



## Greening *Red Vienna*: lessons for social-ecological housing provision

Andreas Novy, Benjamin Baumgartner, Simon Grabow, Leonhard Plank & Hans Volmary

To cite this article: Andreas Novy, Benjamin Baumgartner, Simon Grabow, Leonhard Plank & Hans Volmary (2024) Greening *Red Vienna*: lessons for social-ecological housing provision, *Sustainability: Science, Practice and Policy*, 20:1, 2312674, DOI: [10.1080/15487733.2024.2312674](https://doi.org/10.1080/15487733.2024.2312674)

To link to this article: <https://doi.org/10.1080/15487733.2024.2312674>



© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 21 Feb 2024.



Submit your article to this journal [↗](#)



Article views: 1571






View related articles [↗](#)



View Crossmark data [↗](#)

## Greening *Red Vienna*: lessons for social-ecological housing provision

Andreas Novy<sup>a</sup> , Benjamin Baumgartner<sup>a</sup>, Simon Grabow<sup>a</sup>, Leonhard Plank<sup>b</sup>  and Hans Volmary<sup>a</sup> 

<sup>a</sup>Institute for Multi-level Governance and Development, Vienna University of Economics and Business, Vienna, Austria; <sup>b</sup>Research Unit Public Finance and Infrastructure Policy, Vienna University of Technology Wien, Vienna, Austria

### ABSTRACT

Contemporary housing systems neither live up to their social nor their ecological aims, resulting in affordability and environmental crises. We explore the potentials for securing access to affordable and adequate housing for all while rapidly reducing energy and resource use and associated greenhouse-gas (GHG) emissions. For this purpose, we carry out a case study of the housing system in Vienna to scrutinize how social-ecological provision has been enabled or restrained by Viennese housing regulations. We introduce a broad conceptualization of housing that encompasses material objects (housing as noun) and socio-cultural practices (housing as verb) and embed these concepts in a provisioning perspective. The history of Vienna's housing system is outlined with an emphasis on the radical municipal reformism of *Red Vienna* (1919–1934) and path dependencies from welfare capitalism to neoliberalism. Based on the historical analysis, we highlight barriers hindering social-ecological housing provision today and suggest three sets of measures for greening *Red Vienna*: (1) Establishing social-ecological obligations to property ownership, prioritizing ecological upgrading, and favoring retrofitting instead of new constructions; (2) introducing lower and upper limits on housing provision to reduce inequalities; and (3) overcoming the focus on individual building sites and widening the scope of housing policies toward securing habitation for all residents.

### ARTICLE HISTORY

Received 9 August 2023  
Accepted 28 January 2024

### KEYWORDS

Housing; Vienna; habitation; transformation; provisioning; climate change

### Introduction

As a prerequisite for human flourishing, housing plays a crucial role in efforts to stay within planetary boundaries and represents a key domain for social-ecological transformation. Yet housing systems around the world are neither satisfying social needs nor respecting ecological limits. With estimates of 1.6 billion people to be affected by 2025 (World Bank 2021), housing shortages amount to a global tragedy. In Europe, over the last decade, house prices increased by 42% and rents by 16% (Eurostat 2022b), generating rising housing costs and exacerbating inequalities (Dewilde and De Decker 2016; Lee, Kemp, and Reina 2022). Even before the COVID-19 pandemic and soaring energy prices, one in ten Europeans spent more than 40% of their income on housing (Eurostat 2022a).

Additionally, contemporary housing systems fall short of complying with ecological objectives (IPCC 2022; zu Ermgassen et al. 2022).<sup>1</sup> Buildings and their related energy requirements are responsible for 16% of global greenhouse-gas (GHG) emissions (IPCC

2022).<sup>2</sup> Two of the most important construction materials, steel and cement, account for more than half of all industry-related GHG emissions (Rissman et al. 2020). Moreover, the expansion of housing infrastructure and the related necessary supply chains for construction materials contribute to land-use change and biodiversity loss, threatening approximately 24% of endangered species listed on the International Union for the Conservation of Nature's (IUCN) Red List (Torres et al. 2022; zu Ermgassen et al. 2019).

In summary, since Engels' (1975 [1872]) original formulation, contemporary housing questions have evolved. Housing shortages have spread across social strata and the ecological dimension of housing provision is increasingly problematized (zu Ermgassen et al. 2022). This article explores the potentials for securing access to affordable and adequate housing for all while rapidly reducing energy and resource use and associated GHG emissions. For this purpose, we carry out a case study of the housing system in Vienna and consider how social-ecological provision

has been enabled or restrained by housing regulation. It is, thus, an attempt to find answers to the housing questions of the 21st century. The following section explains our underlying conceptual strategy, while the next section concretizes this approach by specifying our broad understanding of housing and the related political economy of housing. We then describe the housing system of *Red Vienna* and outline the contemporary Viennese housing system, shaped by path dependencies from welfare capitalism and neoliberalism. The article subsequently highlights three main barriers hindering social-ecological housing provision today and proposes a transformative agenda to tackle these barriers, drawing on the legacy of *Red Vienna*. The final section offers our concluding comments.

## Research approach

Contemporary research on provisioning systems acknowledges the importance of integrating socio-metabolic with politico-economic perspectives (Mattioli et al. 2020; Pirgmaier 2021; zu Ermgassen et al. 2022), often in historical analyses (Bärnthaler, Novy, and Stadelmann 2023; Fine, Bayliss, and Robertson 2018) to identify “key socio-economic factors [that] enable societies to meet human needs within sustainable levels of energy use” (Vogel et al. 2021, 1). Drawing on this literature, we adopt a case-study design that follows a Social Provisioning Perspective (SPP) (Fanning, O’Neill, and Büchs 2020; Jo and Todorova 2017) as well as a System of Provision (SoP) approach (Bayliss and Fine 2020). Further, we relate this body of research to the interdisciplinary field of housing studies, which has for a long time analyzed housing provision as embedded in wider societal structures (Ball 1986; Barlow and Duncan 1994; Kemeny 1995; Stephens 2020).

First, this approach is committed to a SPP based on an “embedded view of the economy” (Jo and Todorova 2017, 32) in social and biophysical processes, conceptualizing it in line with an Aristotelian tradition as the “management of the material basis of the household or...politics” (Jo and Todorova 2017, 29) and as the organization of livelihood (Polanyi and Pearson 1977). Hence, we relate decent housing provision to human flourishing in general, thereby explicitly rejecting a reductionist understanding of housing as a solely private affair and instead conceptualizing it broadly as habitation (Bärnthaler, Novy, and Stadelmann 2023). This has, as demonstrated later in this article, significant implications for policymaking. Second, we follow a SoP approach by exploring the distinctive political economy of a concrete phenomenon (Bärnthaler

et al. 2022), namely the specific housing-provisioning system in Vienna. This entails integrating production, consumption, and distribution while also exploring the interplay of politico-economic and socio-cultural elements in the analysis of a particular provisioning system (Bayliss and Fine 2020). This integrative approach will guide the historical analysis of the Viennese housing system.

The SoP approach was inspired by debates within housing studies starting in the 1980s, in particular the structures of provision approach developed by Ball, who claimed that housing provision should be analyzed “in terms of the totality of social relations associated with the form of housing provision in question” (Ball 1986, 1). Furthermore, analyses of the political economy of housing (Aalbers 2017; Ryan-Collins et al. 2017), as well as explicitly historical approaches emphasizing path dependency (Bengtsson and Ruonavaara 2010; Blackwell and Kohl 2019) are well-established in the field. Consequently, housing scholars have analyzed the institutional mechanisms of housing provision in the spheres of consumption, production, and distribution and their embedding in wider socio-economic structures (e.g., Stephens 2020; Baumgartner and Volmar 2022). The decoupling of energy use from human-needs satisfaction, however, has only recently been addressed (e.g., Cohen 2021; Lorek and Spangenberg 2019; zu Ermgassen et al. 2022). We expand on this literature by bringing together two important research traditions that have only lately started to relate to one another: research on housing provision as a social problem and as an ecological challenge. This helps us to enrich both research traditions and overcome social-only as well as environmental-only policy recommendations.

We do so by conceptualizing housing as a materiality (housing as a noun) and a practice (housing as a verb). This enables us to identify potentials and barriers for social-ecological housing provision in Vienna. In our historical and institutional analysis, we first examine regulatory changes in the political economy of the Viennese housing system, focusing on the relative power of landlords, tenants, and the municipality in advancing or hindering social and ecological housing policies. Second, we examine how these regulatory changes result in housing infrastructures (housing as a noun) and practices (housing as a verb) with distinct social-ecological consequences. Examples include average per capita floor space and daily mobility practices.

The Viennese housing system serves as a suitable case study, as the city is widely regarded as a best-practice example for providing both high-quality and affordable housing to large parts of its population (Mari and Locatelli 2023; Marquardt and Glaser

2020). Rooted in *Red Vienna's* socialist agenda, the city is still governed by social democrats and maintains responsibility for housing provision, which includes a large municipal stock. Notably, while sustainability was not explicitly addressed at that time, many of *Red Vienna's* policies align with contemporary sustainability efforts and universal public services to “deliver strong social outcomes without high levels of resource use” (Hickel et al. 2022, 401). Hence, our study examines *Red Vienna's* legacy as well as the changing trajectory of housing provision in Vienna since World War II, which contributed to today's systematic ecological overshoot.

### Conceptualizing housing for social-ecological transformations

To concretize our provisioning approach outlined in the prior section, housing has to be investigated as a multi-faceted research object that can be approached from various perspectives (Anacker, Nguyen, and Varadym 2015; Schippner and Vollmer 2020). For understanding the social and ecological impacts of housing systems, we propose a broad conceptualization of housing that encompasses material objects (housing as noun) and socio-cultural practices (housing as verb) (Turner 1972). Moreover, we conceptualize housing as providing use and exchange value (Aalbers and Christophers 2014; Harvey 2006) and stress the significance of property rights in appropriating the latter (Robé 2020).

### Broadening the understanding of housing

As social-ecological housing is decisive for human flourishing, climate research increasingly acknowledges the necessity to go beyond a hedonistic understanding of well-being that privileges individual pleasure-seeking (Brand-Correa and Steinberger 2017). Instead, there is a revival of Aristotelian approaches that focus on *eudaimonia* (flourishing), human capabilities and needs, and a good life for all within planetary boundaries (Gough 2017; O'Neill et al. 2018). By conceptualizing housing as habitation (Polanyi 2001), we draw on the notion of habitat, which accentuates the “long-term maintenance to guarantee the reproduction of both human and non-human life” (Savini 2021, 1089). This includes material infrastructures (e.g., buildings, transport infrastructures) and socio-cultural practices (e.g., taking care of children or washing dishes) (Bärnthaler, Novy, and Stadelmann 2023), leading to a comprehensive understanding of framework conditions for social-ecological housing provision, including

the built environment and contextualized society-nature relations.

For such a broader understanding of housing, it is useful to distinguish housing as both noun and verb (Turner 1972). As a verb it encompasses all activities connected to “doing housing,” in other words living and acting in a place (including daily commuting for work and leisure activities) which shape homes and their surroundings. And, as residents organize their daily lives in and between (always contested) private, communal, and public spaces, they attribute meaning to the material objects, turning them into a home. As a noun, housing describes material objects that shape land and nature. It is a dwelling, usually a house or an apartment, that provides shelter. Furthermore, it is embedded within a built environment—material infrastructures that are constitutive of daily life, like pipes and cables, streets, or green and public spaces. Housing understood in this sense fulfills—more or less effectively—the basic human needs of autonomy, physical health, and societal participation (Doyal and Gough 1991; Max-Neef, Elizalde, and Hopenhayn 1991). It creates and sustains a private and intimate sphere of autonomous action within one's own walls, the space one possesses as a tenant or owner; it supports physical health in providing protection from the elements and by providing access to biophysical necessities like water and heating; and it influences opportunities for societal participation, as private spaces are embedded in and entangled with socio-spatial networks.

Almost every aspect of housing provision is associated with energy and resource use, so that housing as noun and verb have distinct ecological implications. As a material object, the construction, maintenance, and refurbishment of housing infrastructure is associated with GHG emissions that are embodied in construction materials (Röck et al. 2020; Ürges-Vorsatz et al. 2020). As a socio-cultural practice, housing produces direct (e.g., heating and cooling of buildings) and indirect (e.g., energy production and distribution, mobility) GHG emissions (Kayaçetin and Tanyer 2020; Ürges-Vorsatz et al. 2015, 2020).

Housing links infrastructures to a diversity of practices, thereby creating path-dependent provisioning systems. While housing structures everyday routines, these routines create and shape the built environment and affect socioeconomic and spatial inequalities (Strüver 2020). This includes spatial development patterns such as low-density housing forms that foster car dependency (e.g., Gill and Moeller 2018) and structurally privilege car ownership for wealthy households in suburban areas. At the same time, increased car traffic creates pressure

to further extend road infrastructures for motorized transport. Summing up, housing provision depends on both material infrastructures and socio-cultural practices.<sup>3</sup>

### **The political economy of property rights and use and exchange value**

The needs-satisfying functions of housing described above constitute its use value, relevant for anyone seeking to lead a decent life. As a verb, housing is seen as residents using a dwelling, thus emphasizing its use value. As a noun, it is regarded as a material object that can be traded on markets, emphasizing its exchange value (Thompson 2020, 50). In capitalist societies, real estate markets combine basic need satisfaction for some with the often-speculative intentions of private and institutional investors which derive from housing's exchange value due to the fact that housing serves as a perfect form of collateral (Ryan-Collins 2021) as well as a storage of value for excess capital (Aalbers and Christophers 2014). Its exchange value is further elevated by the scarcity of the land on which it is built (Ryan-Collins et al. 2017), making it a key asset class and economic sector in financialized capitalism (Piketty 2014).

When exchange-value considerations are dominant, modern societies become market societies (Polanyi 2001), with strong traces of possessive individualism. In market societies, property rights structure not only the possession of homes but also the right to improve, sell, or buy housing (Robé 2020). Ownership, thus, impacts upon any potential transformation in housing provision. While both owners and tenants can possess and use housing, owners have the right to exclude others and are the decision-makers: “[o]wners are akin to lawmakers in connection with their property” (Robé 2020, 53). Their rights go well beyond possessing a thing: a tenant can possess an apartment, but only the owner has the “right of decision-making as a matter of principle” (Robé 2020, 53). This includes investments in building improvements or letting practices. Therefore, transforming housing-provisioning systems toward social-ecological goals depends not only on appropriate policies from public decision-makers (governments, parliaments, and public administrations), but is heavily reliant on private owners and other types of investors. Their legal forms, whether a natural person or a large corporation, as well as the restrictions imposed on legal prerogatives of property strongly influence the potential for social-ecological housing provision.

Large-scale landlords, such as institutional investors (private equity, sovereign wealth funds,

insurance companies, exchange-traded funds, and family offices) or wealthy individuals, have the capacity to shape housing-provisioning systems and siphon off value (Janoschka et al. 2020). These powerful players often ally with middle-class households profiting from price appreciation of their homes (Adkins, Konings, and Cooper 2020), resulting in broad political support for adding new housing stock (zu Ermgassen et al. 2022). Whether the extension of housing production serves the satisfaction of basic human needs or the profit-interest of institutional and private investors crucially depends on the regulation of housing provision—in particular rights and obligations tied to property ownership. Especially since the Great Financial Crisis of 2008 housing systems have privileged “not-for-housing housing” over “for-housing housing” (Doling and Ronald 2019). Such an “overproduction of (financialized) housing” hinders social-ecological housing provision as it “increases overall housing prices (weakening the floor) and devours massive amounts of resources (transgressing the ceiling)” (Bärnthaler and Gough 2023, 9 in this Special Issue). To sum up, rights as well as obligations related to property ownership crucially shape the pathways for social-ecological housing provision.

### **Red Vienna (1919–1934)**

In Vienna, collective responsibility for existential provision dates to the 19th century when energy, transport, and other foundational infrastructures, like water and sanitation, were municipalized (Bärnthaler, Novy, and Stadelmann 2023). This explicit anti-liberal strategy assumed that “every member of society is in need of externally provided infrastructural services like ‘water, gas and electricity’” (Forsthoff in Folkers 2017, 861). However, the municipality did not fully assume responsibility for social provisioning, leaving the satisfaction of housing needs to market logic. The housing boom of the 19th century *Gründerzeit* (founding era) consisted mainly of overcrowded private tenement houses in a still densely populated “compact urban zone” (Musil, Brand, and Punz 2022, 7). While world famous for its arts and intellectual life, the city suffered a tremendous housing crisis, with soaring rents and precarious living standards (Novy 2011, 243).

After World War I, Europe entered a crisis-prone interregnum, opening space for regulatory experimentation (Becker and Novy 1999). In Vienna, from 1919 to 1934, social democrats implemented a radical municipal reform agenda—*Rotes Wien*—with inclusive housing provision at its core (Kadi 2015; Kadi and Suitner 2019). Supported by a strong

worker and settler movement “from below,” progressive social policies were implemented “from above,” via the local state. This was enabled by four favorable framework conditions. First and foremost, housing as a verb was also a political act, resulting from collective mobilization. For example, the settler movement constructed 3,000 self-built homes at the city’s periphery in the years prior to 1925 (Krasny 2012; Novy 1981). Second, rent controls, introduced during the war, were maintained thereafter (Weihsmann 1985). Huge population loss after the dissolution of the Habsburg Empire additionally reduced earnings expectations for landlords and strengthened tenants’ relative bargaining power, which kept private rents low (Kadi and Matznetter 2022). Third, urban land was cheap, and the municipality owned nearly 25% of the land located in Greater Vienna’s territory (Blau 1999), which facilitated public housing construction. Finally, in 1922 Vienna became the ninth Austrian province and was granted additional legal powers, including taxation. The province introduced “a set of progressively staggered consumption taxes on luxury goods such as cars, riding-horses, hotel rooms as well as private servants” (Weihsmann 1985, 32), in particular a municipal luxury housing tax that focused on large dwellings (*Wohnbausteuer*) while leaving small working-class homes largely unaffected. The most expensive 0.5% of taxed objects generated roughly 45% of the revenue (Weihsmann 1985).

These framework conditions facilitated the construction of 64,000 municipal apartments in little more than a decade, an achievement that has shaped the city ever since (Maderthaler 1993). Council housing offered workers access to affordable and decent housing. All apartments had access to running water and washrooms, and were equipped with “electricity, gas, tiled floors in the kitchen and hardwood floors in the other rooms” (Haderer 2023b, 55). The social-democratic municipal government promised to provide a “place that is no longer a mere bedding but a real dwelling” (Bauer in Haderer 2023b, 28). Housing practices, however, remained closely linked to middle-class and bourgeois imaginaries. “Norms of privacy, kitchen design, the forms of social control exercised in the communal housing blocks” (Haderer 2023b, 28) reproduced conventional gender norms. As semi-public water taps (*Bassena*) were abolished, a turn toward the interior was fostered. Within the apartments, the popular live-in kitchen was increasingly substituted by “modern” work-kitchens, inspired by time-saving studies. Although based on radical and emancipatory intentions, household work and cooking tasks came to be performed in

the work-kitchen by women in solitude (Haderer 2023b, 57).

At the same time, *Red Vienna* emerged from collective empowerment “from below,” by means of popular political agency. The municipal administration, supported by a mass movement, made a huge effort to improve non-private spaces, reconciling different housing practices and functions like care, dwelling, play, and consumption (Blau 1999). Infrastructures like public baths, libraries, kindergartens, youth centers, and medical care accompanied large apartment complexes such as the *Karl-Marx-Hof*. Spread around the city, these large estates with their spacious common areas addressed various social groups, thereby contributing to social mixing (Friesenecker and Kazepov 2021; Kadi and Suitner 2019). Council estates, however, remained islands of good housing, enclaves in the existing urban setting and townscape. Planning was seldom extended to the surrounding streets and thus lacked a systematic transformation of public spaces (Hegemann 1926). Mobility was organized in the densely populated, still “walkable” *Gründerzeit*-city by a municipal public transport system, especially cost-effective and resource-light tramways.

Even though environmental concerns were secondary, the practice of collective consumption entailed positive ecological potentials as well as crucial lessons for social-ecological housing provision today. Apartments were small, mainly between 38 and 48 square meters (m<sup>2</sup>) (409 and 517 square feet (ft<sup>2</sup>)) (Weihsmann 1985), but complemented with communal facilities, like green areas, kindergartens, and libraries (Kadi and Suitner 2019). This significantly improved living conditions and capacitated workers as healthy laborers and self-conscious citizens. Shared facilities enabled needs satisfaction in a relatively resource-efficient manner (e.g., Baltruszewicz et al. 2021). Supporting healthy living conditions, like access to fresh air and sunlight as well as green spaces for all, added an ecological dimension to Vienna’s social infrastructure that was hardly acknowledged at the time. This institutionalized the right to decent housing for increasingly more residents as part of a broader municipal transformative agenda. However, these infrastructures focused on the interior of the council-housing estates.

In summary, *Red Vienna* successfully tackled housing questions of its time, fulfilling the basic need of housing for large parts of its population. In doing so, the municipal government pursued the following strategies: it (1) assumed collective responsibility for social provisioning, (2) tackled housing-related inequalities with progressive taxation, generating funds for social-housing construction, and (3)

embedded its housing program in a reformist agenda to change wider social-cultural practices.

### Vienna's contemporary housing system

In this section, we characterize the contemporary Viennese housing system, focusing on path dependencies created by welfare capitalist and neoliberal housing regulation which influence possibilities for social-ecological housing provision today.

#### *Vienna during welfare capitalism and the transgression of planetary boundaries*

*Red Vienna* created a cornerstone for accessible and affordable housing. In 1934, however, this radical reformism was ended by a civil war, leading first to Austro-fascism (1934–1938) and then to Nazi-fascism (1938–1945). After World War II, Austrian political governance became structured around a top-down national compromise between social democrats and conservatives. The former continued to favor subsidized council housing and limited-profit housing associations (LPHAs), companies providing cost-rental housing, satisfying needs through largely decommodified housing (Matznetter 2002, 272). More conservative interests favored subsidizing home ownership, enabled by increased purchasing power. These opposing interests were successfully accommodated during the high-growth decades after World War II (Kadi 2018).

In Vienna, fiscal transfers from the federal government replaced the municipal luxury housing tax (Novy et al. 2001). Regulating building codes, managing council housing, and administering housing subsidies remained competencies of the City of Vienna (Kadi, Vollmer, and Stein 2021). The municipality upheld council housing, but slowly delegated responsibility for the construction of social housing to LPHAs, whose construction activity started to exceed council housing from the mid-1980s onwards (Matznetter 2002).

During the 1960s, the net increase in apartments, mainly at the urban perimeters, hit a peak with 105,000 units (Eigner and Resch 2001). However, rigid rent controls disincentivized private investment in inner-city *Gründerzeit*-neighborhoods and contributed to the deterioration of the 19th-century housing stock (Kadi 2018). Countering these developments, from the 1970s onward, Vienna initiated its comprehensive “gentle urban renewal” program with the aim to refurbish its existing building stock without negative social consequences like gentrification. The program was successful in revitalizing and upgrading approximately 340,000 apartments (Novy

and Hammer 2007). However, it resulted in larger apartment sizes by merging smaller, often-substandard apartments, and re-introduced commodification logic by limiting legal protection for sitting tenants to 15 years and increasing the attractiveness of *Gründerzeit*-apartments for high-income households (Hatz 2019). Many landlords took up public subsidies in the expectation of higher long-term earnings, contributing in the long term to gentrification (Hatz 2019).

In welfare-capitalist Vienna, urban sprawl and the spatial separation of work and home, requiring lengthy daily commuting, accelerated the expansion of road infrastructure and institutionalized car dependency, for example, by closing tramway lines to enlarge automobile infrastructure (Eigner and Resch 2001). As a key regulatory framework, the road-traffic act of 1960, still in force today, prioritizes moving traffic over livability, thereby disadvantaging active mobility, like walking and cycling (Furchtlehner et al. 2023). In 1993, car-based mobility constituted 40% of transport demand, while public transport accounted for 29%, pedestrians for 28%, and bicycles for only 3% (Linien 2023). Mass consumerism and social progress during welfare capitalism thus went hand in hand with GHG emission-intensive mobility practices, resulting in the transgressing of planetary boundaries (Büchs and Koch 2017; Koch 2022; Steffen et al. 2015).

#### *Vienna during neoliberalism and the deepening climate crisis*

The corporatist Austrian housing system was also conservative in resisting neoliberal privatization and commodification (Matznetter 2002). Although adhering to New Public Management and austerity policies, it remained committed to social housing and restrictions on financialization, like strict regulations on loan-to-value (LTV) ratios and the exclusion of mortgage securitization (Mundt 2018; Springler and Wöhl 2020). These policies prevented significant price surges until the 2008 Great Financial Crisis, although a liberalized tenancy law, that legalized time-limited rental contracts and a location-based premium for rent-regulated apartments, had already been enacted in 1994 (Baron et al. 2021; Kadi 2015). In 2004, council-housing construction ended, while subsidized housing construction by LPHAs increased (Friesenecker and Kazepov 2021).

After 2008, Vienna's population grew rapidly, and investors discovered the city as a profitable opportunity. This led to a construction boom that culminated between 2018 and 2021, when almost 60,000 units were built, mainly by profit-driven developers in the unregulated housing segment at prices unaffordable to

average Viennese citizens (Plank, Schneider, and Kadi 2022). “Buy-to-let” (BTL) became a popular investment vehicle for private (Aigner 2022) and institutional investors (Plank et al. 2023). In Austria, there are still relatively strict rental regulations in place for apartments in pre-1945 buildings. This incentivizes developers to demolish historic stock in *Gründerzeit*-neighborhoods and to build new and unregulated housing, predominantly condominiums (Plank, Schneider, and Kadi 2022), which leads to displacement (Musil et al. 2022). Furthermore, by agreeing to rent out a (new) apartment for a minimum of 20 years (Bauernfeind et al. 2021), buyers of so-called *Vorsorgewohnungen* (investment apartments) can reclaim valued-added tax (VAT) and deduct loan interest. In 2018, 446 projects with 23,886 *Vorsorgewohnungen* were developed (Aigner 2022), often in large residential towers (e.g., *Triiiple* in the 3rd and *Rivus* in the 23rd district).

The share of non-subsidized private for-profit housing construction increased from around one-tenth in the early 1990s to more than two-thirds by the late 2010s (Plank, Schneider, and Kadi 2022). As some investors, particularly in the BTL sector, view housing as solely a storage of value, exchange value increasingly dominates the social use of housing. Increasing this type of housing supply will hardly improve accessibility and affordability for low- and middle-class residents, as newly built units are often designed to suit preferences of high-income households, with average private rents twice as high as the average social rents (Plank, Schneider, and Kadi 2022). Moreover, vacancy rates (approximated as units without registered residents) remain high at almost 10% across the total housing stock (Statistik Austria 2023d) and can go up to 20% in new construction projects of profit-oriented developers (Plank, Schneider, and Kadi 2022), indicating that some apartments primarily serve as assets for future valorization. Furthermore, institutional investment has driven up land prices, negatively affecting housing affordability because, first, social housing construction relies on affordable land prices (Kössl 2022), and second, the location-based premium in rent-regulated private rentals is coupled to the price of land (Kadi 2015). Accordingly, average rents in the private rental segment rose by over 50% from €6.9 per square meter (€/m<sup>2</sup>) (2008) to 10.4 €/m<sup>2</sup> (2021) (Statistik Austria 2021), while average prices for apartments in 2021 stood at 235% (compared to 2008), indicating a housing bubble as highlighted by the central bank’s monitor (ÖNB 2023). This significant increase in rents, concentrated in attractive inner-city areas, reinforces segregation and gentrification (Kadi and Verlic 2019). Those newly arriving

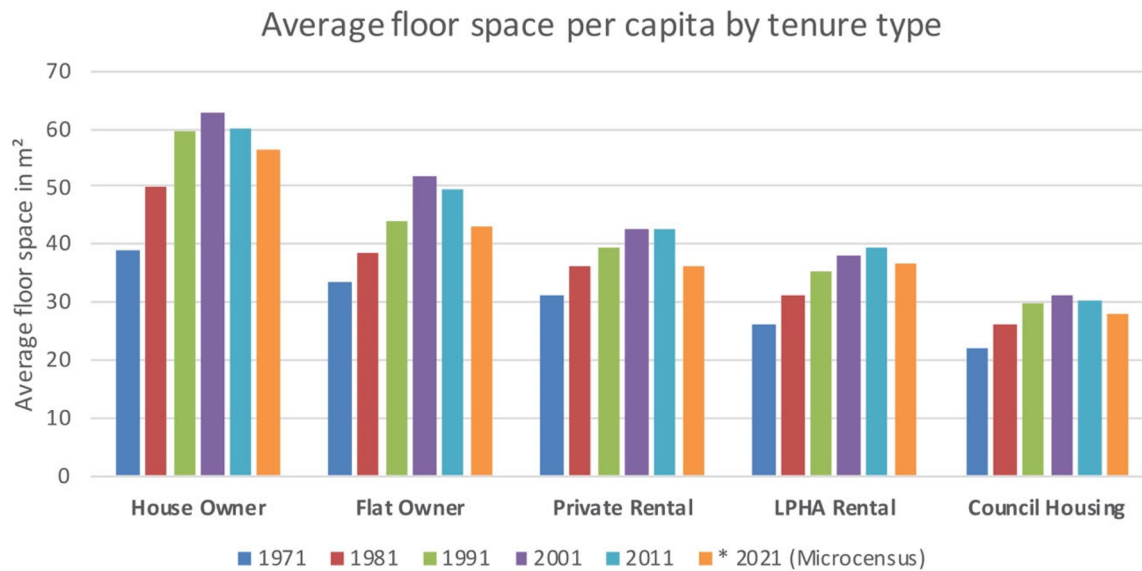
in the city, especially young people and immigrants, face significant entry barriers for council housing; and even when eligible, they have to wait several years for an apartment (Aigner 2019). They are consequently disadvantaged as they depend on an overpriced private rental sector (Kadi 2015 2023).

Environmental and climate issues became important in Austria during the decades dominated by neo-liberal ideology, which prioritized technology-oriented, market-compliant, and efficiency-enhancing policies (Haas et al. 2023). Against this backdrop, Vienna’s 2005 urban development plan focused on supporting economic development, with green spaces aiming to foster livability as well as the city’s international competitiveness (Mocca, Friesenecker, and Kazepov 2020). Subsequently, Vienna’s Smart City strategy integrated social, economic, and environmental objectives. It does not, however, address potential conflicts and tradeoffs (Brandl and Zielinska 2020; City of Vienna 2019) and focuses on experimentation, thereby avoiding “collectively binding, political decisions” (Haderer 2023a, 2). Recently, the city formulated ambitious goals for becoming climate-friendly by, for example, phasing out fossil-heat supply by 2040 and drastically reducing final energy consumed and resultant emissions through energy-efficiency improvements and a shift toward renewables (City of Vienna 2022b).

Overall, the housing sector is the second largest contributor to Vienna’s target-relevant GHG emissions, accounting for as much as 30% (City of Vienna 2022b). Most emissions originate from operational energy requirements due to low insulation levels in much of the city’s housing stock (Haas et al. 2022). However, Vienna has cut emissions from operational energy use by 37% (UBA 2021b) in comparison to 1990 levels in spite of substantial population growth (+25%) and increases in available floor space (City of Vienna 2022a).

Until 2001, living space grew rapidly and continuously. Since 2001, however, average floor space slightly decreased from 38 square meters per person (m<sup>2</sup>/person) (409 ft<sup>2</sup>/person) in 2001 to 36.8 m<sup>2</sup>/person (396 ft<sup>2</sup>/person) in 2021 (Jany et al. 2022), partly due to skyrocketing land prices increasing the attractiveness of smaller, compact dwellings for developers and consumers (Albay 2018). Figure 1 visualizes significant inequalities along different tenure types: individuals owning a house or a flat benefited the most from floor-space growth between 1971 and 2021, with living space growing by 17.6 m<sup>2</sup>/person (189 ft<sup>2</sup>/person) and 9.6 m<sup>2</sup>/person (103 ft<sup>2</sup>/person), respectively. However, also tenants in the private market (+5.1 m<sup>2</sup>/person or 55 ft<sup>2</sup>/person), LPHAs (+10.4 m<sup>2</sup>/person or 112 ft<sup>2</sup>/person) and council housing (+5.5 m<sup>2</sup>/person or 59 ft<sup>2</sup>/person)





**Figure 1.** Average floor space per capita across different tenure types in Vienna.

experienced increases in average floor space. Affluent homeowners thus occupy significantly more floor space than the average Viennese, namely  $19.4\text{m}^2/\text{person}$  ( $209\text{ft}^2/\text{person}$ ) as well as  $28.6\text{m}^2/\text{person}$  ( $308\text{ft}^2/\text{person}$ ) more than tenants living in council housing. Inequalities in the distribution of floor space are not only a reflection of prevailing socio-economic disparities, but translate into housing-related environmental inequalities (Frascati 2018; Theine et al. 2022). This can be attributed to floor space being a key determinant of energy consumption as well as land and material requirements (Heeren and Hellweg 2019; Huebner and Shipworth 2017; Ivanova and Büchs 2020).

Due to its low operational energy requirements, stock expansion is commonly framed as environmentally beneficial. This characterization neglects indirect emissions embodied in construction materials, which account for an additional 20% of yearly use-phase GHG emissions (Haas et al. 2022). Embodied GHG emissions of new buildings are substantially higher than those necessary for retrofitting the existing stock (Haas et al. 2022; Ürge-Vorsatz et al. 2020; zu Ermgassen et al. 2022). This is also true for the expansion of public transport infrastructures, in particular regarding extensions to the underground railway that are emission-intensive in construction and material when compared to similar tramway-based expansions (Buehler, Pucher, and Altshuler 2017). Constructions, moreover, drive land-use change, as agricultural land is repurposed for urban development leading to soil-sealing (Augustin 2016).

From the 1990s onwards, mobility policies have prioritized “as-well-as” strategies, reconciling continuing car-friendly policies with increased investment in

public transport. This has resulted in a substantial reduction of the car-based share in overall mobility to 26%, increases in walking and cycling to 35% and 9%, respectively, and a share of public transport of 30% in 2022 (Linien 2023); but Vienna is characterized by limited tree cover and limited venues for active mobility compared to other European cities such as Rotterdam, Copenhagen, and Munich (Furchtlehner and Lička 2019). Although the city has successfully decreased the share of motorized individual transport, its transport emissions still increased by as much as 51% between 1990 and 2019 (UBA 2021a). Today, the mobility system remains the largest contributor to GHG emissions released within city boundaries, accounting for as much as 43%, with 78% of mobility-related GHG emissions originating from private car use (City of Vienna 2022b).

### Key barriers to transforming housing provisioning

Based on our conceptual reflections on housing as a noun and a verb, as well as the historical overview showing the politico-economic shift toward neoliberalization, financialization, and empowerment of landlords, we identify three main path-dependent politico-economic barriers to social-ecological housing provision: (1) reluctance of (private and public) landlords to invest in social-ecological housing provision, reinforced by neoliberal rent regulation, (2) overproduction and overconsumption of housing, reinforced by welfare capitalism, and (3) the lack of comprehensive planning for secure and ecological housing, reinforced by a narrow understanding of housing as private space only.

First, while Vienna has defended a substantial public housing sector, re-regulation of the federal Tenancy Act and tax incentives has strengthened landlords at the expense of tenants in an Austrian legal system with strong constitutional prerogatives to protect private property (Kadi 2023).<sup>4</sup> Private decision-makers are today much more powerful than during the days of *Red Vienna*. If retrofitting does not match income aspirations, landlords can deny support for socially and ecologically beneficial investments, or alternatively, as has occurred following the period of gentle urban renewal, use retrofitting to justify rent hikes. Thus, without preventative policies to secure basic provisioning, retrofitting can lead to rising property values and “low-carbon” gentrification (Bouzarovski, Frankowski, and Tirado Herrero 2018; Cucca and Friesenecker 2022); this will increase the quality of life for those who can afford it, but can lead to displacement of incumbent residents. This market-compliant mode of living valorizes a broader understanding of good living but restricts its access (Bärnthaler, Novy, and Stadelmann 2023). For example, co-housing initiatives, aligned to communal living ideals with more communal spaces and sometimes ambitious degrowth agendas (Hagbert et al. 2020), remain niche projects for like-minded middle-class households, who have the time and financial means to participate (Cucca and Friesenecker 2022; Xue 2018).

At the same time, Vienna’s ambitious climate roadmap (City of Vienna 2022b) does not list any concrete obligations for greening council housing. Despite having substantial decision-making power by owning 24% of the Viennese housing stock, the municipality’s potential to drastically cut operational energy requirements and resulting emissions remains hardly explored. This illustrates the lack of a coherent political strategy that integrates short-term social with long-term ecological goals. Simultaneously, LPHAs face the problem that social obligations, like limits on rentals, are legal obligations, while environmental obligations like decarbonization are still voluntary. This represents a key barrier, as together council housing and LPHAs account for almost half of the housing stock in Vienna.

Second, growth-oriented housing policies have focused on housing as a noun as they have framed the housing question as a matter of inadequate supply. As a result, stock expansion has been the prime focus in tackling the housing shortage and precarity—from *Red Vienna* to the current municipal objectives of constructing at least 75,000 additional housing units before 2030 (City of Vienna 2019)—has hardly solved the affordability crisis for young and low-income residents forced to rent in the

private rental sector (Kadi 2023). Overproduction, especially of unaffordable and not-for-housing dwellings, peaked between 2018 and 2021, resulting in greater supply of large luxury apartments without immediate price-dampening effects for the many (Plank, Schneider, and Kadi 2022). Moreover, unsustainable mass-consumption patterns, especially greater floor space and intertwined housing and mobility practices, have become the standard of a middle-class lifestyle. Therefore, reductions in floor space cannot be restricted to high-income households only. In order to decarbonize the housing sector, reductions by the middle class cannot be averted.

Third, the current reductionist understanding of housing as a means of shelter is a root cause of unsustainability, as it neglects its implications for housing practices. This impedes a more harmonious human-nature relationship of mutual interdependence by neglecting the impact of surroundings on well-being. City planning in welfare capitalism was inspired by Corbusier’s ideal of a functionally divided city (Biagi 2021). Neoliberalism saw a partial reversal of the modernist functional division between production and reproduction through the implementation of soft urban renewal in formerly degraded *Gründerzeit*-neighborhoods, but reinforced segregation and gentrification (Kadi and Matznetter 2022). Even in *Red Vienna*, despite its socialist aspirations, housing policies centered more on *Gemeinschaft* (milieu-segregated communities) within the council estates, neglecting streets and public spaces. Consequently, social housing complexes remain enclaves with high-quality communal infrastructures, while the surrounding city maintains its non-collectivist traces of the Habsburg Empire and capitalist modernization. Potential synergies of housing provision with other provisioning systems such as mobility have been neglected and car-dependency consolidated.

### **A transformative agenda for greening *Red Vienna***

A transition to social-ecological housing provision that overcomes social-only and environmental-only policies has to align accessible and affordable housing with environmental goals beyond individual building units. This requires, first and foremost, a change in the priorities of urban policies in general. After more than three decades of “experimentation,” understood as “locally anchored, socially embedded, context-sensitive, participatory, adaptive, and reflexive upscaling [of] social innovations” (Haderer 2023a, 1), what is really needed is a different form of “experiment” that returns to more conventional

forms of government.<sup>5</sup> It would re-empower public decision-making by linking deliberative and representative forms of democracy (Bärnthaler 2024). As the task of overcoming social-only as well as environmental-only policies is enormous, the use of multiple instruments is required, reinforcing the conviction that (local) “states can do a great deal to facilitate societal transformations” (Eckersley 2021, 248). For social and ecological housing provision, transformations at multiple levels are necessary. However, cities are nodal points in this transformation. Therefore, municipalities are key actors as they can help to overcome dualisms of top-down and bottom-up policies by better linking different forms of agency. Top-linked policies use public institutions, scientific expertise, and civic participation to implement rules that are valid and binding for the whole city (e.g., limits on luxury housing), and combine it with context-sensitive implementation by means of diverse bottom-linked activities (e.g., co-housing initiatives that cooperate with urban planning institutions) (Oosterlynck, Novy, and Kazepov 2019).

While 100 years ago, *Red Vienna* successfully tackled the housing question by providing decent dwellings on a mass basis, today a new agenda is required to shape housing provision in an integrated way. This agenda has to overcome the ecologically detrimental effects of social-only measures predominant in 20th century welfare capitalism, as well as commodification-enhancing environment-only measures dominant during neoliberalism. To overcome the barriers summarized above, we highlight three corresponding objectives and suggest related sets of measures for greening *Red Vienna*: (1) Establishing social-ecological obligations to property ownership; (2) introducing lower and upper limits on housing provision; and (3) widening the scope of housing policies toward securing habitation for all residents.

### **Establishing social-ecological obligations to property ownership**

Landlords, who as a “matter of principle” (Robé 2020, 78) decide on investment decisions, should be under stronger, enforceable obligations to contribute to social-ecological transformations, mainly by prioritizing ecological upgrading, especially thermal rehabilitations and greening buildings and their surroundings. A return to the Aristotelian principle of “social obligations of property” (Szaif 2005) would also mark a paradigm shift toward a more precautionary relationship to nature that respects biophysical boundaries.

*Red Vienna* was a socialist project that aimed at changing property relations by increasing the share

of public property in mixed economies. It successfully created a strong municipal sector for public provision based on material and social infrastructures. Today, 24% of Viennese residents live in council housing and an additional 21% in LPHAs (Statistik Austria 2020). Affordability of housing long benefited from national rent regulation and a shrinking population, which disempowered landlords. Today, the municipality is facing increasing difficulties in countering neoliberal commodification and financialization dynamics that hinder social-ecological transformation.

In infrastructure-abundant European cities, new constructions should be a measure of last resort (e.g., Schneider 2018). Prioritizing retrofitting reduces operational energy requirements of the existing stock and minimizes raw material consumption and embodied emissions (Haas et al. 2022; Lederer et al. 2021; zu Ermgassen et al. 2022). Both socially and ecologically advantageous, retrofitting is a key contemporary social obligation: energy-efficiency improvements result in enhanced thermal comfort and lower utility bills, producing co-benefits for tenants and homeowners. It is also beneficial to the larger economy by creating domestic value-added (Böhm and Getzner 2017; Ürge-Vorsatz et al. 2020). To achieve its self-declared goal of zero housing emissions by 2040, the municipality needs to switch about 500,000 gas-heated apartments to renewable energy sources and ramp up its efforts to elevate renovation levels from currently 0.9% to 2.1–2.4% per year by Aue and Burger (2021; City of Vienna 2022b). Implementation, however, remains slow due to diverging interests and uneven decision-making power (Ebrahimigharehbaghi et al. 2019). Thus, to drastically cut emissions in the housing sector, mobilizing public and private capital and engaging private owners will be a prerequisite.

While legal obligations to retrofit are hard to implement given the current legal framework, there are several instruments that facilitate instituting social-ecological obligations to property. First, regulation could require owners to implement specific measures within a reasonable timeframe. This could be induced via tax reductions and subsidies. Such a “carrot-and-stick”-approach could also be used for greening façades, unsealing courtyards, planting trees, or opening spaces to the public. Alternatively, one could take up the idea of social licensing, which is a private law approach elaborated by the Foundational Economy Collective that ties public support to private redistribution for well-being (FEC 2018).

Second, landlords could be required to make a fair contribution to finance the necessary transition, for example, via a land-value tax or betterment

levies that capture unearned value increases (Norris and Lawson 2023; Ryan-Collins et al. 2017).

Finally, averting social discontent against environmentally beneficial measures requires regulatory changes, especially rent regulations, so that burden shifting to low-income tenants as well as inactivity by (private and public) landlords is avoided (Weißermel and Wehrhahn 2020).

### **Introducing lower and upper limits**

Current climate research offers increasing evidence that societal disparities in GHG emissions are key drivers of climate change (Chancel 2022; Oswald, Owen, and Steinberger 2020), deepening the consensus that climate policies require courageous distributional policies (Lorek and Spangenberg 2019; Millward-Hopkins and Oswald 2023). Introducing lower as well as upper limits disincentivizes the construction of housing and redistributes existing housing stocks.

Such policies can take inspiration from *Red Vienna's* agenda that challenged the privileges of the wealthy, among other measures by taxing luxury consumption, while guaranteeing decent living standards for workers by subsidizing leisure activities, social assistance, and school reforms. *Red Vienna's* quickly escalating progressive housing tax disincentivized excess floor-space consumption and provided revenues for the construction of affordable housing on a mass basis. The key logic of introducing lower and upper limits is “a minimum social floor and a maximum biophysical ceiling” (Cohen 2021, 178) to secure existential provisioning (“guaranteeing a lower limit”), while redistributing away from the main polluters, the affluent, who benefit from “rent-seeking” (“imposing an upper limit”) (see also Bärnthaler and Gough (2023) in this Special Issue; Fuchs et al. (2021)). However, imposing an upper limit is more challenging today than during *Red Vienna*, as the (mass) production and consumption norms established during welfare capitalism imply not only “taking from the rich” but also limiting current (housing) consumption practices of the middle classes (Cohen 2021).

Notwithstanding these substantial challenges, several pragmatic measures are feasible for transitioning toward more sustainable housing systems. First and foremost, current tax reductions and exemptions for housing construction, homeownership, and institutional investors should be scrapped, as they have effects similar to “fossil-fuel subsidies” in nudging overproduction and overconsumption.

Second, for the majority unable to obtain property, more effective rent regulation is one key factor

for achieving affordable housing. Well-designed rent regulation can de-financialize housing provision by limiting value extraction via short-term rental contracts and location-based premiums (Kadi 2015), while largely avoiding negative consequences (Marsh, Gibb, and Soaita 2022; Whitehead and Williams 2018).

Third, existing stock should be used more efficiently in order to free up unused residential spaces for basic needs satisfaction. Pragmatic measures with radical potential for limiting overconsumption would be progressive taxation of secondary homes, multiple property ownership, and vacancies to ensure more effective utilization of underutilized housing (Heindl 2022a). Similarly, regulatory requirements that limit the practice of “demolish to replace” to the most energy inefficient housing stock (Cabrera Serrenho et al. 2019) could restrain overproduction, as developers tend to apply this strategy to circumvent tenant-friendly rental regulations tied to older buildings (Heindl 2022b). Preventing the unnecessary demolition of retrofittable housing stock and instead shifting toward low-carbon retrofits wherever possible further lowers material throughput and thus embodied emissions (zu Ermgassen et al. 2022). We thus agree with the call of Calafati et al. (2023) for adaptive reuse to prioritize adding, transforming, and reusing over demolishing, removing, and replacing. In addition, and in light of mounting empirical evidence pointing toward the importance of curbing the consumption of floor space for achieving decarbonization targets (e.g., due to higher material requirements and temperature-controlled living space) (Cabrera Serrenho et al. 2019; Pauliuk et al. 2021), promoting “space-efficient” housing via downsizing programs or support for elders to move into smaller apartments can limit overconsumption of floor space (Cohen 2021; Lund 2019).

Fourth, LPHA stock expansion could be enabled through favorable tax and subsidy design and by providing inexpensive land (Norris and Lawson 2023; Plank et al. 2023), while limiting right-to-buy schemes for such apartments (Mundt 2018).

Finally, preventing the burdening of low-income tenants in private LPHAs and public apartments with the costs of switching from fossil-based energy sources to renewables will be imperative for averting low-carbon gentrification.

### **From housing to habitation**

To contribute to human flourishing, housing policies have to overcome their focus on housing as a noun and individual building sites as if they were islands in the townscape. Buildings are always embedded in

places composed of complex human-nature relations, in settlement structures and infrastructures for mobility, leisure, and care (Cohen 2021). This enables more or less social and ecological practices of “doing housing.” Therefore, social-ecological provision of housing is about *habitation*—socio-cultural belonging resulting from acting in a place in which one’s home is embedded. To support housing provision that enables human flourishing while reducing emissions and resource use (Haas et al. 2023; Haderer et al. 2023) requires profound changes which will not be possible without public institutions that systematically align housing policies with urban planning as well as social, environmental, and economic policies.

In *Red Vienna*, ecological concerns focused on equal access and public health, providing shared infrastructures and communal areas of good quality, such as public baths, kindergartens, libraries, medical care, and green areas within council housing.<sup>6</sup> Along with providing shelter, privacy, individual autonomy, and security for tenants, *Red Vienna* promoted a sense of belonging that shaped communal ways of “doing housing.” However, social-ecological housing provision today needs to be more ambitious and based on a broader understanding of housing and belonging, embedding the home in the neighborhood by integrating private, communal, and public spaces, enlarging the forms of doing housing beyond the private domain (Bärnthaler, Novy, and Stadelmann 2023). As in *Red Vienna*, the municipal government is a key actor for this transition, supported by other levels, especially the federal state in charge of rent regulation, social, and fiscal policies.

A crucial enabler for this shift in perspective from housing to habitation goes beyond the traditional field of (municipal) housing and planning policies and relates to national policies, like sufficiency-enhancing investments in public infrastructures or updating the road-traffic act. The latter must stipulate livability as a second main function of streets after smoothly moving traffic. Such a change in nationally binding regulations would facilitate the transformation of car-dominated streets into green streets with landscaped areas and leisure facilities for all generations, countering heat islands and compensating for small homes (Furchtlehner et al. 2023, 99). Socially inclusive and ecologically sustainable neighborhoods comprising green and public spaces, living streets, and lively and walkable neighborhoods that enable emission-saving practices (e.g., accessible and affordable public transport, compact city designs, and the proximity of everyday amenities and services) avoid unnecessary commuting while fostering active mobility (Creutzig et al. 2022; UNECE 2020).

## Conclusion

The prime aim of this contribution has been to provide lessons for addressing the housing question of the 21st century which critically hinges on overcoming social-only and environmental-only analyses and policies. The analytical approach that we employed draws on different provisioning approaches—Social Provisioning Perspective and Systems of Provision Approach—which is detailed in our conceptualization of housing for social-ecological transformation. We mobilize this approach to explore the unique political economy of Vienna’s housing system and its social-ecological consequences. To do so, we link insights from housing studies with different strands of environmental research. While the former tends to focus on the historical and institutional analyses of social issues with ecological concerns remaining peripheral, the latter seldomly incorporates insights from politico-economic research. We enrich the literature on provisioning systems by exploring historical and institutional dynamics and policies at the interface of social and ecological questions. Moreover, our broader understanding of housing as more than just a private space opens new ways for addressing the housing questions of our time by taking inspiration from *Red Vienna*.

By bridging social-only and environmental-only analyses, we try to contribute to the improved alignment of social and environmental goals in housing policies. We consider this an imperative, as public acceptance for drastic reductions in housing-related impacts (e.g., emissions, resource- and land-use) can only be achieved if social impacts are made transparent and cushioned. To do so, we investigated how politico-economic regulations have materialized in a built environment that has over the last century been shaped by changing housing practices. *Red Vienna* laid a foundation for social housing as part of a wider transformative municipal agenda by constructing new housing as well as changing housing practices. While it is rightly known for addressing the housing questions of its time, the radical reformist project also included ecological dimensions with respect to public health and recreation, representing forms of eco-social policies *avant la lettre* and fostered social-ecological infrastructures. Welfare capitalism has increased purchasing power and opportunities for many people but encouraged environmentally harmful socio-cultural practices of mass consumption, contributing to the systematic transgression of planetary boundaries. While the beginning of the 21st century was marked by the growing importance of climate policies, neoliberal governance endangered both social and ecological aims of housing provision by promoting market-centric

policies. Although Vienna's social housing model remained "remarkably stable" (Kadi and Lilius 2022), landlord-friendly re-regulation of the Tenancy Act contributed to rising land, housing, and rental prices. The recent housing boom with overproduction of luxury and "not-for-housing housing" reinforces this trend. At the same time, operational energy requirements of the existing stock continue to account for a large share of overall emissions, with low renovation levels counteracting Vienna's mitigation objectives.

In this conjuncture, a transformative agenda toward social-ecological housing provision consists of at least three fields of action: First, introducing social and ecological obligations for private property and greening public property can satisfy human needs of autonomy, health, and participation while respecting environmental boundaries. Second, redistributing the existing stock by introducing upper and lower limits (e.g., via luxury housing tax à la *Red Vienna*) is imperative for curbing environmental pressures and achieving decarbonization targets in the housing sector. Third, cities must be transformed as a whole to overcome social-only and environmental-only policies. Pursuing the transformation of habitation, not just housing, requires top-linked policies that align courageous public decision-makers with civic participation and expert knowledge. The outlined measures are imperative for achieving social-ecological housing provision and addressing the housing question of the 21st century.

## Notes

1. Following Bourne, housing systems encompass "the full range of interrelationships between all of the actors (individual and corporate), housing units and institutions involved in the production, consumption and regulation of housing. It is thus a much broader term than housing market or sector" (Bourne 1981, 12).
2. As the residential housing sector is responsible for almost 80% of building emissions in Austria (UBA 2021b), we use building emissions as a proxy for housing emissions.
3. Housing sufficiency—limiting housing consumption to what is enough—encompasses the material infrastructure, such as floor size or settlement structures, but also broader practices associated with housing, such as commuting and shopping for daily necessities, which these structures foster (Cohen 2021).
4. The Austrian Tenancy Act governs all rent-regulated private apartments. In Vienna, this concerns predominantly apartments in old buildings, generally those built before 1945. Rents for apartments in these buildings are capped at moderate levels but the law does feature the possibility to deviate from these rent ceilings, depending on the location, amenities, and other features.

5. For a systematic critique cf. Novy, Barlow, and Fankhauser (2022).
6. Today, council-housing complexes have 70,000 trees and one million bushes (Furchtlehner et al. 2023, 100).

## Disclosure statement

The authors report there are no competing interests to declare.

## Funding

Benjamin Baumgartner's and Hans Volmary's contributions were supported by the Austrian Academy of Sciences (DOC-team 114).

## ORCID

Andreas Novy  <http://orcid.org/0000-0001-8292-9777>

Leonhard Plank  <http://orcid.org/0000-0002-4754-131X>

Hans Volmary  <http://orcid.org/0009-0006-1871-6973>

## References

- Aalbers, M. 2017. *The Financialization of Housing: A Political Economy Approach*. London: Routledge.
- Aalbers, M., and B. Christophers. 2014. "Centring Housing in Political Economy." *Housing, Theory and Society* 31 (4): 1–20. doi:10.1080/14036096.2014.947082.
- Adkins, L., M. Konings, and M. Cooper. 2020. *The Asset Economy: Property Ownership and the New Logic of Inequality*. Cambridge: Polity Press.
- Aigner, A. 2019. "Housing Entry Pathways of Refugees in Vienna, a City of Social Housing." *Housing Studies* 34 (5): 779–803. doi:10.1080/02673037.2018.1485882.
- Aigner, A. 2022. "What's Wrong with Investment Apartments? On the Construction of a 'Financialized' Rental Investment Product in Vienna." *Housing Studies* 37 (3): 355–375. doi:10.1080/02673037.2020.1806992.
- Albay, G. 2018. *WOHNFLEX—Flexibles und smartes Wohnen in WIEN, aus ökologischer, ökonomischer und demografischer Betrachtung (WOHNFLEX—Flexible and Smart Living in VIENNA, from an Ecological, Economic, and Demographic Perspective)*, Thesis, Technische Universität Wien. <https://repositum.tuwien.at/handle/20.500.12708/10429>
- Anacker, K., M. Nguyen, and D. Varadym, Eds. 2015. *The Routledge Handbook of Housing Policy and Planning*. London: Routledge.
- Aue, G., and A. Burger. 2021. *Wärme & Kälte, Mobilität, Strom: Szenarien für die Dekarbonisierung des Wiener Energiesystems bis 2040 (Heating & Cooling, Mobility, Electricity: Scenarios for the Decarbonization of the Vienna Energy System by 2040)*. Vienna: Compass Lexecon. <https://positionen.wienenergie.at/wp-content/uploads/2021/10/WE-DECARB21-Studie.pdf>
- Augustin, H. 2016. "Bauliche Dichte und Landnutzung in Wien—Verliert die wachsende Stadt an Boden? (Building Density and Land Use in Vienna—is the Growing City Losing Ground?)" *Beiträge zur Stadtentwicklung* 40. <https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008477.pdf>.

- Ball, M. 1986. "Housing Analysis: Time for a Theoretical Refocus?" *Housing Studies* 1 (3): 147–166. doi:10.1080/02673038608720573.
- Baltruszewicz, M., J. Steinberger, D. Ivanova, L. Brand-Correa, J. Paavola, and A. Owen. 2021. "Household Final Energy Footprints in Nepal, Vietnam and Zambia: Composition, Inequality and Links to Well-Being." *Environmental Research Letters* 16 (2): 025011. doi:10.1088/1748-9326/abd588.
- Barlow, J., and S. Duncan. 1994. *Success and Failure in Housing Provision: European Systems Compared*. Oxford: Pergamon Press.
- Bärnthaler, R., M. Haderer, A. Novy, and C. Schneider. 2022. "Shaping Provisioning Systems for a Social-Ecological Transformation." *Polanyi Papers*. <https://www.karlpolanysociety.com/publications/polanyi-papers/>
- Bärnthaler, R. 2024. "Towards Eco-Social Politics: A Case Study of Transformative Strategies to Overcome Forms-of-Life Crises." *Environmental Politics* 33 (1): 92–113. doi:10.1080/09644016.2023.2180910.
- Bärnthaler, R., and I. Gough. 2023. "Provisioning for Sufficiency: Envisaging Production Corridors." *Sustainability: Science, Practice, and Policy* 19 (1): 2218690. doi:10.1080/15487733.2023.2218690.
- Bärnthaler, R., A. Novy, and B. Stadelmann. 2023. "A Polanyi-Inspired Perspective on Social-Ecological Transformations of Cities." *Journal of Urban Affairs* 45 (2): 117–141. doi:10.1080/07352166.2020.1834404.
- Baron, D., T. Doan, D. Kadi, and D. Plank. 2021. *Wohnungspolitik und Wohnversorgung: Bericht aus fünf wachsenden europäischen Millionenstädten (Housing Policy and Housing Supply: Report from Five Growing European Cities with Millions of Inhabitants)*. Vienna: Arbeiterkammer. [https://wien.arbeiterkammer.at/interessenvertretung/meinestadt/Studie\\_Wohnversorgung\\_2021.pdf](https://wien.arbeiterkammer.at/interessenvertretung/meinestadt/Studie_Wohnversorgung_2021.pdf)
- Bauernfeind, S., K. Fuhrmann, E. Pirker, and S. Verweijen. 2021. *Vorsorgewohnungen: Richtige Auswahl der Immobilie (Retirement Apartments: Correct Selection of Property)*. Vienna: Manz.
- Baumgartner, B., and H. Volmary. 2022. "Variegated Housing Regimes: A Comparison of Housing Provision across European Countries." Linz: Johannes Kepler University and Vienna: Vienna University of Economics and Business. [https://www.contestedcareandhousing.com/\\_files/ugd/3be10a\\_7f5ce74f088840a7a84eacd8e158925f.pdf](https://www.contestedcareandhousing.com/_files/ugd/3be10a_7f5ce74f088840a7a84eacd8e158925f.pdf)
- Bayliss, K., and B. Fine. 2020. *A Guide to the Systems of Provision Approach: Who Gets What, How and Why*. Cham: Springer.
- Becker, J., and A. Novy. 1999. "Divergence and Convergence of National and Local Regulation: The Case of Austria and Vienna." *European Urban and Regional Studies* 6 (2): 127–143. doi:10.1177/096977649900600203.
- Bengtsson, B., and H. Ruonavaara. 2010. "Introduction to the Special Issue: Path Dependence in Housing." *Housing, Theory and Society* 27 (3): 193–203. doi:10.1080/14036090903326411.
- Biagi, F. 2021. "Henri Lefebvre's Critique of Le Corbusier's Urban Functionalism." *International Critical Thought* 11 (4): 599–615. doi:10.1080/21598282.2021.2010587.
- Blackwell, T., and S. Kohl. 2019. "Historicizing Housing Typologies: Beyond Welfare State Regimes and Varieties of Residential Capitalism." *Housing Studies* 34 (2): 298–318. doi:10.1080/02673037.2018.1487037.
- Blau, E. 1999. *The Architecture of Red Vienna, 1919–1934*. Cambridge, MA: MIT Press.
- Böhm, M., and M. Getzner. 2017. *Ökonomische Wirkungen der thermischen Sanierung von Wohngebäuden in Österreich (Economic Effects of Thermal Renovation of Residential Buildings in Austria)*. Münster: LIT Verlag.
- Bourne, L. 1981. *The Geography of Housing*. London: Hodder & Stoughton.
- Bouzarovski, S., J. Frankowski, and S. Tirado Herrero. 2018. "Low-Carbon Gentrification: When Climate Change Encounters Residential Displacement." *International Journal of Urban and Regional Research* 42 (5): 845–863. doi:10.1111/1468-2427.12634.
- Brand-Correa, L., and J. Steinberger. 2017. "A Framework for Decoupling Human Need Satisfaction from Energy Use." *Ecological Economics* 141: 43–52. doi:10.1016/j.ecolecon.2017.05.019.
- Brandl, J., and I. Zielinska. 2020. "Reviewing the Smart City Vienna Framework Strategy's Potential as an Eco-Social Policy in the Context of Quality of Work and Socio-Ecological Transformation." *Sustainability* 12 (3): 859. doi:10.3390/su12030859.
- Büchs, M., and M. Koch. 2017. *Postgrowth and Wellbeing: Challenges to Sustainable Welfare*. Cham: Springer.
- Buehler, R., J. Pucher, and A. Altshuler. 2017. "Vienna's Path to Sustainable Transport." *International Journal of Sustainable Transportation* 11 (4): 257–271. doi:10.1080/15568318.2016.1251997.
- Cabrera Serrenho, A., M. Drewniok, C. Dunant, and J. Allwood. 2019. "Testing the Greenhouse Gas Emissions Reduction Potential of Alternative Strategies for the English Housing Stock." *Resources, Conservation and Recycling* 144: 267–275. doi:10.1016/j.resconrec.2019.02.001.
- Calafati, L., J. Froud, C. Haslam, S. Johal, and K. Williams. 2023. *When Nothing Works: From Cost of Living to Foundational Liveability*. Manchester: Manchester University Press.
- Chancel, L. 2022. "Global Carbon Inequality Over 1990–2019." *Nature Sustainability* 5 (11): 931–938. doi:10.1038/s41893-022-00955-z.
- City of Vienna. 2019. *Smart City Wien Rahmenstrategie 2019–2050: Die Wiener Strategie für eine nachhaltige Entwicklung (Smart City Vienna Framework Strategy 2019–2050: The Vienna Strategy for Sustainable Development)*. Vienna: City of Vienna. <https://smartcity.wien.gv.at/strategie>
- City of Vienna. 2022a. *Statistisches Jahrbuch der Stadt Wien 2022 (Statistical Yearbook of the City of Vienna 2022)*. Vienna: City of Vienna. <https://www.wien.gv.at/statistik/publikationen/jahrbuch.html>
- City of Vienna. 2022b. *Vienna Climate Guide*. Vienna: City of Vienna. <https://www.digital.wienbibliothek.at/wbrup/download/pdf/4047968?originalFilename=true>
- Cohen, M. 2021. "New Conceptions of Sufficient Home Size in High-Income Countries: Are We Approaching a Sustainable Consumption Transition?" *Housing, Theory and Society* 38 (2): 173–203. doi:10.1080/14036096.2020.1722218.
- Creutzig, F., J. Roy, P. Devine-Wright, J. Díaz-José, W. Geels, A. Grubler, N. Maïzi, et al. 2022. "Demand, Services and Social Aspects of Mitigation." In *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by P. Shukla, J. Skea, R. Slade, A.

- Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, and J. Malley. Cambridge: Cambridge University Press. doi:10.1017/9781009157926.007.
- Cucca, R., and M. Friesenecker. 2022. "Potential and Limitations of Innovative Housing Solutions in Planning for Degrowth: The Case of Vienna." *Local Environment* 27 (4): 502–516. doi:10.1080/13549839.2021.1872513.
- Dewilde, C., and P. De Decker. 2016. "Changing Inequalities in Housing Outcomes across Western Europe." *Housing, Theory and Society* 33 (2): 121–161. doi:10.1080/14036096.2015.1109545.
- Doling, J., and R. Ronald. 2019. "Not for Housing' Housing: Widening the Scope of Housing Studies." *Critical Housing Analysis* 6 (1): 22–31. doi:10.13060/23362839.2019.6.1.450.
- Doyal, L., and I. Gough. 1991. *A Theory of Human Need*. London: Bloomsbury.
- Ebrahimigharehbaghi, S., Q. Qian, F. Meijer, and H. Visscher. 2019. "Unravelling Dutch Homeowners' Behaviour towards Energy Efficiency Renovations: What Drives and Hinders Their Decision-Making?" *Energy Policy* 129: 546–561. doi:10.1016/j.enpol.2019.02.046.
- Eckersley, R. 2021. "Greening States and Societies: From Transitions to Great Transformations." *Environmental Politics* 30 (1-2): 245–265. doi:10.1080/09644016.2020.1810890.
- Eigner, P., and A. Resch. 2001. "Phasen der Wiener Stadtentwicklung (Phases of Vienna's Urban Development)." Vienna: Demokratiezentrum Wien. [https://www.demokratiezentrum.org/wp-content/uploads/2022/10/eigner\\_resch\\_phasen.pdf](https://www.demokratiezentrum.org/wp-content/uploads/2022/10/eigner_resch_phasen.pdf)
- Engels, F. 1975 [1872]. *The Housing Question*. Dagenham: Central Books.
- Eurostat. 2022a. "Housing in Europe—Statistics Visualised: Housing in Europe." Luxembourg: Eurostat. <https://ec.europa.eu/eurostat/cache/digpub/housing/index.html?lang=en>
- Eurostat. 2022b. "Rents Up by 16%, House Prices by 42% Since 2010." Luxembourg: Eurostat. <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220408-1>
- Fanning, A., D. O'Neill, and M. Büchs. 2020. "Provisioning Systems for a Good Life within Planetary Boundaries." *Global Environmental Change* 64: 102135. doi:10.1016/j.gloenvcha.2020.102135.
- Fine, B., K. Bayliss, and M. Robertson. 2018. "The Systems of Provision Approach to Understanding Consumption." In *The Sage Handbook of Consumer Culture*, edited by O. Kravets, P. Maclaran, S. Miles, and A. Venkatesh, 27–42. Thousand Oaks, CA: Sage. doi:10.4135/9781473998803.n3.
- Folkers, A. 2017. "Existential Provisions: The Technopolitics of Public Infrastructure." *Environment and Planning D: Society and Space* 35 (5): 855–874. doi:10.1177/0263775817698699.
- Foundational Economy Collective (FEC). 2018. *Foundational Economy: The Infrastructure of Everyday Life*. Manchester: Manchester University Press.
- Frascati, M. 2018. *Climate Injustice in Austria*. Vienna: Greenpeace in Central and Eastern Europe. [https://mobilitaet.greenpeace.at/assets/uploads/assets/uploads/GP\\_ReportKlimaungerechtigkeitAT.pdf](https://mobilitaet.greenpeace.at/assets/uploads/assets/uploads/GP_ReportKlimaungerechtigkeitAT.pdf)
- Friesenecker, M., and Y. Kazepov. 2021. "Housing Vienna: The Socio-Spatial Effects of Inclusionary and Exclusionary Mechanisms of Housing Provision." *Social Inclusion* 9 (2): 77–90. doi:10.17645/si.v9i2.3837.
- Fuchs, D., M. Sahakian, T. Gumbert, A. Di Giulio, M. Maniates, S. Lorek, and A. Graf. 2021. *Consumption Corridors: Living a Good Life within Sustainable Limits*. London: Routledge.
- Furchtlehner, J., and L. Lička. 2019. "Back on the Street: Vienna, Copenhagen, Munich, and Rotterdam in Focus." *Journal of Landscape Architecture* 14 (1): 72–83. doi:10.1080/18626033.2019.1623551.
- Furchtlehner, J., N. Heger, D. Lehner, and L. Licka. 2023. *Grünraumgerechtigkeit für eine resiliente Stadt (Green Space Justice for a Resilient City)*. Vienna: Verlag Arbeiterkammer Wien. <https://emedien.arbeiterkammer.at/viewer/image/AC16878339>
- Gill, B., and S. Moeller. 2018. "GHG Emissions and the Rural-Urban Divide: A Carbon Footprint Analysis Based on the German Official Income and Expenditure Survey." *Ecological Economics* 145: 160–169. doi:10.1016/j.ecolecon.2017.09.004.
- Gough, I. 2017. *Heat, Greed and Human Need: Climate Change, Capitalism and Sustainable Wellbeing*. Cheltenham: Edward Elgar.
- Haas, R., M. Siebenhofer, J. Lederer, and A. Ajanovic. 2022. "Historical Evolution and Scenarios up to 2050 of Heating Energy Consumption and CO<sub>2</sub> Emissions of Residential Buildings in Vienna." *Journal of Energy and Power Technology* 4 (3): 1–21. doi:10.21926/jept.2203030.
- Haas, W., A. Muhar, C. Dorninger, and K. Gugerell. 2023. "Synthese: Pfade zur Transformation struktureller Bedingungen für ein klimafreundliches Leben (Synthesis: Paths to Transform Structural Conditions for a Climate-friendly Life)." In *APCC Special Report: Strukturen Für Ein Klimafreundliches Leben (APCC Special Report: Structures for Climate-friendly Life)*, edited by C. Görg, V. Madner, A. Muhar, A. Novy, A. Posch, K. Steininger, and E. Aigner. Berlin: Springer.
- Haderer, M. 2023a. "Experimental Climate Governance as Organized Irresponsibility? A Case for Revamping Governing (Also) through Government." *Sustainability: Science, Practice and Policy* 19 (1): 2186078. doi:10.1080/15487733.2023.2186078.
- Haderer, M. 2023b. *Rebuilding Cities and Citizens: Mass Housing in Red Vienna and Cold War Berlin*. Amsterdam: Amsterdam University Press.
- Haderer, M., U. Brand, A. Daniel, A. Exner, J. Frankhauser, C. Görg, A. Novy, T. Schinko, N. Schlitz, and A. Strüver. 2023. "Theorien des Wandels und der Gestaltung von Strukturen: Gesellschaftsperspektive (Theories of Change and the Design of Structures: Social Perspective)." In *APCC Special Report: Strukturen Für Ein Klimafreundliches Leben (APCC Special Report: Structures for Climate-friendly Life)*, edited by C. Görg, V. Madner, A. Muhar, A. Novy, A. Posch, K. Steininger, and E. Aigner. Berlin: Springer.
- Hagbert, P., H. Holt Larsen, H. Thörn, and C. Wasshede. 2020. *Contemporary Co-Housing in Europe: Towards Sustainable Cities?* London: Routledge.
- Harvey, D. 2006. *The Limits to Capital*. London: Verso.
- Hatz, G. 2019. "Gentrifizierung durch das Programm der 'sanften Stadterneuerung' (Gentrification through the 'Soft Urban Renewal Program')." In *Gentrifizierung in Wien: Perspektiven aus Wissenschaft, Politik und Praxis (Gentrification in Vienna: Perspectives from Science, Politics*



- and Practice), edited by J. Kadi and M. Verlič, 55–70. Vienna: Arbeiterkammer. [https://wien.arbeiterkammer.at/interessenvertretung/meinestadt/stadtpunkte\\_nr.27\\_2019\\_5.pdf](https://wien.arbeiterkammer.at/interessenvertretung/meinestadt/stadtpunkte_nr.27_2019_5.pdf).
- Heeren, N., and S. Hellweg. 2019. “Tracking Construction Material over Space and Time: Prospective and Geo-referenced Modeling of Building Stocks and Construction Material Flows.” *Journal of Industrial Ecology* 23 (1): 253–267. doi:10.1111/jiec.12739.
- Hegemann, W. 1926. “Kritisches zu den Wohnbauten der Stadt Wien (Critical Comments on the Residential Buildings in the City of Vienna).” *Wasmuths Monatshefte für Baukunst und Städtebau* 9: 3623–3670.
- Heindl, G. 2022a. “Urban Housing: An Overview of Strategies for Social-Ecological Transformation in the Field of Urban Housing.” In *Degrowth & Strategy: How to Bring about Social-Ecological Transformation*, edited by N. Barlow, L. Regen, N. Cadiou, E. Chartkovskaya, M. Hollweg, C. Plank, M. Schulken, and V. Wolf. London: Mayfly Books.
- Heindl, G. 2022b. *Stadtkonflikte: Radikale Demokratie in Architektur und Stadtplanung (Urban Conflicts: Radical Democracy in Architecture and Urban Planning)*. Vienna: Mandelbaum Verlag.
- Hickel, J., G. Kallis, T. Jackson, D. O’Neill, J. Schor, J. Steinberger, P. Victor, and D. Ürge-Vorsatz. 2022. “Degrowth Can Work—Here’s How Science Can Help.” *Nature* 612 (7940): 400–403. doi:10.1038/d41586-022-04412-x.
- Huebner, G., and D. Shipworth. 2017. “All about Size?—The Potential of Downsizing in Reducing Energy Demand.” *Applied Energy* 186: 226–233. doi:10.1016/j.apenergy.2016.02.066.
- Intergovernmental Panel on Climate Change (IPCC). 2022. “Summary for Policymakers.” In *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by P. Shukla, J. Skea, R. Slade, A. Al Khouradajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley. Cambridge: Cambridge University Press. doi:10.1017/9781009157926.001.
- Ivanova, D., and M. Büchs. 2020. “Household Sharing for Carbon and Energy Reductions: The Case of EU Countries.” *Energies* 13 (8): 1909. doi:10.3390/en13081909.
- Janoschka, M., G. Alexandri, H. Ramos, and S. Vives-Miró. 2020. “Tracing the Socio-Spatial Logics of Transnational Landlords’ Real Estate Investment: Blackstone in Madrid.” *European Urban and Regional Studies* 27 (2): 125–141. doi:10.1177/0969776418822061.
- Jany, A., M. Bukowski, G. Heindl, and K. Kreissl. 2022. “Wohnen (Housing).” In *APCC Special Report: Strukturen Für Ein Klimafreundliches Leben (APCC Special Report: Structures for Climate-Friendly Life)*, edited by C. Görg, V. Madner, A. Muhar, A. Novy, A. Posch, K. Steininger, and E. Aigner. Berlin: Springer.
- Jo, T.-H., and Z. Todorova. 2017. “Social Provisioning Process: A Heterodox View of the Economy.” In *The Routledge Handbook of Heterodox Economics: Theorizing, Analyzing and Transforming Capitalism*, edited by T.-H. Jo, L. Chester, and C. D’Ippoliti, 29–40. London: Routledge.
- Kadi, J. 2015. “Recommodifying Housing in Formerly ‘Red’ Vienna?” *Housing, Theory and Society* 32 (3): 247–265. doi:10.1080/14036096.2015.1024885.
- Kadi, J. 2018. “Die drei Phasen der sozialen Wohnungspolitik in Wien (The Three Phases of Social Housing Policy in Vienna).” In *Modell vagy külön út: Bécs szociális építészete (Model of Separate Path: Vienna’s Social Architecture)*, edited by M. Tamáska and J. Koscis, 51–62. Budapest: Martin Opitz Bt.
- Kadi, J. 2023. “The Supercommodification of Private Renting: The Case of Vienna.” Paper presented at the Sixth International Foundational Economy Conference, September 14–16, Technische Universität Wien.
- Kadi, J., and J. Lilius. 2022. “The Remarkable Stability of Social Housing in Vienna and Helsinki: A Multi-dimensional Analysis.” *Housing Studies*: 1–25. doi:10.1080/02673037.2022.2135170.
- Kadi, J., and J. Suitner. 2019. “Red Vienna, 1919–1934.” In *The Wiley-Blackwell Encyclopedia of Urban and Regional Studies*, edited by A. Orum. Hoboken: Wiley. doi:10.1002/9781118568446.eurs0259.
- Kadi, J., and M. Verlic, Eds. 2019. *Gentrifizierung in Wien: Perspektiven aus Wissenschaft, Politik und Praxis (Gentrification in Vienna: Perspectives from Science, Politics and Practice)*. Vienna: Arbeiterkammer.
- Kadi, J., and W. Matznetter. 2022. “The Long History of Gentrification in Vienna, 1890–2020.” *City* 26 (2–3): 450–472. doi:10.1080/13604813.2022.2054221.
- Kadi, J., L. Vollmer, and S. Stein. 2021. “Post-neoliberal Housing Policy? Disentangling Recent Reforms in New York, Berlin, and Vienna.” *European Urban and Regional Studies* 28 (4): 353–374. doi:10.1177/09697764211003626.
- Kayaçetin, N., and A. Tanyer. 2020. “Embodied Carbon Assessment of Residential Housing at Urban Scale.” *Renewable and Sustainable Energy Reviews* 117: 109470. doi:10.1016/j.rser.2019.109470.
- Kemeny, J. 1995. *From Public Housing to the Social Market: Rental Policy Strategies in Comparative Perspective*. London: Routledge.
- Koch, M. 2022. “Social Policy without Growth: Moving towards Sustainable Welfare States.” *Social Policy and Society* 21 (3): 447–459. doi:10.1017/S1474746421000361.
- Kössl, G. 2022. “Affordable Housing and Social Inclusion: The Case of Vienna and Austria.” In *Future Urban Habitation*, edited by O. Heckmann, 115–129. Hoboken: Wiley. doi:10.1002/9781119734895.ch6.
- Krasny, E. 2012. *Hands-on Urbanism 1850–2012: The Right to Green*. Vienna: Verlag Turia+Kant.
- Lederer, J., A. Gassner, J. Fellner, U. Mollay, and C. Schremmer. 2021. “Raw Materials Consumption and Demolition Waste Generation of the Urban Building Sector 2016–2050: A Scenario-Based Material Flow Analysis of Vienna.” *Journal of Cleaner Production* 288: 125566. doi:10.1016/j.jclepro.2020.125566.
- Lee, Y., P. Kemp, and V. Reina. 2022. “Drivers of Housing (Un)Affordability in the Advanced Economies: A Review and New Evidence.” *Housing Studies* 37 (10): 1739–1752. doi:10.1080/02673037.2022.2123623.
- Loirek, S., and J. Spangenberg. 2019. “Energy Sufficiency through Social Innovation in Housing.” *Energy Policy* 126: 287–294. doi:10.1016/j.enpol.2018.11.026.
- Lund, B. 2019. “Making Better Use of the Existing Housing Stock.” In *Housing in the United Kingdom: Whose Crisis?*, edited by B. Lund, 187–216. Cham: Springer. doi:10.1007/978-3-030-04128-1\_6.
- Maderthaner, W. 1993. “Die österreichische Sozialdemokratie von 1919 bis 1934 (The Austrian Social Democracy from 1918 to 1934).” In *Das Rote Wien 1918–1934 (Red Vienna*

- 1918–1934), edited by W. Öhlinger, 28–44. Vienna: Museums of the City of Vienna.
- Mari, F., and L. Locatelli. 2023. “Lessons from a Renters’ Utopia.” *The New York Times*, May 23. <https://www.nytimes.com/2023/05/23/magazine/vienna-social-housing.html>
- Marquardt, S., and D. Glaser. 2020. “How Much State and How Much Market? Comparing Social Housing in Berlin and Vienna.” *German Politics* 32 (2): 361–380. doi:10.1080/09644008.2020.1771696.
- Marsh, A., K. Gibb, and A. Soaita. 2022. “Rent Regulation: Unpacking the Debates.” *International Journal of Housing Policy* 23 (4): 734–757. doi:10.1080/19491247.2022.2089079.
- Mattioli, G., C. Roberts, J. Steinberger, and A. Brown. 2020. “The Political Economy of Car Dependence: A Systems of Provision Approach.” *Energy Research & Social Science* 66: 101486. doi:10.1016/j.erss.2020.101486.
- Matznetter, W. 2002. “Social Housing Policy in a Conservative Welfare State: Austria as an Example.” *Urban Studies* 39 (2): 265–282. doi:10.1080/00420980120102966.
- Max-Neef, M., A. Elizalde, and M. Hopenhayn. 1991. *Human-Scale Development: Conception, Application and Further Reflections*. New York: Apex Press.
- Millward-Hopkins, J., and Y. Oswald. 2023. “Reducing Global Inequality to Secure Human Wellbeing and Climate Safety: A Modelling Study.” *The Lancet Planetary Health* 7 (2): e147–e154. doi:10.1016/S2542-5196(23)00004-9.
- Mocca, E., M. Friesenecker, and Y. Kazepov. 2020. “Greening Vienna: The Multi-Level Interplay of Urban Environmental Policy-Making.” *Sustainability* 12 (4): 1577. doi:10.3390/su12041577.
- Mundt, A. 2018. “Privileged but Challenged: The State of Social Housing in Austria in 2018.” *Critical Housing Analysis* 5 (1): 12–25. doi:10.13060/23362839.2018.5.1.408.
- Musil, R., F. Brand, and S. Punz. 2022. “The Commodification of a Rent-Regulated Housing Market: Actors and Strategies in Viennese Neighbourhoods.” *Housing Studies*: 1–21. doi:10.1080/02673037.2022.2149707.
- Musil, R., F. Brand, H. Huemer, and M. Wonaschütz. 2022. “The *Zinshaus* Market and Gentrification Dynamics: The Transformation of the Historic Housing Stock in Vienna, 2007–2019.” *Urban Studies* 59 (5): 974–994. doi:10.1177/00420980211051906.
- Norris, M., and J. Lawson. 2023. “Tools to Tame the Financialisation of Housing.” *New Political Economy* 28 (3): 363–379. doi:10.1080/13563467.2022.2126447.
- Novy, A. 2011. “Unequal Diversity—On the Political Economy of Social Cohesion in Vienna.” *European Urban and Regional Studies* 18 (3): 239–253. doi:10.1177/0969776411403991.
- Novy, A., and E. Hammer. 2007. “Radical Innovation in the Era of Liberal Governance: The Case of Vienna.” *European Urban and Regional Studies* 14 (3): 210–222. doi:10.1177/0969776407077738.
- Novy, A., N. Barlow, and J. Fankhauser. 2022. “Transformative Innovation.” *Discussion Paper*. Vienna: Institute for Multi-Level Governance and Development, Department of Socioeconomics, Vienna University of Economics and Business. <http://www-ruw.wu-wien.ac.at/dpprice.html>.
- Novy, A., Redak, V. Jäger, and A. Hamedinger. 2001. “The End of Red Vienna: Recent Ruptures and Continuities in Urban Governance.” *European Urban and Regional Studies* 8 (2): 131–144. doi:10.1177/096977640100800204.
- Novy, K. 1981. “Selbsthilfe als Reformbewegung: Der Kampf der Wiener Siedler nach dem 1. Weltkrieg (Self-Help as a Reform Movement: The Struggle of the Viennese Settlers after the First World War).” *Kampf um Selbsthilfe* 55: 26–41. <https://archplus.net/en/ausgabe/55>.
- O’Neill, D., A. Fanning, W. Lamb, and J. Steinberger. 2018. “A Good Life for All within Planetary Boundaries.” *Nature Sustainability* 1 (2): 88–95. doi:10.1038/s41893-018-0021-4.
- Oesterreichische Nationalbank (ÖNB). 2023. *Data on Residential Property Prices—2023-Q1. Focus Area: Real Estate Market Analysis*. Vienna: ÖNB. <https://www.oenb.at/en/Monetary-Policy/focus-area-real-estate-market-analysis.html>.
- Oosterlynck, S., A. Novy, and Y. Kazepov. 2019. *Local Social Innovation to Combat Poverty and Exclusion: A Critical Appraisal*. Bristol: Policy Press. doi:10.2307/j.ctvs32tpj.
- Oswald, Y., A. Owen, and J. Steinberger. 2020. “Large Inequality in International and Intranational Energy Footprints between Income Groups and across Consumption Categories.” *Nature Energy* 5 (3): 231–239. doi:10.1038/s41560-020-0579-8.
- Pauliuk, S., N. Heeren, P. Berrill, T. Fishman, A. Nistad, Q. Tu, P. Wolfram, and E. Hertwich. 2021. “Global Scenarios of Resource and Emission Savings from Material Efficiency in Residential Buildings and Cars.” *Nature Communications* 12 (1): 5097. doi:10.1038/s41467-021-25300-4.
- Piketty, T. 2014. *Capital in the Twenty-First Century*. Cambridge, MA: Belknap Press.
- Pirgmaier, E. 2021. “The Value of Value Theory for Ecological Economics.” *Ecological Economics* 179: 106790. doi:10.1016/j.ecolecon.2020.106790.
- Plank, L., A. Schneider, and J. Kadi. 2022. *Wohnbauboom in Wien 2018/2021: Preise, Käufer:innen und Leerstände in der Wohnbauproduktion (Housing Boom in Vienna 2018–2021: Prices, Buyers and Vacancies in Housing Production)*. Vienna: Arbeiterkammer.
- Plank, L., H. Volmary, M. Krenn, and W. Blaas. 2023. *Shareholderorientierte Transnationale Investoren in der kritischen sozialen Infrastruktur (Shareholder-Oriented Transnational Investors in Critical Social Infrastructure)*. Vienna: Arbeiterkammer.
- Polanyi, K. 2001. *The Great Transformation: The Political and Economic Origins of Our Time*. Boston: Beacon Press.
- Polanyi, K., and H. Pearson. 1977. *The Livelihood of Man*. New York: Academic Press.
- Rissman, J., C. Bataille, E. Masanet, N. Aden, W. Morrow, N. Zhou, N. Elliott, et al. 2020. “Technologies and Policies to Decarbonize Global Industry: Review and Assessment of Mitigation Drivers through 2070.” *Applied Energy* 266: 114848. doi:10.1016/j.apenergy.2020.114848.
- Robé, J.-P. 2020. *Property, Power and Politics: Why We Need to Rethink the World Power System*. Bristol: Policy Press.
- Röck, M., M. Saade, M. Balouktsi, F. Rasmussen, H. Birgisdottir, R. Frischknecht, G. Habert, T. Lützkendorf, and A. Passer. 2020. “Embodied GHG Emissions of Buildings—The Hidden Challenge for Effective Climate Change Mitigation.” *Applied Energy* 258: 114107. doi:10.1016/j.apenergy.2019.114107.
- Ryan-Collins, J. 2021. “Breaking the Housing-Finance Cycle: Macroeconomic Policy Reforms for More Affordable Homes.” *Environment and Planning A: Economy and Space* 53 (3): 480–502. doi:10.1177/0308518X19862811.

- Ryan-Collins, J., T. Lloyd, L. MacFarlane, and J. Muellbauer. 2017. *Rethinking the Economics of Land and Housing*. London: Zed Books.
- Savini, F. 2021. "Towards an Urban Degrowth: Habitability, Finitude and Polycentric Autonomism." *Environment and Planning A: Economy and Space* 53 (5): 1076–1095. doi:10.1177/0308518X20981391.
- Schippner, S., and L. Vollmer, Eds. 2020. *Wohnungsforschung: Ein Reader (Housing Research: A Reader)*. Bielefeld: Transcript.
- Schneider, F. 2018. "Housing for Degrowth Narratives." In *Housing for Degrowth: Principles, Models, Challenges and Opportunities*, edited by A. Nelson and S. Schneider, 14–29. London: Routledge.
- Springler, E., and S. Wöhl. 2020. "The Financialization of the Housing Market in Austria and Ireland." In *The State of the European Union: Fault Lines in European Integration*, edited by S. Wöhl, E. Springler, M. Pachel, and B. Zeilinger. Wiesbaden: Springer.
- Statistik Austria. 2020. *Wohnen: Zahlen, Daten und Indikatoren der Wohnstatistik (Housing: Numbers, Data and Indicators of Housing Statistics)*. Vienna: Statistik Austria. [https://www.statistik.at/fileadmin/publications/Wohnen\\_2020\\_-\\_Zahlen\\_\\_Daten\\_und\\_Indikatoren\\_der\\_Wohnstatistik.pdf](https://www.statistik.at/fileadmin/publications/Wohnen_2020_-_Zahlen__Daten_und_Indikatoren_der_Wohnstatistik.pdf)
- Statistik Austria. 2021. *Housing: Zahlen, Daten und Indikatoren der Wohnstatistik (Housing: Numbers, Data and Indicators of Housing Statistics)*. Vienna: Statistik Austria. [https://www.statistik.at/web\\_de/statistiken/menschen\\_und\\_gesellschaft/wohnen/index.htm](https://www.statistik.at/web_de/statistiken/menschen_und_gesellschaft/wohnen/index.htm)
- Statistik Austria. 2023a. *Wohnen 2022: Zahlen, Daten und Indikatoren der Wohnstatistik (Housing 2022: Numbers, Data, and Indicators of Housing Statistics)*. Vienna: Statistik Austria. <https://www.statistik.at/fileadmin/publications/Wohnen-2021.pdf>
- Statistik Austria. 2023b. *Gebäude: GWZ 2001 Zeitreihen 71–01 (Building: GWZ 2001 Time Series 71-01)*. Vienna: Statistik Austria. <https://statcube.at/statistik.at/ext/statcube/openinfo?id=def1722>
- Statistik Austria. 2023c. *Registerzählung 2011–GWZ: Gebäude (Register Census 2011–GWZ: Building)*. Vienna: Statistik Austria. [https://statcube.at/statistik.at/ext/statcube/openinfo?id=derzgwz\\_rzgwz2011\\_gebaeude](https://statcube.at/statistik.at/ext/statcube/openinfo?id=derzgwz_rzgwz2011_gebaeude)
- Statistik Austria. 2023d. *Zensus Gebäude- und Wohnungszählung 2021: Ergebnisse zu Gebäuden und Wohnungen aus der Registerzählung (Census of Buildings and Apartments 2021: Results on Buildings and Apartments from the Register Census)*. Vienna: Statistik Austria. [https://www.statistik.at/fileadmin/user\\_upload/Zensus-GWZ-2021.pdf](https://www.statistik.at/fileadmin/user_upload/Zensus-GWZ-2021.pdf)
- Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney, and C. Ludwig. 2015. "The Trajectory of the Anthropocene: The Great Acceleration." *The Anthropocene Review* 2 (1): 81–98. doi:10.1177/2053019614564785.
- Stephens, M. 2020. "Towards a Multi-Layered Housing Regime Framework: Responses to Commentators." *Housing, Theory and Society* 37 (5): 584–596. doi:10.1080/14036096.2020.1816573.
- Strüver, A. 2020. "Geschlechterordnung des Wohnens ("Gender Order of Housing")." In *Handbuch Wohnsoziologie (Handbook of Housing Sociology)*, edited by F. Eckardt and S. Meier, 1–17. Wiesbaden: Springer: doi:10.1007/978-3-658-24862-8\_11-1.
- Szaif, J. 2005. "Aristoteles: Eine Teleologische Konzeption Von Besitz und Eigentum (Aristotle: A Teleological Conception of Possession and Property)." In: *Was ist Eigentum? Philosophische Positionen von Platon bis Habermas (What is Property: Philosophical Reflections from Plato to Habermas)*. Munich: C.H. Beck.
- Theine, H., S. Humer, M. Moser, and M. Schnetzer. 2022. "Emissions Inequality: Disparities in Income, Expenditure, and the Carbon Footprint in Austria." *Ecological Economics* 197: 107435. doi:10.1016/j.ecolecon.2022.107435.
- Thompson, M. 2020. *Reconstructing Public Housing: Liverpool's Hidden History of Collective Alternatives*. Liverpool: Liverpool University Press.
- Torres, A., S. Zu Ermgassen, F. Ferri-Yanez, L. Navarro, I. Rosa, F. Teixeira, C. Wittkopp, and J. Liu. 2022. "Unearthing the Global Impact of Mining Construction Minerals on Biodiversity." *BioRxiv*. doi:10.1101/2022.03.23.485272.
- Turner, J. 1972. *Freedom to Build: Dweller Control of the Housing Process*. London: MacMillan.
- Umweltbundesamt (UBA). 2021a. "Bundesländer Luftschadstoff-Inventur 1990–2019: Regionalisierung der nationalen Emissionsdaten auf Grundlage von EU-Berichtspflichten (Datenstand 2021) (Federal States Air Pollutant Inventory 1990–2019: Regionalization of National Emissions Data Based on EU Reporting Requirements (Status 2021))." Vienna: UBA. [https://www.umweltbundesamt.at/studien-reports/publikationsdetail?pub\\_id=2398&cHash=144ec8baec8d4c87fa4fbee9cb80d629](https://www.umweltbundesamt.at/studien-reports/publikationsdetail?pub_id=2398&cHash=144ec8baec8d4c87fa4fbee9cb80d629).
- Umweltbundesamt (UBA). 2021b. *Klimaschutzbericht 2021 (Climate Protection Report 2021)*. Vienna: Umweltbundesamt. <https://www.umweltbundesamt.at/fileadmin/site/publikationen/rep0776.pdf>
- United Nations Economic Commission for Europe (UNECE). 2020. *A Handbook on Sustainable Urban Mobility and Spatial Planning: Promoting Active Mobility*. Geneva: UNECE. doi:10.18356/8d742f54-en.
- Ürge-Vorsatz, D., L. Cabeza, S. Serrano, C. Barreneche, and K. Petrichenko. 2015. "Heating and Cooling Energy Trends and Drivers in Buildings." *Renewable and Sustainable Energy Reviews* 41: 85–98. doi:10.1016/j.rser.2014.08.039.
- Ürge-Vorsatz, D., R. Khosla, R. Bernhardt, Y. Chan, D. Vérez, S. Hu, and L. Cabeza. 2020. "Advances toward a Net-Zero Global Building Sector." *Annual Review of Environment and Resources* 45 (1): 227–269. doi:10.1146/annurev-environ-012420-045843.
- Vogel, J., J. Steinberger, D. O'Neill, W. Lamb, and J. Krishnakumar. 2021. "Socio-Economic Conditions for Satisfying Human Needs at Low Energy Use: An International Analysis of Social Provisioning." *Global Environmental Change* 69: 102287. doi:10.1016/j.gloenvcha.2021.102287.
- Weiner Linien. 2023. "Rückblick & Ausblick: Mehr Stammkundinnen als je zuvor, Wiener Linien als sichere und nachhaltige Arbeitgeberin, Öffi-Ausbau geht weiter (Review & Outlook: More Regular Customers than Ever Before, Wiener Linien as a Safe and Sustainable Employer, Public Transport Expansion Continues)." Vienna: Wiener Linien. <http://www.wienerlinien.at/news/rueckblick-2022-ausblick-2023>
- Weihsmann, H. 1985. *Das Rote Wien: Sozialdemokratische Architektur und Kommunalpolitik 1919–1934 (Red Vienna: Social Democratic Architecture and Local Politics 1919–1934)*. Vienna: Promedia.

- Weißermel, S., and R. Wehrhahn. 2020. “Klimagerechtes Wohnen? Energetische Gebäudesanierung in Einkommensschwachen Quartieren: Kommentar zu Lisa Vollmer und Boris Michel ‘Wohnen in der Klimakrise: Die Wohnungsfrage Als Ökologische Frage’ (Climate-Friendly Living? Energy-Efficient Building Renovation in Low-Income Neighborhoods: Commentary on Lisa Vollmer and Boris Michel ‘Living in the Climate Crisis: The Housing Question as an Ecological Question’)” *Sub\Urban: zeitschrift für Kritische Stadtforschung* 8 (1–2): 211–218. doi:10.36900/suburban.v8i1/2.567.
- Wiener Linien. 2023. *Modal Split—So sind die Wiener unterwegs (Modal Split—This is How the Viennese Travel)*. Vienna: Wiener Linien. [https://www.wienerlinien.at/media/files/2016/modalsplit\\_173728.pdf](https://www.wienerlinien.at/media/files/2016/modalsplit_173728.pdf)
- Whitehead, C., and P. Williams. 2018. *Assessing the Evidence on Rent Control from an International Perspective*. London: Residential Landlords Association. <https://www.lse.ac.uk/geography-and-environment/research/lse-london/documents/Reports/LSE-International-Evidence-on-Rent-Control-Report-2018-Final.pdf>
- World Bank. 2021. “Can New Technology Solve the Global Housing Crisis?” Washington, DC: World Bank. <https://blogs.worldbank.org/sustainablecities/can-new-technology-solve-global-housing-crisis>
- Xue, J. 2018. “Housing for Degrowth: Space, Planning and Distribution.” In *Housing for Degrowth: Principles, Models, Challenges and Opportunities*, edited by A. Nelson and S. Schneider, 185–195. London: Routledge.
- zu Ermgassen, S., M. Drewniok, J. Bull, C. Corlet Walker, M. Mancini, J. Ryan-Collins, and A. Cabrera Serrenho. 2022. “A Home for All within Planetary Boundaries: Pathways for Meeting England’s Housing Needs without Transgressing National Climate and Biodiversity Goals.” *Ecological Economics* 201: 107562. doi:10.1016/j.ecolecon.2022.107562.
- zu Ermgassen, S., P. Utamiputri, L. Bennun, S. Edwards, and J. Bull. 2019. “The Role of ‘No Net Loss’ Policies in Conserving Biodiversity Threatened by the Global Infrastructure Boom.” *One Earth* 1 (3): 305–315. doi:10.1016/j.oneear.2019.10.019.