

The Urban Book Series

Eugenio Arbizzani · Eliana Cangelli ·
Carola Clemente · Fabrizio Cumo ·
Francesca Giofrè · Anna Maria Giovenale ·
Massimo Palme · Spartaco Paris *Editors*

Technological Imagination in the Green and Digital Transition

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Chapter 56

The Urban Potential of Multifamily Housing Renovation



Laura Daglio

Abstract Multifamily post-war middle-class housing in Italy represents a significant heritage which strongly characterizes urban landscapes. Although this huge stock has long been addressed by national policies as a major potential to pursue European climate targets, only the recent massive incentive measures (Superbonus 110%) have started to produce results for the energy upgrading of the buildings, offering alternatives and motivations (through the size of the public funding and the institution of the credit transfer) to the issues of the typical ownership fragmentation. However, these first partial outcomes are controversial from a life cycle, a social and an economic point of view. In addition, policies focus only on the energy performance of the single building, conceiving the interventions through a narrow-minded and generic attitude. The typological obsolescence and the multifaceted relationships between the building and the neighborhood are neglected, although important social, economic and energy efficiency benefits might emerge when addressing the renovation through a multi-scalar, multifunctional, and place-based approach. Stemming from the collection and analysis of ongoing initiatives and projects, possible models are outlined, enlarging the scenario of the transformations to include the urban scale. For example, underused private spaces can host new public or semi-public functions to contribute on the one hand to the management costs of the condominium and on the other hand to trigger local neighborhood regenerations. Moreover, widening the transformation perspective can envisage a group of buildings and the adjacent public spaces as a system to create energy districts where energy infrastructures introduce new amenities and added value.

Keywords Condominium · Energy community public private partnership

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56.1 Introduction

Multifamily post-war middle-class housing in Italy represents a huge heritage where almost 40% of the population¹ live and which strongly characterizes urban landscapes.

Mainly constructed before the first energy saving (L. 373/76) and seismic (L. 64/1974) regulations were enacted and conceived for a now outdated society based on traditional family models even after the Fifties, it features a well-recognized technological as well as typological obsolescence; therefore, it has long since been the target of studies, proposals and initiatives also on a European level, aimed at its upgrading, though hindered by the peculiar ownership fragmentation of the buildings and the resulting difficulties affecting the property management.

Since 1998 (L. 449/97) consecutive national policies were launched and re-ratified year by year, thus characterized by a continuous instability and uncertainty, addressed at the renovation of the private building stock through tax incentives. These measures—beyond literally fostering the maintenance of the large percentage of buildings that had reached the 50 years of age as the recognized threshold of decay—had the aim of combating illegality as a longstanding plague in the building sector and of boosting national economy through the promotion of the construction industry; a typical governmental policy periodically adopted over the years, given the sector's significant contribution to Italy's GDP. Later, the compliance to European energy-saving and anti-pollution norms presented the occasion to introduce further incentive schemes for the energy upgrading of the asset (L. 296/2006, etc.), and in the wake of the occurrence of new tragic earthquakes, the policy was reinterpreted (L. 232/2016) to safeguard the building stock against the threat of seismic activity and in the light of the heightened awareness of risks deriving from their structural inadequacies.

Over the last 25 years, these still ongoing albeit renovated measures have achieved significant results, when considering the general/generic economic and environmental point of view, the fight against tax evasion and the job creation, as monitored by CRESME and by ANCE annual reports. However, conceived to be spread evenly on a territorial and building basis, these laws have produced inadequate and patchy results, especially on an environmental and societal basis. In fact, minor or isolated operations—such as the replacement of windows or boilers—are reported by ENEA yearly (ENEA 2020) as the prevailing interventions compared with a still too low number of deep renovations involving the envelope and building systems which would positively improve the energy performance and environmental impact on the architectural and urban scale. In addition, these measures struggle to support low-income families and affect the house rich and cash poor issues, whereas mainly wealthier strata of society are reported to employ and take advantage of the fiscal incentives.

¹ The current share of Italy's housing stock dating back to the period 1946–1971 amounts to some 10 million homes (in 2011 the national total amounted to some 31 million homes), in which 39.3% of Italian families reside (CENSIS 2011).

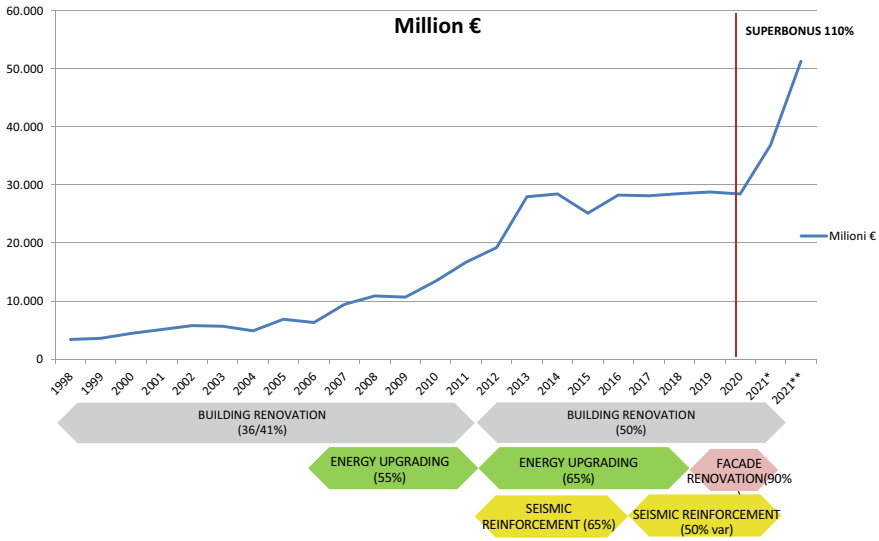


Fig. 56.1 Investments in buildings renovation in Italy since the enforcement of the first tax incentives regulations. The arrows highlight the changes in renovation measure and tax deduction rate (author’s elaboration from: Camera dei Deputati 2021)

Although also developed and revised in order to overcome these limits, the recent Superbonus 110% policy has yet to produce the expected effects (Camera dei Deputati 2021; ENEA 2021) (see Fig. 56.1).

Beyond the controversial results in terms of life cycle (cf. the environmental impact of the insulation employed), a social (cf. the wealth of the incentive recipients) and an economic (cf. the payback periods borne by the state budget) point of view, the set of the energy efficiency measures focus only on the energy performance of the single building, conceiving the interventions through a narrow-minded and generic attitude. Moreover, on the one hand, the urban landscape consequences of the race toward the Superbonus 110% are completely neglected (triggering wide concerns (Sacerdoti 2021) about the fate of common modern architecture and related campaigns for its conservation) despite the expected transformation of the façades due to the added external layers; on the other hand, the Bonus Facciate 90% (now reduced to 60%) has been launched to improve the appearance of public streets and spaces.

Additionally, the typological obsolescence is neglected which is also related to the presence of often underused spaces which comprehend both semi-public condominium areas initially designed as representative of the burgeoning middle class of the time (halls, corridors and entries) or in compliance to the then dominating architectural language (pilotis, etc.) and private big size flats conceived for large families now empty and to let with difficulties or underoccupied by empty nest retired elders.

Finally, the multifaceted relationships between the building and the neighborhood are overlooked, although important social, economic and energy efficiency

benefits might emerge when addressing the renovation through a multi-scalar, multifunctional, place-based approach.

This paper has the aim of highlighting the need for a new attitude in rethinking the post-war residential built environment enlarging the scenario of the transformations to include the urban scale. Accordingly, ongoing initiatives and projects are disclosed outlining possible models and paths for a more integrated design also including an active role of the inhabitants.

56.2 The Urban Potential of Multifamily Housing Renovation

The experiences collected and analyzed demonstrate growing social, technological, regulatory and cultural changes toward an aware involvement of the dwellers, and blurred boundaries between the private and public domain.

Although a shift toward collaborative neighborhood communities was already taking place, from sporadic isolated to more coordinated initiatives,² as a result of a slowly growing shared economy (Manzini 2011) and to face the challenges of a lacking urban welfare, the pandemic lockdown with its forced smart working practices, the new multitasking dimension of the home together with the quest for a new balance between privateness and sociality, has fostered an unprecedented social and collaborative cohesion, also rediscovering the use of communal residential spaces.

Furthermore, the recent recognition from the European Union (Directive 2018/2001 and Directive 2019/944) of the importance of distributed generation for the energy transition, following technological innovation, several successful “bottom-up” projects developed over the decades, and the liberalization of electricity markets, has introduced another important step towards the creation of communities of energy prosumers and to enlarge the scale of the upgrading.

Finally, the convenience of the latest Superbonus and Bonus incentives (since 2020), has canvassed considerable discussions among the owners, highlighting the need for collaborative actions as well as sometimes unassailable cultural barriers about the opportunity of combining the individual gain with the common good.

Widening the perspective from the single building functional, technological and energy upgrading to respond to the social and energy demands on a larger scale, the following possible research and design paths can be explored for the reuse and reinterpretation of individual and shared spaces.

² E.g. <http://www.viviconstile.org>.

56.2.1 *Colonizing Public Space*

As the awareness raises of the pivotal role of Energy Communities to reach European decarbonization for the higher efficiency generated, and also for the enhanced cohesion provided by the economical income, simultaneously different barriers become clear on the one hand because of the national regulatory and market background, which is still transitional, on the other hand because of the existing urban texture constraints in terms of density, orientation, projected shadows, free space available for the new energy infrastructures. Experimental projects and case studies are ongoing and monitored concerning private condominiums (Legambiente 2020) and multifamily public housing addressing the challenge of merging multi-energy approaches with a multi-player perspective (Zatti et al. 2021) and underscoring the need for a channeled communication and for the active engagement of the inhabitants to pursue the general decarbonization targets within a renovation strategy (Minuto et al. 2021). However, even beyond the boundaries of the Energy communities definitory and regulatory Italian framework, the opportunity to interpret and enact the systemic nature of sustainable design, applying and further developing the digested principle that “No building is an island” (Addington 2007) emerges in the light of the lower power density and thus spatial impact (van Zalk and Behrens 2018) of renewables in comparison with the fossil fuel burning systems.

Accordingly, the conversion of the existing built environment to a low energy consuming stock, requiring both active and passive solutions should take into consideration the new installation of renewable energy infrastructures which might not be always located within the boundaries of the property they are conceived for (Fig. 56.2). This is also consistent with the smart grid concept involving a more efficient integration of the different energy production, storage, and distribution systems, maximizing the possible synergies among the available energy vectors and networks which extend beyond the limits of the private property plots. In terms of design applications, for example, small energy districts can be realized, grouping buildings and open spaces despite the ownership, so as to optimize the location of the necessary infrastructures (PV and thermal panels, heat pumps, geothermal power plants) not only following energy efficiency but also the urban morphology constraints and potentials. Since in dense urban environments there is often not enough space available in the private plot area for a possible renewable conversion (roof surface for solar panels, courtyards, or ancillary spaces for pumps or co-generators, etc.) to satisfy the demand of a single building, a system can be designed selectively grouping different properties with different layouts (including open spaces), even comprehending public areas. The new infrastructures through an integrated urban and energy design approach can become new amenities to set up and qualify underused public spaces with canopies, sport facilities³ or even art installations.⁴ The augmented functions of the energy devices in the urban landscape follows a multifunctional approach

³ E.g. Modus, Mozart waste to energy plant, Brixen 2005 or NL Architects, WOS 8 Heat Transfer Station, Utrecht, The Netherlands.

⁴ Cf. Hood Design, Solar Strand, Buffalo, USA, 2012.

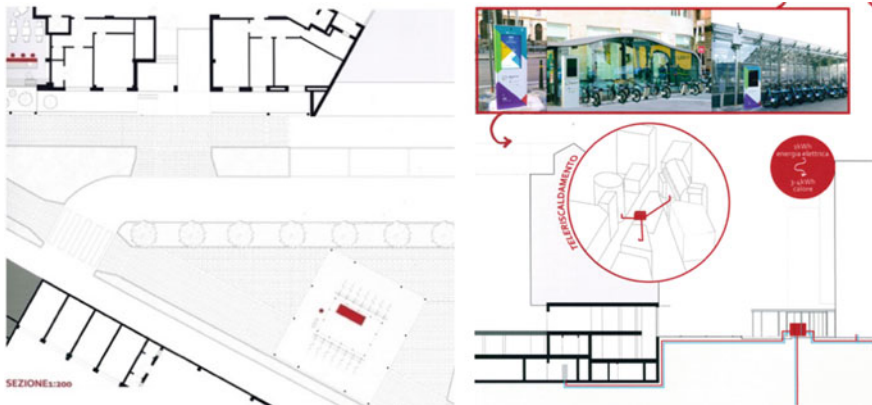


Fig. 56.2 Design exploration of a small district heating plant to be integrated with a bicycle rental facility in an existing open space in Milan (design exploration by Pamela Bosio, Elena Maria Rossi with Laura Daglio and Roberto Podda)

allowing to combine function form and use and overcoming common biases toward the impact of renewables in the landscape.

However, a similar paradigm shift as for the energy market and management is required for the property rights culture as well as for legislation.

56.2.2 *Reinterpreting Semi-public Spaces as Common Facilities*

Many of the postwar condominium complexes are characterized by the presence of communal indoor or outdoor spaces, whether in XIX century or in rationalist open block morphology: roof lofts, ground floor, abandoned janitor's quarters, large size halls, pilotis spaces, courtyards, small gardens, parking and flat roofs of single-floor garages, etc. These underused semiprivate areas can have a significant social and environmental potential for the building and for the local communities, especially after the issues harshened by the pandemic lockdown. The Municipality of Milan,⁵ for example, has launched tenders and grants for the funding of new neighborhood welfare and commercial facilities to boost the economy, respond to services demand after the lack of public facilities harshened by the COVID-19 emergency and overcome the problems created by planned or market led monofunctional zoning.

⁵ <https://www.comune.milano.it/-/milano-punta-su-attivita-di-vicinato-impres-sociali-e-start-up-per-lo-sviluppo-post-covid-19>. Moreover, in the "Strade aperte" plan, launched in 2020 to rethink mobility and public space Milano Municipality also hints the possibility of considering the condominium private courtyard and gardens to increase the available surfaces as playgrounds for children (<https://www.comune.milano.it/documents/20126/7117896/Open+streets.pdf/d9be0547-1eb0-5abf-410b-a8ca97945136?t=1589195741171>).

Moreover, a changing housing demand moves towards the sharing of functions and services once encompassed in the traditional family home, a network-based concept of co-housing (Coricelli et al. 2018) to satisfy the demands both of the elderly as well as of the young.

As some pilot projects demonstrate, the condominium indoor spaces can host new shared facilities for the inhabitants as well as for the neighborhood, dedicated to the care of the elderly or of children (shared caregivers or babysitters) or for smart-working space. The upcycling of the underused area can offer a new income for the inhabitants in order to fund renovation works or the ordinary maintenance of the building or to reduce the management costs (tax and operational), simultaneously providing new welfare facilities, new jobs and thus a positive impact on the urban context. In addition to social sustainability benefits, also environmental advantages can emerge: the new energy-efficient enclosure of ground floor space or upgrading of the loft space, can contribute to the heat exchanges balance of the building envelope; moreover, the greening of impervious surfaces and flat roofs to create accessible shared gardens and orchards, as witnessed by some unfortunately too isolated experiences,⁶ can contribute to the ecosystem quality of the urban area, when applied on a large scale. However, the implementation of public private partnerships agreements models and of a strategic shift in the design approach are required (Fig. 56.3).

56.2.3 *Rethinking Private Spaces as Community Welfare Services*

Finally, with a special focus on unoccupied or underused big size private flats, new upcycling chances can stem from the adoption of a service system approach. In fact, these residential spaces whether reorganized and divided in more than one unit one for the owner/s resident, the other/s to be let with controlled prices, can play a part on the one hand to respond to the rising demand of affordable, low rental housing, on the other hand, to host as well new neighborhood welfare services or small young enterprises offering an opportunity for a diversification of monofunctional residential districts, new jobs and providing a small income to the inhabitant. A financial plan distributing the owners' investment with a possible tax reduction together with the rental yields over the years can provide the economic feasibility of the operation.⁷ Accordingly, a win-win strategy can be generated rethinking the traditional welfare system to combine private assets, new services initiatives with a supervision by the public, following an ongoing trend towards the growing role of private association and enterprises in the welfare sector (Fig. 56.4).

Although apparently with a limited punctual impact, the multiplication on the urban or local scale can show a significant contribution to respond to the unanswered

⁶ Cf. Piuarch, Orto fra i cortili, Milan, 2015 (<https://www.piuarch.it/it/progetti/orto-fra-i-cortili>) or the OrtiAlti experience in Turin (<https://ortialti.com/2021/02/orti-urbani-sui-tetti/>).

⁷ A more detailed description of the proposal can be found in Daglio et al. (2021).

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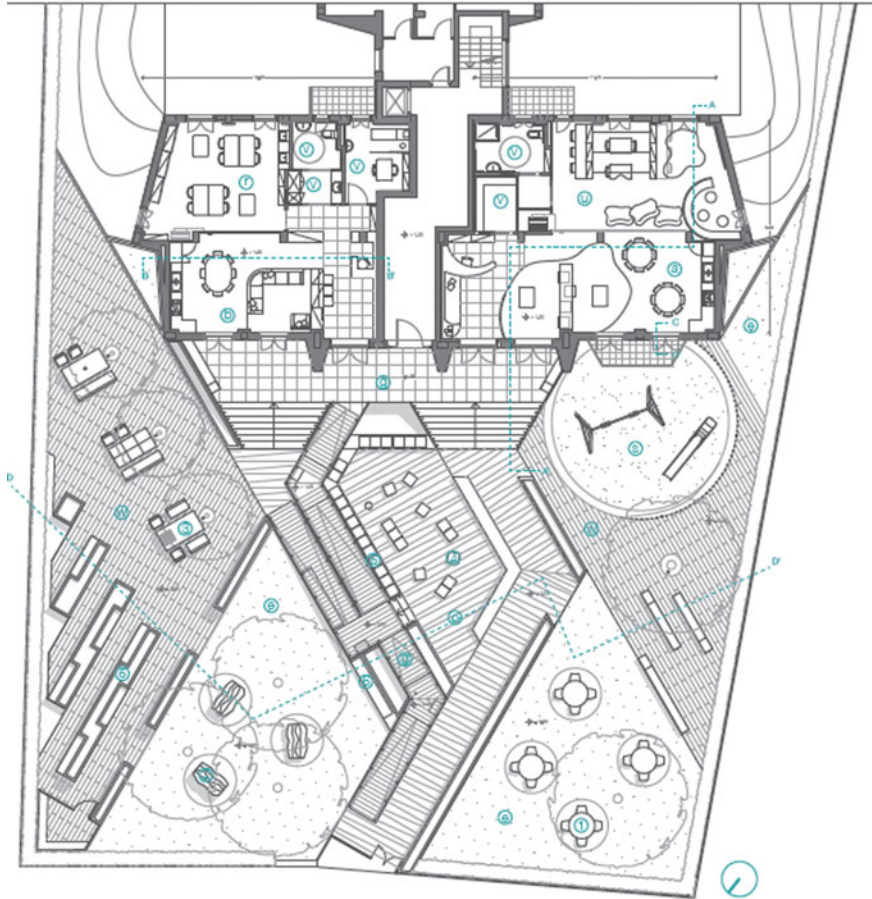


Fig. 56.3 Design exploration of a ground floor private flats and garden spaces conversion in kindergarten (design exploration by Elisa Beretta, Carlo Rossi, Valentina Zecchi with Laura Daglio and Roberto Podda)

social demand especially in metropolitan areas. Moreover, the specific renovation works required in the process, to be carried out possibly applying lightweight technologies for flexible and convertible layout reorganizations, can become a training field for new building enterprises to develop a specialization, new economies of scale and a transformation of the traditional supply chain to trigger an innovation path in the construction industry in general.

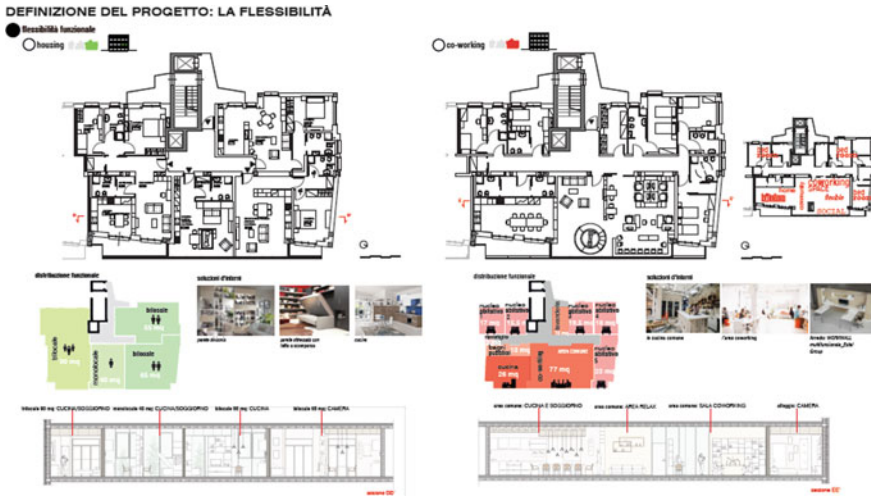


Fig. 56.4 Reuse of a large flat for health facilities in a private residential building in Milan (design exploration by Martina Lusi, Caterina Mancuso, Olga Massaro Valeria Trainini with Laura Daglio and Roberto Podda)

56.3 Conclusion

The dimension, complexity, and multifarious features and geographies of the multifamily post war private stock require innovative renovation design models to be integrated and interpreted beyond the traditional upgrading carried out so far in compliance with and following the tax incentive policies. This heritage should be conceived as a resource and opportunity on a multi-scalar level. On the one hand, a strategic dimension of design should be adopted, requiring the organization and definition of the overall process and the possible stakeholders involved, offering the power of technological imagination to anticipate new scenarios and to respond to contemporary demands. On the other hand, a rethinking of the boundaries between private and public ownership should take place as the basis for innovative forms of public–private partnerships, a move from the concept of asset to that of service, a paradigm shift which is recalled by distributed generation and prosumers community as well as by sharing economy. Finally, the regulatory framework should be enhanced and merged with local policies (Zanfi et al. 2021), taking into consideration the reality of local contexts to engender virtuous systemic links and win–win strategies.

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