

## **Towards socio-ecological inclusion. Scaling up housing innovation in Vienna**

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### **1. Introduction**

The relation between environmental quality and residential choices and opportunities is a longstanding issue and has always affected the distribution of different social groups in the urban context. Through history, gardens and parks have always characterized the most affluent parts of urban areas, whereas the most polluted and unhealthy areas have been spaces of spatial segregation for the most deprived social groups. Over the years, numerous studies have reported that minorities or socio-economically disadvantaged people are exposed to greater environmental harm, being concentrated in areas affected by high levels of pollution (poor air quality, unavailability of green areas, high levels of noise, etc.). Environmental Justice (EJ) scholars and activists have gradually unveiled mechanisms and processes leading to the residential segregation of low income groups in contaminated areas (Bullard 1990).

Beside these investigations, more recently a new research topic is gaining momentum in EJ literature (Cucca 2020). It focuses on the other side of the coin: the unequal access to beneficial environmental factors, such as the exposure to urban green space, clean air, waterfront, biodiversity, good aesthetics, and community resources. According to this literature, the unequal distribution of these benefits is strongly connected on the one side with the self-segregation of the affluent groups in urban areas characterized by high environmental standards, and on the other side with the displacement of low income groups due to rising housing costs in areas affected by green urban renewal. As reported in many studies on socio-spatial inequalities in several cities worldwide, residential segregation has been rising especially as result of the self-segregation of the most well-off. According to these investigations, green urban renewal and the design of new eco-districts (Caprotti 2014) may be interpreted as a driver of segregation since high income people have been moving in areas affected by ecological upgrading. However, providing good environmental standards, enhancing local conditions for ecological innovation, at the same time promoting housing affordability and fighting against segregation, is supposed to be a fundamental and accepted goal for urban sustainability. In this paper we will explore the socio-spatial implications of innovative housing projects oriented towards sustainability standards, by analyzing two case studies in Vienna. The Austrian Capital is an interesting case study to understand the relations between green urban renewal and housing affordability. In comparison to many other cities in Europe, in Vienna a very large part of the housing stock is subsidized by the public (social or municipal housing) and a relevant part of the private rental market is subjected to rent control. In this specific context, many housing projects have experimented new solutions for urban sustainability, by promoting bottom-up initiatives and by providing ecological innovation in the social housing stock. In the next section we will discuss the state of the art of the literature developed on the socio-spatial implications of urban greening; in the second section we will describe the case studies, and finally we will provide some conclusive remarks on opportunities and challenges characterizing these projects in terms of EJ.

### **2. State of the Art**

To better understand the state of the art of the literature developed on the socio-spatial implications of urban greening, two branches of literature are particularly helpful.

The first refers to the concept of “green or ecological gentrification” (Dooling, 2008). The process of green gentrification is believed to be started by greening initiatives that create or restore environmental amenities (renewal of parks, waterfront redevelopment, urban retrofitting, etc.), drawing in wealthier groups of residents and pushing out lower-income residents, thus creating gentrification (Checker 2011). Green gentrification studies emphasize two important trends related to urban justice. On the one side inequalities in relation to EJ, when it comes to the access of low-income groups to the new environmental amenities created through renewal and local innovation. On

the other side, growing spatial inequalities due to increasing housing costs in areas affected by sustainability policies, as reported in many studies in different areas of the world (Beretta and Cucca 2019).

Another interesting critical literature has been developed on processes of self-segregation of affluent groups in new developments branded as eco-districts and eco-cities. On one hand, eco-cities can be seen as a continuation of planning and architectural and design trends that have sought to reconcile nature and the city from the 19th century onwards. On the other hand, they also contain elements that are novel, because the creation of eco-districts has been suggested as a way to combat urban sprawl and the related socio-environmental issues, in particular environmental degradation and spatial segregation. However, the development of eco-districts has been criticized for their high costs and their failure to meet the expectations with respect to increased environmental quality (Holden et al. 2015). Moreover, housing and services are often affordable by only a small elite. Consequently, spatial segregation as well as social inequality may increase.

In the framework of the literature developed on the socio-spatial consequences of greening, this paper will instead focus on an under-investigated topic: the socio-spatial justice implications of collaborative housing projects oriented to reach sustainability standards, linking social and environmental innovation. Among these projects, co-housing initiatives are the most popular; they are usually defined as intentional communities in which reduction of environmental impact, and living in a more sustainable manner, is an accepted goal (Jarvis 2011); “a type of intentional, collaborative housing in which residents actively participate in the design and operation of their neighborhoods” (CAUS 2014). These urban forms of intentional communities (Metcalf 2012), are usually based on a bottom-up approach to design and management, mainly oriented towards a Degrowth pattern of socio-ecological innovation. Indeed, the trend of reducing environmental impacts was already identified across a number of studies, highlighting the importance of everyday consumption practices, particularly relating to food, inhabiting the household, and transportation, to the reduction of footprints. However, already many studies have risen issues related to socio-spatial justice implications of these intentional communities: despite the aspirations to a socially mixed structure, indeed co-housing inhabitants are predominantly well-educated, middle-income households (Bresson and Deneffe 2015). On the other side, intentional communities have been perceived in many contexts as opportunities for vulnerable urban areas. Crucial differences among co-housing projects lie in the everyday practices and design features, such as opening the common gardens or services to outsiders or not (Ruiu 2014). Local authorities’ role has been considered vital in defining different levels of inclusiveness of co-housing through planning practices (Droste 2015). On the other side, local authorities seemed to have also learned lessons from the social and environmental practices developed in these intentional communities and have tried to up-scale such innovations as well.

One interesting case study to understand the socio-spatial implications of these innovative projects and the possibility of up-scale innovations is the city of Vienna. Over the last years, the municipal administration has been subsidizing different kind of housing projects characterized by socio-ecological innovation, sharing some common principle (for example the orientation towards sustainability) but also showing very deep differences as far as some management and access procedures are concerned. In this paper we aim to understand opportunities and shortcomings of these projects in terms of socio-spatial justice, by analyzing two different initiatives: 1) the first is a *Baugruppen* project. *Baugruppen* are intentional communities characterized by a quite radical, self-determined approach to collaborative housing; 2) the second one is a social housing project which focuses, amongst other communal infrastructure, on the provision of urban gardening infrastructure as a trigger for collaborative housing.

### 3. Socio-ecological housing in Vienna

Historically, Vienna’s urban development and housing policy is characterized by strong public intervention. Vienna’s legacy in constructing municipal housing lasted between 1999 and 2004 and produced around 220.000 housing units which are still maintained by the City. Communal infrastructure and collaborative housing were already central elements of the early municipal housing

estates built during the era of Red Vienna (1922 – 1934). Although intendedly planned to serve social needs, the construction of schools, libraries, green spaces, common washing and laundry rooms contribute - from a today's perspective - to socio-ecological practices in terms of access to green space, sharing of infrastructure and short distances in everyday life (City of Vienna – Wiener Wohnen 2018). Nevertheless, this approach was characterized by a strong top-down supply of housing since the City financed, planned and allocated the buildings and housing units.

Due to changing demographic and economic conditions, urban development and social housing policy withdrew from the direct construction of municipal housing by the City. The last municipal housing estate was erected in 2004, although the construction of new municipal housing was resumed in 2018 and the construction of around 3.700 apartments are planned for coming years (Wiener Wohnen 2019). Nevertheless, Vienna's policy in urban development shifted more and more towards a steering role and outsourced the construction of social housing to Limited-Profit Housing Associations (LPHA). The City's steering role focus on land allocation, subsidizing housing construction and ensuring social, ecological, architectural and economic standards by developers' competitions. Adapting and introducing new planning approaches by the City of Vienna were necessary to continue the legacy of collaborative housing. Against this background, we will in the following, first, shed light on how recent changes in urban development and housing policies enables the production of a) experimental, resident-led housing projects (*Baugruppen*) and b) top-down oriented collaborative aspects in social housing models. Second, we will explore the socio-ecological implications of these housing models by comparing two exemplarily housing estates.

### 3.1. Socio-ecological aspects of Vienna's urban development and housing policy

*Baugruppen* are characterized by a radical, self-determined approach to collaborative housing. They can be broadly defined as associations of citizens that initiate, plan and (co-)construct self-determined housing for self-use, communitarian services and collaborative housing. Collaborative living and social responsibility seem to be a Viennese specificity compared to other *Baugruppen* experiences in Europe (Gruber 2012). Within the subsidized housing framework of Vienna, Gruber and Lang (2018) distinguish three main sub-models of *Baugruppen* with different grades of independence and financial risks:

1. "*Baugruppen* in Partnership": A large limited-profit housing association finances and constructs the building for a group of residents organized as an independent association. Initially architects play a leading role as the association participates actively in the planning process of communal spaces. At a later stage, the resident association arranges the daily life in communal spaces. If *Baugruppen* in Partnership usually receive housing subsidies by the City of Vienna and in return the projects are obliged to hand over one third of the apartments to the communal allocation system for social housing *Wiener Wohnen*.

2. "Autonomous *Baugruppe*: *Wohnheim*" allow more self-determination for the residents' association. This type receives a specific subsidy that originally was meant for dormitories or elderly homes (*Wohnheim*) and has been adopted by the administration to allow for self-determination in the management of buildings. Besides, self-determination in the planning process, this allows for the management of the building by tenant associations as "a sort of mini-cooperative" (Gruber and Lang 2018, 50). Usually an independent association, comprised of all the tenants, owns the house and the apartments collectively which allows also for collective decisions on the use and management of the house. Individual apartments are rented from the association. Although the *Wohnheim* subsidy do not allow for individual housing allowances of the tenants, building code regulations are less strict which result in lower construction costs and higher capabilities to establish social and cultural infrastructure, which also serves the wider neighborhood such as a Kindergarten, an event space or a swimming pool. This model has become the blueprint for subsidized *Baugruppen* in Vienna since it was first used and developed during the 10 years planning period of Vienna's most iconic *Baugruppe* "*Sargfabrik*" in 1990s. This iconic project paved the way for the dominant practice of self-determining planning, owning and managing *Baugruppen* as an association or cooperative in Vienna, but also to live solidarity and social responsibility.

3. “Syndicate model”, inspired by the German “*Mietshäuser Syndikat*” (Tenement Syndicate), is a recently established *Baugruppen* model (Gruber and Lang 2018, 51). Within this model a house owning company (“*Hausbesitz-GmbH*”) with two shareholders owns the building of the *Baugruppe*. The two shareholders are a) the tenant association of each house and b) the umbrella organization “*habiTAT*”, that consists currently of all “*habiTAT*” housing projects in Austria (Habitat 2019). Of importance is, that the umbrella organization has a veto when the building of the projects should be sold. The tenant association, on the other hand, has autonomy over house management and the organization of everyday life within the project. The tenants pay a small fee to the umbrella organization in order to support other projects.

Beside the main models identified above, more mixed models have been developed lately and a clear-cut classification is not always easily possible. Especially, the financing of *Baugruppen* often relies on a broad mix of bank loans, direct credits, subsidies from the municipality and, still, major investments of future tenants. Although varying types and models exist, essential to *Baugruppen* are self-determination in financing, planning, construction, maintaining, and dwelling the properties. As a consequence, *Baugruppen* are rather homogenous in socio-economic and -demographic terms as higher educated groups, with enough financial capabilities and time-resources feel addressed and, at the same time, are able to participate in such projects (Temel et al. 2009, 45).

The above presented types already showed that housing subsidies are the predominant instrument by the City administration to support resident-led housing project. A second instrument used by the City is land allocation for *Baugruppen* in large-scale development areas. Land allocation, however, is coupled to developer’s competition, where usually *Baugruppen* team up with developers, architects and consultants with expertise in group formation and apply for a building lot. An expert panel, which consists of different experts from the city administration, but also architects, city planners, ecologists, etc. selects the projects. The decision is based on the four pillars social sustainability, ecology, economy and architecture. Land allocation in eco-districts like *Aspern*, at the outer skirts of Vienna, and redevelopment of brownfield inner-city railway stations like *Sonnwendviertel* or *Nordwestbahnhof* initiated a new wave of *Baugruppen* since 2010 (Temel and Weiser 2015).

A renewed interest in collaborative housing can also be depicted in the current social housing approach by the City of Vienna. After withdrawing from municipal housing, currently social housing is constructed by big, limited-profit housing associations (LPHA) and to a lesser extent by non-profit cooperatives (see also Lang and Novy 2011). This social housing model is currently the dominant practice by the City administration to build new large-scale affordable housing (Ludwig 2017). The construction of limited-profit housing is subsidized by the administration, but the funding binds the housing associations to specific regulations. Since 2012 newly constructed projects have to provide two-thirds of regular subsidized apartments and one-third of so-called Smart-Apartments. Usually, renters of regularly subsidized apartments have to pay substantial capital contributions for construction and land. Newly built social housing in Vienna is, therefore, considered to be rather middle-class oriented (Franz and Gruber 2018; Mundt 2018). As a counter reaction, a “Smart Apartment Program” was launched in 2012. Smart Apartments are characterized by compact ground floor size ranging from 40m<sup>2</sup> to 100m<sup>2</sup> including caps on the square meter rent and the financial contributions. In addition, tenants of Smart Apartments are eligible for a so-called “super subsidy” (*Superförderung*), where the City administration grants specific loans that lower or cover the full capital contributions of the tenant’s dependent on different income thresholds (Wohnfonds Wien 2019). The allocation of the apartments is split between the LPHA’s and the City, whereas income thresholds regulate the general accessibility to subsidized social housing. Apartments that are allocated by the City administration foresees additional access rules, such as two years of permanent residency in Vienna. In the end, social housing caters low income groups, but income limits are designed to also cater mid-income groups in social housing in Vienna (Franz and Gruber 2018).

To ensure high-quality standards of subsidized housing, builder's competitions have been introduced in 1995 for building lots that are owned by the City (Wohnfonds Wien) or projects with more than 500 apartments (Wohnfonds Wien 2017a)<sup>1</sup>. Projects are assessed according to economic (land and construction costs, affordability), architectural (urban form, building structure) and ecological criteria. Ecological criteria focus on climate- and resource-efficient construction such as low-energy consumption standards of the building hull, energy-efficient heating and the use of ecological materials. Further criteria are the support health and environmental-friendly housing, support of energy-friendly lifestyles (cycling garages for example) and the provision of high-quality green spaces. Collaborative aspects in social housing have been re-emphasized with the introduction of the criteria 'social sustainability' in 2009 as the fourth pillar. Especially the sub-criteria of collaborative housing led to a renaissance of communal infrastructure in large-scale social housing and is characterized by a strong top-down planning approach to collaborative housing. In some, limited cases there is tentative experimentation with participatory planning of apartments and common spaces in social housing (Gruber and Lang 2018). But dominantly, communal infrastructure in social housing projects are planned top-down without any participation of future tenants. However, evaluations showed that provision of communal infrastructure alone leads to insufficient use (Gutmann and Huber 2014). Based on that experiences it is nowadays dominant practice that consultants, that have specialized on group formation, support the organization and initiate the use and, in some cases, the self-maintenance of common spaces in the first years (Brandl and Gruber 2014). In some cases, tenants are able to participate in equipping the pre-defined communal infrastructure, which increases the participatory aspects of the social housing model. In 2013 the builder's competition has been further innovated into a 'dialogue-orientated' two-stage builder's competition and tackles the scale of the neighborhood in the planning phase. In a first step, winners of single building lots are determined and in a second step single projects are further advanced in relation to other building lots or to existing infrastructure of the surrounding neighborhood (Gutmann and Huber 2014). Furthermore, developer's competition uses social – such as intergenerational living, intercultural living, but also ecological foci – such as car-free neighborhoods or urban gardening to develop topic-orientated housing (Wohnfonds Wien 2017a).

Given the strict building related ecological standards in subsidized housing in Vienna, we want to turn our focus to distributional and procedural aspects of socio-ecological justice in *Baugruppen* and social housing with regard to everyday socio-ecological practices. By comparing two selected projects characterized by a strong socio-ecological orientation we investigate the distributional and procedural aspects by focusing on who plans and finances social and ecological infrastructure, who benefits from it and which socio-ecological practices are enabled by it.

### 3.2. Socio-ecological implications of selected co-housing models

Motivations that drive the construction of communal and green spaces in *Baugruppen* and social housing are at the same time of social, economic and ecological nature. Socially, community living, neighborhood help, and local identification is favored over the anonymous everyday life of contemporary cities. A more efficient use of the built infrastructure in form of higher utilization of common spaces rather than individual spaces contributes to ecological as well as economic sustainability. Affordable housing for individual renters also contributes to economic sustainability.

As specific *Baugruppen* and social housing projects very much differ in their concrete realization we focus on two exemplary projects that show a strong socio-ecological orientation.

The first is the *Baugruppe "Wohnen im Grünen Markt"* (Green Market), which was realized in the form of the participatory model in co-construction with a limited-profit developer, though without subsidies. It is located in the inner-city development area *Sonnwendviertel*, which is a mixed used and mixed-class neighborhood. One-third of the area is dedicated to social housing, one-third to free-

<sup>1</sup> Smaller subsidized housing projects are assessed by the Vienna Land Advisory Board.

financed housing and one-third consists of mixed-use buildings including five *Baugruppen* and ten *Quartiershäuser* (neighborhood centers). The latter are buildings that are characterized by a mixed use in terms of living and working. The Green Market has been chosen, since it is focused around this interesting social-ecological practice by combining workspaces, shops, offices and collaborative housing in the form of a *Baugruppe* in one building.

The second is the social housing project "*Auf lange Sicht*" (In the long view; as it offers a long view through the neighborhood) which focuses, amongst other communal infrastructure, on the provision urban gardening infrastructure as a trigger for collaborative housing. It is located in the outer city working class neighborhood "*Alt-Erlaa*" in the southern part of Vienna and is characterized by large social housing buildings from the 1960s, 1970s and 2000s. The housing project "*Auf lange Sicht*" is part of the newly erected neighborhood "*Erlaaer Flur*" which consists of five subsidized large-scale developments and was per builders' competition devoted to urban gardening ("*In der Wiesen: urban gardening*").

#### *Socio-ecological practices: Sharing is caring or 'just' using?*

The Green Market is split into two main areas, around 30% are workspaces and shops at the lower floors, and 70% are living space with 50 apartments at higher floors (Wohnen im Grünen Markt 2019). Already during the planning process this divide raised questions about the accessibility of communal spaces as most of the communal infrastructure has been co-planned between the architects and the tenant association of the Green Market. The Green Market features a substantial amount of communal infrastructure for collaborative living and for socio-ecological practices. An atelier, a library, a community kitchen, a laundry room, a lounge, a cinema, a sauna, a yoga room, a workshop, a children's playroom and a youth room make up 350m<sup>2</sup> inside communal infrastructure. The interior design for these spaces has been organized and financed by the tenant group itself; each adult had to pay a fee for equipping the communal spaces but was also assigned to co-organize at least one communal space. Two roof top terraces equipped with playground, beds for urban gardening and relaxing areas sum up to 700m<sup>2</sup> additional outdoor common space. As a consequence of the co-planning approach, the usage of the mentioned spaces is limited to members of tenant association only. Also, because the association rents these spaces from the landlord based on a monthly fee paid by the individual renters. This also means that renters – and potential entrepreneurs - that are not part of the tenant association are excluded from using those spaces.

Nevertheless, this extensive amount of common spaces and the collective planning process fostered two main socio-ecological practices: sharing and swapping. First, sharing common spaces led to the planning of smaller apartment layouts of the individual tenants. The design of the physical infrastructure towards their needs, especially the communal kitchen, the laundry rooms, the atelier/workshop, the roof-top terraces and children's playroom, were motivations to reduce the size of individual apartments. Furthermore, the tenant group started early to incorporate shared, sustainable modes of transport into their project such as cargo bikes and private car sharing. Furthermore, the IT infrastructure was planned collectively without individual connections and, last but not least, a food cooperation has been established. Second, swapping and reuse has been inscribed into the physical space. Spaces for non-profit swapping and sharing of books, media, and other everyday objects such as clothes, kitchen utilities, etc. has been established.

In contrast to the 'exclusive' common spaces mentioned above, also common spaces that are open to the public are foreseen in the Green Market. The "*Machhalle*" – which can be literally translated into the 'Hall of Doing' – is the ground floor space where entrepreneurs reside. It functions as a place for local everyday supply, as a lively neighborhood center and event location. Attached to this is the "*Scala Publica*", which is a public staircase and at the same can be used as an event location. A forecourt and a (green) playground beside the building opens up to the pedestrian zone of the neighborhood. Although only a limited number of green amenities are shared with the public, the concept of the Green Market strongly relies on the concept of 'short distances' and 'mixed use' to reduce commuting and leisure mobility.

Table 1: Comparison of distributional and procedural aspects of the selected projects

	The Green Market	In the long view
Housing accessibility	<ul style="list-style-type: none"> <li>- Rent: 11,62€ per square meter</li> <li>- Capital contribution: 700€ per square meter</li> <li>- Association fee: 40€ per month and adult</li> <li>- Fee for equipping and planning: ca. 5.000 € per adult</li> <li>- Housing allocation by the tenant association</li> </ul>	<ul style="list-style-type: none"> <li>- Rent: 6.95€ per square meter</li> <li>- Capital contribution: 459€ per square meter</li> <li>- Housing allocation: <ul style="list-style-type: none"> <li>- Income limits apply to all apartments</li> <li>- Allocation split between the City and the developer</li> <li>- For (smart) apartments allocated by the City additional criteria such as a two-years residency in Vienna applies</li> </ul> </li> </ul>
Diversity	Rather homogenous: <ul style="list-style-type: none"> <li>- Higher education backgrounds</li> <li>- Mid to high incomes</li> <li>- Mostly Western European</li> </ul>	More mixed: <ul style="list-style-type: none"> <li>- Lower to high education backgrounds</li> <li>- Low to mid incomes</li> <li>- Diverse immigration backgrounds</li> </ul>
Socio-ecological orientation and practices	<ul style="list-style-type: none"> <li>- Mixed-use: living and working in one building</li> <li>- Sharing of communal infrastructure: community kitchen, laundry rooms, playgrounds, roof-top terraces, workshops, IT-infrastructure, bike and car sharing, food cooperation</li> <li>- Smaller individual apartments and alternative living arrangements (Cluster living)</li> <li>- Reuse: Swapping of everyday objects</li> </ul>	<ul style="list-style-type: none"> <li>- Urban Gardening as leading theme</li> <li>- Provision of affordable, yet ecological individual apartments (smart apartments)</li> <li>- Provision of compensating spaces for smaller apartments: <ul style="list-style-type: none"> <li>- Green infrastructure: garden beds, glass houses, green space with eatable plants and community garden</li> <li>- Communal spaces: laundry rooms, roof-top terraced, playgrounds, multi-purpose community rooms, sports hall</li> </ul> </li> <li>- (Yet) mainly using than sharing</li> </ul>
Aspects of procedural justice	High participatory possibilities: <ul style="list-style-type: none"> <li>- Co-planning of green and communal infrastructure with architects</li> <li>- Early integration of shared use and swapping scenarios in the planning of communal spaces by the future tenants</li> </ul>	Limited participatory possibilities: <ul style="list-style-type: none"> <li>- Top-down planning of green and communal infrastructure</li> <li>- Participation in organizing the use and equipping after the provision of pre-standardized communal spaces (supported by consultants)</li> <li>- Participatory planning of neighborhood-wide community garden</li> </ul>
Aspects of distributional justice	Limited distributional aspects: <ul style="list-style-type: none"> <li>- Access to communal and green infrastructure is limited to a homogenous group of higher status</li> <li>- Only limited provision of amenities to the wider neighborhood of similar population structure</li> </ul>	Strong distributional aspects: <ul style="list-style-type: none"> <li>- Access to communal and green infrastructure for a heterogenous group of residents</li> <li>- Public green space and communal spaces are also accessible to the wider, working-class neighborhood</li> </ul>

Own compilation based on Wohnen im Grünen Markt 2019 and Wohnfonds Wien 2017b

The case of the large-scale social housing premise “In the long view” consists of 323 subsidized apartments of which 108 are SMART-Apartments. Although affordability was the main driver of introducing smart apartments into the current system of social housing, the compact ground-floor plans of smart apartments are resource-friendly at the same time. However, via the instrument of builder’s competition, the City demands social and green amenities as compensating spaces (Wohnfonds Wien 2009). The project was planned top-down by architects and the limited profit housing associations under supervision of the two-stage builder’s competition. The first stage focused on social, economic, ecological and architectural qualities of the building itself under the thematic

focus on urban gardening. Infrastructure for urban gardening was implemented at the ground floor as arable spaces for tenants, a terrace with raise beds and in the form of common glass houses for wintertime. Moreover, shared facilities that are exclusively for the tenants, such as bike storage rooms for 720 bikes, two laundry rooms, four multi-purpose communal rooms including community kitchens and/or playing zones for children, four terraces with different purposes and amenities, extensive public green spaces with eatable plants and a public children's playground are integral part of the before mentioned social and green 'compensating' spaces on the building level.

As all common spaces are predefined within this housing model, a two-year lasting participatory process aims at making "dwellers to neighbors" (Wohnfond Wien 2017b). The tenants are supported in the organization of equipping and using the common spaces by the consultant companies. First of all, the urban gardening infrastructure was allocated to interested households by the first come, first serve principle, but a waiting list already exists. But tenants already teamed up and started to collaboratively plant the garden beds. However, in contrast to the *Baugruppen* example, tenants do not put the ecological role of common spaces, apart from the garden beds, to the fore. The social rationale is more present, and common spaces are rather used for birthday celebrations, sports activities and cultural activities. This is also related to the online booking system, where individual tenants can book rooms for specific time slots only. Sharing is not (yet) an essential part, although this is also pursued by the consultant company – such as private carsharing, but already early meetings have been postponed due to low interest.

The second stage of the builder's competition focused more on the integration of the buildings into a common neighborhood vision. As a consequence, each of the five large-scale buildings provided one communal space to the neighborhood: a sports hall, a neighborhood kitchen, an atelier/workshop, a seminar room, a gym now can be reserved by the neighbors via an online booking system and chip-based access system. The core of the neighborhood, however, is built upon a neighborhood garden which aims at the "community aspects of gardening in large scale social housing" (Wohnfonds Wien 2017b). It is planned that the beds will not be used by individuals, but planting shall be organized rather in a collective manner. The neighborhood garden will be open to every tenant of the neighborhood and the planning of the neighborhood garden is participatory. Residents develop the neighborhood garden under the guidance of consultants. For equipping the garden, a collective fund was established by the housing associations to cover initial investment costs.

#### **4. Discussing socio-ecological practices: from whom, for whom?**

What can we learn from these two examples in terms of socio-ecological justice? From a procedural socio-ecological justice perspective, the bottom-up planning approach of the *Baugruppen* project generated a substantial amount of communal spaces. Additionally, the planning of communal spaces at an early stage allowed for a tight integration with scenarios of lived socio-ecological practices at the latter stage of living together. The planned infrastructure is, therefore, better compatible with smaller apartment designs due to shared spaces but also sharing and swapping practices in the everyday life of tenants. These socio-ecological practices are clearly oriented at a de-growth approach to greening. However, the distributional aspect of socio-ecological justice is rather limited for *Baugruppen*. First of all, the common spaces that allow for environmentally friendly practices are exclusively limited to the tenant association. But also, the limitation of *Baugruppen* to higher socio-economic groups and higher educational levels adds up to a rather elitist production of housing and ecological practices.

The top-down approach of the social housing project, however, shows strong distributional aspects of EJ. The access to environmental green spaces in the chosen social housing premise is more equal since social housing in Vienna includes lower and mid-income groups. Also, the efficient use of physical space in the form of compact apartments includes environmentally friendly aspects. Additionally, the distributional aspects of EJ open up to the wider neighborhood, since the building provides public green spaces and communal, social infrastructure to the neighborhood. However, aspects of

procedural justice are limited to organizational questions of use and equipment after moving into the building. The use of communal and green infrastructure is more important to the tenants than sharing and swapping practices. Nevertheless, the support of consultants aims to establish such practices, also by enabling the possibilities to plan 'iconic' neighborhood garden participatory. The 'just' provision and use of amenities are stronger than sharing practices oriented at de-growth for this model.

To sum up, these case studies are helpful to shed light on some relevant aspects of the debate about urban greening and urban justice. The first one is related to new research needs emerging in the scientific literature developed on the socio-spatial implications of greening. So far, the debate has been focusing especially on the possible negative impacts of urban greening on housing affordability and socio-spatial segregation (Haase et al. 2017). Instead, this paper attempts to critically analyze some possible socio-ecological practices that are able to combine urban justice and ecological innovation. The second contribution is related to the literature developed on intentional communities and co-housing practices. Green Market confirms some criticalities already explored in the literature: these communities may be affected by self-segregation processes, bringing limited distributional benefits in terms of environmental and social justice. However, in line with Droste (2015), we agree that local authorities are crucial in defining different levels of inclusiveness of co-housing through planning practices. In the long view case, local authorities have learned relevant lessons in terms of social and environmental practices developed in *Baugruppen* and other kind of intentional communities. However, they have been able to up-scale innovations, by providing through housing policies better opportunities for inclusiveness and justice.

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