock are a function of whether the use of certain types of goods and services take precedence or stifle the use of other goods and services. The best conditions for housing stock sustainability exist when shelter is prioritized over non-shelter uses but non-shelter uses are not stifled.

3. The institutional regime as a shaper of user behaviour

The institutional regime regulates who can use which goods and services and how. Not surprisingly, changes in the regime modify the way that goods and services are used, potentially improving or worsening their sustainability.

Changes in public policies, property rights and contracts can produce changes in uses of goods and services in two principle ways. First, the introduction of new regulations oblige (or at the very least encourage) the user to change the way they use a good and service. For example, a new law on housing obliges stock owners to calculate rent based on the cost of living instead of mortgage rates. Second, the introduction of new regulations allow new actors to gain access to the use of a good or service, such as when the liberalization of the electricity markets allowed new providers access to *US 1 Demand for Energy*.

These changes in a regime happen regularly but they can also be less obvious than the examples provided. Changes in the use of a good or service can occur as an indirect consequence of a regulatory change: following a regulatory change, a stock manager may need to change his or her management strategy and subsequently change the conditions of use of the stock's goods or services via new contracts.

All of these changes in the use of goods and services that result from changes in the regime have consequences on the sustainability of the housing stock. As actors change their behaviour with respect to the good and service to which they have use rights, environmental, economic and social effects—big or small—are sure to occur. Another less obvious but just as important effect, however, can occur as changes in the regime create the potential for new conflicts with the uses of other goods and services due to coherence problems.

To fully evaluate the sustainability of the housing stock, changes in the behaviour of actors resulting from regime changes must be assessed not only based on their traditional sustainability effects, but also on whether new conflicts arise that may threaten its sustainability.

4. The institutional regime as a shaper of management strategy

Somewhat evidently, the regime provides the regulatory framework for how housing stock owners and managers develop their strategies for the management of their stock.

As noted previously, different legal forms of stock owners are subject to different property rights and regulations. For instance, the strategies of a Swiss pension foundation are governed in part by the Occupational Pensions Act as well as laws pertaining to foundations; a housing cooperative is governed by laws on cooperatives that limit dividends and provide all members with an opportunity to vote. Thus, when property rights change, through either legislative changes or the sale of the stock to another owner, the regulatory framework that shapes management strategies can change drastically. A clear example of this occurred in Germany when the law on non-profit housing in 1990 was abrogated. Housing that had been non-profit no longer had this legal designation and restrictions on sale of the stock and dividends were lifted. This change in property rights set the stage for the privatization of many large, public,

formerly non-profit housing stocks. Changes in policies can oblige stock owners to take a different strategic direction just as they can oblige actors to change their use of goods and services.

The institutional regime, however, is not responsible for all management actions; if it were, all housing stocks belonging to a single regime would be identical, which is evidently not the case. Rather, managers have a 'room to manoeuvre' to make and implement autonomous decisions that are not in response to changes in the regime. This room for management manoeuvre is critical as it enables managers to find alternative ways of dealing with and resolving regime based sustainability issues. Many rooms for manoeuvre actions were revealed during the course of research, a sample of which is given in Table 4.

Table 4. Examples of room for manoeuvre options

Room for manoeuvre options	Example
Creating and implementing regulations where none exist	Tenants leave common activity rooms *(NR 2 Collective Indoor Space)* in disarray after use. The manager creates enforceable regulations regarding maintenance of the rooms.
Creating a 'self-imposed' regime	A formerly non-profit publicly-owned stock owner wishes to provide low-cost housing *(NM 1 Solving General Housing Needs)* and therefore passes new statutes that prohibits the possible sale of the stock to short-term investors, keeps limits on dividends, etc.
Enforcing existing regulations	A stock owner who has not been collecting rent regularly *(PF 1 Capital Investment)* begins to do so.
Changing which actors have use rights	A stock manager switches from oil heating to district heating *(US 1 Demand for electricity)*.
Introducing new actors to the system	Garbage compactors are hired to reduce the volume of waste in outdoor bins *(US 3 Material Discharge)* to reduce the waste fees, which are calculated by volume.
Opting out of one regime and into another	A stock owner decides to switch from providing subsidized housing to market housing.

A comprehensive evaluation of stock sustainability looks at how changes in the regime affect management strategies regarding the various goods and services. However, stock owners can assess what room for manoeuvre they have within the confines of the regime to manage the goods and services of their stocks so that they develop more sustainably.

3.3 Evaluating sustainability

The checklist in the following section guides users of this handbook through a comprehensive assessment of the sustainability of their housing stock. Using an institutional regimes approach, each of the four key factors of institutional regimes affecting housing sustainability is addressed before evaluating the environmental, economic and social sustainability of the use of each good and service.

Review of four key factors affecting housing sustainability

For each good and service, it is essential to evaluate four key factors:

1. Where does conflict exist between uses of goods and services? Is conflict the result of low extent or low coherence? Conflict due to low extent or low coherence indicates a likely sustainability problem.

2. Does the regime allow housing for shelter to be treated as secondary to housing for other purposes? If this is the case, sustainability may be compromised. Alternatively, does the use of housing for shelter prevent non-shelter goods and services from being used? If actors are completely prevented from using housing for purposes other than shelter, sustainability problems are likely.
3. Have actors changed their use of goods and services due to changes in the regime? Have new actors been introduced? Are new regulations foreseen that will cause changes in the use of goods and services? The use of goods and services may become more or less sustainable as a result of changes in the regime.
4. How have stock managers changed their management strategies due to changes in the regime? Changes in management strategies resulting from regime changes may cause users to use goods and services in a more or less sustainable manner. Given the conflicts and sustainability effects from regime changes, what room for manoeuvre does the stock owner have and what options are available for making the stock more sustainable?

Using Sustainability Indicators

The four factors above affect the sustainability of the use of each good and service, but how do we evaluate sustainability? Returning to the traditional interpretation of sustainability—environmental, economic and social effects resulting from the use of the housing stock—sustainability indicators are used to evaluate whether the use of a good or service is heading in the right sustainability direction.

Relevant indicators vary not only from country to country but also from region to region and even city to city. For the purposes of this handbook, however, the indicators selected are based on an extensive set of 124 indicators from the Bern Sustainability Compass[1], which was developed by the Office of environment and energy of the canton of Bern to evaluate the effects of projects on sustainable development.

To simplify matters, the sustainability evaluation proposed in this handbook uses the 13 environmental, 13 economic and 17 social thematic indicator categories (Table 5) under which the 124 indicators are classified. Appendix 1 lists the full list of indicators and should be referenced for a better understanding of the categories.

[1] Berner Nachhaltigkeitskompass, Boussole bernoise du développement durable. http://www.bve.be.ch/site/bve_aue_berner_nachhaltigkeitskompass

Table 5. Sustainability indicators, based on the Bern Sustainability Compass

Environmental Indicators	Economic Indicators	Social indicators
Water management	Income	Quality of the landscape
Water quality	Cost of living	Housing quality
Land consumption	Jobs	Quality of the living environment
Soil quality	New infrastructure investment	Offer of goods and services
Material flow	Maintenance of infrastructure	Mobility
Material recycling	Economic development	Health
Quality of materials	Real costs	Security
Biological diversity	Resource efficiency	Participation
Natural spaces	Economic structure	Integration
Air quality	Tax burden	Community
Climate	Public finances	Distribution of income and wealth
Energy consumption	Know-how	Equal opportunity
Quality of energy	Innovation	Supraregional cooperation
		Leisure
		Culture
		Education
		Social security

For the use of each good and service, the stock owner must decide which indicators are relevant since evidently not all will be. The choice of some indicators will be obvious but others will require more thought. For example, "Water quality" is an obvious indicator selection for US *5 Water Discharge*, whose use affects the quality of the receiving water bodies; however, the less obvious indicator "Quality of energy" is also relevant if waste solids from the treatment process are used as fuel for the district heating incinerator, as it is in many municipalities.

4 Examples of the uses of goods and services and their effects

To assist the user of this handbook understand how the housing stock institutional regime influences housing stock sustainability, empirical examples for each good and service are presented below. Each example comes from the case studies analysed during research and demonstrates how the institutional regimes framework is practically applied. The examples consist of two parts: the first is a description of the use situation; the second is a summary box that includes the following information, where it is applicable:

1. Whether the use of the good and service had low extent or low coherence (see section 3.2).
2. Whether a shelter-related good and service was treated as secondary to the use of a non-shelter good and service; *or* whether a shelter-related good and service stifled the use of a non-shelter good and service (see section 3.2).
3. Changes in regulations that produced changes in the use of the good and service (see section 3.2).
4. Use conflicts that occurred with other goods and services.
5. The evaluation of sustainability indicators prior to any management intervention (see Table 5 and Appendix 1).
6. Management solutions or changes in strategy (see Table 4).
7. The evaluation of sustainability indicators after management intervention (see Table 5 and Appendix 1).

RS 1 Living Space

Repayment of rent

Tenants in the three Spanish public housing stocks consistently defaulted on their payment of rent. To avoid evicting low-income tenants, the management of the three stocks established the unusual precedent of *not* enforcing payment. This produced a conflict between the tenants, who used *RS 1 Living Space* without paying rent, and the public owners, whose use of *PF 1 Capital Investment* depended on rental revenues. Low revenues meant less maintenance of the stock and poorer public finances and the conflict between tenants and management resulted in a decrease of general well-being of both groups.

When a new coalition government in Catalonia was voted into office in 2003, it revised its housing policy to include better monitoring of failure to pay rent in its public stocks. Motivated by the regulations, management worked with tenants to find individualized repayment solutions, with the understanding that legal action would be taken should a tenant not begin repayment. These measures have apparently resulted in a significant decrease in failure to pay.

Thus, the change in policy that led to new contracts for the payment of rents changed the conditions of use by tenants of *RS 1 Living Space* who must now pay for their apartments.

This tactic, of reaching individualized agreements with tenants, has been employed by other stock managers elsewhere even without the pressure of a change in policy. The economic payoff of slowly but steadily recouping lost rent is better than evicting tenants and finding new ones.

- **Conflict:** *RS 1 Living Space* and *PF 1 Capital Investment*
- **Low coherence:** not enforcing regulations regarding regular payment of rent
  - **Evaluation of sustainability indicators:** poor 1. maintenance of infrastructure, 2. public finances (economic), 3. health (social).
- **Change in policy:** change management strategy and tenants' use of *RS 1 Living Space*.
- **Management strategy:** enforcing existing regulations.
  - **Evaluation of sustainability indicators:** improvement in 1. maintenance of infrastructure, 2. public finances (economic).

RS 2 Indoor Climate & Technical Services

Clean air legislation

In Switzerland, lower emissions' limits prescribed in the federal ordinance on clean air[2] became more stringent in 1992. To comply with the ordinance, one Swiss stock retrofitted the heating system with the effect that that emissions fell within the acceptable range (intended consequence of the ordinance) but at the expense of tenant comfort due to the reduced capacity of the system and lower operating safety (unintended consequence of the ordinance). Consequently, the tenants were impeded from being able to satisfactorily use *RS 2 Indoor Climate & Technical Services*. Although improvements were made in environmental sustainability, notably air quality and climate, they came at the expense of social sustainability, chiefly housing quality, health and security.

The problem was rectified in a recent renovation programme with the wholesale replacement of the heating system, which will not only be much more efficient but will use renewable fuel sources: wood chips for space heating and solar for 60% of hot water needs. Thus, not only will tenant comfort and safety improve but environmental gains will also be made in energy consumption and quality of energy. Thus, in this example, the regime change of 1992 did produce a net positive effect on sustainability but not until 17 years after its implementation.

[2] Ordonnance du 16 décembre 1985 sur la protection de l'air (OPair) RS 814.318.142.1

- **Low coherence:** changes in policy produce unintended sustainability consequences
  - **Evaluation of sustainability indicators:** improvement in 1. air quality and 2. climate (environmental); decline in 1. housing quality, 2. health and 3. Security (social).
- **Management strategy:** creating and implementing new strategy.
  - **Evaluation of sustainability indicators:** improvement in 1. housing quality, 2. health 3. security (social) and 4. energy consumption, 5. quality of energy (environmental).

Ecological Tax Reform

Ecological tax reform[3] was introduced in Germany in 1999 and strengthened again in 2002. A main goal of this tax was to encourage energy efficiency; in fact it produces little effect on the energy consumption habits (use of *RS 2 Indoor Climate & Technical Services*) of tenants in collective housing stocks. Whereas electricity use (e.g., for lighting) is strongly dictated by the renter, this is not the case for space heating which, along with hot water, is where the vast majority of household energy is consumed. Although tenants can modify their behaviour to reduce consumption by a small degree, overall consumption is largely influenced by building-related factors such as façade insulation and efficiency of the heating system, elements that are beyond the control of the tenant. The stock owner, who is most responsible for energy use, passes on the cost of the ecological taxes to renters and thus remains insufficiently targeted by the law.

- **Low coherence:** the design of a public policy targets the wrong group and the effect desired by the regulation does not occur.
  - **Evaluation of sustainability indicators:** no improvement in 1. climate, 2. energy consumption (environmental); decline in 1. real costs, 2. cost of living (economic).

NR 1 Commercial Space

Inexistence of property rights

As a result of frequent and unorthodox sales of a Spanish housing stock from private to public owners, the contract of sale for the ground-floor commercial premises and any documentation that might indicate who the owner of these spaces might be cannot be found. Thus, the holder of the property rights remains unknown. With no ownership, some individuals have attempted to squat the spaces that normally would be reserved for commercial establishments or other institutional services. Consequently, the public company that manages the rest of the stock has had to act as the *de facto* manager of spaces they are not legally bound to manage. Their solution has been to board up these spaces to prevent squatters from appropriating them. Maintenance, by either the manager or public authorities, is minimal.

[3] *Gesetz zum Einstieg in die ökologische Steuerreform*

- **Low extent:** no property rights on commercial space of the stock.
- **Management strategy:** change which actors have access to commercial spaces (from squatters to no one).
  - **Evaluation of sustainability indicators:** improvement in 1. security (social); poor 1. public finances, 2. investment in maintenance (economic).

NR 2 Collective Indoor Space

Maintenance of activity rooms

The maintenance of activity rooms is a recurring issue in a few stocks. In several instances, these spaces are not maintained or even vandalized by the users, and consequently fall into disrepair. One stock owner in Switzerland decided no longer to include these rooms in new buildings whereas another in Germany decided to transfer use of the space to a day care. The misuse of *NR 2 Collective Indoor Space* resulted from either 1) a lack of enforcement of existing regulations regarding the use of the rooms, or 2) the use of the rooms being unregulated.

- **Low extent:** no regulations regarding the use of activity rooms, OR **low coherence:** lack of enforcement of rules regarding use of activity rooms.
- **Management strategy 1:** change which actors have use-rights to activity rooms, i.e., no one.
  - **Evaluation of sustainability indicators 1:** decline in 1. community, 2. leisure (social).
- **Management strategy 2:** lease space to an institutional service
  - **Evaluation of sustainability indicators 2:** decline in: 1. community, 2. leisure (social); but improvements in 1. economic development (economic) and the use of *UF 3 Demand for Institutional Service*.

NR 3 Functional Space

Cleaning functional space

The mandate of the one German public housing stock manager is to provide affordable housing to its tenants; consequently management have tried to reduce costs wherever possible. One such elimination of cost comes by not hiring cleaners to clean the hallways and other functional spaces of the stock. Instead, the Volkswohnung relies on a system whereby the tenants take it in turn to clean these spaces. Some tenants fulfil this responsibility whereas others do not, causing conflict when it is perceived that some are doing less than their share. In the language of the institutional regime, in order for the stock manager to prioritise *RS 1 Living Space* (low rent) it suppresses the use-right of cleaning companies to use *PF 3 Labour Investment*. In actual fact, this situation represents a sustainability trade-off: gains made socially and economically through lower rents are somewhat off-set by the losses in social cohesion between tenants.

- **Conflict:** between users of *NR 3 Functional Space*.
- **Management strategy:** deny professional cleaners the right to clean functional spaces (i.e., no use rights to *NR 3 Functional Space* or *PF 3 Labour Investment*) in order to keep operational costs low.
  - **Evaluation of sustainability indicators:** improvement in 1. cost of living, 2. income (economic); but decline of 1. health, 2. community (social).

NR 4 Collective Outdoor Space

Removal of benches due to noise

Noisy and disruptive youths disturbed tenants of one housing stock, constituting an abusive use of *NR 4 Collective Outdoor Space*. The management responded by removing the outdoor benches on the property to discourage their presence on the premises. Although this resolved the problem of the disruptive youth, it also prevented tenants, particularly elderly residents, from enjoying the outdoor space since they no longer had anywhere to sit. Thus, the improvement in security came at the expense of opportunities for outdoor exchanges between residents and general enjoyment of the living environment.

- **Low coherence:** no enforcement of regulations concerning outdoor use of the premises.
- **Management strategy:** to encourage a change in which actor's access outdoor space (from everyone, including disruptive youths, to no one).
  - **Evaluation of sustainability indicators:** improvement in 1. health, 2. security (social); but decline in 1. quality of the living environment, 2. community, 3. leisure (social).

PF 1 Capital Investment

New property rights shape a new management strategy: case 1

Swiss pension foundations are governed by federal legislation on foundations and occupational pensions, and by their deeds of foundation. The articles contained in these regulations set a framework within which a pension foundation may manage its housing stock: for instance, pension foundations must administer their fortune in a manner that guarantees security of investment, reasonable return on investment, diversification of risks and have sufficient liquidity to cover foreseeable needs. The most significant effect of these regulations is that a pension foundation must make efforts to invest securely for the long term. Thus, management strategies that would tend toward a quick sale of the stock for profit maximisation are effectively disallowed.

When one Swiss pension foundation purchased a housing stock, its objectives for the renovation of the stock was one of *"new positioning"*, that is, renovating the stock so that the living space (as well as other goods and services necessary for living in the stock such as technical services) conformed to market demand now and, more significantly, in years to come. This highlights a strategy based on a long-term perspective.

- Change in property rights through the sale of the stock can influence management strategies
- **Management strategy:** obligation to have a strategy based on a long-term perspective.

New property rights shape a new management strategy: case 2

The discussion on the obligation to have a long-term strategy is also pertinent to the case of the formerly non-profit housing stocks in Germany (see also the example in *NM 1 Solving General Housing Needs*). Since the German law on non-profit housing was abrogated in 1990, these stocks are free to be sold to anyone. Consequently, several very large public housing stocks (namely the GSW in Berlin and WoBA in Dresden) have been sold to banking consortiums and hedge funds with the purpose of using the proceeds to eliminate some of the huge debt incurred by many German cities. The change in property rights from a public non-profit housing company with a regime-dictated long-term strategy to a profit-driven hedge fund with no temporal constraints on their strategy may have some potentially dramatic effects on the sustainability of the housing stocks.

In the case of the sale of the stock to short-term investors:

- A non-shelter service, *PF 1 Capital Investment*, takes precedence over using the housing stock for shelter.
- **Management strategy:** no obligation to have a strategy based on a long-term perspective.
  - **Evaluation of sustainability indicators:** potential decline in 1. cost of living, 2. maintenance of infrastructure, 3. resource efficiency (economic), 4. health, 5. social security (social). Improvement in 1. public finances (economic).

Default on payment of rent and charges

As described in the example of *RS 1 Living Space*, the management of the Spanish housing stocks adopted management strategies that ignored tenants' non-compliance with regulations on payment of rent so as to avoid conflicts. This strategy has led to an economically unsatisfactory use of *PF 1 Capital investment* and we observe that the repercussions of these strategies, on economic and social sustainability are negative. For instance, low rental revenues put negative pressures on public finances, there was little investment in maintenance of the stock thus reducing resource efficiency, and the lack of funds for stock maintenance has created considerable tension between managers and tenants negatively affecting mental health and security.

This example serves as the complement to the previous one, namely that prioritising housing-related goods and services without guaranteeing a minimal use of non-housing related goods and services can lead to the deterioration of the stock and other sustainability concerns. Here,

the prioritisation of shelter goods and services (*RS 1 Living Space* and *NM 1 Solving General Housing Needs*) has effectively resulted in the suppression of a non-housing related one *(PF 1 Capital investment)*, with negative consequences both on the sustainability of the use of many goods and services *and* on the condition of the stock.

- Using housing for shelter suppresses the right to use the non-shelter service *PF 1 Capital Investment*.
- **Low coherence:** lack of enforcement of regulations regarding payment of rent.
  - **Evaluation of sustainability indicators**: poor 1. public finances, 2. maintenance of infrastructure, 3. resource efficiency (economic), 4. health, 5. security (social).

PF 2 Land Investment

Mass purchase of land for new housing development

A 1959 municipal building ordinance in a small town near Zurich prohibited the construction of buildings higher than three stories. But in 1964, during the severe housing crisis in Zurich (and indeed, the whole of Switzerland), an additional paragraph was added to the ordinance that allowed large construction projects over 10 000m^2 to deviate from the specifications in the building ordinance. During this period, two associates purchased much of the agricultural land in the town.

The large scale land purchase (use of *PF 2 Land Investment*) produced immediate changes in the use of several goods and services. Once the purchases were completed, the purchasers were able to exert pressure on the town to declassify the land to constructible land. With the encouragement of the canton, plans were made to erect large housing developments to relieve housing pressures (use of *NM 1 Solving General Housing Needs* by public authorities). At the same time, the cantonal department of regional planning hired an architect to produce a "spatial model" against which all new proposed developments in the town could be assessed. The architect created a plan in a terraced or stadium style with high-rise buildings closest to the inland edge of the town and getting lower as one moved toward the lake, thereby using the service of *NM 3 Shaping the Characteristic Landscape*. The land owner created specific development plans in accordance to the spatial modes, thereby using *UF 1 Urban Design*.

- Change in policy (building ordinance) changes use of *PF 2 Land Investment*.
- **Synergy:** *UF 1 Design of Urban Space* (as used by the developer), *NM 3 Shaping the Characteristic Landscape* (used by the architect), *and NM 1 Solving General Housing Needs* (used by cantonal authorities).

Land comes with labour

Constructible land, as noted by one Swiss stockowner, is rarely available without conditions linked to its sale. These dictate, for example, which architects, contractor, or builders must be used for housing construction. Often, there is already a housing project linked to the land in which case the potential land purchaser must work with the seller to find a solution for all parties. Acquisition of land is becoming increasingly difficult since land owners not only exert a use right on the land (*PF 2 Land Investment*) but rights to *UF 3 Labour Investment* even after the land has been sold. This arrangement can be at times beneficial, but at times problematic and is considered a limit to the architectural quality of projects.

The challenge of finding land without conditions has manifested itself over the last 10 to 12 years, during which time more individuals buy land and create such conditions for development.

- Contract of sale of land ties *PF 2 Land Investment* and *PF 3 Labour Investment*.
- **Synergy:** *PF 2 Land Investment* and *PF 3 Labour Investment*.
- **Conflict:** potential conflict between *PF 2 Land Investment* (land owner) and *PF 1 Capital Investment* (purchaser) when the project and labour attached to the land are unsatisfactory.
- **Management strategy:** negotiation with the landowner

PF 3 Labour Investment

Prefabricated slab construction

Many large-scale housing developments in canton Zurich were built in the 1960s by the general contractor Ernst Göhner AG using a prefabricated slab system (*Grossplattenbausystem*). This construction technique enabled the very rapid erection of several stocks, which was particularly important for alleviating the severe housing shortage that had hit Switzerland. Furthermore, the cheaper construction methods meant that, in principle, lower rents could be charged. One negative consequence of this construction technique, however, was the monotonous design and appearance of the buildings.

- Change in use of *PF 3 Labour Investment* (use of prefabricated slab system) was a result of technology changes, not regime changes.
  - **Evaluation of sustainability indicators**: improvement in 1. cost of living, 2. innovation (economic); decline in 1. quality of the living environment.

US 1 Demand for Energy

Liberalization of the electricity market

Until 1998, the energy market in Germany was characterised by service area monopolies with state supervision on prices and misuse. With the introduction of changes in the federal law on energy in 2005, the energy market was liberalized allowing a multitude of new actors to gain access to *US 1 Demand for Energy*. Germany now has approximately 1000 electricity companies, of which 700 are small and medium sized municipal utilities. Tenants, in theory, now have a choice of electricity provider and the conclusion of a service contract with any one of them effectively introduces the actor into the regime.

Since liberalization, the cost of electricity has increased for tenants. The manager of one public housing stock has remarked that this poses a problem for tenants who have a fixed income to spend on rent and utilities; the more electricity costs, the less an individual can spend on rent. For owners of social housing (but also market housing) the increased costs of electricity forces them to find cost savings in other areas, such as not hiring cleaners for functional spaces (see *NR 3 Functional Space*).

- Changes in energy policy allow new actors to have use rights to *US 1 Demand for Energy*.
- **Conflict:** between electric utilities' use of *US 1 Demand for Energy* and 1) the tenants use of *RS 2 Indoor Climate & Technical Services*, due to increased prices, 2) social stock owners' use of *NM 1 Solving General Housing Needs*, due to needing to find cost savings for tenants.
  - **Evaluation of sustainability indicators:** decline in 1. cost of living, 2. income (economic).
- **Management strategy:** find cost savings by changing which actors have use rights to *NR 3 Functional Space* (space cleaned by tenants instead of hired cleaners).
  - **Evaluation of sustainability indicators:** improvement in 1. cost of living, 2. income (economic); decline in 1. jobs (economic), 2. health, 3. security (social).

US 2 Material Storage and Sink

Using durable materials

Several housing stock owners choose to build new collective housing buildings with materials that are more durable and longer lasting. Although the upfront cost is greater, the savings from less maintenance and less frequent repairs and renovations compensate.

- **Management strategy:** creating own regulations regarding who to contract with for the supply of materials.
  - **Evaluation of sustainability indicators:** improvement in 1. material flow (environmental), 2. resource efficiency (economic).

US 3 Material Discharge

Waste disposal

In Germany, the introduction in 1981 of the federal packaging ordinance obliged manufactures and distributors to take back all sales packaging in Germany and have them recycled. An alternative was introduced with the *Duales System* introduced in 1991, which organises the collection and sorting of packaging marked with the "Green Dot" and requires the separation of household waste into different containers. The use of compost bins is also obligatory. The German law on waste (1994) and local waste disposal bylaws require stock owners to make available the necessary bins for different types of waste and sufficient space to ensure collection and control of waste separation. The requirement for more and more bins has led to space problems for a number of collective housing stock owners, including waste overflowing onto the ground due to insufficient space.

One course of action by one manager was to contract a third party to manage the storage of bins in the limited space available; the company sorts and compacts waste (use of *US 3 Material Discharge*) in order to reduce the number of bins required. Since the municipality charges waste disposal fees based on volume and the stock now produces less waste per volume, the new service is financed through savings which are considerable enough to also reduce the operating costs charged to tenants.

- **Low coherence:** incoherence between waste management policy and existing infrastructure of many housing stocks.
- **Conflict:** between *US 3 Material Discharge* and *NR 4 Collective Outdoor Space.*
  - **Evaluation of sustainability indicators:** poor 1. quality of soil (environmental), 2. housing quality, 2. health, 3. security (social).
- **Management strategy:** introducing new actors, waste compactors, to the use of *US 3 Material Discharge*.
  - **Evaluation of sustainability indicators: i**mprovement in 1. quality of housing, 2. health, safety (social), 3. cost of living, 4. income (economic); decline in 1. public finances (economic).

US 4 Water Sink

A regime does not reflect reality

A change in the use of a good or service with consequences on sustainability can occur when a public policy does not adapt to changing lifestyles. This is evident in the case of the increased use of bottled water in European households. The demand for potable water has traditionally been satisfied by public water suppliers but within the last 15 years or so, bottled water companies have made significant gains in the use of *US 4 Water Sink*. The marketing strategy of bottled water companies has convinced a significant proportion of the public that their water is purer and better for one's health than the water that comes from the tap. Studies have shown, however, that this is not the case; furthermore, quality control of bottled water is

not as stringent as that of publicly supplied water. Thus, the sustainability of the use of *US 4 Water Sink* has been allowed to decline because the regulations have failed to adapt to the new reality of water supply. Until such regulations are put in place, public suppliers of water will continue their own counter-marketing campaign to convince the public that tap water is clean, safe and, thanks to no packaging, better for the environment.

- **Low coherence:** incoherence between current water supply legislation and the increased consumption of bottled water.
  - **Evaluation of sustainability indicators:** poor 1. material flows, 2. quality of materials, 3. energy consumption (environmental).
- **Management strategy:** cooperating with public water suppliers to promote the use of tap water.
  - **Evaluation of sustainability indicators:** improvement in 1. material flows, 2. quality of materials, 3. energy consumption (environmental).

US 5 Water discharge

When regulation is not easy

Over the last 50 years, wastewater treatment plants have dramatically improved the health of water bodies. But new threats to water have emerged due to the increasing quantities of micropollutants that are being added to wastewater through actions such as flushing medications and household products down toilets and sinks. The removal of micropollutants is energy-intensive, expensive and difficult although technologies are being developed to handle these types of wastes. Flushing micropollutants put negative pressure on the receiving water quality, biological diversity, investment: new, public finances and health.

This is a case of an abusive use of *NR 2 Indoor Climate & Technical Services* (specifically the technical service of sinks and toilets) by tenants of housing stocks which has an adverse effect on the way that wastewater treatment plants use *US 5 Water Discharge*. In other words, when tenants flush these types of pollutants, they make it difficult for wastewater treatment plants to efficiently and adequately treat wastewater. This abusive use, however, is one that would be very difficult to stop through regulation since enforceability would be highly problematic. The alternative is to introduce regulations that oblige wastewater treatment plants to treat micropollutants to an acceptable level. This may indeed occur in the future, but at the moment our collective knowledge on the concentration, the effects and the treatment of these micropollutants is still insufficient to be able to regulate.

- **Low extent:** regulations on flushing micropollutants (use of *RS 2 Indoor Climate & Technical Services*) do not exist as they would be difficult to enforce. Regulations on treating micropollutants (use of *US 5 Water Discharge*) in the wastewater stream do not exist as the technology does not yet exist.
- **Conflict:** *US 5 Water Discharge* and *NR 2 Indoor Climate & Technical Services*.
  - **Evaluation of sustainability indicators:** poor 1. water quality, 2. biological diversity, 3. energy consumption (environmental), 4. public finances (economic).

UF 1 Design of Urban Space

Isolation of tenants

In the rush to produce housing, the use of *UF 1 Design of Urban Space* can be lost. This is the case in one Spanish stock whose buildings are divided between two complexes, a northern residential area and a southern residential area. In both areas there is a series of parks built inside the complexes that are fairly enclosed and scarcely visible from the outside. Given the neighbourhood's bad reputation, this does not seem to be the best way to encourage the residents to use this space on a daily basis. The park that is located between the two residential areas in the neighbourhood does not have this problem; however, it is isolated from the southern residential area by a two-way express roadway which makes it somewhat difficult to reach. In this case, the articulation between certain spaces and the urban fabric of the city gives rise to a sensation of isolation between the public space and the street, which does not really encourage certain population groups who reside within the stock to use these spaces.

- Poor use of *UF 1 Design of Urban Space*.
  - **Evaluation of sustainability indicators:** poor 1. quality of the living environment, 2. security, 3. community, 4. leisure (social).

UF 2 Demand for Traffic Related Infrastructure

Street parking versus on-site parking

In the early 1960s, the creation of parking garages in collective housing buildings became a planning requirement of the city of Lausanne, thus stock owners had little choice but to provide a minimum number of on-site parking spaces. At the same time, some stock owners were obliged to cede some of their street-side land for street widening that was being done with public money. Not only were these stocks obliged to have parking garages but they also had to compete with free street parking made possible by the street widening. In this case, the urban planning policy which encouraged street widening was incoherent with regulations concerning housing construction. One stock owner responded by creating a new regulation that required all tenants with cars to rent a space in the building's parking garage.

- Change in public policies change the use of *UF 2 Demand for Traffic Related Infrastructure*.
- **Low coherence:** conflicting regulations regarding obligation to provide on-site parking and street-widening for free street parking.
- **Conflict:** *UF 2 Demand for Traffic Related Infrastructure* and *PF 1 Capital Investment*.
  - **Evaluation of sustainability indicators:** poor 1. land consumption (environmental), 2. real costs (economic), 3. quality of the living environment (environmental).
- **Management strategy:** create and implement new regulations obliging tenants with cars to rent an on-site parking space.

UF 3 Demand for Institutional Services

Negotiation for space

During the planning for a large housing development by one Swiss stock owner, the city approached the owners to request space for a day care, which the stock owner readily agreed to due to the large size of the development and the expected demand for such services. The city has an indeterminate use on the space under the condition that the use remains the same. Thus, the demand for early child care *(UF 3 Demand for Institutional Services)* created by the large number of young families in the stock is satisfied by the day care, which simultaneously rents commercial space in the stock (*NR 1 Commercial Space*).

- **Synergy:** *UF 3 Demand for Institutional Services* and *NR 1 Commercial Space*.
- **Management strategy:** grant use rights for the day care to have access to space in the building.
  - **Evaluation of sustainability indicators:** good 1. jobs, 2. economic development, 3. resource efficiency (economy), 4. mobility, 5. community (social).

UF 4 Demand for Goods and Services

High demand but low supply of consumer goods and services

At one Spanish stock, there is a demand for consumer goods and services within close proximity that is underused by businesses. Since there is a lack of businesses within the neighbourhood, which is also fairly isolated from the rest of the city, residents must walk long distances to obtain the needed goods and services. According to the residents, another effect of this lack of local business is that the neighbourhood seems less alive.

- Underuse of *UF 4 Demand for Goods and Services*.
  - **Evaluation of sustainability indicators:** poor 1. jobs, 2. economic development (economic), 3. offer of goods and services, 4. community (social).

NM 1 Solving General Housing Needs

Abrogation of non-profit housing

One of the most significant changes in policy that occurred in the German case studies was the gradual liberalisation of the housing market that culminated with the abrogation of the law on non-profit housing (WGG) in 1990. Under the stipulations of the law, non-profit housing companies had a tax-advantaged status on the condition they aim for cost recovery and forgo profit maximization (e.g., maximum 4% dividend limit for shareholders), build housing for those in need and conform to certain restrictions on the uses of assets and capital (e.g., restrictions on the sale of the stock). These conditions were lifted with the repeal of the WGG.

In anticipation of the changes that the abrogation of the WGG would affect the management of one a publicly owned stock rewrote its statutes to effectively incorporate the conditions that were in the WGG (i.e., management created a self-imposed regime). Essentially, although it was legally no longer a non-profit housing company (since that designation no longer existed), management continued as much as possible to act like one. With the removal of the dividend limits as well as the restrictions on allocation of assets and capital, management knew it would come under increased economic pressure. Fortunately for the company, until 2004, the public majority shareholder waived its right to the increased dividends it was now entitled to receive, and the funds were instead redirected into the capital reserves of the company, thereby increasing its value.

The basic reaction of the management of a second publicly owned housing stock was similar to the above case in that it too rewrote its statutes in anticipation of the abrogation of the WGG; however, one significant strategic difference is signalled by the massive investment management made in its stock in 2000. With the repeal of the WGG, the once non-profit housing companies were now eligible to be sold. In fact, the process of wholesale privatisation of housing companies to market-oriented investors had started, particular of companies that were owned or majority owned by municipalities or states that were heavily indebted. To prevent such a situation, management decided to activate its accrued capital reserves, which amounted to hundreds of millions of Euros, as quickly as possible and hence tie these funds to the stock. By activating the funds and assigning them to value-maintaining and -increasing measures, the company became a less attractive purchase for potential buyers with short-term investment horizons and the highest possible rate of return objectives.

Thus, prior to the abrogation of the WGG in 1990, the two companies were able to prioritise *NM 1 Solving General Housing Needs* through legislation on public policies modifying property rights. Since then, these restrictions have been transferred to the statues of the companies; in other words the prioritisation of these goods and services has become a contractual obligation. However, should the stock be sold to a private investor, the statutes would no longer apply and a shift to prioritising *PF 1 Capital Investment* could occur.

- Change in policy (abrogation of WGG) changes the property rights of formerly non-profit housing stocks.
- **Management strategy:** creating a self imposed regime by rewriting statutes to include provision of the former WGG.
  - **Evaluation of sustainability indicators:** if the stocks are sold, potential for decline in 1. cost of living, 2. maintenance of infrastructure, 3. resource efficiency (economic), 4. health, 5. social security (social); improvements in 1. public finances (economic).

Illegal transfer of apartments

The rents at Can Vilardell are very low (between 48 and 140 Euros, depending on the age of the lease) and therefore the apartments are in high demand. Consequently, an illegal market has developed whereby a vacated apartment is sold to the incoming tenant either by the leaving tenant or by the neighbouring tenants. The sums transferred are not inconsequential: for the right to benefit from such low rents an incoming tenant in this system pays approximately 24 000 Euros.

According to the rental lease, the tenants are obligated to notify the managers when they move out. Management then has the right to select a new tenant for the vacated apartment. When an illegal transfer is conducted, however, the parties involved do not notify management and the new tenant instead assumes the identity of the former one. Given the limited financial and staff resources of the stock managers, it is very difficult for them to catch this transaction if the new tenant continues to pay rent. Thus, the managers are unable to implement their regulation on notification of moving.

In addition to being an illegal use of *RS 1 Living Space* by the new tenant, and an illegal use of *PF 1 Capital Investment* by the sellers, such transactions impede the management from using the stock for the use of *NM 1 Solving General Housing Needs*. More specifically, since these apartments are subsidized and management should be renting them to people who qualify under the Subsidised Housing Act of 1978, illegal transfer of apartments removes apartments from the pool of both publicly subsidised housing and rental housing both of which are in short supply in Catalonia.

From a traditional sustainability perspective, economic sustainability is impeded since low rents are offset by the price of the sale, and an efficient use of public finances is not promoted. Social sustainability is also diminished due to difficulty of housing low income households.

- **Low coherence:** regulations regarding notification of moving are not enforced.
- **Conflict:** between *NM 1 Solving General Housing Needs* and illegal use of *RS 1 Living Space* and illegal use of *PF 1 Capital Investment*.
  - **Evaluation of sustainability indicators:** poor 1. cost of living, 2. public finances (economic), 3. integration (social).

NM 2 Solving Non-Housing Needs

Using housing to clear municipal and state debt

As described in the example provided for *NM 1 Solving General Housing Needs*, the abrogation of the German law on non-profit housing in 1990 lifted restrictions on the sale of the formerly non-profit housing stocks. Consequently, several very large public housing stocks (namely the GSW in Berlin and WoBA in Dresden) have been sold to banking consortiums and hedge funds with the purpose of using the proceeds to eliminate some of the huge debt incurred by many German cities (use of *NM 2 Solving Non-Housing Needs*). The change in property rights from a public non-profit housing company with a regime-dictated long-term strategy to a profit-driven hedge fund with no temporal constraints on their strategy may have some potentially dramatic effects on the sustainability of the housing stocks.

- A non-shelter service, *PF 1 Capital Investment*, takes precedence over using the housing stock for shelter.
- **Management strategy:** no obligation to have a strategy based on a long-term perspective.
  - **Evaluation of sustainability indicators:** potential decline in 1. cost of living, 2. maintenance of infrastructure, 3. resource efficiency (economic), 4. health, 5. integration, 6. social security (social); improvement in 1. public finances (economic).

NM 3 Shaping the Characteristic Landscape

Stadium style landscape

Since one Swiss housing stock was a large development constructed on wide open land (see *PF 2 Land Investment*), the opportunities to make an architectural statement on the landscape were great. Hence, the architect hired by the canton of Zurich to design a spatial model that would be the basis of all new housing developments created a model of the landscape from the waterfront that would produce a "stadium" effect, with low rise buildings in the foreground and increasing in size back toward the rail lines. The amendment of the 1959 building ordinance that allowed large scale housing developments is the regime element that paved the way for this design to become a reality. The sustainability merits of the design are debatable, but overall the impact of high rise construction on the landscape has not been viewed favourably.

- Change in regulations (building ordinance) allowed for a much less restricted use of *NM 3 Shaping the Characteristic Landscape*.
  - Evaluation of sustainability indicators: poor 1. quality of the landscape, 2. quality of the living environment (social).

NM 4 Social & Cultural Complexity

Improving diversity through renovations

By the late 1980s, many tenants in one high-rise housing stock in Switzerland had moved away since single-family homes were now trendy. The once tight-knit community began to drift apart and the principle of "social topography" emerged in the town, whereby neighbourhoods with houses with the fewest stories had the highest prestige and the eight-story high-rise buildings had the lowest; the number of stories of housing buildings became a reflection of their internal social structure. This situation was neither beneficial to the town nor the stock owner, so renovations to the stock were proposed that would re-inject a wider social and cultural range of tenants into the stock (change the use of *RS 1 Living Space*). A change in use in *NM 4 Social & Cultural Complexity* was motivated by a desire to benefit from increased rental income of the stock *(PF 1 Capital Investment)* but also to avoid a homogenous social structure within.

- **Conflict:** Use of *NM 4 Social & Cultural Complexities* and *PF 1 Capital Investment*.
  - **Evaluation of sustainability indicators:** poor 1. community, 2. culture (social).
- **Management strategy:** encourage changes in the actors that use *RS 1 Living Space* by conducting an extensive renovation program, thereby improving the use of *NM 4 Social and Cultural Complexity*.
  - **Evaluation of sustainability indicators:** improvement in 1. maintenance of infrastructure (economic), 2. quality of the living environment, 3. community, 4. culture (social) as well as the use of *PF 1 Capital Investment*.

NM 5 Conservation and Transmission of Social and Historical Values

Radical change of the landscape

The construction of the high-rise apartment towers radically changed the character of one Swiss rural town, which previous to 1967 had been historical and agricultural. One could make the argument that this represented an underuse of *NM 5 Conservation & Transmission of Social & Historical Values* by the town and the cantonal authorities that allowed the construction to happen.

- Underuse of *NM 5 Conservation and Transmission of Social and Historical Values*.
  - **Evaluation of sustainability indicators:** poor 1. land consumption (environmental), 2. quality of the Landscape, 3. quality of the living environment, 4. community, 5. culture (social).

5 Description of summaries

The summaries present the most significant findings for each of the 23 goods and services from the case studies in Switzerland, Germany and Spain. They describe empirical results from the research; therefore some entries may be relevant to other stocks whereas others may not. The purpose of the summaries is to illustrate the type of information that should be considered when evaluating goods and services of the housing stock.

Each summary consists of the following sections:

A. Description

A definition of the good or service is provided, followed by a table that addresses the user, the use and the use right to the good and service.

User actor	Intended use	Forms of use right
1. Who are the users of the good or service?	How do the users use the good and service and for what purpose?	What regulations grant the user the right to use the good or service?
2. …	…	…

B. Conflicts, Synergy and Effects

A brief summary of the key actors with whom the users interacts is presented, followed by a table that lists which of the 22 other goods and services might come into use conflict, the effects of these conflicts on actors and on sustainability, and the regime based cause for the conflict (low extent, low coherence). Similarly, potential synergies are also presented.

Use conflict with...	Description and effects	Cause
1. Good and service in use conflict	Description of conflict Effect of conflict on actors and sustainability.	Regime-based cause of conflict (low extent, low coherence)
2. …	…	…
Synergy with...	**Description and effect**	**Cause**
1. Good and service in use synergy	Description of synergy Effect on actors and sustainability	

C. Prioritization of Goods and Services

This section addresses whether the use of non-shelter goods and services was prioritized over the use of shelter goods and services (described in Table 3) and, conversely, whether the use of shelter goods and services stifled the use of non-shelter goods and services, both cases of which have consequences on the sustainability of the housing stock.

For the analysis of a shelter good and service, the following two questions are asked:

- Was the use of the shelter related good or service considered secondary to the use of non-shelter goods and services?
- Did the use of the shelter related good or service stifle the use of housing for non-shelter purposes?

The formulation of the questions for non-shelter goods and services is slightly different:

- Did the use of the non-shelter good or service take priority over the use of housing for shelter?
- Was the use of the non-shelter good or service stifled by using housing for shelter?

D. The Regime and Actor Behaviour

This section addresses how changes in the regime can change who has use rights to goods and services and how they use them, both of which have sustainability consequences.

- Did recent, current or anticipated regulations introduce new users to use the good or service?
- Did recent, current or anticipated regulations change the way current users use the good or service?

E. The Regime and Management Strategies

What are the ways that management strategies can be adapted to address conflicts (B. above), prioritisation and stifling of goods and services (C. above), and actor behaviours (D. above)? How can these decisions and strategies help housing stock sustainability?

F. Sustainability Assessment and Applicable Indicators

Sustainability indicators that were applicable in the case studies are listed in this section and address conflicts, synergy and effects (B., above), the prioritization of goods and services (C.), the regime and actor behaviour (D.), as well as additional sustainability observations regarding the use of the good or service.

Environmental	Economic	Social
Land consumption	Revenue	Quality of the living environment
Energy consumption	Cost of living	Integration
…	Resource efficiency	Culture
…	Public finances	…

SUMMARY: RS 1 LIVING SPACE

A. DESCRIPTION

RS 1 Living Space is the private space in which household members live, i.e., the apartment.

User actor	Intended use	Forms of use right
1. Tenants with unrestricted rights to apartments	To have a home in which to eat, sleep and live comfortably. For some, it may also be used as a secondary workspace (telecommuting).	Rental contract between tenant and owner
2. Tenants with restricted rights to apartments (subsidized housing)	*Same as above*	Rental contract between tenant and owner, in accordance with restrictions on eligibility defined in public policies.
3. Cooperative owner-tenants	*Same as above*	Rental agreement between cooperative member and management.
4. Squatters	To live in a place that provides adequate shelter, and in some cases to eat, sleep and live comfortably.	None

B. CONFLICTS, SYNERGY AND EFFECTS

The users of *RS 1 Living Space* have contact with many of the other users of their building's goods and services. They interact mainly with each other on a day-to-day basis but also with the stock manager (but not necessarily the stocker owner) and building caretaker.

Use conflict with...	Description and effects	Cause
1. PF 1 Capital Investment	Tenants do not pay rent or are very behind on rent payments. **Effect:** Insufficient rental revenue is earned by the owner to adequately maintain the stock.	**Low coherence:** the rental conditions of the lease are not enforced.
2. NM 1 Solving General Housing Needs	Subsidized apartments are transferred to new tenants for a fee paid to the old tenants, all without the knowledge of the stock manager. **Effect:** subsidized apartments are not being inhabited by tenants qualified for them.	**Low coherence:** the conditions for the attribution of subsidized housing are not being enforced.
Synergy with...	**Description and effect**	**Cause**

C. PRIORITIZATION OF GOODS AND SERVICES

Was the use of RS 1 (housing for shelter) considered secondary to the use of non-shelter goods and services?

- No.

Did the use of RS 1 stifle the use of housing for non-shelter purposes?

- There is one instance in which the use of *RS 1 Living Space* stifled the use of *PF 1 Capital Investment*, a non-shelter service of housing (see conflict 1). The owners of a social housing stock in Spain did not insist on collecting rent in order to avoid evicting tenants who would otherwise have few housing alternatives. Since revenues were significantly lower than they should have been, the stock was not maintained and the public owners found themselves heavily indebted. Aside from this case, the use of RS 1 has not stifled the use of non-shelter goods and services.

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to RS 1?

- No.

Did recent, current or anticipated regulations change the way users use RS 1?

- A revision of the tenancy act in Switzerland mandates changes in the way rent is set, effectively changing the conditions for use of *RS 1 Living Space*.
- Recent legislative changes (Spain) mandate that new subsidized housing must be rental and not for sale.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Health and safety concerns regarding squatted spaces.

Environmental	Economic	Social
Land consumption	Revenue Cost of living Resource efficiency Public finances	Quality of the living environment Health Security Integration Culture

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Resolving use conflicts

- Establishing repayment schemes with individual tenants who are in arrears.
- Spain: Areas being squatted are being boarded up, but this is still leading to a deterioration of the stock.

C. Prioritization of goods and services

- Spain: New public policies on social housing oblige stock owners and managers to devise plans for rent repayment and require that a maintenance and renovation plan be drafted.

SUMMARY: RS 2 INDOOR CLIMATE & TECHNICAL SERVICES

A. DESCRIPTION

RS 2 are the services that tenants use to enjoy an acceptable level of indoor environmental comfort within their apartments (e.g. showers, toilets, and sinks, radiators and electrical outlets).

User actor	Intended use	Forms of use right
1. Tenants	To live comfortably in the apartment by having conditions of adequate indoor environmental quality and by using services of drinking water, domestic hot water, wastewater drainage, gas, electricity, etc.	Contract between tenant and service provider; contract between tenant and stock owner; public policy allowing taxation or billing for services
2. Squatters	To use, where feasible, services of drinking water, domestic hot water, wastewater drainage, gas, electricity, etc. to live as comfortably as possible.	

B. CONFLICTS, SYNERGY AND EFFECTS

Tenants using RS 2 interact with some utility services, such as for the provision of electricity to individual apartments, and the housing stock manager who bills the tenant for the use of other services, such as water and heating.

Use conflict with...	Description and effects	Cause
1. PF 1 Capital Investment	Stock owner does not adequately maintain the technical services (e.g., drafty windows, leaking faucets). **Effect:** Tenants must use and pay for more heat or more water.	**Low coherence – policy target wrong group:** eco-type taxes target stock owners, but the cost is passed on to the tenant even though they have little control over energy consumption.
2. US 5 Water Discharge	Tenants flush medications down toilets and drains. **Effect:** micropollutants are added to the wastewater system which are difficult to remove.	**Low extent:** no regulations concerning flushing medications (but they would be difficult to enforce if they existed).
3. NM 1 Solving General Housing Needs	As the cost of utility services increase, tenants must dedicate to them a growing portion of their available income for housing. For social housing owners, this is particularly problematic. **Effect:** housing affordability decreases.	**Low coherence – incoherence between regulations:** policies on the liberalization of the electricity markets have led to cost increases (e.g. in Germany) which conflict with the low cost objectives of social housing.
Synergy with	**Description and effects**	**Cause**
1. US 4 Water Supply	Each new connection to the water supply network allows the water to circulate faster and thus stagnate less. **Effect:** flushing mechanism is good for water quality.	

C. PRIORITIZATION OF GOODS AND SERVICES

Was the use of RS 2 (housing for shelter) considered secondary to the use of non-shelter goods and services?

- No.

Did the use of RS 2 stifle the use of housing for non-shelter purposes?

- No.

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to RS 2?

- No.

Did recent, current or anticipated regulations change the way users use RS 2?

- The liberalization of electricity markets may result in an increase in the price for electricity consumption. Users of RS 2 with limited income may feel such cost increases acutely and consequently reduce their use of technical services at the expense of their comfort.
- There exist no regulations concerning flushing medications and other household products that add micropollutants to the wastewater stream. However, at the moment it does not seem conceivable that such regulations, if they did exist, could be enforced.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Increasing presence of micropollutants in wastewater stream.
- Increasing bills for the use of technical services.
- Energy consumption due to poor technical services or poor use of technical services.

Environmental	Economic	Social
Water management	Revenue	Quality of the apartment
Water quality	Cost of living	Health
Consumption of primary resources: material flows	Reflection of real costs	Security
Consumption of primary resources: material recycling	Public finances	
Air quality		
Climate		
Energy consumption		
Energy quality		

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

<u>B. Resolving use conflicts</u>

- Managers can work with wastewater treatment utilities on raising awareness regarding flushing medications.
- Distributing materials regarding proper use of technical services.

SUMMARY: NR 1 COMMERCIAL SPACE

A. DESCRIPTION

NR 1 Commercial Space is space that can be rented or used by third parties including businesses, associations and kindergartens.

User actor	Intended use	Forms of use right
1. Stores, businesses, associations, schools, community centres, etc.	To lease space that is not used for living purposes with the objective of running a business or other service.	Lease between tenant and stock owner or manager.
2. Squatters	To use the space for living.	None.

B. CONFLICTS, SYNERGY AND EFFECTS

Users of commercial space have a regulated relationship (via the contract) with the stock manager, and unregulated relationships with the tenants of the stock, local residents and others who frequent their businesses or institutions.

Use conflict with	Description and effects	Cause
1. RS 1 Living Space	Squatters of unrented commercial space can disrupt the sense of security of tenants. **Effect:** lower sense of security.	**Low extent:** squatter have no use rights to the commercial space and therefore appropriate it.
2. RS 1 Living Space	Noise from commercial space can be disruptive to tenants. **Effect:** Decrease in enjoyment of home.	-
Synergy with	**Description and effects**	**Cause**
1. UF 3 Demand for institutional services	Institutions that rent the commercial space use the demand for their services generated by tenants and other local residents. **Effect:** increase in accessibility of services	Contract with public authorities. Stockowners must at times provide space in new buildings for institutions such as kindergartens in order to obtain a building permit.
2. UF 4 Demand for goods and services	Businesses that rent the commercial space simultaneously use the demand for goods and services generated by tenants and other local residents. **Effect:** increase in accessibility of goods and services	Contract between business and stock manager.

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of NR 1 take priority over the use of housing for shelter?

- No

Was the use of NR 1 stifled by using housing for shelter?

- No

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NR 1?

- No

Did recent, current or anticipated regulations change the way users use NR 1?

- No

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Safety and security concerns of tenants regarding squatters.
- Relationship between renters of commercial space, managers and tenants.
- Reduction of travel necessary for accessing goods and services.
- Opportunity for employment from the businesses and institutions in the commercial spaces.
- Empty spaces deteriorate more rapidly.

Environmental	Economic	Social
Climate	Jobs	Offer of goods and services Leisure Health Safety

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Resolving use conflicts

- Unused commercial spaces can be boarded up. This may prevent squatters from inhabiting them but may lead to a deterioration of the space and social unease.
- Commercial spaces are not rented to certain categories of businesses or institutions, such as restaurants or bars.

SUMMARY: NR 2 COLLECTIVE INDOOR SPACE

A. DESCRIPTION

NR 2 Collective Indoor Space consists of all spaces that are used for particular activities by tenants and building caretakers including laundry rooms, storage areas, meeting and activity rooms and indoor parking.

User actor	Intended use	Forms of use right
1. Tenants	To use common rooms for laundry, storage, meetings and parking	Some might be described in the rental lease (e.g., use of parking space), whereas others might be unregulated (e.g., use of activity rooms). These vary from one stock to the other.
2. Non-residents who rent parking spaces	To park their car	Rental contract with stock owner
3. Building caretaker	To ensure maintenance of collective spaces in return for payment or lower rent	Rental lease or job contract with stock owner

B. CONFLICTS, SYNERGY AND EFFECTS

The users of *NR 2 Collective Indoor Space* interact mainly with each other (e.g., tenant with tenant, tenant with building caretaker) or with the housing stock manager (e.g., non-residents who rent parking spaces from the stock manager).

Use conflict with...	Description and effects	Cause
1. NR 2 Collective Indoor Space	Misuse of activity rooms by some tenants lead to their deterioration and discourage others from using them. **Effect:** decreased social & leisure opportunities within the stock.	**Low extent:** use of common rooms is unregulated, OR **Low coherence – regulations not enforced:** existing regulations on the proper use of indoor space are not being enforced
2. PF 1 Capital Investment	Misuse of common spaces by tenants oblige stock owners to conduct more frequent maintenance and renovation work. **Effect:** higher expenditures for stock owner.	*Same as above*
3. PF 1 Capital Investment	Parking spaces in one stock were found to have no legal owner, i.e., no one had possession of the use right. **Effect:**,spaces were not maintained and physically deteriorated.	**Low extent:** use of parking spaces unregulated due to lack of property rights.
Synergy with...	**Description and effects**	**Cause**
1. PF 1 Capital Investment	Rental of parking spaces to non-residents can be an important revenue stream for the stock owner.	-

C. PRIORITIZATION OF GOODS AND SERVICES

Was the use of NR 2 (housing for shelter) considered secondary to the use of non-shelter goods and services?

- No.

Did the use of NR 2 stifle the use of housing for non-shelter purposes?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NR 2?

- No.

Did recent, current or anticipated regulations change the way users use NR 2?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Premature deterioration of spaces can occur due to poor maintenance.
- Decrease in on-site recreation and leisure opportunities if activity rooms are in poor condition or if they are closed by the stock owner.

Environmental	Economic	Social
	Resource efficiency	Community Recreation

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

<u>B. Resolving use conflict</u>

- Some owners have stopped providing activity rooms in new buildings or have closed existing activity rooms due to constant misuse of the space in other buildings. This has the consequence of reducing leisure and recreation opportunities in the stock.
- Stock managers may charge a fee or a damage deposit for the use of common spaces to ensure they are well maintained by the user during use.

SUMMARY: NR 3 FUNCTIONAL SPACE

A. DESCRIPTION

NR 3 Functional Indoor space consists of all spaces that have a functional purpose and without which the buildings of the stock could not exist, such as hallways, stairwells, entranceways, elevators, etc.

	User actor	Intended use	Forms of use right
1.	Tenants	To use these spaces to access other parts of the building (apartment, parking, entrance, etc.).	Rental lease
2.	Cleaners, maintenance staff	To clean and maintain these spaces in return for payment or lower rent.	Contract with stock owner or manager
3.	Visitors	To use these spaces to visit tenants.	None

B. CONFLICTS, SYNERGY AND EFFECTS

Users of functional space do not have any significant interaction with other actors, except when conflict arises as described below.

	Use conflict with...	Description and effects	Cause
1.	NR 3 Functional Space	When tenants are responsible for cleaning functional spaces, conflict may occur when certain tenants do not do their share. **Effect:** lower social cohesion between tenants.	**Low extent:** cleaning of functional spaces is unregulated.
2.	PF 1 Capital Investment	Conflict between tenants and stock manager can arise if functional spaces are not maintained (e.g., broken lights, broken intercom, dirty hallways). **Effect:** deterioration of building; tension between stock owner and tenants.	**Low coherence – poorly described regulations:** does tenant withhold rent if spaces are poorly maintained or can stock owner not maintain spaces if rents are not being paid?
3.	NM 1 Solving General Housing Needs	To keep rents low, owners of social housing may forgo hiring cleaners for functional space. **Effect:** spaces may be poorly maintained (also see conflict 1)	-
	Synergy with...	**Description and effect**	**Cause**

C. PRIORITIZATION OF GOODS AND SERVICES

Was the use of NR 3 (housing for shelter) considered secondary to the use of non-shelter goods and services?

- As described in conflict 2, there may circumstances when the use of *NR 3 Functional Spaces* (a shelter-related good and service) is treated as secondary to the use of non-shelter goods and services, specifically *PF 1 Capital Investment*. This occurs when the stock owner invests insufficiently in the maintenance of the functional spaces.

Did the use of NR 3 stifle the use of housing for non-shelter purposes?

- As described in conflict 2, there may be circumstances when the use of *NR 3 Functional Spaces* stifles the use of the non-shelter service *PF 1 Capital Investment*. This occurs when tenants either do not pay rent, which provides revenue for the maintenance of these spaces, or when tenants wilfully damage property (graffiti, breaking intercoms, damaging doors, etc.).

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NR 3?

- No.

Did recent, current or anticipated regulations change the way users use NR 3?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Vandalism, misused spaces cause rapid deterioration.
- Poor cohesion between neighbours in the case where functional space is not maintained or cleaned.
- Poor cohesion between tenants and stock manager if functional space is not maintained or repaired.
- Hiring cleaners increases rental costs.
- Safety concerns if the door is automatically locked throughout the night when there is no intercom access.
- Problems when some apartments are rented, others are owned. Who is responsible for cleaning, maintenance of functional spaces?

Environmental	Economic	Social
	Cost of living Resource efficiency	Quality of the living environment Health Security Community

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

<u>B. Resolving use conflicts</u>

- A formalized system for cleaning functional spaces can be established between tenants whereby a household on each floor has the responsibility to clean the space for a week.

<u>C. Prioritization of goods and services</u>

- Recent public policies in Spain oblige public stock owners to devise maintenance and renovation plans for the functional spaces (amongst other spaces) of their stock.

SUMMARY: NR 4 COLLECTIVE OUTDOOR SPACE

A. DESCRIPTION

NR 4 Collective Outdoor Space is the outdoor space located on the building property that is typically used for parking, play areas, green space, outdoor storage and building access.

User actor	Intended use	Forms of use right
1. Tenants	To gain access to the building and to enjoy the outdoor space.	Rental lease may describe some conditions of use of outdoor space, especially regarding parking.
2. Non-tenants with access to the exterior of the stock	To enjoy the outdoor space.	None.
3. Waste collection services	To collect waste and recyclables from the bins located outside.	Waste legislation describing what waste must be collected from where.
4. Maintenance staff	To maintain the outdoor area in return for payment.	Contract with stock owner

B. CONFLICTS, SYNERGY AND EFFECTS

Use conflict with...	Description and effects	Cause
1. RS 1 Living Space, and RS 4 Collective Outdoor Space	Disruptive individuals may discourage tenants from using outdoor space or may disrupt their enjoyment of their apartments. **Effect:** security concerns, decrease in enjoyment of apartments.	**Low coherence – regulations not enforced:** Who is responsible? Stock manager or police?
2. PF 1 Capital Investment	Lack of care and even vandalism by some residents can make outdoor spaces shabby and dirty. **Effect:** outdoor spaces are shabby and dirty.	**Low coherence – regulations not enforced**.
3. US 3 Waste Discharge	There may be insufficient outdoor space for the number of waste and recycling bins required. **Effect:** awkward configuration of bins for collection; waste spills onto the ground.	**Change in regulations:** Requirement for additional bins was unforeseen.
Synergy with	**Description and effects**	**Cause**

C. PRIORITIZATION OF GOODS AND SERVICES

Was the use of NR 4 (housing for shelter) considered secondary to the use of non-shelter goods and services?

- No.

Did the use of NR 4 stifle the use of housing for non-shelter purposes?

- No.

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NR 4?

- No.

Did recent, current or anticipated regulations change the way users use NR 4?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Vandalism, misused spaces cause rapid deterioration.
- Some outdoor spaces may be used for drug dealing.
- The outdoor space can be very important for social interactions, especially in warm climates such as Spain.
- Planning and design characteristics may make private spaces seem public, or public spaces seem private.
- Landscaping may have large water consumption requirements.

Environmental	Economic	Social
Water consumption Land consumption Natural spaces	Resource efficiency	Quality of the landscape Quality of the living environment Health Security Community Recreation

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

<u>B. Resolving use conflicts</u>

- Stock managers become more proactive at enforcing regulations regarding loitering, noise and vandalism.
- Benches are removed from outdoor spaces to disruptive individuals from congregating.
- Stock managers hire third parties to compact waste prior to collection, thereby reducing the number of bins that need to go in the limited space.

SUMMARY: PF 1 CAPITAL INVESTMENT

A. DESCRIPTION

PF 1 Capital Investment allows the investor to perceive some economic benefit related to the ownership of the stock.

User actor	Intended use	Forms of use right
1. Housing stock owner	To make profits from rental revenues.	Property rights of the stock owner.
2. Housing stock developer	To make profits from developing and selling a housing stock.	Contract of sale of the housing stock.
3. Banks and other mortgage providers	To make profits from interest repayments related to loans and mortgages.	Loan or mortgage contract with the stock owner.
4. Housing cooperative shareholders	To earn dividends on shares.	Cooperative contract detailing conditions of purchase of shares.
5. Employees of companies whose pension plan includes shares of the owning foundation	To invest in the stock for retirement.	Described in policies on occupational pensions.

B. CONFLICTS, SYNERGY AND EFFECTS

The main users of *PF 1 Capital Investment* (the stock owners) interact with nearly all other actors of the housing institutional regime. Consequently, the conflicts and synergies from the case studies related to the use of PF 1 are documented in the summaries of the other goods and services and are not repeated here.

Use conflict with...	Description and effects	Cause

Synergy with	Description and effect	Causes

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of PF 1 take priority over the use of housing for shelter?

- Yes; please refer to the summaries of *NR 3 Functional Space* and *NM 1 Solving General Housing Needs*.

Was the use of PF 1 stifled by using housing for shelter?

- Yes; please refer to the summaries of *RS 1 Living Space, NR 3 Functional Space* and *NM 1 Solving General Housing Needs.*

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to PF 1?

- Changes in property rights that occur via legislative changes may allow new actors a use right to PF 1. For instance, the abrogation of the German law on non-profit housing allowed many investors with short-term investment objectives to purchase large public housing stocks.

Did recent, current or anticipated regulations change the way users use PF 1?

- Changes in property rights that occur via legislative changes allow the stock owner to use the investment potential of the housing stock differently, as in the above example. Additionally, some public policies may also affect the use of PF 1. For instance, changes in public policies on occupational pensions may affect how institutional investors invest in housing.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

Many other indicators may be applicable.

Environmental	Economic	Social
Land consumption	Income	Quality of the landscape
Material flow	Cost of living	Quality of the living environment
Material recycling	New investment	Security
Air quality	Maintenance of infrastructure	Integration
Climate	Real costs	Community
Energy consumption	Resource efficiency	Recreation
Energy quality	Public finances	Social security

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

Refer to the summaries of the other goods and services for suggestions on improving the sustainable use of *PF 1 Capital Investment*.

SUMMARY: PF 2 LAND INVESTMENT

A. DESCRIPTION

PF 2 Land Investment allows the investor to perceive some economic benefit from the ownership, sale or leasing of land for the housing stock.

User actor	Intended use	Forms of use right
1. Public landowners	To encourage housing construction by public-interest or speculative housing entities by granting surface rights or selling land. To mitigate real estate speculation.	Contract for sale of land; contract for granting surface rights
2. Private landowners	To make a profit from the sale of the land.	Contract for sale of land.

B. CONFLICTS, SYNERGY AND EFFECTS

Land owners interact primarily with the stock owner or public authorities.

Use conflict with	Description and effects	Cause
1. UF 1 Design of Urban Space	Surface rights to public land have been offered for land that is poorly situated, thus encouraging poor use of the design of urban space. **Effect:** exposure to noise, traffic, air-borne particulates	-
2. NM 1 Solving General Housing Needs	Some private landowners hesitate to sell to cooperatives since they do not look favourably upon housing cooperatives, non-profit or subsidized housing. **Effect:** difficulties for cooperatives to buy suitable land.	-
3. UF 1 Design of Urban Space	Land zoned for agricultural use is bought in large tracts to exert pressure on municipalities to have it declassified to constructible land. **Effect:** consumption of agricultural land.	**Low coherence – incoherence between regulations:** policies allowing housing construction outside "buildable land" areas conflict with land use policies intended to preserve the integrity of agricultural land.
Synergy with	**Description and effects**	**Cause**
1. NM 1 Solving General Housing needs	Inexpensive surface rights of public land allow non-profit housing organizations to build affordable housing.	
2. PF 3 Labour Investment	Landowners who are architects or tradespeople sell land on condition that their services be used for the design and construction of the project.	Contract for sale of land

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of PF 2 taken priority over the use of housing for shelter?

- No.

Was the use of PF 2 stifled by the use of housing for shelter?

- No.

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to PF 2?

- No.

Did recent, current or anticipated regulations change the way users use PF 2?

- Changes in zoning and building ordinances that encourage housing construction may encourage landowners to sell their land.
- A revision of the law on spatial development (Switzerland) may change some actors' behaviour with respect to selling or leasing their land for housing.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Surface rights to public land or acquisition of inexpensive land for non-profit housing organizations encourages the production of affordable housing.
- Surface rights to public land can be granted under conditions that promote sustainable development (e.g., the housing stock owner must fulfil certain criteria on energy efficiency, water consumption, material use, etc.)
- By granting surface rights instead of selling, public authorities remove some land from the speculative real estate market.
- When one owner owns a lot of land in a municipality, it may give him or her considerable influence over development plans and zoning changes.

Environmental	Economic	Social
Land consumption Natural spaces	Public finances	Quality of the landscape

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

-

SUMMARY: PF 3 LABOUR INVESTMENT

A. DESCRIPTION

PF 3 Labour Investment allows persons to perceive some economic benefit from investment of labour in the housing stock.

User actor	Intended use	Forms of use right
1. Construction and renovation companies	To use the demand for labour generated by the need for the construction, maintenance and deconstruction / demolition of the housing stock with the purpose of generating profits.	Contracts (private or public law). Use rights may be granted based on, e.g., type of actor (cooperative or not), location (local company or not), and compliance with labour regulations.
2. Architects and designers	To use the demand for labour generated by the need for design and planning of the housing with the purpose of generating profits.	Contracts (private or public law).
3. Building caretakers, cleaners	To use the demand for labour generated by the need for maintenance and upkeep of the stock with the purpose of generating profits.	Contracts with stock manager. Conditions may be described in rental lease if actor lives in the stock.

B. CONFLICTS, SYNERGY AND EFFECTS

Users of *PF 3 Labour Investment* interact primarily with the stock owner.

Use conflict with...	Description and effects	Cause
1. RS 1 Living Space	During renovations, tenants are moved temporarily from their apartments. **Effect:** temporary interruption in the use of own living space.	-
2. NM 1 Solving General Housing Needs	Labour shortages in the non-profit housing sector occurred due to a more attractive demand (i.e., more profit) from other sectors, such as market housing. **Effect:** insufficient availability of labour to build affordable housing.	**Low coherence:** Several laws promoted the construction of affordable housing but failed to address the problem of labour shortages.
Synergy with	**Description and effects**	**Cause**
3. PF 2 Land Investment	Contracts for labour have been awarded as a condition of sale of land.	
4. NM 2 Solving Non-Housing Needs	Housing assistance has previously been offered to create and renovate housing with the purpose of jumpstarting the construction sector and thus the general economy.	

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of PF 3 take priority over the use of housing for shelter?

- The use of *PF 3 Labour Investment* has taken precedence over using housing for shelter when it has been underused. This means that there has been insufficient labour to meet the demand of public and private affordable housing organizations to build necessary housing.

Was the use of PF 3 stifled by the use of housing for shelter?

- No.

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to PF 3?

- No.

Did recent, current or anticipated regulations change the way users use PF 3?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Social effects of sudden increase of foreign workers
- Safety concerns regarding poor construction practices
- Activity in the construction sector influencing the economy
- Increasing costs of construction

Environmental	Economic	Social
	Jobs Investment: new Investment: maintenance of the stock Resource efficiency	Health Security

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

-

SUMMARY: US 1 DEMAND FOR ENERGY

A. DESCRIPTION

US 1 Demand for energy is composed of heating demand and electricity demand by the housing stock.

User actor	Intended use	Forms of use right
1. Public or private suppliers of electricity	To compete for and satisfy the demand for electricity.	Contract with individual tenants for demand in apartments or contract with stock manager for common electricity use.
2. Public or private suppliers of gas, oil, wood, and any other heating fuel	To compete for and satisfy the demand for heating fuel.	Sale contract with the stock manager.
3. District heating supplier	To satisfy the demand for heating in areas serviced by district heating network.	Contract with the stock manager, but use right may be mandated in energy supply policies.
4. Suppliers of photovoltaic panels, solar hot water heaters	To sell solar based heating and hot water systems.	Contract with the stock manager.

B. CONFLICTS, SYNERGY AND EFFECTS

The users of *US 1 Demand for Energy* interact mainly with those who purchase their goods or services, namely the individual tenants or the stock owner/manager. They may also interact with users of *US 3 Material Discharge*, who collect household waste for incineration, the waste energy of which can be used for electricity generation or district heating. Finally, profits from public utilities' use of *US 1 Demand for Energy* have been used to offset losses in other services, such as public transportation.

Use conflict with...	Description and effects	Cause
1. US 1 Demand for Energy	Competition to satisfy demand for energy can turn into conflict if different types of heating are promoted within the same public utility.	**Low coherence:** existing regulations on heating provision encourage both e.g., district heating and natural gas.
2. PF 1 Capital Investment	Rising costs of heat and electricity oblige some stock owners to search for cost savings in other areas to keep the total housing cost (rent plus operational charges) low. **Effect:** increase in total cost to tenant but decrease in profits for stock owner.	**Low coherence – incoherence between policies:** liberalization of the energy markets leading to price hikes conflicts with affordable housing objectives.
Synergy with	**Description and effects**	**Cause**
1. US 3 Material Discharge	Waste collected from housing stocks is used as fuel for incineration, which in turn produces energy for electricity or district heating.	Public policies on waste treatment and disposal

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of US 1 take priority over the use of housing for shelter?

- The use of *US 1 Demand for Energy* can stifle using housing for shelter if the costs of energy become too large a proportion of the overall amount tenants pay for their apartment (rent plus operational charges).

Was the use of US 1 stifled by the use of housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to US 1?

- The liberalization of electricity markets has allowed many new electric utilities to compete for access to the demand for energy.

Did recent, current or anticipated regulations change the way users use US 1?

- The CO2 tax in Switzerland will encourage suppliers of renewable energies and discourage non-renewable energies.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Different energy sources (e.g. oil versus solar) produce less or greater environmental damage.
- Increasing costs or fluctuating costs of energy may significantly affect housing affordability for some.
- The price tenants pay for energy may not reflect real costs.

Environmental	Economic	Social
Air quality	Revenue	Security
Climate	Cost of living	Quality of the living environment
Energy consumption	Investment: new	
Quality of energy	Investment: maintenance of stock	
	Real costs	
	Resource efficiency	

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Resolving use conflicts

- As the cost of energy increases, housing stock owners may seek to lower costs in other areas (e.g., forgo using cleaners for functional space) to keep overall housing costs lower.
- Renovation strategies can include energy efficiency measures.

SUMMARY: US 2 MATERIAL STORAGE & SINK

A. DESCRIPTION

US 2 Material Storage & Sink consists of the large quantities of materials that the construction, maintenance and renovation of housing stocks require.

User actor	Intended use	Forms of use right
1. Suppliers of construction, renovation and maintenance materials	To rationally exploit the stock of raw resources to sell materials needed for the construction and renovation of housing.	Contracts between stock owner and suppliers of materials or contractors

B. CONFLICTS, SYNERGY AND EFFECTS

The users of *US 2 Material Storage & Sink* interact mainly with the stock owner and with the general contractor, who is the user of *PF 3 Labour Investment*.

Use conflict with...	Description and effects	Cause
1. PF 1 Capital Investment	An underuse of US 2 (i.e., a shortage of materials) has previously slowed down and halted housing construction. **Effect:** insufficient housing built.	-
2. NM Solving General Housing Needs	*Same as above.*	-
Synergy with	**Description and effects**	**Cause**
1. PF 3 Labour Investment	The supplier of materials may be directly related to the construction or renovation company.	-

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of US 2 take priority over the use of housing for shelter?

- The users of *US 2 Material Storage & Sink* have in the past under-used this good and service. Demand for materials in other sectors (road construction) may have diverted supply of materials away from housing construction.

Was the use of US 2 stifled by the use of housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to US 2?

- No.

Did recent, current or anticipated regulations change the way users use US 2?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Poor quality or selection of materials can result in more maintenance requirements, decreased enjoyment by tenants and even health problems (in the case of moisture problems).
- Materials of low durability must be replaced sooner.
- The use of recycled or reusable materials and materials with low embodied energy and pollution production can be of environmental benefit.

Environmental	Economic	Social
Soil quality	Revenue	Quality of the apartment
Consumption of primary resources: material flow	Cost of living	Health
Consumption of primary resources: material recycling	Investment: new	
Air quality	Investment: maintenance of the stock	
Climate	Public finances	
Energy consumption		
Quality of energy		

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

-

SUMMARY: US 3 MATERIAL DISCHARGE

A. DESCRIPTION

US 3 Material Discharge comes in the form of household waste, household recyclable materials and construction waste.

	User actor	Intended use	Forms of use right
1.	Waste pre-treatment actors (e.g., waste compaction services, waste sorting companies)	To treat waste by compacting or pre-sorting on-site before it is collected.	Contract between stock manager and the compaction or sorting company.
2.	Waste and recyclables collectors (public or private)	To regularly collect waste and recyclables from the housing stocks and deliver them to treatment or disposal facilities.	Contract between collectors and treatment facilities (e.g., waste compactors); public policy may dictate who has the right to which type of waste.
3.	Waste treatment and disposal actors (e.g., landfill operators, incinerators)	To treat and dispose of household waste and recyclables	Public policy; service contract between municipality and treatment/disposal actors

B. CONFLICTS, SYNERGY AND EFFECTS

Users of US 3 interact with the stock manager, public authorities and at times incinerators who are the users of *US 1 Demand for Energy*.

	Use conflict with...	Description and effects	Cause
1.	NR 4 Collective Outdoor Space	Required number of waste/recycling bins exceeds available space. Bins are located on green space. **Effects:** lower enjoyment of outdoor space by tenants.	**Content of new regulations:** public policies on waste management require additional bins for recycling, compost, etc.
2.	NR 4 Collective Outdoor Space	Infrequent collection results in waste overflowing onto ground. **Effects:** unsanitary conditions, lower enjoyment of outdoor space by tenants.	**Low coherence—regulations have unintended outcomes:** frequency of collection is insufficient.
3.	NM 2 Solving Non-Housing Needs	Public utilities that charge for collection based on volume will see decreased revenues from stocks that have waste pre-treatment **Effects:** utility may increase fees.	**Low coherence—regulations have unintended effects:**
	Synergy with...	**Description and effects**	**Cause**
1.	PF 1 Capital Investment	Fewer bins required in stocks where pre-treatment occurs, resulting in lower charges.	Contract between pre-treatment actors and stock manager.
2.	US 1 Demand for Energy	Waste heat from incineration is used for electricity and district heat production.	Public policies on energy, waste disposal.

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of US 3 take priority over the use of housing for shelter?

- No.

Was the use of US 3 stifled by the use of housing for shelter?

- No.

D. THE REGIME AND ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to US 3?

- Public policies on packaging (in Germany) have encouraged some stock owners to introduce pre-treatment actors to using US 3. See conflict above for description.

Did recent, current or anticipated regulations change the way users use US 3?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Insufficient collection may result in public health concerns.
- The incineration of waste can be used for the production of electricity or heating energy.
- Rates of material recycling affect environmental sustainability.
- The reduction in volume of waste collected may result in reduced revenues for public authorities.
- Savings from waste compaction can be passed on to tenants of social housing.

Environmental	Economic	Social
Soil quality	Revenue	Quality of the living environment
Air quality	Cost of living	Health
Climate	Real costs	
Quality of energy	Resource efficiency	
Consumption of primary resources: material flow	Public finances	
Consumption of primary resources: material recycling		

F. THE REGIME AND MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

<u>B. Resolving use conflicts</u>

- To reduce the number of bins required, waste pre-treatment companies are hired to compact waste. In addition to saving space, this action reduces fees that are paid based on volume. This may be offset by a decision by public authorities to raise fees to make up the difference in lost revenue.

SUMMARY: US 4 WATER SINK

A. DESCRIPTION

US 4 Water Sink consists of the demand for potable water.

	User actor	Intended use	Forms of use right
1.	Public water treatment plants and distributors	To rationally exploit the water supply for the region to provide potable water in sufficient quantity and quality to the housing stock.	Public policy regarding water treatment and distribution. Contract to connect new buildings to the water distribution network.
2.	Bottled water suppliers	To make a profit from selling bottled water as an alternative to tap water.	Sale of bottled water.

B. CONFLICTS, SYNERGY AND EFFECTS

Domestic water suppliers interact with the stock manager who in turn charges the tenant (user of RS 2 Indoor Climate & Technical Services). Bottled water suppliers deal directly with the individual tenant.

	Use conflict with...	Description and effects	Cause
1.	US 4 Water Sink	Municipal suppliers and bottled water companies do not compete over water sources but rather the perception of the quality of their product by consumers. **Effect:** Increased consumption of bottled water produces greater waste and energy use.	**Low extent:** bottled water does not have to be treated to the same standards as the domestic water supply
2.	PF 1 Capital Investment	If water equipment in the stock is poorly maintained by the stock owner, there is little the municipal supplier can do to ensure good quality water. **Effect:** poor water quality for the tenants	**Low coherence:** regulations on water quality do not include maintenance of water equipment inside the stock.
	Synergy with	**Description and effects**	**Cause**
1.	RS 2 Indoor Climate & Technical Services	When a new building is connected to the water supply network, water circulation in the pipes increases, thereby reducing water stagnation and ensuring better water quality.	-

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of US 4 take priority over the use of housing for shelter?

- No

Was the use of US 4 stifled by using housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to US 4?

- No, but legislation does not reflect the presence of bottled water suppliers.

Did recent, current or anticipated regulations change the way users use US 4?

- No

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Bottled water is not regulated to the same standards as tap water.
- Bottled water creates large energy demands for treatment and bottling and produces large quantities of waste from used bottles.
- There is a minimum volume at which the water treatment plant runs efficiently, meaning a minimum use of water by tenants is needed. This may have unintended environmental consequences.
- Other environmental consequences may depend on whether water demand can be satisfied by a good water source.

Environmental	Economic	Social
Water management Water quality	Revenue Cost of living Investment: new Investment: maintenance of the stock Public finances	Health

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

D. Changing actor behaviour

- Some managers work in conjunction with public authorities to promote the use of the municipal water supply.

SUMMARY: US 5 WATER DISCHARGE

A. DESCRIPTION

US 5 Water Discharge consists of the flows of wastewater leaving the stock.

	User actor	Intended use	Forms of use right
1.	Wastewater collection and treatment plants	To accept wastewater of appropriate quality and quantity, treat it to required standards and discharge it back into water bodies.	Public policies on environmental and water protection; contract with stock owner to connect new buildings to the collection network.

B. CONFLICTS, SYNERGY AND EFFECTS

Wastewater treatment services interact with the stock manager who in turn charges the tenant (user of *RS 2 Indoor Climate & Technical Services*).

	Use conflict with...	Description and effects	Cause
1.	RS 2 Indoor Climate & Technical Services	People are increasingly flushing medication down toilets and drains adding pollutants to wastewater that currently are impossible or very difficult to remove. **Effect:** presence of micropollutants in water bodies; increased costs of wastewater treatment.	**Low extent:** this use of toilets and sinks is difficult to regulate due to difficulties of enforcement; until the technology exists to remove micropollutants, legislating discharge standards for micropollutants is not feasible.
	Synergy with	**Description and effects**	**Cause**
1.	US 1 Demand for Energy	The dehydrated treated solids from the wastewater treatment plants can be burned for fuel at the incinerator, the reject heat of which is absorbed by the district heating network.	

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of US 5 take priority over the use of housing for shelter?

- No.

Was the use of US 5 stifled by using housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to US 5?

- No.

Did recent, current or anticipated regulations change the way users use US 5?

- No, but as new technologies develop, standards for wastewater treatment may change to reflect a need to remove micropollutants.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Polluted water bodies from insufficient treatment can pose public health problems.
- The presence of micropollutants is increasing in water bodies.
- Hot and dry summers make wastewater treatment problematic.
- Division of storm water and wastewater streams may or may not be environmentally advantageous

Environmental	Economic	Social
Water management Water quality	Revenue Cost of living Investment: new Investment: maintenance of infrastructure Real costs Public finances	Health

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Resolving use conflicts

- Stock managers can work with wastewater treatment utility to raise awareness of tenants regarding the problems caused by flushing medications and other household products.

SUMMARY: UF 1 DESIGN OF URBAN SPACE

A. DESCRIPTION

UF 1 Design of Urban Space is the housing stock's ability to be part of a design of urban space.

	User actor	Intended use	Forms of use right
1.	Public planning authorities	To create and use building and zoning regulations that support good urban design. To create a well-designed urban setting by using the buildings of the housing stock as an element of urban design	Zoning regulations; neighbourhood plans
2.	Planners and architects	*See above*	*See above*
3.	The housing stock owner	*See above*	Building permits

B. CONFLICTS, SYNERGY AND EFFECTS

The users of *UF 1 Design of Urban Space* interact with each other during the design and planning phases of the housing stock. During renovation, tenants are often consulted.

	Use conflict with...	Description and effects	Cause
1.	PF 1 Capital Investment	Design restrictions, such as limits on density, limit the number of units the stock owner can build. **Effects:** density limits may stifle supply of additional dwelling units during housing shortages.	**Low coherence – incoherence between policies:** planning regulations call for restrictions on density but do not acknowledge the effect on housing availability.
2.	*Neighbours (external actor)*	Neighbours may oppose design proposals.	-

Synergy with	Description and effects	Cause

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of UF 1 take priority over the use of housing for shelter?

- No.

Was the use of UF 1 stifled by the use of housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to UF 1?

- No.

Did recent, current or anticipated regulations change the way users use UF 1?

- As planning regulations change, so does the allowable behaviour of planners, architects and designers.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Urban design has effects on housing density and the liveability of communities.
- There may be issues regarding equitable treatment concerning adjacent buildings that are granted different densities.
- Poor urban design may isolate the housing stock from the rest of the community.

Environmental	Economic	Social
Land consumption	Resource efficiency	Quality of the landscape Quality of the living environment Offer of goods and services Mobility Health Safety Community

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

- The stock owner can work with planners and public authorities to ensure new housing buildings support good urban planning and design.

SUMMARY: UF 2 DEMAND FOR TRAFFIC RELATED INFRASTRUCTURE

A. DESCRIPTION

UF 2 Demand for Traffic Related Infrastructure consists of the demand created by the inhabitants of a housings stock for public transit, roads, parking places, bike paths, etc.

User actor	Intended use	Forms of use right
1. Public transit providers	To use the demand for public transportation to extend the transit network	Policies on public transportation; contract between municipalities and the public or private transit company
2. Those who control surfaces used for traffic and parking	To provide space for parking and driving (motorized and non-motorized vehicles)	

B. CONFLICTS, SYNERGY AND EFFECTS

Public transit providers may interact with stock owners in new developments in order to determine demand.

Use conflict with...	Description and effects	Cause
1. PF 1 Capital Investment	In the past, the use of free street parking that resulted from street widening has interfered with the use of on-site parking spaces that stock owners are obliged to provide. **Effect:** decrease in rental revenues derived from on-site parking spaces.	**Low coherence – incoherence between policies:** conflict between regulations mandating street widening to accommodate more vehicles and the regulations requiring minimum on-site parking.
Synergy with	**Description and effects**	**Cause**
1. UF 3 Demand for Institutional Services	Institutional services serviced by transit are more accessible.	Planning regulations (zoning)
2. UF 4 Demand for Goods and Services	Businesses serviced by transit are more accessible.	Planning regulations (zoning)

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of UF 2 take priority over the use of housing for shelter?

- No.

Was the use of UF 2 stifled by the use of housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to UF 2?

- No.

Did recent, current or anticipated regulations change the way users use UF 2?

- No.

SUMMARY: UF 2 DEMAND FOR TRAFFIC RELATED INFRASTRUCTURE

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Problems of insufficient public transit service even where demand is present.
- Decrease of motorized vehicle trips or encouragement of motorized vehicle trips depending on the reliability of public transit.

Environmental	Economic	Social
Consumption of soil	Investment: new	Quality of the apartment
Soil quality	Investment: in existing infrastructure	Quality of the living environment
Air quality		Mobility
Climate	Real costs	
Energy consumption	Resource efficiency	
	Public finances	

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

- Housing stock owners should ensure new housing is located in areas that will be well serviced by public transit and other traffic-related infrastructure.

SUMMARY: UF 3 DEMAND FOR INSTITUTIONAL SERVICES

A. DESCRIPTION

UF 3 Demand for Institutional Services consists of the demand created by the inhabitants of a housing stock for hospitals, schools and other institutional services.

User actor	Intended use	Forms of use right
1. Persons or groups that provide collective institutional services	To fulfil the demand for institutional services generated by the tenants of housing stocks	-

B. CONFLICTS, SYNERGY AND EFFECTS

The users of *UF 3 Demand for Institutional Services* interact mainly with the residents of the housing stock. They may also deal with the housing stock owner when negotiating the lease of commercial premises in the stock and with public authorities when new housing stocks and, consequently, new services are being proposed.

Use conflict with...	Description and effects	Cause

Synergy with	Description and effects	Cause
1. NR 1 Commercial Space	Institutional services that rent non-residential space also benefit from the demand for their services that exists within the stock.	Contract between stock owner and institutional services; contract between stock owner and public authorities
2. UF 1 Design of Urban Space	Good density creates demand for services that can create communities that are more liveable.	Planning regulations.

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of UF 3 take priority over the use of housing for shelter?

- No.

Was the use of UF 3 stifled by the use of housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to UF 3?

- No.

Did recent, current or anticipated regulations change the way users use UF 3?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Proximity of services addresses issues of liveability of communities.
- Rapid population growth (such as when large housing stock developments are constructed) may place strain on available services.
- The lack of services where there is demand (under use of US 3) can be particularly problematic when services that are further away are difficult to access.
- Motorized transportation becomes necessary if the services are not located within close proximity.
- Nearby institutional services may provide employment opportunities for tenants of the stock.

Environmental	Economic	Social
Climate	Job creation	Offer of goods and services
Energy consumption	Resource efficiency	Mobility
	Economic structure	Community
		Leisure

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Improving use synergy

- Including space for institutional services such as daycares as part of negotiating strategy for development of new buildings of the stock.

SUMMARY: UF 4 DEMAND FOR GOODS AND SERVICES

A. DESCRIPTION

UF 4 Demand for Goods and Services consists of the demand created by the inhabitants of a housing stock for goods and services within close proximity.

User actor	Intended use	Forms of use right
1. Companies or organizations that provide goods and services (stores, restaurants, businesses, etc.)	To fulfil the demand for goods and services generated by the tenants of housing stocks. To use the demand for jobs created by an increase in population.	-

B. CONFLICTS, SYNERGY AND EFFECTS

The users of *UF 4 Demand for Goods and Services* interact mainly with the residents of the housing stock. They may also deal with the housing stock owner when negotiating the lease of commercial premises in the stock.

Use conflict with...	Description and effects	Cause
1. RS 1 Living Space	Some businesses may be too noisy (e.g., restaurants or clubs) and disrupt tenants. **Effect:** decrease in enjoyment of living environment	-

Synergy with	Description and effects	Cause
1. NR 1 Commercial Space	Businesses and organizations that rent non-residential space also benefit from the demand for their goods and services that exists within the stock.	Lease with housing stock owner
2. UF 1 Design of Urban Space	Good density creates local demand for goods and services which can create communities that are more liveable.	-

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of UF 4 take priority over the use of housing for shelter?

- No.

Was the use of UF 4 stifled by the use of housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to UF 4?

- No.

Did recent, current or anticipated regulations change the way users use UF 4?

- No.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Proximity of businesses addresses issues of liveability of communities.
- Rapid population growth (such as when large housing stock developments are constructed) may place strain on available businesses.
- The lack of businesses (such as stores) where they are wanted and where there is sufficient demand can be particularly problematic when businesses that are further away are difficult to access.
- Motorized transportation becomes necessary if the businesses are not located within close proximity.
- Nearby businesses may provide employment opportunities for tenants of the stock.

Environmental	Economic	Social
Climate Energy consumption	Job creation Resource efficiency	Offer of goods and services Mobility Community

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Resolving use conflict

- Restrictions may be placed on what type of businesses can rent the commercial space in the stock to avoid problems of noise.

SUMMARY: NM 1 SOLVING GENERAL HOUSING NEEDS

A. DESCRIPTION

The service *NM 1 Solving General Housing Needs* refers to using the housing stock to resolve housing problems of either a general nature (e.g., overall housing shortage) or a specific nature (e.g. resolving housing needs of specific groups such as low income households).

User actor	Intended use	Forms of use right
1. Housing stock owners (usually public, cooperative or other non-profit)	To satisfy the housing needs of the general public, specific populations (families, seniors, people with disabilities) or members in the case of housing cooperatives.	Property rights: ownership or cooperative ownership of housing stock (property rights); contractual obligation to provide social housing in return for housing assistance.
2. Public authorities	To satisfy the housing needs of all of the people within their administrative boundaries, especially during housing shortages.	Constitutional articles on housing; public policy on housing; planning policy.

B. CONFLICTS, SYNERGY AND EFFECTS

For all subsidized housing, the stock owner must interact with public authorities and housing offices, as well as the institutions set up to manage loans, subsidies and loan guarantees. Cooperative housing owners deal primarily with their cooperative members to ensure their needs are satisfied.

Use conflict with...	Description and effects	Cause
1. RS 1 Living Space	Tenants who no longer meet subsidised housing conditions may have to leave even though they cannot afford market housing. **Effect:** housing not affordable for all.	**Low coherence – incoherence in policy:** eligibility conditions for subsidized housing does not always reflect financial needs of many low-income families.
2. PF 1 Capital Investment	Rivalry between the shareholders of publicly-owned housing companies who prioritize social objectives and other shareholders who want to sell the stock to pay off public debts. **Effect:** risk of decrease in affordable housing.	**Low coherence:** changes in property rights (elimination of non-profit status) allow formerly non-profit stock owners to sell their stock thereby jeopardizing social housing objectives.
3. PF 1 Capital Investment	Public housing owners who do not insist on rent payment become heavily indebted. **Effect:** inability to sufficiently invest in the upkeep of the stock.	**Low coherence – regulations not enforced:** conditions of rental lease are not followed.
4. NM 1 Solving General Housing Needs	When cooperatives accept subsidies from public authorities, they lose some management independence and thus their ability to exclusively address the needs of members. **Effect:** cooperative management may forgo housing subsidies to keep full independence.	-
5. NM 5 Shaping the Characteristic Landscape	Large housing developments that are rapidly erected to resolve housing shortages can scar the landscape. **Effect:** deterioration of the landscape.	-
Synergy with	**Description and effects**	**Cause**
1. RS 1 Living Space	Non-profit housing companies make apartments available to low income and other households with specific housing needs.	-
2. PF 1 Capital Investment	During housing shortages, public authorities may encourage investment in housing from the private, for-profit sector.	Sale of public land; rezoning to accommodate more housing.

C. PRIORITIZATION OF GOODS AND SERVICES

Was the use of NM 1 (housing for shelter) secondary to the use of non-shelter goods and services?

- The use of *NM 1 Solving General Housing Needs* (a shelter-related good and service) has been treated as secondary to *PF 1 Capital Investment* (in Germany). As many housing stocks lost their non-profit status and restrictions on the sale of the stock were lifted, many public owners decided to sell their stock to investors with short-term investment objectives in order to pay off crushing public debt. This loss of vast amounts of social housing in return for capital is an example of shelter being treated secondary to non-shelter uses.

Did the use of NM 1 stifle the use of housing for non-shelter purposes?

- Conversely to the above example, the right to use *NM 1 Solving General Housing Needs* has also stifled the right to use *PF 1 Capital Investment* (Spanish case studies). In this example, providing low cost housing has come at the expense of recouping sufficient rental revenue, which is detrimental both to the stock owner and to the physical condition of the stock.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NM 1?

- No.

Did recent, current or anticipated regulations change the way users use NM 1?

- Housing policy is consistently evolving, often with fewer subsidization opportunities becoming available. As an alternative to subsidization, some municipalities have created innovative ways of creating affordable housing such as by providing surface rights in return for housing that is not only non-profit but meets certain sustainability criteria.
- Changes in planning regulations and amendments to planning ordinances can encourage or discourage for-profit and non-profit companies from building housing.

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- The granting of housing assistance may be tied to adequate design and space requirements, such as meeting specific energy efficiency standards.
- Subsidization of the construction of affordable housing has helped make available housing to segments of the population that otherwise might not be able to afford market housing.
- Housing shortages can be alleviated when large-scale projects are encouraged; however, developments that are built too rapidly may produce undesirable housing in the long term and may also substantially change the neighbourhood or city in which they are located.
- Rapid population increases in small towns with large construction projects can place strains on existing infrastructure and services.
- Agricultural land is converted to constructible land for housing construction.

Environmental	Economic	Social
Land consumption	Revenue	Quality of the living environment
Consumption of primary resources: material flow	Cost of living	Offer of goods and services
Consumption of primary resources: material recycling	Investment: new	Health
Quality of materials	Investment: maintenance of infrastructure	Integration
Air quality	Public finances	Community
Climate		Social security
Energy consumption		
Quality of energy		

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Resolving use conflicts

- Cooperatives that find the conditions for receiving public subsidies too restrictive can choose to forgo the subsidies. In this way, they are able to keep full management independence and have greater flexibility to fulfil the housing needs of their cooperative members.

C. Prioritization of goods and services

- After the abrogation of the law on non-profit housing, some stock owners rewrote their statutes to ensure that they could continue to fulfil social objectives as best as possible. Changes included articles on restrictions on the sale of the stock and limits on dividends to shareholders.
- By adhering to new policies on the mandatory payment of rent, public stock owners in Spain were able to regain their use right to *PF 1 Capital Investment* and increase their rental revenues.

D. Actor behaviour

- Stock owners can participate in programs that promote assistance to non-profit housing in exchange for, for example, designs that meet sustainable development objectives.

SUMMARY: NM 2 SOLVING NON-HOUSING NEEDS

A. DESCRIPTION

The service *NM 2 Solving Non-Housing Needs* refers to using the housing stock to address issues not associated with housing.

	User actor	Intended use	Forms of use right
1.	Public authorities	To use housing (especially the encouragement of housing construction) to control inflation, fight unemployment and create jobs, jump-start the economy, etc.	Emergency ordinances 1) granting money for the housing construction sector, 2) limiting the speculative housing market, etc.

B. CONFLICTS, SYNERGY AND EFFECTS

Public authorities using NM 2 interact with housing stock owners and construction companies (users of *PF 3 Labour Investment*)

	Use conflict with...	Description and effects	Cause
1.	NM 1 Solving General Housing Needs	Measures to slow the economy intended to increase affordable housing have had the opposite effect.	**Low coherence:** policies were poorly designed and had unintended effects.

	Synergy with	Description and effects	Cause
1.	NM 1 Solving General Housing Needs	Conversely to the above, measures to jump-start the economy or calm inflation have also helped create housing.	-
2.	NM 4 Social and cultural complexity	Housing can be used to promote integration of immigrants.	

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of NM 2 take priority over the use of housing for shelter?

- There have been several instances when *NM 2 Solving Non-Housing Needs* has taken precedence over using shelter for housing. For instance, in Spain the encouragement of housing construction as a means of creating jobs has had the effect of producing housing stocks that lie empty because there is little demand. Consequently, the stocks quickly fall into disrepair.

Was the use of NM 2 stifled by using housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NM 2?

- No

Did recent, current or anticipated regulations change the way users use NM 2?

- No

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Using the housing sector to solve non-housing needs may have unintended negative consequences on housing for shelter. For instance, using housing construction for job creation when there is no pronounced housing demand may produce uninhabited stocks (Spain). It may also favour some types of housing (for-profit) over others (non-profit).
- Conversely to the above, using the housing sector to solve non-housing needs may produce the desired effect, e.g., jump-starting the economy.
- Housing policy may be used to address the integration of immigrants. The Frankfurter Contract (Germany) is such an example. Limits are set for the number of immigrants in any given building of a participating stock (public and other non-profit). The objective is to reduce ghettoisation.

Environmental	Economic	Social
	Jobs Investment: new Investment: maintenance of infrastructure Economic encouragement Public finances	Integration Community Culture

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

-

SUMMARY: NM 3 SHAPING THE CHARACTERISTIC LANDSCAPE

A. DESCRIPTION

The service *NM 3 Shaping the Characteristic Landscape* consists of the use of the buildings of a stock to create a distinctive landscape.

User actor	Intended use	Forms of use right
1. Urban planners and designers	To add characteristic features to the landscape through the design and placement of the buildings of the stock.	Planning and especially zoning regulations.
2. Architects	*Same as above*	Contract with stock owner or public authorities.

B. CONFLICTS, SYNERGY AND EFFECTS

Users of NM 3 interact primarily with each other in addition to the housing stock owner.

Use conflict with...	Description and effects	Cause
1. NM 1 Solving General Housing Needs	The large, high-rise housing stocks built in the late 1960s and 1970s in rural areas or on the edges of towns that were part of the effort to relieve the housing shortage are generally considered to have scarred the landscape. **Effect:** Landscape that is not pleasing; decrease in pride of tenants in their living environment.	-
Synergy with	**Description and effects**	**Cause**

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of NM 3 take priority over the use of housing for shelter?

- No.

Was the use of NM 3 stifled by using housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NM 3?

- No

Did recent, current or anticipated regulations change the way users use NM 3?

- No

SUMMARY: NM 3 SHAPING THE CHARACTERISTIC LANDSCAPE

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

- Large housing developments have had obvious aesthetics consequences, but have also affected the pride that tenants have in the building in which they live.
- Exterior renovations of housing stocks can improve their effect on the landscape and can consequently change tenants' perceptions of their home in a positive manner.

Environmental	Economic	Social
Land consumption		Quality of the landscape Community

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

B. Resolving use conflict

- During renovation projects, the building exteriors can be aesthetically improved to create a more pleasing effect on the landscape.

SUMMARY: NM 4 SOCIAL AND CULTURAL COMPLEXITY

A. DESCRIPTION

NM 4 consists of using the housing stock as a physical representation of the cultural and material capital of society.

User actor	Intended use	Forms of use right
1. Stock owners, particularly non-profit housing owners.	To use the building stock as a physical symbol of certain values or events (e.g., a housing cooperative uses its stock as a physical manifestation of the provision of affordable housing)	-

B. CONFLICTS, SYNERGY AND EFFECTS

Use conflict with...	Description and effects	Cause
		-

Synergy with	Description and effects	Cause

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of NM 4 take priority over the use of housing for shelter?

- No.

Was the use of NM 4 stifled by using housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NM 4?

- No

Did recent, current or anticipated regulations change the way users use NM 4?

- No

E. SUSTAINABILITY ASSESSMENT AND APPLICABLE INDICATORS

Environmental	Economic	Social
		Integration Community Culture

F. MANAGEMENT STRATEGIES

What autonomous decisions can the stock owner make to improve sustainability?

SUMMARY: NM 5 CONSERVATION & TRANSMISSION OF SOCIAL & HISTORICAL VALUES

A. DESCRIPTION

The service NM 5 consists of the buildings as the physical means of representing social and historical values of a region.

User actor	Intended use	Forms of use right
1. Public authorities, especially those concerned with building protection	To preserve the social and historical values of a region through the preservation of certain housing stocks.	Monument protection designation

B. CONFLICTS, SYNERGY AND EFFECTS

Use conflict with...	Description and effects	Cause
	-	

Synergy with	Description and effects	Cause

C. PRIORITIZATION OF GOODS AND SERVICES

Did the use of NM 5 take priority over the use of housing for shelter?

- No.

Was the use of NM 5 stifled by using housing for shelter?

- No.

D. ACTOR BEHAVIOUR

Did recent, current or anticipated regulations introduce new users to NM 5?

- No

Did recent, current or anticipated regulations change the way users use NM 5?

- No

SUMMARY: NM 5 CONSERVATION & TRANSMISSION OF SOCIAL & HISTORICAL VALUES

E. Sustainability Assessment and Applicable Indicators

- Housing stocks with historical protection designation may be more problematic to renovate.

Environmental	Economic	Social
		Integration Community Culture

F. Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

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APPENDIX 1: INDICATORS OF THE BERN SUSTAINABILITY COMPASS

Environment

Water management
- Reduction in water consumption
- Reduction in the quantity of wastewater

Water quality
- Reduction in the concentration of pollutants
- Reduction in the concentration of nutrients
- Reduction in the microbiological pollution

Land consumption
- Reduction in the impermeability of the soil
- Reduction in living space per person
- Increase in interior development (growth within the existing agglomeration)
- Reduction of soil erosion

Soil quality
- Reduction in the concentration of pollutants
- Reduction in the concentration of nutrients
- Reduction in soil compaction

Material flow
- Reduction in the quantity of waste
- Reduction in the quantity of materials used

Material recycling
- Increase in the proportion of reused or recycled materials
- Increase in the proportion of recycled organic material

Quality of materials
- Increase in the proportion of renewable primary resources in global consumption
- Increase in the proportion of materials and products containing few pollutants

Biological diversity
- Improvement in the habitat of rare and endangered species
- Improvement and preventive protection of habitats of existing species
- Improvement in the quality of lakes and water bodies as habitats (including maintaining sufficient flow rates)

Natural spaces
- Increase in the proportion of surfaces close to a natural state
- Rehabilitation of surfaces close to a natural state (e.g., improvement in connectivity of different natural spaces)

Air quality
- Reduction in the load of nitrogen oxide immissions (NOX)
- Reduction in the load of suspended particulate immissions (PM10)
- Reduction in the load ozone immissions

Climate
- Reduction in CO2 emissions
- Reduction in the emissions of other greenhouse gases (e.g., methane, nitrous oxide, CFCs)

Energy consumption
- Reduction of stationary energy consumption
- Reduction of energy consumption for transportation
- Increase in the efficiency of stationary energy use
- Increase in the efficiency of energy use for transportation

Quality of energy
- Increase in the proportion of renewable energy in global consumption
- Increase in the proportion of local energy in global consumption

Economy

Income
- Increase in average income
- Increase in average disposable income

Cost of living
- Decrease in the price of consumer goods
- Decrease in rents

Jobs
- Job creation
- Reduction in unemployment

New infrastructure investment
- Development of local infrastructure: physical services (transport, telecommunication, energy, water, etc.)

Maintenance of infrastructure
- Maintenance and investment for the replacement of local infrastructure

Economic development
- Improvement in the framework conditions for the economy: services and consulting, space and available objects, networks and contacts, etc.
- Increase in the number of child care spaces

Real costs
- Tax according to polluter pays
- Improvement in the indemnification of services offered by main cities

Resource efficiency
- Increase in regional collaboration (with supplier, partners, etc.)
- Decrease in transportation intensity resulting from the economy
- Prolongation of the life span of products
- Improvement in the rate of utilization of public infrastructure

Economic structure
- Increase in the establishment of businesses with high added value
- Promotion of a broader range of professional branches
- Better exploitation of regional strengths

Tax burden
- Reduction in taxation of moral persons
- Reduction in taxation of physical persons

Public finances
- More balanced budget
- Reduction of debt
- Promotion of a more efficient use of public funds
- Increase in fiscal revenues

Know-how
- Increase in the offer of professional courses
- Increase in the qualification of employees
- Improvement in access to information

Innovation
- Increase in the part of innovative goods and services in the creation of value at the local level
- Promotion of research and development

Society

Quality of the landscape
- Improvement in the quality of natural landscapes
- Improvement in the quality of cultural landscapes

Housing quality
- Reduction in sound immissions due to traffic
- Reduction in sound immissions due to industry, etc.
- Reduction of non-ionizing radiation (electric smog)
- Reduction of nauseating pollutants

Quality of the living environment
- Improvement in recreation areas within close proximity (e.g., enhancement of green spaces in urban zones)
- Increase in the proportion of the population that live in the centre of towns
- Enhancement of urban zones (e.g., urban quality, quality of the environment)
- Extension of pedestrian areas, slow transit and meeting places
- Development of historical and cultural objects

Offer of goods and services
- Improvement in the local offer of consumer goods
- Improvement in the local offer of specialized products
- Improvement in the local offer of services (banks, post office, doctor, hairdresser, etc.)

Mobility
- Increase in the proportion of the population living and working in the same place.
- Increase in the attractivity of public transit
- Increase in the attractivity of slow mobility
- Decrease in the distance or length of trips

Health
- Improvement in the promotion of health and the sickness prevention
- Increase in psychological well being
- Improvement in health
- Increase in physical activity conducive to good health
- Decrease in drug consumption

Security
- Increase in the sense of security of the population
- Decrease in criminality
- Decrease in traffic, workplace and at-home accidents
- Increase in emergency services
- Increase in security of energy provision, water supply
- Increase in protection from natural catastrophes
- Reduction in the risk of major accidents

Participation
- Increase in voter participation in votes and elections
- Promotion of volunteer work
- Promotion of involvement of the local population

Integration
- Improvement in re-integration of the unemployed
- Improvement in the integration of the elderly, the sick and people with disabilities
- Improvement in the integration of foreigners
- Improvement in the integration of people at risk.
- Improvement in the integration of youth with behavioural problems

Community
- Promotion of village and neighbourhood culture.
- Promotion of meeting opportunities

Distribution of income and wealth
- Decrease in income differences
- Decrease in the proportion of the working poor

Equal opportunity
- Increase in the equal opportunity between different population groups (e.g. men/women)

Supraregional cooperation
- Improvement in the collaboration or the financial commitment for partnerships with other regions in Switzerland or with industrial countries.
- Improvement in the collaboration or financial commitment for partnerships with other regions of emerging countries or countries in transition.

Recreation
- Improvement in the offer of sporting activities
- Improvement in the offer of youth centres
- Improvement in the offer of other recreational activities

Culture
- Improvement in cultural offers (cinema, theatre museums, etc.)
- Promotion of cultural life and creativity
- Promotion of cultural diversity
- Reinforcement of cultural heritage (e.g., customs)

Education
- Improvement in educational offer in compulsory schooling
- Improvement in educational offer in non-compulsory schooling
- Improvement in the offer of apprenticeship positions
- Improvement in the offer of adult education and non-professional education

Social security
- Improvement in the offer of the structure of housing specific for the elderly, people with handicaps, etc.
- Improvement in the offer of ambulatory services
- Improvement in other offers covering social risks
- Decrease in the number of people dependent on social assistance and unemployment benefits.

Instructions

The checklists allow stock owners or stock managers to ascertain the sustainability of the goods and services of their stock. The fields to be completed in each checklist follow the same sequence and require the same type of information presented in the summaries.

This workbook contains the following worksheets:

1. An example checklist
   § The example (US 3 Material Discharge) should be used as a model for the completion of all the checklists.

2. A two-page checklist for each of the 23 good and services of the housing stock.

3. Two blank checklists to be used if more space is required or if addtional goods and services are evaluated
   § one checklist applicable to shelter related goods and services
   § one checklist applicable to non-shelter related goods and services

To view a specific worksheet, simply click the appropriate tab at the bottom of the screen.

A. Description

US 3 Material Discharge comes in the form of household waste, household recyclable materials and construction waste.

User Actor	Intended Use	Forms of use rights
1. Waste compaction service (private)	To treat household waste by compacting it on-site before it is collected.	Service contract between stock manager and the compaction service
2. Collectors of waste (public), collectors of recyclables (private)	To collect waste and recyclables from the housing stocks and deliver them to treatment facilities.	Municipal regulations on waste collection specify who has the right to collect waste.
3. Waste treatment and disposal actors (e.g., incinerators)	To treat and dispose of household waste and recyclables.	Environmental policy on waste treatment determines how waste can be treated and by whom.

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with US 3? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with US 3	
1. Use conflict/synergy:	*NR 4 Collective Outdoor Space*
Description:	The number of bins required to satisfy the waste and recyclables disposal needs of the stock exceeds the available space. Bins are consequently located on green space.
Cause:	Low coherence – public policies on waste management require additional bins for different types of waste, but do not account for the limited outdoor space of existing housing stocks.
Effects on sustainability:	Lower enjoyment of outdoor space by tenants. Collectors have difficulty accessing bins due to the restricted space.
2. Use conflict/synergy:	*NM 2 Solving Non-Housing Needs*
Description:	The publicly-owned waste collection service charges collection fees on a per-volume basis. If waste volumes decrease as a result of hiring compaction services, public authorities will experience a decrease in waste collection revenues.
Cause:	Low coherence – regulations have unintended effects
Effects on sustainability:	The waste utility may react by increasing fees to make up for the lower revenues.
3. Use conflict/synergy:	*US 1 Demand for Energy*
Description:	Released energy from the incineration of household waste is used for the generation of electricity and district heat production.
Cause:	Coordination of polices on energy and waste disposal.
Effects on sustainability:	Environmental benefit of using waste as a fuel for energy production; avoidance of landfills

C. Prioritization of Goods and Services

	yes	no
Does the use of US 3 take priority over the use of housing for shelter?	☐	☑
Is the use of US 3 stifled by using housing for shelter?	☐	☑

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use US 3?	☑	☐
Are recent, current or anticipated regulations changing the way current users use US 3?	☐	☑

Comments:

Public policies on packaging (in Germany) have encouraged some stock owners to introduce waste compacting companies to the use of US 3. (See conflict 1 and synergy 1 for description.)

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with US 3 *(refer to part B)*

Hire waste compactors to reduce the number of bins required for the disposal of household waste and recyclables (conflict 1). The reduction in volume-based fees will offset the cost of compacting (synergy 1). The public waste collector may increase the per-volume fees to compensate for lost revenue but savings will likely still remain.

Prioritization or stifling of US 3 *(refer to part C)*

Not applicable.

Changes in the use of US 3 *(refer to part D)*

See "Conflcit with US 3" above

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after
Quality of energy	+		Income					
Material flow			Cost of living					
Material recycling			Public finances					

Additional Comments

A. Description

RS 1 Living Space is the space in which individual households live, i.e., the apartment.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with RS 1? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with RS 1	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Is the use of RS 1 (housing for shelter) secondary to the use of non-shelter goods and services?	☐	☐
Does the use of RS 1 stifle the use of housing for non-shelter purposes?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use RS 1?	☐	☐
Are recent, current or anticipated regulations changing the way current users use RS 1?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with RS 1 *(refer to part B)*

Prioritization or stifling of RS 1 *(refer to part C)*

Changes in the use of RS 1 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

RS 2 include the services that tenants use to enjoy an acceptable level of indoor environmental comfort within their apartments (e.g. showers, toilets, and sinks, radiators and electrical outlets)

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with RS 2? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with RS 2	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Is the use of RS 2 (housing for shelter) secondary to the use of non-shelter goods and services?	☐	☐
Does the use of RS 2 stifle the use of housing for non-shelter purposes?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use RS 2?	☐	☐
Are recent, current or anticipated regulations changing the way current users use RS 2?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with RS 2 *(refer to part B)*

Prioritization or stifling of RS 2 *(refer to part C)*

Changes in the use of RS 2 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

NR 1 Commercial Space can be rented or used by third parties including businesses, associations and kindergartens.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NR 1? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NR 1	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of NR 1 take priority over the use of housing for shelter?	☐	☐
Is the use of NR 1 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NR 1?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NR 1?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NR 1 *(refer to part B)*

Prioritization or stifling of NR 1 *(refer to part C)*

Changes in the use of NR 1 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

NR 2 consists of all spaces that are used for particular activities by tenants and building caretakers. This includes laundry rooms, storage areas, meeting and activity rooms and underground parking.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NR 2? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NR 2	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Is the use of NR 2 (housing for shelter) secondary to the use of non-shelter goods and services?	☐	☐
Does the use of NR 2 stifle the use of housing for non-shelter purposes?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NR 2?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NR 2?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NR 2 *(refer to part B)*

Prioritization or stifling of NR 2 *(refer to part C)*

Changes in the use of NR 2 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

NR 3 Functional indoor space consists of all spaces that have a functional purpose and without which the buildings of the stock could not exist, such as hallways, stairwells, entranceway, elevators, etc.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NR 3? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NR 3	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Is the use of NR 3 (housing for shelter) secondary to the use of non-shelter goods and services?	☐	☐
Does the use of NR 3 stifle the use of housing for non-shelter purposes?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NR 3?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NR 3?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NR 3 *(refer to part B)*

Prioritization or stifling of NR 3 *(refer to part C)*

Changes in the use of NR 3 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

NR 4 Collective outdoor space is the outdoor space located on the building property that is typically used for parking, play areas, green space, outdoor storage and building access.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NR 4 Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NR 4	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Is the use of NR 4 (housing for shelter) secondary to the use of non-shelter goods and services?	☐	☐
Does the use of NR 4 stifle the use of housing for non-shelter purposes?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NR 4?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NR 4?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NR 4 *(refer to part B)*

Prioritization or stifling of NR 4 *(refer to part C)*

Changes in the use of NR 4 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

PF 1 Capital Investment allows the investor to perceive some economic benefit related to the ownership of the stock.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with PF 1? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with PF 1	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of PF 1 take priority over the use of housing for shelter?	☐	☐
Is the use of PF 1 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use PF 1?	☐	☐
Are recent, current or anticipated regulations changing the way current users use PF 1?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with PF 1 *(refer to part B)*

Prioritization or stifling of PF 1 *(refer to part C)*

Changes in the use of PF 1 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

PF 2 Land Investment allows the investor to perceive some economic benefit from the ownership, sale or leasing of land for the housing stock.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with PF 2? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with PF 2	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of PF 2 take priority over the use of housing for shelter?	☐	☐
Is the use of PF 2 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use PF 2?	☐	☐
Are recent, current or anticipated regulations changing the way current users use PF 2?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with PF 2 *(refer to part B)*

Prioritization or stifling of PF 2 *(refer to part C)*

Changes in the use of PF 2 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

PF 3 Labour Investment allows persons to perceive some economic benefit from labour in the housing stock.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with PF 3? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with PF 3	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of PF 3 take priority over the use of housing for shelter?	☐	☐
Is the use of PF 3 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use PF 3?	☐	☐
Are recent, current or anticipated regulations changing the way current users use PF 3?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with PF 3 *(refer to part B)*

Prioritization or stifling of PF 3 *(refer to part C)*

Changes in the use of PF 3 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

US 1 Demand for Energy is composed of heating demand and electricity demand.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with US 1? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with US 1	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of US 1 take priority over the use of housing for shelter?	☐	☐
Is the use of US 1 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use US 1?	☐	☐
Are recent, current or anticipated regulations changing the way current users use US 1?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with US 1 *(refer to part B)*

Prioritization or stifling of US 1 *(refer to part C)*

Changes in the use of US 1 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

US 2 Material Storage & Sink consist of the large quantities of materials that the construction, maintenance and renovation of housing stocks require.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with US 2? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with US 2	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of US 2 take priority over the use of housing for shelter?	☐	☐
Is the use of US 2 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use US 2?	☐	☐
Are recent, current or anticipated regulations changing the way current users use US 2?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with US 2 *(refer to part B)*

Prioritization or stifling of US 2 *(refer to part C)*

Changes in the use of US 2 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

US 3 Material Discharge comes in the form of household waste, household recyclable materials and construction waste.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with US 3? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with US 3	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of US 3 take priority over the use of housing for shelter?	☐	☐
Is the use of US 3 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use US 3?	☐	☐
Are recent, current or anticipated regulations changing the way current users use US 3?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with US 3 *(refer to part B)*

Prioritization or stifling of US 3 *(refer to part C)*

Changes in the use of US 3 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

US 4 Water Sink consists of the demand for potable water.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with US 4 Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with US 4	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of US 4 take priority over the use of housing for shelter?	☐	☐
Is the use of US 4 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use US 4?	☐	☐
Are recent, current or anticipated regulations changing the way current users use US 4?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with US 4 *(refer to part B)*

Prioritization or stifling of US 4 *(refer to part C)*

Changes in the use of US 4 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

US 5 Water Discharge consists of the flows of wastewater leaving the stock.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with US 5 Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with US 5	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of US 5 take priority over the use of housing for shelter?	☐	☐
Is the use of US 5 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use US 5?	☐	☐
Are recent, current or anticipated regulations changing the way current users use US 5?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with US 5 *(refer to part B)*

Prioritization or stifling of US 5 *(refer to part C)*

Changes in the use of US 5 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

UF 1 Design of Urban Space is the housing stock's ability to be part of a design of urban space

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with UF 1? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with UF 1	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of UF 1 take priority over the use of housing for shelter?	☐	☐
Is the use of UF 1 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use UF 1?	☐	☐
Are recent, current or anticipated regulations changing the way current users use UF 1?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with UF 1 *(refer to part B)*

Prioritization or stifling of UF 1 *(refer to part C)*

Changes in the use of UF 1 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

UF 2 Demand for traffic related infrastructure consist of the demand created by the inhabitants of a housings stock for public transit, roads, parking places, bike paths, etc.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with UF 2? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with UF 2	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of UF 2 take priority over the use of housing for shelter?	☐	☐
Is the use of UF 2 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use UF 2?	☐	☐
Are recent, current or anticipated regulations changing the way current users use UF 2?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with UF 2 *(refer to part B)*

Prioritization or stifling of UF 2 *(refer to part C)*

Changes in the use of UF 2 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

UF 3 Demand for Institutional Services consists of the demand created by the inhabitants of a housings stock for hospitals, schools and other institutional services.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with UF 3? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with UF 3	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of UF 3 take priority over the use of housing for shelter?	☐	☐
Is the use of UF 3 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use UF 3?	☐	☐
Are recent, current or anticipated regulations changing the way current users use UF 3?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with UF 3 *(refer to part B)*

Prioritization or stifling of UF 3 *(refer to part C)*

Changes in the use of UF 3 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

UF 4 Demand for Goods and Services consists of the demand created by the inhabitants of a housing stock for goods and services within close proximity.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with UF 4? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with UF 4	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of UF 4 take priority over the use of housing for shelter?	☐	☐
Is the use of UF 4 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use UF 4?	☐	☐
Are recent, current or anticipated regulations changing the way current users use UF 4?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with UF 4 *(refer to part B)*

Prioritization or stifling of UF 4 *(refer to part C)*

Changes in the use of UF 4 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

NM 1 refers to using the housing stock to resolve housing problems of either a general nature (e.g., overall housing shortage) or a specific nature (e.g. resolving housing needs of specific groups).

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NM 1? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NM 1	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Is the use of NM 1 (housing for shelter) secondary to the use of non-shelter goods and services?	☐	☐
Does the use of NM 1 stifle the use of housing for non-shelter purposes?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NM 1?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NM 1?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NM 1 *(refer to part B)*

Prioritization or stifling of NM 1 *(refer to part C)*

Changes in the use of NM 1 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

The service NM 2 Solving Non-Housing Needs refers to using the housing stock to address problems not associated with housing.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NM 2? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NM 2	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of NM 2 take priority over the use of housing for shelter?	☐	☐
Is the use of NM 2 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NM 2?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NM 2?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NM 2 *(refer to part B)*

Prioritization or stifling of NM 2 *(refer to part C)*

Changes in the use of NM 2 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

The service NM 3 Shaping the Characteristic Landscape consists of the use of the buildings of a stock to create a distinctive landscape.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NM 3? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NM 3	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of NM 3 take priority over the use of housing for shelter?	☐	☐
Is the use of NM 3 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NM 3?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NM 3?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NM 3 *(refer to part B)*

Prioritization or stifling of NM 3 *(refer to part C)*

Changes in the use of NM 3 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

The service NM 4 consists of the use the stock to create social and cultural complexity.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NM 4? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NM 4	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of NM 4 take priority over the use of housing for shelter?	☐	☐
Is the use of NM 4 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NM 4?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NM 4?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NM 4 *(refer to part B)*

Prioritization or stifling of NM 4 *(refer to part C)*

Changes in the use of NM 4 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

NM 5 Conservation & Transmission of Social & Historical Values

A. Description

The service NM 5 consists of the buildings as the physical means of representing social and historical values of a region.

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy with NM 5? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy with NM 5	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of NM 5 take priority over the use of housing for shelter?	☐	☐
Is the use of NM 5 stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use NM 5?	☐	☐
Are recent, current or anticipated regulations changing the way current users use NM 5?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts with NM 5 *(refer to part B)*

Prioritization or stifling of NM 5 *(refer to part C)*

Changes in the use of NM 5 *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

User Actor	Intended Use	Forms of use rights
1. e		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Is the use of ____ (housing for shelter) secondary to the use of non-shelter goods and services?	☐	☐
Does the use of ____ stifle the use of housing for non-shelter purposes?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use ____?	☐	☐
Are recent, current or anticipated regulations changing the way current users use ____?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts *(refer to part B)*

Prioritization or stifling *(refer to part C)*

Changes in the use *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments

A. Description

User Actor	Intended Use	Forms of use rights
1.		
2.		
3.		

B. Identifying Use Conflicts and Synergy

Which goods and services have a) use conflict or b) use synergy? Describe the conflict or synergy, the cause and the effects on sustainability.

Description of use conflict or use synergy	
1. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
2. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	
3. Use conflict/synergy:	*Click here to select a good or service from the dropdown list*
Description:	
Cause:	
Effects on sustainability:	

C. Prioritization of Goods and Services

	yes	no
Does the use of ____ take priority over the use of housing for shelter?	☐	☐
Is the use of ____ stifled by using housing for shelter?	☐	☐

Comments:

D. The Regime and Actor Behaviour

	yes	no
Are recent, current or anticipated regulations introducing new users to use ____?	☐	☐
Are recent, current or anticipated regulations changing the way current users use ____?	☐	☐

Comments:

E. The Regime and Management Strategies

What autonomous decisions can the stock owner make to improve sustainability?

Conflicts *(refer to part B)*

Prioritization or stifling *(refer to part C)*

Changes in the use *(refer to part D)*

F. Assessment of Sustainability Indicators

Which indicators are applicable? How are they evaluated before implementing different management strategies? : good (+), bad (-) or neutral (n)? Will they improve (i); worsen (w); stay high (+); or stay low (-) after implementing new strategies?

Environmental	before	after	Economic	before	after	Social	before	after

Additional Comments