Social-ecological housing provision by limited-profit housing associations. The case of Vienna

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Abstract

Housing is at the same time a basic human need and a major contributor to ecological overshoot. Housing provision regularly fails to address either of these two functions, falling short of social minima whilst exceeding ecological ceilings. Against this background, this article conceptualizes social-ecological housing as decommodified, energy efficient and decarbonized, and sufficient. It carries out a multi-level policy analysis of the limited-profit housing sector in Vienna in order to reveal whether and how the policy context is conducive (or not) to the provision of social-ecological housing by limited-profit housing associations. This should contribute to theoretical debates around alleged trade-offs between social and ecological goals in housing policy as well as provide policy learnings for academics and practitioners.

Keywords: Social housing; Ecological housing; Housing Associations; Housing Policy

Introduction

Housing is a basic need that is crucial for human well-being since it provides a place of security and the ability to participate in society (Kunnert & Baumgartner, 2012; Novy et al., 2024). At the same time, housing has an environmental impact throughout construction as well as during the act of dwelling, as both require energy, material, and land resources (OECD, 2021). Currently, housing provision in Europe and beyond regularly fails to provide basic social necessities, while overshooting ecological boundaries at the same time. That social boundaries are not respected in contemporary housing systems is connected to the process of financialization, driving crises of unaffordability and socio-spatial segregation (Perucca et al. 2023). Next to social issues, the housing sector contributes to environmental degradation through high resource use. Energy use in housing is mostly sourced by fossil fuels which makes the housing sector a great emitter of greenhouse gas emissions (GHG) (OECD, 2023). Moreover, new construction of housing necessitates large amounts of energy, carbon-intense materials, and land which contributes to biodiversity depletion (Bohnenberger, 2021; zu Ermgassen et al., 2022). Therefore, ecological boundaries are not respected in contemporary housing systems either.

Against this background, this article investigates and adopts the concept of social-ecological housing to explore how the social and ecological dimensions of housing relate to each other. It takes a specific provisioning system, limited-profit housing in Vienna, as a case study to assess its multi-level policy context and how it is conducive (or not) to the provision of social-ecological housing. Limited-profit housing in Vienna has already received great attention concerning its social dimension. A buffering effect of the Austrian LPH sector on rent levels in the private sector has been observed (Klien et al.,

2023). By protecting parts of the housing system from market logic, the LPH sector prioritizes housing's function as a basic service and thus contributes to housing affordability (Kössl, 2022). At the same time, the Viennese LPH sector has higher rates of energy savings than the private sector, and LPH flats only emit one-third of the heating-related CO_2 emissions of private flats (Gutheil-Knopp-Kirchwald, 2020). These aspects make the LPH sector a promising sector that could contribute to social-ecological housing in Vienna (Litschauer et al., 2021) and a suitable case study for a policy analysis.
The contribution of the article is twofold. By conceptualizing social-ecological housing it contributes theoretically to recent debates around fair decarbonization and alleged trade-offs in ecologically sustainable housing provision (Bärnthaler, 2024; Novy et al, 2024; Gough et al., 2024; Lehner et al., 2024). At the same time, it adds empirical evidence by providing a policy analysis of a particular provisioning system that should enable policy learnings for academics as well as practitioners around how to mediate social and ecological goals in policymaking.
The next section conceptualizes social-ecological housing. Section 2 explains the underlying methodology. Section 3 explains the limited-profit housing system in Austria and Vienna. Subsequently, the impact of housing policies at the municipal, national, and EU level on providing social-ecological housing by LPHAs is analysed (Section 4). This is followed by a discussion of the Viennese LPH sector's contribution to social-ecological housing in Section 5. The conclusion relates the analysis to the concept of social-ecological housing and which aspects are fostered and/or neglected (section 6).

Defining social-ecological housing

In this section, we elaborate our perspective on social-ecological housing. It departs from three assumptions: 1.) housing is necessary for human flourishing due to its unique set of needs-satisfying functions; 2.) housing is a key sector in a social-ecological transformation. We then go on to define three pillars of social-ecological housing.

Housing as a basic human need

Doyal & Gough (1991) define physical health, autonomy and social participation as basic human needs. At the most basic level, a dwelling (most often a house or an apartment) provides physical shelter from the outside and, thus, contributes to physical wellbeing. As a safe space for social reproduction, it is necessary for guaranteeing human subsistence (Gough, 2019; Heuer, 1979; Max-Neef et al., 1991). In addition, mental security is provided for by housing since one's dwelling serves as an intimate space that allows inhabitants to act autonomously (Doyal & Gough, 1991; Novy et al., 2024). Moreover, housing facilitates societal participation through interactions with neighbors, the living environment and other socio-spatial networks (Gough, 2019; Kunnert & Baumgartner, 2012).
Accordingly, the foundational character of housing is recognized in international human rights law (Blaas, 1991; Davis, 2021). Article 25 of the UN Declaration of Human Rights states that "everyone has the right to a standard of living adequate for the health and well-being of him[*her]self and of his[*her] family" which includes housing (United Nations, n.d.-b). Adequate housing entails having a secure tenure and not facing the risk of being displaced by eviction, environmental disaster, or armed conflict (Davis, 2021; United Nations, n.d.-a). Moreover, housing must be affordable so one can enjoy their freedom to choose where and how one wants to live (Kucs et al., 2008; United Nations, n.d.-a). However, decent or "good" housing includes other dimensions as well, namely habitability, location, accessibility, availability of services and infrastructure, security of tenure, cultural adequacy and sustainability (Mazzucato & Farha 2023: 13).
To sum up, housing satisfies the basic human needs of physical health, autonomy and societal participation, making it a basic human right. Despite being provided for in various ways around the world, the human need for housing is universal.

Housing as a key contributor GHG emissions

Secondly, the provision of housing has significant ecological ramifications, making it a key sector for a social-ecological transformation. The housing sector has a great direct impact on the environment given that construction, use, and demolition of housing consume great amounts of material, energy, and land

resources (Bohnenberger, 2021; OECD, 2021; Xue, 2015). Brick, concrete, and steel are the most common building materials that are fossil fuel- and energy-intense products and therefore greatly contribute to GHG emissions (OECD, 2021; Pauliuk et al., 2021; Švajlenka & Kozlovská, 2018; Ürge-Vorsatz et al., 2020). The constant growth of average dwelling sizes is another important aspect of construction related GHG emissions. Since larger dwellings require more material and energy, bigger houses have a higher carbon footprint (Lorek & Spangenberg, 2019).

GHG emissions also arise from housing practices such as heating and cooling activities. Everyday housing practices such as heating, cooking, washing, or lighting consume energy and are mainly responsible for housing's high energy use (Bohnenberger, 2021). Since most energy still stems from fossil fuel combustion, high GHG emissions are connected to the energy use of households (OECD, 2023; Pauliuk et al., 2021). The energy efficiency of appliances and a household's user behavior impact how much energy is consumed during the operation of buildings (Bierwirth & Thomas, 2019). The building size is also a key determinant of energy use (Cohen, 2021; Huebner & Shipworth, 2017), since larger floor areas require more energy for heating and cooling activities (Clune et al., 2012; Viggers et al., 2017).

Next to a high carbon footprint, biodiversity loss through housing construction has a major environmental impact (zu Ermgassen et al., 2022). For the expansion of housing infrastructure, the soil is sealed, and the habitat of different species is destroyed (zu Ermgassen et al., 2019). Urbanization is especially critical for biodiversity loss since natural or farmland is developed for housing (OECD, 2021). In addition, the mining of construction minerals is a major driver of biodiversity loss with 1047 species on the UN Red List being affected by construction mineral mining (Torres et al., 2022). Overall, 24% of threatened species globally are endangered by the expansion of housing infrastructure (zu Ermgassen et al., 2022).

Dimensions of social-ecological housing provision

To sum up, housing combines a unique set of needs-satisfying functions with significant ecological implications. However currently, there are simultaneous crises regarding both of its functions. Social crises, mostly in the form of affordability and segregation, as well as ecological overshoot. For example, 1.6 billion people worldwide are being affected by housing shortages (World Bank 2022), while average house prices (47%) and rents (19%) have skyrocketed in the European Union between 2010 and 2022 (Eurostat 2022).

Against this background, there is a need to conceptualize social-ecological housing, i.e. define housing provision that is neither falling short of supplying enough affordable and accessible housing, nor overshooting ecological ceilings (Fuchs et al. 2021; Bärnthaler & Gough 2023). We conceive of social-ecological housing policy as sufficient, i.e. as a "a set of measures and daily practices that avoid demand for energy, materials, land and water while delivering human wellbeing for all within planetary boundaries" (IPCC 2023: 72). As a preliminary attempt to define it as a concept, we identify three pillars of social-ecological housing: 1.) decommodified provision; 2.) high energy efficiency and decarbonization; 3.) sufficient use of floor space and land.

Decommodified provision

Decommodified housing provision is at the heart of social-ecological housing. Commodification and, in the current conjuncture, housing financialization is at the core of unaffordability crises, overproduction of luxury housing as well as ecologically unsustainable production patterns (zu Ermgassen et al. 2022; Bärnthaler 2024; Gough et al. 2024; Novy et al. 2024; Perucca et al. 2023; Stratford 2020).

In social-ecological housing provision, housing's basic function of providing shelter prevails over housing's function as a financial asset. Decommodified housing infrastructure that prioritizes the basic right to housing is strengthened and the financialized housing sector is tamed (Mete, 2022; Xue, 2015). The main pillar of a decommodified housing system is a strong social housing sector that is not influenced by market logics but provides housing as a basic service that is accessible to all (Gallent et al., 2018; Ryan-Collins, 2021).

Potential leverage points to decommodify housing are the management of the cost, scale, and focus of financial circuits in the housing market (Norris & Lawson, 2022). For example, the attractiveness of housing as a financial asset can be reduced through raising the cost of speculation and rent-seeking through e.g., a land value tax (Norris & Lawson, 2022; Ryan-Collins et al., 2017). Tighter mortgage lending rules could also create barriers to speculative investment in housing and tighten the scale of financial circuits (Norris & Lawson, 2022).
Building a strong decommodified housing sector necessitates shifting the focus of financial circuits away from speculation (Norris & Lawson, 2022). This way private capital can be secured for building a strong social sector. However, the risk that the social objective of the third sector is undermined by the rent-seeking objective of institutional investors that invest in social housing exists (Wijburg & Waldron, 2020). Therefore, non-market funding opportunities that preserve the social objective are vital for a strong social sector (Norris & Lawson, 2022).

High energy efficiency and decarbonization

As a second pillar of social-ecological housing, high energy and material efficiency and reduced fossil fuel dependencies of the housing sector are important measures to ensure low energy and material consumption of the housing sector. Strategies such as retrofitting the existing housing stock and setting high energy efficiency standards for new developments can reduce energy use (Fitzpatrick et al., 2022; Schneider, 2019). Moreover, the decarbonization of heating in the existing and new housing stock is important to reduce fossil fuel combustion (Bierwirth & Thomas, 2019). In a social-ecological housing system, oil and gas furnaces are replaced with heating systems that rely on renewable energies (Pauliuk et al., 2021).
Also, the use of low-carbon materials such as locally and sustainably sourced wood can contribute to decarbonizing the housing sector (Švajlenka & Kozlovská, 2018; Ürge-Vorsatz et al., 2020). Strategies such as recycling and reusing building materials when houses are deconstructed are ways to reduce energy and resource consumption (Hertwich et al., 2020; Jany et al., 2023). Therefore, the possibility to recycle material must already be considered during the design and development phase of buildings (Pauliuk et al., 2021).
Viggers et al. (2017) find that energy savings due to energy efficiency improvement in anglophone countries were nullified by the increase in dwelling sizes over time. Given that larger dwellings require more energy in their construction, use, and demolition phase, energy efficiency improvement can be canceled out by large house sizes (Cohen, 2021; Kitzmann, 2023; Röck et al., 2020). Therefore, a combination of efficiency measures such as thermal redevelopments and sufficiency measures such as downsizing is necessary to ensure a reduction in energy use (Serrenho et al., 2019).

Sufficient use of floor space and land

Consequently, reductions in overall consumption levels and lifestyle changes are required to drastically cut resource use (Bohnenberger, 2021). The concept of sufficiency advocates for such cuts in consumption (Lage, 2022; Savini, 2022) and production (Bärnthaler & Gough 2023). In the housing sector, sufficiency policies aim to reduce the demand for new construction and land resources by reducing the demand for housing space (Kitzmann, 2023; Lorek & Spangenberg, 2019). The low consumption of housing space contributes to respecting planetary boundaries since housing size is a key predictor of energy, material, and land use (Cohen, 2021; Lorek & Spangenberg, 2019). Therefore, sufficiency measures and narratives are embraced in a social-ecological housing system (zu Ermgassen et al., 2022).
A shift in cultural values away from housing as a consumer good and status symbol are necessary to foster housing sufficiency practices (Huebner & Shipworth, 2017; Sandberg, 2018). People need to reflect on what their actual housing needs are and how culturally imposed wants contribute to the overconsumption of housing (Bohnenberger, 2021). In particular, changes in housing and housing-related practices of high- and middle-income households are relevant since their lifestyle is largely responsible for environmental pollution (Essletzbichler et al., 2023).
The reuse and redistribution of the existing housing stock are key for reduced housing space consumption and reduced pressure for new construction (Schneider, 2019). In a social-ecological

housing system, overconsumption of space is limited and a just distribution of housing space is ensured (Savini, 2022). Financial disincentives for overconsumption of space and easy relocation programs could motivate people to downsize and adapt housing space to their actual needs (Bohnenberger, 2021; Lorek & Spangenberg, 2019). Limits on second homes and mandatory use of vacancies are necessary to make unused space available (Durrant et al., 2023; zu Ermgassen et al., 2022).

To sum up, we acknowledge that housing provision is currently failing to fulfill basic human needs for increasing parts of the population, while its current consumption and production is unsustainable. Against this background, we conceptualize social-ecological housing as being decommodified, energy efficient and decarbonized, and sufficient.

Methods

This article employs a qualitative methodology to investigate the multi-level policy context of social-ecological housing provision by LPHAs in Vienna.
Document analysis (Bowen, 2009) is used to synthesize data from a total of 17 documents that are relevant to the legislative and policy architecture of the LPH sector. This includes laws, regulations, administrative programs, policy strategies, and coalition agreements on the municipal, national, and European level (see table 1).

Level	Documents
Municipal	Building regulation (Bauordnung für Wien) Coalition document of the city government 2020 Guidelines for developer competitions (4-Säulen Modell) Housing subsidy and redevelopment act (Wiener Wohnbauförderungs- und Wohnhaussanierungsgesetz) Housing subsidy regulation for redevelopment and decarbonization (Sanierungs- und Dekarbonisierungsverordnung) Housing subsidy regulation for new builds (Neubauverordnung) Smarty City Strategie Wien (Smart City Strategy Vienna) Technical funding guidelines for apartment buildings and residence halls. Regulation for new builds – Amendment 2022 (Technische Förderrichtlinie für Mehrwohnungshäuser und Wohnheime. Neubauverordnung 2007 – Novelle 2022) Wiener Klimafahrplan (Vienna Climate Guide)
National	Climate Law (Klimaschutzgesetz) Limited-Profit Housing Act (Wohnungsgemeinnützigkeitsgesetz) National Energy and Climate Plan (Draft for public consultation) Renewable Heating Act (Erneuerbare Wärme Gesetz) “Raus aus Öl und Gas“ funding scheme “Sanierungsoffensive” funding scheme
EU	Energy efficiency directive Energy performance of buildings directive

Table 1: Selected documents for the document analysis

Semi-structured expert interviews (Meuser & Nagel, 2009) then extract field-specific knowledge on the opportunities and challenges that stakeholders encounter in greening the LPH sector. The interviews are “seen as crystallization points for practical insider knowledge” (Bogner et al. (2009, p. 2). In November and December 2023, eleven interviews with experts from different fields were conducted (see table 2). Interviewees were selected based on their expertise in the LPH sector and pertinent policy instruments following a process of theoretical sampling.

Interview	Interviewee/ Organization	Function of the organization
1	Department for New Construction at wohnfonds_wien	Responsible for quality assurance through e.g., developer competitions

2	Lawyer on WGG matters	
3	Researcher at Institute for Real Estate, Construction, and Housing (IIBW)	Research and implementation platform on the topics of real estate, construction, housing, and sustainability
4	Researcher at the IIBW	
5	WGG Expert and former head of the housing department at the Ministry for Labor and Economics (BMAW)	Federal ministry responsible for the WGG
6	Advisor at the housing department at the BMAW	
7	Department of Housing Economics and Research at the Austrian Association of Limited-Profit Housing Associations (GBV)	Umbrella organization of Austrian LPHAs
8	Department for Budget, Controlling, Digitalization, and Housing Research at the MA50	City department responsible for housing subsidies
9	Communal housing provider	
10	GESIBA	LPHA operating in Vienna
11	Technical consultant to LPHAs	

Table 2: Interview partners

The analysis was carried out at the sub-national level, which has only recently received increasing attention in housing research (e.g. Blackwell & Kohl, 2018; Kadi & Lilius, 2022; Lang & Stoeger, 2018; Wijburg, 2021b). The national scale has long been the dominant scale for analysis in housing research (Matznetter 2020). However, with globalization and decentralization, the nation-state is weakened and other scales such as the international and local scale receive more attention (Brenner, 2009; Hoekstra, 2020). Housing researchers, furthermore, argue that local housing regimes decisively shape housing provision in general and the social housing sector in particular (Baumgartner & Volmary 2024; Kadi & Lilius, 2022; Matznetter, 2020). Consequently, our analysis acknowledges the interplay of local, national and international socio-political scales but is rooted in a local analysis.

Limited-profit housing in Vienna

In this section we characterize the limited-profit housing system in Vienna and explain its core mechanisms and the role it plays in overall housing provision. The law regulating LPH all over Austria (WGG) is national law. Nevertheless, housing policy in Austria is fragmented since most housing competencies have been transferred from the federal level to the provinces (Jany et al., 2023). We will, thus, discuss the national context first and explain the special role of LPH in Vienna in a second step.

National context

In Austria, 48.2% of main residencies are owner-occupied (36.7% houses; 11.5% apartments), 18.7% private rentals, 16.8% limited-profit housing, 6.8% municipal housing, and 9.6% other tenures (Statistik Austria, 2022). The social housing sector entails municipal and LPH and makes up around 24% of housing which is the second highest share globally after the Netherlands (Amann, 2022a). In contrast to other EU countries, the Austrian social housing sector is not only accessible to low-income groups but to a broad share of the population (Norris & Byrne, 2018).

In Austrian housing politics, a corporatist power dynamic exists which describes that the different political interests are negotiated and compromise solutions are found in policy making (Kemeny, 2006; Matznetter, 2002). Conservatives favor subsidizing homeownership, whilst Social Democrats focus on supporting social housing (del Pulgar, 2022; Kadi, 2015). Even though national housing subsidies aim to foster homeownership, a cross-party acceptance of the importance of the social sector exists which is why LPH is a key pillar in Austrian housing policy (Lawson, 2010; Reinprecht, 2014).

The LPH sector aims to supply low-cost housing to low- and middle-income households by only charging rents that cover the overall costs of construction, management, and maintenance of the building (Marquardt & Glaser, 2020). Limited-profit housing associations (LPHAs) operate under the limited-

profit principle which determines the core of LPHAs' business activities as providing affordable housing and reinvesting funds into the LPH sector (Klien et al., 2023; Kössl, 2022).
The social orientation of LPHAs is institutionalized in the Limited-Profit Housing Act (WGG) that all LPHAs must adhere to. In the WGG, the main task of LPHAs is defined as providing public welfare through affordable housing (WGG, 1979, para. 1.2). Therefore, LPHAs do not operate under the profit maximization logic which keeps rents affordable (Kössl, 2022).
The financing system of LPHAs is designed to secure a steady rather autonomous financing stream (Marquardt & Glaser, 2020). Around one-third of development costs are secured by public loans, one-third to half by bank loans, around 15% come from own equity, and up to 10% through the down payments of tenants (Kössl, 2022; Pittini et al., 2021). However, the role of private finance has increased over time (Lawson, 2010). Now, around half of new construction is financed majorly through market loans which makes the LPH sector more vulnerable to financial turmoil (Housing Europe, 2023).
Next to the strong social sector, the low share of homeownership and a relatively tenure-neutral subsidy system contribute to competition between the private and the social housing sector (Amann & Mundt, 2021; Deutsch, 2009; Norris & Byrne, 2018). Klien et al. (2023) have added empirical evidence to the claim that a large social housing sector has "rent-dampening influence on the overall rent level" (Matznetter & Mundt 2012, p.284; cf. Kemeny 2006). A 10% increase in the market share of the LPH sector translates into a decrease in the price difference between the LPH and the private sector by 30 to 40 cents/m^2 (Klien et al., 2023). The LPH's buffering effect shows that LPH plays a crucial role in housing decommodification that has an impact beyond the boundaries of LPH.

Municipal context

The tenure mix in Vienna is different from the Austrian housing sector. Owner-occupied housing makes up for a way smaller share with only 5% owner-occupied houses and 14% owner-occupied apartments (Statistik Austria, 2022). The social housing sector provides for 43.3% of Viennese housing, while the private rental sector represents 32.4%. Limited-profit (21.4%) and municipal housing (21.9%) each constitute around half of Vienna's social housing sector (Kadi & Lilius, 2022). In Vienna, average net rents are at €6.34/m^2 in the private sector, €4.84/m^2 in LPH, and €3.97/m^2 in municipal housing (Kadi & Lilius, 2022).
The legacy of 'Red Vienna' is evident in the strong commitment of the city government to social housing (Novy et al. 2024). The Social Democrats (SPÖ) have been the governing party in Vienna for decades. Governance intervention in the housing market is a key pillar of Viennese housing policy. Accordingly, the Viennese social housing sector experiences a high degree of stability and financial support (Kadi et al., 2021). Social cohesion through promoting a social mix in social housing is another pillar of Viennese housing policy (Friesenecker & Litschauer, 2021; Kadi & Lilius, 2022). The income requirements for municipal and limited-profit housing are set rather high to make social housing accessible to low- and middle-income groups (Lang & Stoeger, 2018). Even though financial support for social housing has declined on the national level, Vienna still dedicates a large share of its city budget to social housing (Mundt, 2018).
Housing policy in Vienna greatly supports decommodified housing (Marquardt & Glaser, 2020). The political will to ensure affordable housing and strong political support for social housing exist (del Pulgar, 2022; Kadi & Lilius, 2022; Stadt Wien, n.d.-c). The social sector makes up a large and stable part of housing in Vienna and has an overall price-dampening effect. The LPH sector plays a crucial role in this (Klien et al., 2023).

Multi-level policy context of LPH provision

In this section we present our empirical findings pertaining to the multi-level policy context for social-ecological housing provision by LPHAs. We focus on the factors enabling and/or restraining the greening of the LPH sector in Vienna – with implications for the overall housing system. Based on our document analysis and expert interviews, we investigate key policies at the municipal, national and European level.

Municipal level

We have identified three key policies at the municipal level: 1.) housing subsidy (*Wohnbauförderung*); 2.) developer competitions; 3.) land banking.

Housing subsidy

The housing subsidy is managed on the municipal level which allows the City to decide upon the funding criteria and include social and ecological standards. The scheme is tenure-neutral which means that private and limited-profit actors can apply for funding if they comply with the requirements (Deutsch, 2009; Plank et al., 2022). The subsidy system is described as resilient since loans are refinanced through the repayment of former loans and interest rates (Norris & Byrne, 2018; Pittini et al., 2021). Moreover, the housing subsidy is financed through a housing contribution of the income tax, which is 1% of the income and paid half each by the employer and the employee (Stadt Wien, n.d.-e). This system provides a steady financing stream for public funding for housing, tied to social *and* ecological criteria (Marquardt & Glaser, 2020).
However, the instrument is mostly conceived of in social terms. "The housing subsidy is primarily understood as a social policy instrument" (I8) since it requires affordable rents. However, "if you look at the housing subsidy it has always [also] incorporated ecological criteria" (I4). Different policy documents (e.g. Klima- und Energiestrategie 2018, #mission2030) claim the importance of the housing subsidy as an instrument for greening the housing sector (Amann, 2023). The interviewees describe the housing subsidy as an important measure that moves the LPH sector to take ecological measures (I3, I6).
Through the ecological criteria of the housing subsidy, higher ecological standards are brought to the mainstream in housing construction and redevelopment (Amann & Mundt, 2021).
The funding criteria are monitored and improved responding to new developments in ecological housing construction and redevelopment. For example, a new decarbonization premium for tenants to switch their gas cooking facilities was introduced. In addition, preparing measures for decarbonizing heating systems such as the centralization of heating can receive a subsidy with the newest amendment (Sanierungs- Und Dekarbonisierungsverordnung 2024, 2024).
A stronger focus on supporting redevelopment is demanded by several interviewees (I4; I6; I7) and scholars (Amann, 2023; Jany et al., 2023). They are described as crucial for achieving the LPH sector's target of climate neutrality in 2040. Currently, funding for new construction and redevelopment compete, which leads to less focus and less funding for redevelopments (I6; I8; I11; Struber, 2023).

Developer Competitions

The second pillar of housing policy at the municipal level are developer competitions. Developer competitions are tender procedures through which the *wohnfonds_wien* decides which developer can buy and build on the plots of lands it owns. They apply to developments that build more than 500 apartments and are open to profit and limited-profit developers. An interdisciplinary jury decides on the best development projects based on a four-pillar model (Stadt Wien, n.d.-b), including economics, social sustainability, architecture, and ecology (wohnfonds_wien, 2019). All pillars are treated as equally important. Some competitions have a specific focus where certain aspects of the four pillars are considered particularly important. Currently, for example, the wohnfonds has a tender with a focus on wood construction, circular economy, and renewable energy sources (wohnfonds_wien, n.d.-a).
Each of the four pillars has sub-criteria which further define the aspects that need to be respected in the project. The ecology pillar includes criteria that go beyond the standards in other policy instruments. Projects should aim at having a "low ecological lifetime cost", "use material that is easy to dismantle with low grey energy" and "use renewable energy sources" (wohnfonds_wien, 2019, p. 7).
Interviewees 1, 7, and 10 agree that the developer competitions set the highest ecological standards in funded development and therefore achieve model-like developments for the housing sector. One downside of the developer competitions is that it contributes to the construction of only a few model-like developments, and the innovations of the competition often do not reach the mainstream (I3).

Land banking

As the third pillar of the municipal policy mix, we identify land banking. The wohnfonds_wien is responsible for land banking and the management of municipal land which is closely connected to the developer competitions. Since the 1980s, the wohnfonds has been acquiring land for the City of Vienna (Friesenecker & Litschauer, 2021). The wohnfonds resells plots for strategic urban development at low costs to developers that have won the respective developer competition (Lawson, 2010). The main objective of active land banking is to keep land prices moderate and offer land at prices that allow for the construction of affordable apartments (Litschauer et al., 2023; Marquardt & Glaser, 2020). As Interviewee 1 states: "Price regulation is now the number one objective. It is simply about ensuring that there is still land available to construct [affordable] housing".
By owning plots of land, the City has the power to decide what kind of developments are built on the land. Through developer competitions and rent caps of the housing subsidy, it ensures that affordable and high-quality housing is built on municipal land (Litschauer et al., 2023; Marquardt & Glaser, 2020).

National level

At the national level, we have identified three key policies: 1.) the limited-profit housing act (WGG); 2.) the federal subsidy scheme; 3.) the renewable heating act.

Limited-profit housing Act

The Limited-Profit Housing Act (WGG) is the national legislation that all LPHAs must adhere to. "The fundamental and actually most important goal of the WGG is affordable housing" (I6) which highlights the primary social aim of the legislation. The cost-rent principle is key to ensuring that rents in the LPH sector are affordable. The cost-rent principle requires the LPHAs to charge rents that only cover the cost of construction, maintenance, and management of the respective building (GBV, n.d.-b). These costs include the repayments of public and private loans, the maintenance and improvement premium (EVB), interest rate payments on invested equity, administration costs, reserve funds, service charges, and VAT (Kössl, 2022). Once the investment costs are covered, a legally defined basic rent (Grundmiete) applies (Kössl, 2022). The cost-rent principle contributes to average LPH rents that are around €2/m^2 lower than in the private sector (Kadi & Lilius, 2022).
The most relevant principle in the WGG for taking ecological measures is the system of internal revolving funds which provides funds for taking ecological measures and fortifies the long-term and high-quality perspective within the sector. The system of internal revolving funds requires the LPHAs to constantly reinvest their equity, which they can build up when loans for a building have been repaid and only the basic rent is charged (Pittini et al., 2021). These profits must be reinvested into the sector through financing projects such as new constructions or redevelopments. Interviewee 10 describes that there are more funds for ecological measures available because "we don't have the profit that we can squander, but we have to reinvest it". The advantage of reinvesting equity is explained as follows:

> I think that's part of the business model because if the money that is earned has to stay within the sector and cannot be taken out […] then the money is there. And if the money is there, then you might do something with it. […] You can buy new properties, you can implement new projects, or you can invest in the existing properties. (I8)

In addition, there is a premium for maintenance and improvement (EVB). A maximum of €2.13/m^2 can be charged as part of the rent depending on the age of the building (Kössl, 2022). The LPHAs must reinvest this premium into the specific building it was collected from and repay it to the tenants if it was not used 20 years after collection (Kössl, 2022). The premium must be used for measures that are defined as maintenance and improvement measures. "The limited-profit sector has the best regime when it comes to funding refurbishment. There is the maintenance and improvement premium, which is much higher than in the other regimes." (I3). Maintenance measures have a higher priority than improvement measures which means that improvement measures can only be taken when the fund is not needed for maintenance measures. In the past, the EVB has contributed to taking measures to upgrade the energy efficiency of the buildings and will be increasingly needed for the change of heating systems (Housing

Europe, 2023). However, most interviewees point out that the EVB will not be enough to finance the upcoming investments for decarbonization and other ecological measures (I4; I7; I11).

Next to providing funding for taking ecological measures, the internal revolving funds model is also identified as a key factor that fosters the LPHAs' long-term focus on providing high-quality apartments. "There is a basic understanding that the buildings should be maintained and improved in the long term, and there is also an earmarked fund that is intended for this purpose" (I7). Given the obligation to reinvest and improve, the LPHAs adopt a long-term perspective on their housing stock that is necessary to ensure that the apartments are updated to new ecological standards.
The long-term perspective on providing affordable and high-quality ecological housing is also fostered by the generation obligation in the WGG. "LPHAs have to use their equity to guarantee a long-term sustainable housing supply for current and future generations" (WGG, 1979, para. 1). Therefore, LPHAs have an interest in building housing that is high quality and endures a long time. This long-term perspective enables them to prioritize "retention of property value, smooth maintenance, and social sustainability" (I2; Amann & Mundt, 2021).
One major barrier connected to the WGG stemming from residential civil law is the lack of tolerance obligations of the tenants. Under the current legal framework, the LPHAs need to get the consent of all the tenants for redevelopment measures such as changing the heating system within a building. Communication efforts to convince the tenants of such redevelopments are necessary which requires communicative skill and great time efforts of the LPHAs. It would be a great relief for the LPH sector if the legislation was changed in a way that tenants have to tolerate certain ecological measures (Gutheil-Knopp-Kirchwald, 2021). For example, Interviewee 10 proposed that a qualified majority among the tenants should be sufficient for changing the heating system. The hope that the Renewable Heating Act (EWG) would have induced changes in residential civil law through the obligation to switch heating existed (I5; I7; I9, see below).

National subsidy schemes

Much less important than the WGG, the national subsidy scheme is conducive to ecological redevelopments since subsidies for the decarbonization of heating and energy efficiency improvements exist. The national subsidy scheme "Raus aus Öl und Gas" provides funds for changing oil and gas boilers to renewable or low-carbon district heating systems (BMK, 2023c). The "Sanierungsoffensive" is a subsidy scheme for thermal redevelopment measures (BMK, 2023d). Both subsidy schemes are coordinated by the Climate Ministry and are considered important instruments to contribute to achieving climate neutrality by 2040 (BMK, 2023c, 2023d). With the EWG, the national government has decided that more funding from national subsidy schemes for decarbonizing the housing sector should be made available (Auer, 2023; Szigetvari & Gepp, 2023).
However, a key limitation of national subsidies is that they are geared towards homeownership and single-family homes. Since the LPH sector in Vienna is characterized by multi-story buildings, national subsidies are difficult to capture for LPHAs. The national funding schemes have only recently been opened to multi-story houses which is why LPHAs have less experience with the national system than the municipal system. In addtion, LPHAs have more difficulties in complying with the national funding requirements since the subsidies are not fitted very well toward the needs of the LPH sector. The required time frame between the application for a subsidy and the implementation of the redevelopment project is too short for LPHAs (I8). Therefore, the national funding is less accessible to the LPHAs which makes it currently less relevant than municipal subsidies for greening the sector.

Renewable Heating Act

Lastly, in its current form, the Renewable Heating Act (EWG) represents a barrier to greening the LPH sector since it does not feature any obligations to phase out fossil fuel heating by 2040 anymore. In the first draft, this obligation was still included but after several negotiations, the government has decided to only increase the funding for the decarbonization of heating (Auer, 2023; Wirth, 2023). This way the LPH sector does not face any national obligation to decarbonize their heating systems. Some interviewees claim that such a strict goal would have been very helpful to the sector since it would have

given planning security and orientation towards the next important steps in greening the sector (I4; I7; I9; I11).

European level

Our findings suggest that the European level is the least decisive in shaping social-ecological housing provision by LPHAs, which is why we only include them in table 3. Interviewees mentioned EU regulation, EU funding and the social taxonomy to exert influence.

Table 3 summarises the key policies discussed above and how they enable or restrict social-ecological housing provision by LPHAs.

Policies	Enabling and restricting factors
Municipal level	
Housing subsidy	+ Guiding greening in the LPH sector through ecological funding criteria + Crucial for financing ecological measures - Complex system divided between municipal departments
Developer competitions	+ Guides greening and drives innovation in the LPH sector through high ecological standards + Ecological criteria that go beyond the status quo - Limited impact scope since only a few developments with these very high standards
Land banking	+ Provides LPHAs with low-cost land necessary for affordable rents + Partly impact on high ecological quality through developer competitions
National level	
Limited-Profit Housing Act (WGG)	+ Institutionalizes social focus and long-term perspective on high-quality stock + System of internal revolving funds provides funds for taking ecological measures - Missing regulation on tolerance obligation
Federal subsidy schemes	+ Funding schemes for thermal redevelopments and decarbonization of heating - Geared towards homeowners and single-family homes - Little coordination with municipal subsidy schemes
Renewable Heating Act (EWG)	+ More national funding for decarbonization measures - No public obligation for change of heating systems
EU level	
EU regulations	+ Potential impact on higher energy efficiency standards and soil protection in municipal policies - Currently, no higher standards are required
EU funding	- Small target group for planning and implementation subsidies and missing experience in the LPH sector
EU taxonomy	+ Potentially guide greening through ecological criteria for bank loans. Yet, little experience until now
Economic context	

Increasing construction material and land prices	+	Additional incentive to use land as efficiently as possible
	-	Additional cost pressure on already tight cost structure to ensure social and ecological aims

Table 1: Multi-level policies with enabling and restricting factors

Economic Challenges

Next to the complex and multi-layered policy context, the interviewees focused on economic challenges to greening the LPH sector in Vienna. The decarbonization of heating and other ecological measures such as ecological construction materials and maintenance of green spaces have high investment costs. These costs cannot be covered with the current financing channels available to the LPHAs which is why new ways to finance these measures are necessary (I4; I5; I7; I10). More state funding was mentioned by most interviewees as a key aspect of tackling the ecological challenges. However, co-financing through other non-state channels will likely be necessary as well (Lawson, 2021). Some LPH projects are only possible through a joint development with private subsidiaries or other for-profit partners since the tight cost pressures are becoming too big (I7).
The financing structure of LPHAs is additionally put under pressure through rising external costs such as increasing material, land, and energy prices. These additional cost pressures make it even more difficult to take ecological measures and ensure affordability, i.e. provide social-ecological housing, since the LPHAs operate under a strict cost regime. The average price for construction land in Vienna has increased by 124% between 2010 and 2019 (Litschauer et al., 2023), which makes it increasingly difficult for LPHAs to find land for affordable construction. In addition, between 2020 and 2022, the housing sector faced an increase in building material costs of nearly 50% with a relaxing trend in 2023 (Gutheil-Knopp-Kirchwald, 2023a). The high material costs led to the postponement of several redevelopment and construction projects in the LPH sector (Housing Europe, 2023; Putschögl, 2023). Redevelopment projects were hit harder by the cost increases since they are easier to put on hold than new developments (I3).
Nevertheless, the cost increase cannot entirely be cushioned by public support which is why ecological measures such as green spaces have often been delayed for LPH projects.

Discussion

The previous analysis shed light on the multi-level context for social-ecological housing provision by LPHAs in Vienna. It reveals a complex interplay of various instruments on different levels. We now turn to the implications, discussing what behavior by LPHAs is enabled and fostered and which aspects are restricted or neglected?

What is enabled/fostered?

Our analysis has confirmed that the LPH sector in Vienna is a key segment of its social housing model that is able to supply decommodified and good quality housing to a large part of the population. While the legacy of Red Vienna and the large chunk of municipal housing is an important leverage point for the city, the LPH sector has taken over as the key component of the Viennese social housing model. This is fostered by the LPH Act, the key policy defining the business model of LPHAs in the whole of Austria and ensuring the provision of decommodified housing by LPHAs. The success and longevity of the model has sufficiently been discussed elsewhere (cf. Marquardt & Glaser, 2020; Kadi & Lilius 2022) and their results have been confirmed by our analysis.
In the LPH sector, the social aspect of affordability is described as part of the sector's DNA and having the highest priority. Nevertheless, the environmental objective of the LPH sector is becoming more engrained in the LPHAs. A strong dedication within the sector towards environmental topics in housing is asserted by the interviewees. Energy efficiency and decarbonization of heating are the most prominent ecological strategies in the LPH sector and its policy context. The decarbonization of heating is named as the crucial ecological strategy for achieving the sector's goal of climate neutrality in 2040. Before

that, energy efficiency upgrades have been the most important ecological strategy in the LPH sector. The revolving funds model, the maintenance obligation, and the close connection between the LPH sector and the housing subsidy have contributed to the high thermal redevelopment rate and enable decarbonization of heating systems. These instruments supply financial capital for phasing out oil and gas heating and contribute to the LPHAs' focus on high ecological quality and their long-term perspective.

What is neglected?

One of the biggest issues for the provision of social-ecological housing by LPHAs at the moment is that rising construction and financing costs put the cost-rent system under pressure. Consequently, LPHAs are managing potential trade-offs. Rent increases are tried to be avoided since they conflict with the social aim of the LPH sector. Therefore, the LPHAs are currently postponing ecological measures in the existing stock. If construction and financing costs remain high in the future, policy makers will eventually need to address this issue.

In addition, land use and housing space consumption receive limited political attention. Reducing land use and redistributing floor space consumption is not mentioned as a housing policy goal in Vienna (Haas et al., 2022; Stadt Wien, 2022b). Amann and Mundt (2019) claim that the problem of urban sprawl is not sufficiently dealt with in housing policies. For example, incentives for reducing land use and a compact building style could be included in the housing subsidy scheme (Amann & Mundt, 2021). In the future, the EU soil protection strategy could become more relevant to the LPH sector once more concrete strategies on how to stop net land take by 2050 are developed.

Furthermore, redevelopment has little political priority in Austria (Amann, 2019; Jany et al., 2023). New buildings still appear more climate-friendly since embodied energy in new buildings is often neglected in the political discourse. In the interviews, the need for a stronger focus on redevelopment in subsidy schemes is voiced. For example, an earmarked budget for redevelopment projects on the municipal and national level could contribute to more funding for redevelopment projects. Increased subsidies are understood as a key enabler for the LPHAs to tackle the great challenge of decarbonizing the heating systems in the sector. However, our interviews also show that there is a clear preference at the national policy level for fostering homeownership and new developments and that redevelopment and redistribution of existing stock is neglected.

Conclusion

In this paper we have set out to define social-ecological housing as being decommodified, energy efficient and decarbonized and sufficient. We have subsequently characterized the LPH sector in Vienna as a successful model of supplying affordable, high-quality housing in a highly institutionalized setting. Subsequently, we have carried out an analysis of the multi-level policy context of social-ecological housing provision by LPHAs in Vienna. The LPH sector already embraces many aspects of social-ecological housing.

The first pillar of social-ecological housing presupposes that housing needs to be decommodified. Affordability in housing is the key objective of the LPHAs and is engrained in their DNA. Given the limited-profit and cost-rent principle of the WGG, the social aim of LPHAs is ensured. Also, the housing subsidy, and the land banking mechanism contribute to the LPHAs being able to charge moderate rents. External cost pressures such as rising building material and land prices pose a threat to affordability in the LPH sector. Nevertheless, since the LPHAs do not have a profit logic and focus on providing affordable housing for a large share of the population, the LPH sector provides decommodified housing.

The second pillar revolves around a highly energy-efficient and decarbonized housing stock to ensure low energy consumption and GHG emissions in the housing sector. In the LPH sector in Vienna, key ecological goals revolve around reducing GHG emissions through fostering high energy efficiency and decarbonization in the sector. The housing subsidy enables ecological strategies in the LPH sector because of its ecological focus and its financial support. The internal revolving funds provides LPHAs with a dedicated fund and long-term perspective for improving and upgrading the ecological quality of their stock. In addition, the ambitious ecological criteria of the developer competitions, national funding

schemes, and ecological criteria of EU directives and the EU taxonomy foster the implementation of decarbonization in the LPH sector.

The third pillar of social-ecological housing deals with the reduction of housing space and new construction to decrease land consumption. The reduction of housing space and land use receive less attention in the LPH sector and related housing policies than the other pillars. The problem of increasing land use is acknowledged within the sector but is at odds with the increasing demand for affordable housing which fuels LPH construction. Nevertheless, given the affordability aim of the sector, the LPHAs have a compact building style that finds a balance between sufficient space for well-being and reducing costs through small housing space. To reduce land consumption, the LPH sector mostly relies on the technological solution of redensification. Sufficiency solutions to limiting housing space consumption are considered more relevant to the private sector. Changes at the political (national) level about prioritizing redevelopment and redistribution of the existing stock, as well as about cultural norms of ownership and building sizes would be needed to fully realize the third pillar of social-ecological housing. Such a political project would need unusual alliance-building across private and profit sectors (Bärnthaler 2024; Lage et al. 2023). How to achieve this constitutes an interesting and important avenue for future research.

References

Amann, W. (2019). *Maßnahmenpaket: Dekarbonisierung des Wohnungssektors*. IIBW - Institute for Real Estate, Construction and Housing Ltd. https://www.oegut.at/downloads/pdf/MassnahmenpaketDekarbonisierungWohnungssektor.pdf?m=1561621272

Amann, W. (2022a). 2. Wohnungsbestände und Wohnkosten. In W. Amann & C. Struber (Hrsg.), *Österreichisches Wohnhandbuch 2022* (Bd. 10, S. 18–48). Linde.

Amann, W. (2022b). 3. Baubewilligungen, Wohnungsfertigstellungen. In W. Amann & C. Struber (Hrsg.), *Österreichisches Wohnhandbuch 2022* (Bd. 10, S. 49–57). Linde.

Amann, W. (2023). 3. Klimaschutz und Föderalismus – die Potenziale der Wohnbauförderung. In W. Amann & C. Struber, *Österreichisches Wohnhandbuch 2023* (11. Auflage). Linde Verlag Ges.m.b.H.

Amann, W., & Mundt, A. (2018). "Wiener Wohnbauinitiative": A new financing vehicle for affordable housing in Vienna, Austria. In *Affordable Housing Governance and Finance*. Routledge.

Amann, W., & Mundt, A. (2019). *Rahmenbedingungen und Handlungsoptionen für qualitätsvolles, dauerhaftes, leistbares und inklusives Wohnen*. Bundesministerium Arbeit, Soziales, Gesundheit und Konsumentenschutz (BMASGK). http://iibw.at/documents/2019%20IIBW%20BMASGK%20Sozialbericht_Wohnen.pdf

Amann, W., & Mundt, A. (2021). *Innovation in housing decarbonisation: Austria* (Housing Finance International). International Union for Housing Finance.

Auer, M. (2023, Oktober 18). Die alte Öl- und Gasheizung darf bleiben. *Die Presse*. https://www.diepresse.com/17746282/die-alte-oel-und-gasheizung-darf-bleiben

Baron, H., Ngoc Doan, T. B., Kadi, J., & Plank, L. (2021). *Wohnungspolitik und Wohnversorgung* (Stadtpunkte Nr. 37). Arbeiterkammer Wien.

Bengtsson, B. (2001). Housing as a social right: Implications for welfare state theory. *Scandinavian Political Studies*, *24*(4), 255–275. https://doi.org/10.1111/1467-9477.00056

Bierwirth, A., & Thomas, S. (2019). *Energy sufficiency in buildings* (Eceee Concept Papers). https://www.energysufficiency.org/libraryresources/library/items/energy-sufficiency-in-buildings-concept-paper/

Blaas, W. (1991). *Mehr Markt oder mehr Staat im Wohnungswesen?: Reformperspektiven für die österreichische Wohnungspolitik*. Böhlau.

BMAW. (o. J.). *Wohnungspolitik*. Bundesministerium für Arbeit und Wirtschaft. Abgerufen 16. November 2023, von https://www.bmaw.gv.at/Themen/KulturellesErbe/Wohnungspolitik.html

BMK. (o. J.). *Klimaschutzgesetz*. Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie. Abgerufen 15. November 2023, von https://www.bmk.gv.at/themen/klima_umwelt/klimaschutz/nat_klimapolitik/klimaschutzgesetz.html

BMK. (2023a). *Nationaler Energie- und Klimaplan—Entwurf zur öffentlichen Konsultation*. Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie. https://www.bmk.gv.at/themen/klima_umwelt/klimaschutz/nat_klimapolitik/energie_klimaplan.html

BMK. (2023b, Januar 4). *Höhere Förderungen für thermische Sanierung 2023*. Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie. https://www.bmk.gv.at/service/presse/gewessler/20230104_sanierungsoffensive.html

BMK. (2023c, Januar 26). *„raus aus Öl und Gas“ 2023/2024*. oesterreich.gv.at - Österreichs digitales Amt. https://www.oesterreich.gv.at/themen/umwelt_und_klima/energie_und_ressourcen_sparen/1/raus_aus_oel.html

BMK. (2023d, Mai 25). *Sanierungsoffensive 2023/2024*. oesterreich.gv.at - Österreichs digitales Amt. https://www.oesterreich.gv.at/themen/umwelt_und_klima/energie_und_ressourcen_sparen/1/sanierungsoffensive.html

Bogner, A., Littig, B., & Menz, W. (2009). Introduction: Expert interviews – An introduction to a new methodological debate. In *Interviewing Experts* (S. 1–16). Palgrave Macmillan UK.

Bohnenberger, K. (2021). Can ‘sufficiency’ reconcile social and environmental goals? A Q-methodological analysis of German housing policy. *Journal of Housing and the Built Environment*, *36*(1), 171–189. https://doi.org/10.1007/s10901-020-09762-4

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Brenner, N. (2004). *New state spaces: Urban governance and the rescaling of statehood*. Oxford University Press.

Clune, S., Morrissey, J., & Moore, T. (2012). Size matters: House size and thermal efficiency as policy strategies to reduce net emissions of new developments. *Energy Policy*, *48*, 657–667. https://doi.org/10.1016/j.enpol.2012.05.072

Cohen, M. J. (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. https://doi.org/10.1080/14036096.2020.1722218

Cucca, R. (2017). *The social impact of green urban renewal in two European Capital Cities: Copenhagen and Vienna in comparison*. http://dx.doi.org/10.25675/10217/183745

Cucca, R., & Friesenecker, M. (2022). Potential and limitations of innovative housing solutions in planning for degrowth: The case of Vienna. *Local Environment*, *27*(4), 502–516. https://doi.org/10.1080/13549839.2021.1872513

Czischke, D. (2014). Social housing and european community competition law. In *Social Housing in Europe* (S. 333–346). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118412367.ch19

Davis, E. E. (2021). Housing as a human right within an era of international exceptionalism. *Constitutional Review*, *7*(2), 241–272.

del Pulgar, C. P. (2022). Prioritizing green and social goals: The progressive Vienna model in jeopardy. In I. Anguelovski & J. J. T. Connolly (Hrsg.), *The Green City and Social Injustice* (S. 267–282). Routledge.

Deutsch, E. (2009). The Austrian social rented sector at the crossroads for housing choice. *European Journal of Housing Policy*, *9*(3), 285–311. https://doi.org/10.1080/14616710903138775

Doyal, L., & Gough, I. (1991). *A theory of human need* (1. Aufl.). Bloomsbury Publishing Plc. https://doi.org/10.1007/978-1-349-21500-3

Durrant, D., Lamker, C., & Rydin, Y. (2023). The potential of post-growth planning: Re-tooling the planning profession for moving beyond growth. *Planning Theory & Practice*, *24*(2), 287–295. https://doi.org/10.1080/14649357.2023.2198876

EIB. (o. J.). *ELENA – European Local ENergy Assistance*. EIB.Org. Abgerufen 30. Januar 2024, von https://www.eib.org/en/products/advisory-services/elena/index.htm

Essletzbichler, J., Miklin, X., Volmary, H., & Ornetzeder, M. (2023). Kapitel 17. Soziale und räumliche Ungleichheit. In C. Görg, V. Madner, A. Muhar, A. Novy, A. Posch, K. W. Steininger, & E. Aigner (Hrsg.), *APCC Special Report: Strukturen für ein klimafreundliches Leben* (S. 481–497). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-662-66497-1_21

EU Commission. (o. J.-a). *EU Taxonomy Navigator*. European Commission - European Commission. Abgerufen 5. Februar 2024, von https://ec.europa.eu/sustainable-finance-taxonomy/taxonomy-compass/the-compass

EU Commission. (o. J.-b). *Soil strategy for 2030*. Abgerufen 18. Januar 2024, von https://environment.ec.europa.eu/topics/soil-and-land/soil-strategy_en

EU Commission. (2023). *Energy Efficiency Directive*. https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en

EU Parliament. (2023, Dezember 15). *Revision of the Energy Performance of Buildings Directive | Legislative Train Schedule*. European Parliament. https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-revision-of-the-energy-performance-of-buildings-directive

Eurostat. (2022). *Air emissions accounts by NACE Rev. 2 activity* [Dataset]. https://ec.europa.eu/eurostat/databrowser/view/ENV_AC_AINAH_R2__custom_7247682/default/table?lang=en

Frascati, M. (2020). *Klimaungerechtigkeit in Österreich. Eine Studie zur ungleichen Verteilung von CO2-Ausstoß nach Einkommensschichten*. Greenpeace. https://mobilitaet.greenpeace.at/assets/uploads/assets/uploads/GP_ReportKlimaungerechtigkeitAT.pdf

Friesenecker, M., & Litschauer, K. (2021). Innovating social housing? Tracing the social in social housing construction. In Y. Kazepov & R. Verwiebe, *Vienna* (1. Aufl., S. 68–82). Routledge. https://doi.org/10.4324/9781003133827-7

Gallent, N., Durrant, D., & Stirling, P. (2018). Between the unimaginable and the unthinkable: Pathways to and from England's housing crisis. *Town Planning Review*, *89*(2), 125–144. https://doi.org/10.3828/tpr.2018.8

GBV. (o. J.-a). *GBV - Grundsätze & Ziele*. Abgerufen 15. November 2023, von http://www.gbv.at/gemeinnuetzige-bauwirtschaft/Grunds%C3%A4tze_Ziele/

GBV. (o. J.-b). *Limited-profit housing associations in Austria*. Abgerufen 16. November 2023, von https://www.gbv.at/english/

Gough, I. (2019). Universal basic services: A theoretical and moral framework. *The Political Quarterly*, *90*(3), 534–542. https://doi.org/10.1111/1467-923X.12706

Gutheil-Knopp-Kirchwald, G. (2020). Dekarbonisierung des Gebäudesektors im gemeinnützigen Wohnungsbestand [Decarbonization of the housing sector in the limited-profit housing stock]. *OiB Aktuell*, *Heft 2*. https://www.oib.or.at/de/oib-aktuell-2020

Gutheil-Knopp-Kirchwald, G. (2021, April 12). Wärmewende im Wohnbau – wie geht's voran? *gbv-aktuell*. https://www.gbv-aktuell.at/news/906-waermewende-im-wohnbau-wie-geht-s-voran?highlight=WyJ3XHUwMGU0cm1ld2VuZGUiXQ%3D%3D

Gutheil-Knopp-Kirchwald, G. (2023a). 1. Der österreichische Wohnbau in Zahlen. In W. Amann & C. Struber (Hrsg.), *Österreichisches Wohnhandbuch 2023* (11. Auflage, S. 1–8). Linde Verlag Ges.m.b.H.

Gutheil-Knopp-Kirchwald, G. (2023b). 2. Wohnbauförderung, gemeinnützige Bauvereinigungen. In W. Amann & C. Struber (Hrsg.), *Österreichisches Wohnhandbuch 2023* (11. Auflage, S. 9–28). Linde Verlag Ges.m.b.H.

Haas, R., Siebenhofer, M., Lederer, J., & Ajanovic, A. (2022). Historical evolution and scenarios up to 2050 of heating energy consumption and CO_2 emissions of residential buildings in Vienna. *Journal of Energy and Power Technology*, *04*(03), 1–21. https://doi.org/10.21926/jept.2203030

Haberl, H., Wiedenhofer, D., Virág, D., Kalt, G., Plank, B., Brockway, P., Fishman, T., Hausknost, D., Krausmann, F., Leon-Gruchalski, B., Mayer, A., Pichler, M., Schaffartzik, A., Sousa, T., Streeck, J., & Creutzig, F. (2020). A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: Synthesizing the insights. *Environmental Research Letters*, *15*(6), 065003. https://doi.org/10.1088/1748-9326/ab842a

Hertwich, E., Lifset, R., Pauliuk, S., & Heeren, N. (2020). *Resource efficiency and climate change: Material efficiency strategies for a low-carbon future*. International Resource Panel. https://www.resourcepanel.org/reports/resource-efficiency-and-climate-change

Heuer, J. H. B. (1979). *Lehrbuch der Wohnungswirtschaft* (1. Aufl.). Knapp.

Hoekstra, J. (2020). Comparing local instead of national housing regimes? Towards international comparative housing research 2.0. *Critical Housing Analysis*, *7*(1), 74–85. https://doi.org/10.13060/23362839.2020.7.1.505

Housing Europe. (2023). *The state of housing in Europe 2023*. Housing Europe. https://www.stateofhousing.eu/

Huebner, G. M., & Shipworth, D. (2017). All about size? – The potential of downsizing in reducing energy demand. *Applied Energy*, *186*, 226–233. https://doi.org/10.1016/j.apenergy.2016.02.066

Hüttler, W., Gutheil-Knopp-Kirchwald, G., & Kössl, G. (2023). 4. Dekarbonisierung im gemeinnützigen Wohnungsbestand. In W. Amann & C. Struber, *Österreichisches Wohnhandbuch 2023* (11. Auflage). Linde Verlag Ges.m.b.H.

IPCC. (2022). Summary for policymakers. In P. R. Shukla, J. Skea, R. Slade, A. A. Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, & J. Malley (Hrsg.), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (1. Aufl., S. 3–48). Cambridge University Press. https://doi.org/10.1017/9781009157926.001

Jany, A., Bukowski, M., Heindl, G., & Kreissl, K. (2023). Wohnen. In C. Görg, V. Madner, A. Muhar, A. Novy, A. Posh, K. W. Steiniger, & E. Aigner (Hrsg.), *APCC Special Report: Strukturen für ein klimafreundliches Leben*. Springer Spektrum. https://doi.org/10.1007/978-3-662-66497-1_8

Kadi, J. (2015). Recommodifying housing in formerly “Red” Vienna? *Housing, Theory and Society*, *32*(3), 247–265. https://doi.org/10.1080/14036096.2015.1024885

Kadi, J., & Lilius, J. (2022). The remarkable stability of social housing in Vienna and Helsinki: A multi-dimensional analysis. *Housing Studies*, *0*(0), 1–25. https://doi.org/10.1080/02673037.2022.2135170

Kadi, J., Vollmer, L., & Stein, S. (2021). Post-neoliberal housing policy? Disentangling recent reforms in New York, Berlin and Vienna. *European Urban and Regional Studies*, *28*(4), 353–374. https://doi.org/10.1177/09697764211003626

Kallis, G., Kostakis, V., Lange, S., Muraca, B., Paulson, S., & Schmelzer, M. (2018). Research on degrowth. *Annual Review of Environment and Resources*, *43*(1), 291–316. https://doi.org/10.1146/annurev-environ-102017-025941

Kazepov, Y., & Verwiebe, R. (2021). Is Vienna still a just city? The challenges of transitions. In Y. Kazepov & R. Verwiebe, *Vienna: Still a Just City?* (1. Aufl., S. 1–16). Routledge. https://www.taylorfrancis.com/books/9781003133827

Kemeny, J. (2006). Corporatism and housing regimes. *Housing, Theory and Society*, *23*(1), 1–18. https://doi.org/10.1080/14036090500375423

Kemeny, J., Kersloot, J., & Thalmann, P. (2005). Non-profit housing influencing, leading and dominating the unitary rental market: Three case studies. *Housing Studies*, *20*(6), 855–872. https://doi.org/10.1080/02673030500290985

Kholodilin, K. A., Kohl, S., & Müller, F. (2022). The rise and fall of social housing? Housing decommodification in long-run comparison. *Journal of Social Policy*, 1–27. https://doi.org/10.1017/S0047279422000770

Kletzan-Slamanig, D., & Köppl, A. (2016). *Subventionen und Steuern mit Umweltrelevanz in den Bereichen Energie und Verkehr*. WIFO - Austrian Institute of Economic Research. https://www.wifo.ac.at/jart/prj3/wifo/resources/person_dokument/person_dokument.jart?publikationsid=58641&mime_type=application/pdf

Klien, M., Huber, P., & Reschenhofer, P. (2023). *Die preisdämpfende Wirkung des gemeinnützigen Wohnbaus*. Österreichisches Institut für Wirtschaftsforschung. https://www.wifo.ac.at/wwa/pubid/69779

Klien, M., & Streicher, G. (2021). *The economic impacts of limited-profit housing associations in Austria*. WIFO - Austrian Institute of Economic Research. https://www.wifo.ac.at/en/news/economic_effects_of_non-profit_housing

Kössl, G. (2022). *The system of limited-profit housing in Austria: Cost-rents, revolving funds, and economic impacts* (CIRIEC No. 2022/04). ciriec International. https://www.ciriec.uliege.be/wp-content/uploads/2022/11/WP2022-04.pdf

Kunnert, A., & Baumgartner, J. (2012). *Instrumente und Wirkungen der österreichischen Wohnungspolitik*. WIFO - Austrian Institute of Economic Research. https://ideas.repec.org//b/wfo/wstudy/45878.html

Lage, J. (2022). Sufficiency and transformation–A semi-systematic literature review of notions of social change in different concepts of sufficiency. *Frontiers in Sustainability*, *3*. https://www.frontiersin.org/articles/10.3389/frsus.2022.954660

Lang, R., & Stoeger, H. (2018). The role of the local institutional context in understanding collaborative housing models: Empirical evidence from Austria. *International Journal of Housing Policy*, *18*(1), 35–54. https://doi.org/10.1080/19491247.2016.1265265

Lawson, J. (2010). Path dependency and emergent relations: Explaining the different role of limited profit housing in the dynamic urban regimes of Vienna and Zurich. *Housing, Theory and Society*, *27*(3), 204–220. https://doi.org/10.1080/14036090903326437

Litschauer, K., & Friesenecker, M. (2021). Affordable housing for all? Challenging the legacy of Red Vienna. In Y. Kazepov & R. Verwiebe, *Vienna* (1. Aufl., S. 53–67). Routledge. https://doi.org/10.4324/9781003133827-6

Litschauer, K., Grabner, D., & Smet, K. (2021). Wohnen: Inklusiv, leistbar, emissionsfrei. In Die Armutskonferenz, ATTAC, & Beigewum (Hrsg.), *Klimasoziale Politik: Eine gerechte und emissionsfreie Gesellschaft gestalten* (1. Aufl., S. 153–161). bahoe books.

Litschauer, K., Kumnig, S., Kohout, R., Wolfmayr, G., & Altreiter, C. (2023). Die Bereitstellung von leistbarem Wohnraum in Zeiten der Wohnkrise. *disP - The Planning Review*, *59*(3), 33–49. https://doi.org/10.1080/02513625.2023.2288448

Lorek, S., & Spangenberg, J. H. (2019). Energy sufficiency through social innovation in housing. *Energy Policy*, *126*, 287–294. https://doi.org/10.1016/j.enpol.2018.11.026

Marquardt, S., & Glaser, D. (2020). How much state and how much market? Comparing social housing in Berlin and Vienna. *German Politics*, 1–20. https://doi.org/10.1080/09644008.2020.1771696

Matznetter, W. (2002). Social housing policy in a conservative welfare state: Austria as an example. *Urban Studies*, *39*(2), 265–282. https://doi.org/10.1080/00420980120102966

Matznetter, W. (2020). How and where non-profit rental markets survive – A reply to Stephens. *Housing, Theory and Society*, *37*(5), 562–566. https://doi.org/10.1080/14036096.2020.1816570

Matznetter, W., & Mundt, A. (2012). Housing and welfare regimes. In *The SAGE handbook of housing studies* (S. 274–294). Sage. https://doi.org/10.4135/9781446247570.n15

Max-Neef, M. A., Elizalde, A., & Hopenhayn, M. (1991). *Human scale development: Conception, application and further reflections*. Apex Press.

Mete, S. (2022). Towards degrowth housing development? Lessons from a scenario-based gaming session in the Oslo region. *Local Environment*, *27*(4), 517–536. https://doi.org/10.1080/13549839.2021.1964456

Meuser, M., & Nagel, U. (2009). The expert interview and changes in knowledge production. In A. Bogner, B. Littig, & W. Menz (Hrsg.), *Interviewing Experts* (S. 17–42). Palgrave Macmillan UK. https://doi.org/10.1057/9780230244276_2

Mocca, E., Friesenecker, M., & Kazepov, Y. (2020). Greening Vienna. The multi-level interplay of urban environmental policy–making. *Sustainability*, *12*(4), 1577. https://doi.org/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. https://doi.org/10.13060/23362839.2018.5.1.408

Muñoz, P., Zwick, S., & Mirzabaev, A. (2020). The impact of urbanization on Austria's carbon footprint. *Journal of Cleaner Production*, *263*, 121326. https://doi.org/10.1016/j.jclepro.2020.121326

Norris, M., & Byrne, M. (2018). Housing market (in)stability and social rented housing: Comparing Austria and Ireland during the global financial crisis. *Journal of Housing and the Built Environment*, *33*(2), 227–245. https://doi.org/10.1007/s10901-018-9595-4

Norris, M., & Lawson, J. (2022). Tools to tame the financialisation of housing. *New Political Economy*, *0*(0), 1–17. https://doi.org/10.1080/13563467.2022.2126447

Novy, A., Baumgartner, B., Grabow, S., Plank, L., & Volmary, H. (2024). Greening Red Vienna—Lessons for a social-ecological housing provisioning. *Sustainability: Science, Practice and Policy*, *20*(1), 2312674. https://doi.org/10.1080/15487733.2024.2312674

OECD. (2021). Reconciling housing and the environment. In *Brick by brick: Building better housing policies*. OECD Publishing. https://doi.org/10.1787/b453b043-en

OECD. (2023). *Austria* (Housing sector country snapshot). OECD. https://www.oecd.org/housing/policy-toolkit/country-snapshots/housing-policy-austria.pdf

O'Neill, D. W., Fanning, A. L., Lamb, W. F., & Steinberger, J. K. (2018). A good life for all within planetary boundaries. *Nature Sustainability*, *1*(2), 88–95. https://doi.org/10.1038/s41893-018-0021-4

Pauliuk, S., Heeren, N., Berrill, P., Fishman, T., Nistad, A., Tu, Q., Wolfram, P., & Hertwich, E. G. (2021). Global scenarios of resource and emission savings from material efficiency in residential buildings and cars. *Nature Communications*, *12*(1), 5097. https://doi.org/10.1038/s41467-021-25300-4

Pittini, A. (2019). *The state of housing in the EU*. Housing Europe. https://www.housingeurope.eu/resource-1323/the-state-of-housing-in-the-eu-2019

Pittini, A., Turnbull, D., & Yordanova, D. (2021). *Cost-based social rental housing in Europe*. Housing Europe. https://www.housingeurope.eu/resource-1651/cost-based-social-rental-housing-in-europe

Plank, L., Schneider, A., & Kadi, J. (2022). *Wohnbauboom in Wien 2018-2021* (Stadtpunkte Nr. 40). Arbeiterkammer Wien. https://wien.arbeiterkammer.at/interessenvertretung/meinestadt/wohnen/Studie_Wohnbauboom_Wien_2018-2021.pdf

Plank, L., Volmary, H., Krenn, M., & Blaas, W. (2023). *Shareholder-orientierte transnationale Investoren in der kritischen sozialen Infrastruktur*. Arbeiterkammer Wien. https://emedien.arbeiterkammer.at/viewer/image/AC16789593/

Putschögl, M. (2023, März 8). Zahlreiche Herausforderungen für den gemeinnützigen Wohnbau. *Der Standard*. https://www.derstandard.at/story/2000144252495/zahlreiche-herausforderungen-fuer-den-gemeinnuetzigen-wohnbau

Reinprecht, C. (2014). Social housing in Austria. In K. Scanlon, C. Whitehead, & M. F. Arrigoitia (Hrsg.), *Social Housing in Europe* (S. 61–73). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118412367.ch4

Röck, M., Saade, M. R. M., Balouktsi, M., Rasmussen, F. N., Birgisdottir, H., Frischknecht, R., Habert, G., Lützkendorf, T., & Passer, A. (2020). Embodied GHG emissions of buildings – The hidden challenge for effective climate change mitigation. *Applied Energy*, *258*, 114107. https://doi.org/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. https://doi.org/10.1177/0308518X19862811

Ryan-Collins, J., Lloyd, T., & Macfarlane, L. (2017). *Rethinking the economics of land and housing*. Bloomsbury Publishing.

Savini, F. (2022). Maintaining autonomy: Urban degrowth and the commoning of housing. *Urban Studies*, 00420980221121517. https://doi.org/10.1177/00420980221121517

Scatigna, M., Szemere, R., & Tsatsaronis, K. (2014). *Residential property price statistics across the globe* (SSRN Scholarly Paper 2498635). https://papers.ssrn.com/abstract=2498635

Schneider, F. (2019). Housing for degrowth narrative. In A. Nelson & F. Schneider (Hrsg.), *Housing for degrowth: Principles, models, challenges and opportunities*. Routledge, Taylor & Francis Group.

Schreier, M. (2012). *Qualitative content analysis in practice*. SAGE.

Schreier, M. (2014). Qualitative content analysis. In U. Flick, *The SAGE Handbook of Qualitative Data Analysis* (S. 170–183). SAGE Publications, Inc. https://doi.org/10.4135/9781446282243.n12

Serrenho, A. C., Drewniok, M., Dunant, C., & Allwood, J. M. (2019). Testing the greenhouse gas emissions reduction potential of alternative strategies for the English housing stock. *Resources, Conservation and Recycling*, *144*, 267–275. https://doi.org/10.1016/j.resconrec.2019.02.001

zu Ermgassen, S. O. S. E., Drewniok, M. P., Bull, J. W., Corlet Walker, C. M., Mancini, M., Ryan-Collins, J., & Cabrera Serrenho, A. (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. https://doi.org/10.1016/j.ecolecon.2022.107562

zu Ermgassen, S. O. S. E., Utamiputri, P., Bennun, L., Edwards, S., & Bull, J. W. (2019). The role of "no net loss" policies in conserving biodiversity threatened by the global infrastructure boom. *One Earth*, *1*(3), 305–315. https://doi.org/10.1016/j.oneear.2019.10.019