REDUCING
HOUSING
INEQUALITIES

National report on the regulatory system of environmental and energy policies: Italy

An extract from Deliverable 3.2, *'National reports on the regulatory system of environmental and energy policies'*, of the ReHousIn project

August 2025

FOREWORD

This report is an extract from Deliverable 3.2, National report on the regulatory system of environmental and energy policies', of the ReHousIn project, which examines the economic mechanisms, norms, and institutional and contextual factors that shape the Environmental and Energy Policies (EEPs) in nine European countries.

The full version of the deliverable is available here.

Title	**National report on the regulatory system of environmental and energy policies: Italy**
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Cite as	Wolfgring C. (2025). National report on the regulatory system of environmental and energy policies: Italy. *Deliverable 3.2, "National reports on the regulatory system of environmental and energy policies"*. ReHousIn: Contextualized pathways to Reduce Housing Inequalities in the green and digital transition. https://rehousin.eu/sites/default/files/media/documents/National%20report%20on%20the%20regulatory%20system%20of%20environmental%20and%20energy%20policies_Italy.pdf
Dissemination level	Public
Submission date	August 2025
Work package	WP3 [Changing environmental & energy policies (EEPs)]
Project title	ReHousIn: Contextualized pathways to Reduce Housing Inequalities in the green and digital transition.
Grant Agreement No.	101132540
Coordinator	Metropolitan Research Institute (MRI)

This document has been prepared in the framework of the European project ReHousIn – "Contextualized pathways to reduce housing inequalities in the green and digital transition".

The ReHousIn project aims to spark innovative policy solutions towards inclusionary and quality housing. To achieve this, it investigates the complex relationship between green transition initiatives and housing inequalities in European urban and rural contexts, and develops innovative policy recommendations for better and context-sensitive integration between environmentally sustainable interventions and socially inclusive housing.

This project is co-funded by the European Union. The UCL's work on this project is funded by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee. The ETH work on this project is funded by the Swiss State Secretariat for Education, Research and Innovation (SERI) under the Swiss government's Horizon Europe funding guarantee.

Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union, European Research Executive Agency (REA) and other granting authorities. Neither the European Union nor the granting authorities can be held responsible for them.

Co-funded by the European Union

UK Research and Innovation

State Secretariat for Education, Research and Innovation SERI

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NATIONAL REPORT ON THE REGULATORY SYSTEM OF EEPs IN ITALY

1 Executive summary

The following report provides an overview of the policy and governance landscapes shaping Italy's approach to the ecological transition, as defined within the framework of the ReHousIn project, focusing on three main policy fields: housing retrofit, nature-based solutions (NBS), and urban densification/regeneration. For each of these sectors, it outlines regulatory provisions, policy instruments, governance dynamics, and eventual implications on housing conditions.

In the field of housing retrofitting, Italy has launched a range of incentive-based starting from the late 1990s, most prominently based on tax deductions – with consistent investments in the context of the National Recovery and Resilience Plan (PNRR) – aimed at improving energy efficiency in the residential stock. While this contributed to a strong increase in renovations, the design of these instruments has disproportionately favoured owner-occupied and higher income households and tended to exacerbate territorial and socio-economic disparities rather than reduce them. The public housing stock – arguably among the segments most in need of retrofitting – has largely been excluded from this scheme. To compensate for this gap, the state has subsequently made available targeted funds for public housing through the National Complementary Plan (PNC), demonstrating a renewed attention to a long-neglected housing sector.

As regards nature-based solutions (NBS), national and regional frameworks in recent years have increasingly integrated them into urban development strategies, with objectives encompassing climate adaptation, the safeguarding of biodiversity, and the improvement of public health. While there is no overarching national law dedicated to NBS, their inclusion in strategic documents – such as the National Strategy for Biodiversity (adopted in 2023) or the National Strategy for Urban Green Spaces (2018) – as well as in local planning tools reflects a growing institutional recognition of their importance, in line with developments and provisions at the EU level. However, the implementation of NBS remains fragmented and project-based, and their systematic integration into housing-related policies and regeneration programmes is limited.

Urban densification as such remains an underexplored concept in Italy, and the term rarely appears in public discourse or legislation. Instead, urban regeneration (rigenerazione urbana) has emerged as a prominent policy field in recent years, supported by policy and regulatory frameworks (at the level of the regions, which hold competencies over territorial governance), directed at reducing soil consumption and promoting the reuse of existing, dismissed or underused areas and buildings. Various instruments – for instance, integrated programmes like the Contratti di Quartiere and, most recently, the PINQuA – are targeting the regeneration of deteriorated neighbourhoods with a strong focus on increasing the quality and provision of housing (public, but not exclusively) and, in several cases, residential retrofitting. A second

strand of urban regeneration refers to large-scale urban redevelopment, involving negotiations between public and private actors. In many cases it is very much market-led, often targeting brownfield sites such as former railway yards and is guided by objectives of financial valorisation. Lastly, densification also occurs at the local level, plot by plot, through the application of ordinary planning tools (such as changes of use and volumetric increases), typically involving minor provisions of public benefits (e.g. quotas of social housing or public space) by private developers.

Concludingly, Italy has adopted ambitious approaches in addressing the ecological transition, with both positive and negative impacts in terms of housing, facing significant challenges – such as a largely outdated housing stock, fragmented governance structures, a lack of coordination, and limited strategic perspectives, along with a lack of sustained funding beyond currently available resources – while at the same time possessing noteworthy resources: it is an extremely biodiverse country, which has moreover accumulated valuable experiences and developed legal and institutional innovations in urban regeneration projects.

2 Introduction and methodology

This report is part of the comparative framework developed within the ReHousIn project, providing an in-depth analysis of the policy and governance landscape shaping Italy's approach to the ecological transition. It focuses on three policy fields which are particularly relevant in terms of housing conditions and, potentially, inequalities: housing retrofit, nature-based solutions (NBS), and urban densification and regeneration. Specifically, the report explores how the ecological transition is being operationalised in Italy – a context characterised by some specificities, as will be outlined – through legal frameworks, public policies, which actors and instruments are involved, and what implications these have for housing conditions and inequalities.

The analysis is based on a mixed-method approach, combining the consultation of academic literature, document analysis, secondary data review, and expert interviews. Furthermore, the outcomes of two Policy Labs (see annex for participants) undertaken in April 2025 in the framework of the Rehousin project – one in Assisi and one in Milano, involving 47 stakeholders – proved highly valuable in building knowledge and validating our initial interpretations and hypotheses. The main sources of information include national and regional legislation relevant to the three selected fields, national and regional strategies and programmes (most prominently, the National Recovery and Resilience Plan), project calls and specifications, data, academic and grey literature, as well as a series of interviews (see annex) and informal exchanges with public officials and researchers which helped to validate key findings. The report combines both quantitative data and qualitative insights, aiming to provide a comprehensive overview of the main issues at stake while also conveying the scope and depth of the investigated phenomena. Key dimensions of the analysis included the types and evolution of policy instruments (regulatory, financial, and strategic), governance and actor arrangements, and the degree of integration between the different policy sectors (including ecological transition and housing policies). While the adopted approach is primarily of a descriptive nature, it at the same time contains an interpretative dimension where the availability of information allows, which will form the basis for further ongoing work within the

ReHousIn project. Each of the three policy fields was examined separately, followed by a brief discussion to identify intersections and divergencies. Specific attention was dedicated to understanding whether and how these policies explicitly or implicitly address housing needs, and which segments of the population are favoured, included, or rather excluded.

There are, however, several methodological limitations to this work. The most significant one stems from the fragmentation of the legislative and planning landscape, where regulations, terminologies and instruments vary, which renders the construction of a coherent national picture difficult. Furthermore, the availability of data on implementation outcomes is limited and fragmented, especially with regard to social impacts or housing inequalities, which are typically not measured. This similarly applies to urban regeneration interventions, where monitoring is fragmented, based on differing methodologies, in many cases non-existent or inaccessible. Moreover, conceptual ambiguities emerged during the analysis, as terms such as “nature-based solutions” are used inconsistently across policy documents. Finally, the lack of comprehensive evaluations for several major programmes of recent realisation at this point in time – for instance the Superbonus 110% and the PINQuA – signifies that longer-term effects cannot be evaluated yet.

3 General governance system

At the national level, the state defines regulatory and strategic frameworks, particularly through legislative instruments and major funding programmes like, most recently, the National Recovery and Resilience Plan (PNRR), which includes provisions relevant to all policy fields addressed in this research – housing retrofit, nature-based solutions, and urban regeneration. National authorities regulate incentive mechanisms like the Superbonus 110%, set energy efficiency targets in line with EU regulations, and define overarching objectives related to biodiversity and climate adaptation.

Regions are key institutional actors in translating national frameworks into regional strategic and operational policies and programmes. They are responsible for the development of housing policies as well as for overseeing regional public housing providers who, however, typically operate at the subregional level. They provide funding for housing retrofitting through specific programmes and participate in environmental and climate-related planning, often integrating NBS into broader regional development strategies. Some spatial planning competences and instruments exist at the regional level, with Regional Territorial Plans (PTR) setting strategic objectives and providing a broad territorial framework which municipalities are expected to align with.

Provinces and metropolitan cities have limited formal competencies, particularly following the Delrio reform (Law 56/2014), which restructured provincial governance and established metropolitan cities. However, some coordination functions remain, regarding the planning and implementation of interventions across several municipalities. In metropolitan cities, strategic planning in several cases includes elements of NBS (for instance, green corridors or peri-urban reforestation activities. In recent years, moreover, several attempts have been undertaken to establish supramunicipal or metropolitan housing observatories.

At the local level, municipalities hold direct implementation responsibilities. They usually own parts of the public housing stock and in some cases manage it themselves (alternatively, as happens in most cases, they entrust regional public housing providers with its management). They are moreover responsible for issuing permits for construction and retrofitting interventions, as well as for the definition of land use strategies (aligned with regional regulatory provisions) through planning instruments, most importantly the Territorial Governance Plan (PGT). Municipalities are furthermore key actors in implementing retrofit, urban regeneration and environmental programmes through incentives and programmes launched at superior (regional, national, and European) governance levels. At the local level, municipalities may moreover choose to adopt voluntary strategic action plans, such as the PAESC (Piano d'Azione per l'Energia Sostenibile e il Clima – Sustainable Energy and Climate Action Plan).

While cross-sectoral integration between different policy fields (for instance, housing retrofit and nature-based solutions) is increasingly present in strategic documents, factual governance and implementation remain largely siloed. However, some degree of integration has emerged at the local scale, where "short institutional distances" between actors in some cases facilitate coordination. In the public housing sector, coordination at various governance levels is structurally embedded, as public housing providers are regional entities, which, however, typically operate at the provincial level and interact closely with municipal administrations, whose housing stock they often manage.

Level	Housing	Housing retrofitting	NBS	Densification
National	Sets general framework through laws (e.g., Law 457/1978, Housing Plans); allocates funding via national programmes.	Defines incentives (e.g., Superbonus 110%, Ecobonus); sets energy efficiency targets (aligned with EU directives); manages tax credits and access criteria.	Defines national strategies; allocates funds (e.g., via PNRR); provides coordination for biodiversity and climate goals.	Encourages regeneration/in some cases densifition through national programmes (e.g., PINQuA, PUI)
Regional	Implementation of national laws; development of regional housing plans; allocation of regional funds; management of public housing through regional public housing providers.	Promotion and funding of targeted retrofitting programmes in some regions (e.g., focused on public housing); maintenance through public housing providers.	Implementation of national strategies through regional environmental plans (PEAR - Piano Energetico Ambientale Regionale, SRSvS - Strategia Regionale per lo Sviluppo Sostenibile), landscape plans (PPR, Piani Paesaggistici Regionali), regional climate adaptation strategies or action plans; interventions of regional relevance (e.g., river renaturalisation)	Spatial planning via Regional Territorial Plans (PTR); provision of planning guidelines to municipalities; may apply for specific programmes (e.g., PINQuA)
Sub-regional (Provinces/Metropolitan Cities)	limited formal competencies; in several cases coordination at the provincial/metropolitan level (e.g., metropolitan housing observatories); regional public housing providers typically operate at the provincial level	limited formal competencies; in some cases coordination of interventions at the metropolitan/provincial level; retrofitting promoted by public housing providers (often operating at the provincial level)	limited formal competencies; may integrate NBS into strategic metropolitan plans (e.g., Città metropolitane green corridors); Provincial Territorial Coordination Plans may include ecological networks	Provincial Territorial Coordination Plans (PTCP) to coordinate land use and infrastructural development across municipalities; may apply for specific programmes (e.g., PINQuA)
Local (Municipalities)	Development of local housing policies and plans; typically ownership over parts of the public housing stock (in some cases also management); definition of land use via local plans (PGTs, Piani di Governo del Territorio)	Apply retrofit incentives locally; issue building permits; may set up one-stop-shops (e.g., Sportello energia)	Implementation of small-scale NBS (e.g., urban parks); integration into territorial governance plans.	Local planning tools, local regeneration initiatives; may apply for specific programmes (e.g., PINQuA)

Figure IT1. Governance of housing, housing retrofitting, NBS, and densification/regeneration, author's elaboration.

4 Housing retrofitting

4.1 The policy cycle: emergence of the issue and policy decisions

A significant share of Italy's residential building stock performs poorly in terms of energy efficiency. According to a survey based on the national database of energy performance certificates (SIAPE), out of 4.4 million registered certificates for residential dwellings, the vast majority (71%) are classified in the lowest energy performance categories E, F, and G (see Figure IT2)[1] (Cresme et al. 2024). Italy's residential sector moreover accounts for a substantial share (27%) of the country's final energy consumption (ibid., p. 24). The high energy demand can be attributed to several factors, among which the fact that much of the housing stock is outdated, the predominance of the typology of single-family homes (51,7% of the residential buildings) – which consume more energy compared to multi-household buildings – and the fact that 42,9% of the residential buildings are located in climate zone E (covering northern regions such as Lombardy, Piedmont, and Veneto), where heating needs are significantly higher (ibid.). Important challenges thus persist, particularly in the post-war housing stock, which suffers from deteriorating building materials, substandard quality, and poor energy efficiency (Daglio and Zanfi 2023). This issue is further reinforced by the fact that 72% of residential buildings had been built before 1980, with almost all of these predating the introduction of Italy's first energy efficiency law (373/1976) (*Norme per il contenimento del consumo energetico per usi termici negli edifici – Regulations for reducing energy consumption for heating in buildings*) (Cresme et al. 2024).

[1] The *Sistema Informativo sugli Attestati di Prestazione Energetica* (SIAPE) is the national database for Energy Performance Certificates (EPCs), established in 2015 and operational since 2016. As of 30 October 2023, the database included around 5 million EPCs, of which 87% (4,4 mio.) refer to residential buildings, representing around 13,7% of Italy's total housing stock (Cresme et al. 2024). While the SIAPE database includes energy performance certificates for both private and public housing stock, the vast majority refers to privately owned dwellings. Between 2016 and 2019, only 18.500 EPCs related to publicly owned buildings were registered, of which 65% concerned the residential sector and the remaining ones non-residential uses (Ministero dello Sviluppo Economico et al. 2020). Consequently, no comprehensive data is available on the energy performance of public housing specifically. However, evidence gathered from interviews and data provided by public housing providers in various Italian cities (Wolfgring 2024) indicate that much of the public housing stock is outdated, in urgent need of retrofitting, and exhibits poor energy performance.

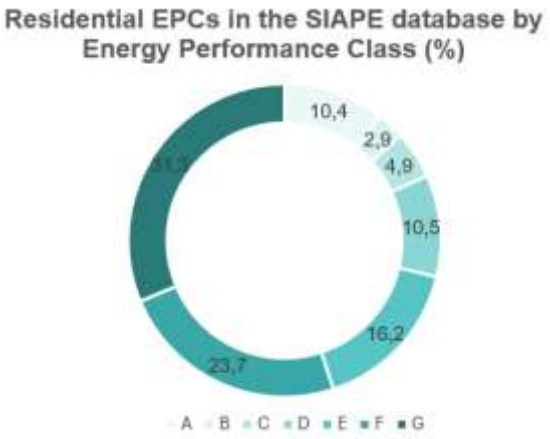

Figure IT2. Energy Performance Certificates in the SIAPE database by Energy Performance Classes in % (Cresme et al. 2024, modified by author).

Over the past two decades, there has been a notable shift in priorities in the Italian residential building sector, moving from a focus on new construction to an emphasis on renovation (Cresme et al. 2024). The balance between new construction and renovation[2] has evolved significantly during this period (see Figure IT3): between 1997 and 2007, investments in the residential building stock in Italy have still focused primarily on new construction. After a peak in 2006/2007, however, investments in residential construction declined significantly until 2017, whereas renovation investments remained stable. By 2017, investments in renovation have doubled as compared to new construction (ibid.).

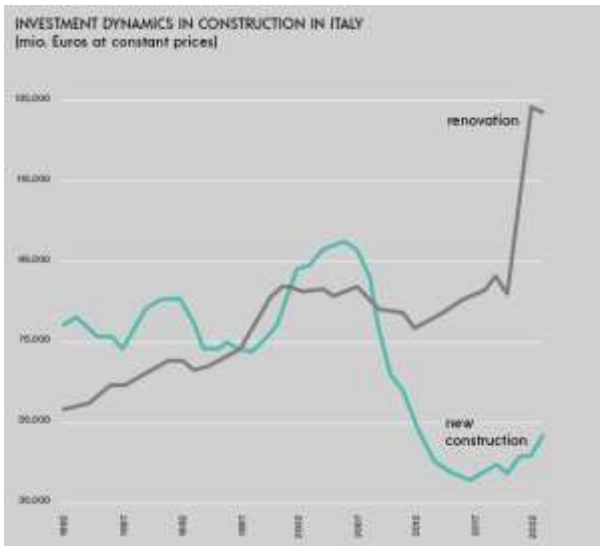

Figure IT3. Investments in new construction vs. renovation (extraordinary maintenance) in Italy, 1982-2022 (Cresme et al. 2024, modified by author).

[2] The term "renovation" here refers to interventions of extraordinary maintenance as defined by law 457/1978 (Regulations for residential construction), slightly modified by DPR 380/2001 (Consolidated text of laws and regulations on construction), encompassing "the works and modifications necessary to renovate and replace parts, including structural parts, of the buildings, as well as to realise and integrate sanitary and technological services, provided that they do not alter the overall volumetry of the buildings and do not involve urbanistically significant changes in the intended uses implying an increase in the urban load […]".

This is largely due to the introduction and promotion of various incentives by a series of laws. Between 2013 and 2020, annual investments in the renovation of buildings reached around €28 billion, with €24 billion allocated to building redevelopment (*ristrutturazione edilizia*) and €4 billion dedicated to energy retrofitting (*riqualificazione energetica*). The introduction of the "Superbonus 110%" scheme in 2020 triggered a significant increase in housing retrofitting investments, reaching €67,1 billion in 2021, €94,6 billion in 2022, and €83,7 billion in 2023. This marked a new (albeit brief) period of stark growth for housing renovation in Italy (Cresme et al. 2024), with the programme being closed in 2023 (as will be further outlined in the next chapter). The incentives introduced in 2020 have had a strong impact, specifically in terms of energy efficiency: "In 2022, 79% of the renovation work carried out in Italy was incentivised, and for the first time, energy efficiency renovations surpassed simple building restoration work in terms of value (€63,6 billion, accounting for 53,6% of the renovation market)" (own translation, Cresme et al. 2024, p.6). Energy retrofitting incentives moreover played a key role in the national economy, contributing 9,9% to GDP growth in 2021 and 25,8% in 2022 (ibid.).

National policies providing funding for the renovation of the private residential stock – first and foremost consisting of tax incentives – have first been launched in the late 1990s in Italy. Such incentives were introduced with the dual objective of supporting the construction sector on the one hand and to reduce the widespread practice of tax evasion on the other (Ufficio Parlamentare di Bilancio 2023). Over time, policies and schemes, which initially targeted renovation measures more generally, evolved to encompass additional goals, particularly regarding energy efficiency and seismic safety. Modifications to policies entailed variations (i.e., the increase or reduction) of tax deduction rates, a growing range of interventions eligible for subsidies, and changing application rules. This reflects both growing efforts and a more targeted approach to the renovation of the residential stock over time. Typical interventions that have taken place in the past three decades, financed through various programmes and schemes, include the replacement of heating systems, windows, and the installation of waterproof layers on roofs, however, interventions overall have demonstrated to be fragmentary and insufficient (Daglio and Zanfi 2023).

Overall, incentives for energy retrofitting have predominantly focused on the private housing stock rather than on public housing. Moreover, the general abolition of structural funds for public housing in the 1990s and the piecemeal alienation of parts of the stock to tenants (at prices far below market) have disincentivised extensive renovation efforts, particularly more complex and integrated ones (Daglio and Zanfi 2023). In public housing estates, the fragmentation of the stock and mixed ownership, insufficient support mechanisms, as well as governance-related complexities further exacerbate existing challenges. However, in recent years, the retrofit and regeneration of public housing have gained relevance in the country's political agenda (Wolfgring 2024) – some national programmes, under the auspices of the Ministry of Infrastructure, have been targeting the retrofitting or regeneration of public and social housing specifically. These include the "Sicuro, verde, sociale" (Safe, Green, Social) programme and the "PINQuA" (*Programma innovativo per la qualità dell'abitare),* the Innovative Programme for the Quality of Housing, as will be further outlined in chapter 6. These schemes are complemented by some experimental projects, promoted in several regions by various regional and local actors.

The European Union significantly influenced the development of energy retrofitting legislation and measures in Italy, beginning with the adoption of the Energy Performance of Buildings Directive (EPBD) in 2002 (Directive 2002/91/EC), which required member states to introduce measures to enhance the energy efficiency of buildings. These efforts gained considerable momentum throughout the 2000s. The following timeline and table outline key legislative milestones regarding housing retrofitting in Italy (see Figure IT4 and Figure IT5).

Law 373/1976 *(Norme per il contenimento del consumo energetico per usi termici negli edifici)*: was Italy's first national legislation addressing energy consumption in buildings, introduced in response to the 1973 oil crisis. It established mandatory thermal insulation standards for new constructions and major renovations, requiring building components to meet maximum U-values to limit heat loss (differing by climatic zones). The law moreover stipulated that building projects include documentation certifying compliance with these efficiency measures.

Law 457/1978 (*Norme per l'edilizia residenziale*): defined, for the first time, interventions in the existing building stock clearly and comprehensively (under Article 31, later amended by DPR 380/2001). These include ordinary maintenance (*manutenzione ordinaria*), extraordinary maintenance (*manutenzione straordinaria*), restoration and conservative rehabilitation (*restauro e risanamento conservativo*), building restructuring (*ristrutturazione edilizia*), and urban restructuring (*ristrutturazione urbanistica*).

Law 449/1997 (*Legge finanziaria per il 1998*): The 1998 budget law introduced the first tax deduction (41%) for the renovation of residential buildings, targeting homeowners and condominiums (Cresme et al. 2024). While it was a temporary measure and not specifically targeted at increasing energy efficiency (but at building retrofit more widely), it marked the starting point of a series of further incentives for renovating residential buildings, however, without defining specific energy renovation targets.

Legislative Decree 19 August 2005, n. 192 (*Attuazione della direttiva 2002/91/CE relativa al rendimento energetico nell'edilizia*): the decree implemented the European Directive 2002/91/EC in Italy, establishing criteria for improving the energy performance of public and private (residential and non) buildings and promoting the rational use of energy. It moreover set out legally binding minimum energy performance standards for new buildings and for existing buildings undergoing significant renovations, tailored to different climatic zones and building types. The decree furthermore introduced energy performance certificates (*Attestati di Prestazione Energetica – APE*) and rendered them mandatory for new buildings and those undergoing substantial renovation interventions. The decree stipulated that as of 31 December 2018, all new buildings occupied and owned by public administrations – including schools – must be nearly zero-energy buildings. Starting from 2021, this requirement applies to all new buildings.

Law 296/2006 (*Legge finanziaria per il 2007*): The 2007 budget law introduced the so-called "Ecobonus", the first tax incentive specifically targeting energy retrofit measures, including thermal insulation, the installation of solar panels, and the replacement of heating systems. Initially providing tax deductions of 55%, the percentage was increased to 65% in 2013, when moreover new interventions to be funded were introduced, including the installation of heat pumps and building automation systems. The Ecobonus didn't require beneficiaries to meet

specific energy renovation targets at the building level but offered deductions for individual energy efficiency measures (e.g., insulation or heating system upgrades), which must comply with minimum technical standards.

Legislative Decree 28/2011 (*Decreto Legislativo 3 marzo 2011, n. 28 – Attuazione della direttiva 2009/28/CE sulla promozione dell'uso dell'energia da fonti rinnovabili*): transposes EU Directive 2009/28/EC into Italian law, promoting the use of renewable energy sources. The decree establishes national targets for renewable energy share in final energy consumption (17% by 2020) and defines rules for the simplification of authorisation procedures for renewable energy installations. It moreover introduces minimum renewable energy quotas for new buildings and major renovations: starting from 2012, at least 50% of domestic hot water demand and 20% of total energy demand (hot water, heating, cooling) had to be covered by renewables. These shares increased to 35% in 2014 and 50% in 2017.

Ministerial Decree 28 December 2012 (*Decreto Ministeriale Applicazione delle metodologie di calcolo delle prestazioni energetiche e definizione delle prescrizioni e dei requisiti minimi degli edifici)*: The decree launched the "Conto Termico" programme as a complementary measure to the Ecobonus, aimed at incentivising smaller-scale energy retrofitting measures for both private (individuals and businesses) and public actors. Interventions funded through the programme include the replacement of heating systems, the installation of solar panels and sunshades, as well as the upgrading of building envelopes. It takes form as a non-repayable grant reimbursing a share of the costs (typically between 40 and 65%), with public entities being eligible for up to 100% reimbursement. No numerical targets for interventions, minimum renewable energy quotas, or energy consumption reduction thresholds have been defined by the law. However, an annual maximum budget for allocation has been set at € 200 mio. for public administrations and € 700 mio. for private individuals and businesses.

Legislative Decree 63/2013 (*Decreto Legge, convertito con modificazioni dalla Legge 03 agosto 2013, n. 90, Disposizioni urgenti per il recepimento della Direttiva 2010/31/UE del Parlamento europeo e del Consiglio del 19 maggio 2010, sulla prestazione energetica nell'edilizia per la definizione delle procedure d'infrazione avviate dalla Commissione europea, nonché altre disposizioni in materia di coesione sociale)* amended Legislative Decree 192/2005 to incorporate the provisions set out in Directive 2010/31/EU. It moreover introduced the "Sismabonus", aimed at improving earthquake safety in buildings (focused on public-use and residential buildings) located in earthquake-prone zones (seismic zones 1, 2, and 3). The programme provides tax deductions ranging from 50% to 85% of the invested costs. While addressing the structural quality of buildings (and thus not energy efficiency specifically), the Sismabonus is often combined with energy efficiency measures for more comprehensive building upgrades. Moreover, eligible interventions include the demolition of buildings, followed by the reconstruction of more energy-efficient buildings.

Law 90/2013 (*Conversione in legge, con modificazioni, del decreto-legge 4 giugno 2013, n. 63, recante disposizioni urgenti per il recepimento della Direttiva 2010/31/UE del Parlamento europeo e del Consiglio del 19 maggio 2010, sulla prestazione energetica nell'edilizia per la definizione delle procedure d'infrazione avviate dalla Commissione europea, nonché altre disposizioni in materia di coesione sociale*) and **Ministerial Decree of 26 June 2015** (*Applicazione delle metodologie di calcolo delle prestazioni energetiche e definizione delle*

prescrizioni e dei requisiti minimi degli edifici) defined the concept of 'major renovations' as "work on the integrated elements and components making up the building envelope", and established a distinction between first-level and second-level renovations, with the former regarding measures involving more than 50% of the total gross dispersing surface of the building, and the latter referring to interventions concerning 25% to 50% of the surface (Ministry for Ecological Transition 2021). Since 2015, newly constructed buildings and those subject to major renovation have to comply with the technical and performance requirements for nearly zero energy buildings (nZEB) as defined in Annex 1 of the decree (ibid.).

Legislative Decree 4 July 2014, n. 102 (*Decreto Legislativo Attuazione della direttiva 2012/27/UE sull'efficienza energetica, che modifica le direttive 2009/125/CE e 2010/30/UE e abroga le direttive 2004/8/CE e 2006/32/CE*) implemented EU Directive 2012/27/EU, introducing measures to improve energy efficiency and setting national energy savings targets. It sets an indicative national target of achieving primary energy savings of 20 Mtoe (equivalent to 15.5 Mtoe in final energy consumption) by 2020 (starting from the benchmark of 2010). The decree furthermore introduces mandatory periodic energy audits for large enterprises and stipulates a 3% annual refurbishment obligation for public building stock.

Law 160/2019 (*Legge Bilancio 2020*): The 2020 budget law introduced the Bonus Facciate (Façade Bonus), providing a 90% tax deduction for upgrading building facades, including external insulation. Originally intended for one year only, the programme was extended (with a reduced deduction rate of 60% in 2022), but closed with the end of 2022. While primarily focusing on increasing aesthetic qualities of facades (having been applicable only on visible walls) and only secondarily on energy efficiency, the instrument did not entail any specific energy-saving targets.

Legislative Decree 34/2020 (*Decreto Rilancio*): the "Relaunch Decree" stipulated the "Superbonus 110%" as part of the economic recovery efforts after the Covid-19 pandemic. The scheme aimed at incentivising retrofitting at a large scale, covering up to 110% of the costs of interventions via tax deductions. Differently from earlier instruments, specific energy-saving targets have been defined: eligible interventions had to result in a minimum improvement of two energy classes, verified through pre- and post-intervention Energy Performance Certificates. The measure distinguished between primary and secondary interventions, with the latter permitted only if carried out alongside major upgrades such as insulation or heating system replacement. All works had to comply with national technical standards and minimum energy performance requirements, rendering the Superbonus a performance-based incentive. Another specificity, as compared to earlier schemes, was that it enabled the transfer of tax credits to a third party (e.g., the companies implementing the works), increasing the accessibility for those with insufficient funds (Ufficio Parlamentare di Bilancio 2023; Ministry for Ecological Transition 2021). Initially addressing private actors only, the programme was extended also to public housing providers upon interventions from within the sector. The programme has had ambivalent effects and was closed in 2023 after heavy criticism (as will be further outlined in the next chapter).

Legislative Decree 10 June 2020, n. 48 (*Attuazione della direttiva (UE) 2018/844 del Parlamento europeo e del Consiglio, del 30 maggio 2018, che modifica la direttiva 2010/31/UE sulla prestazione energetica nell'edilizia e la direttiva 2012/27/UE sull'efficienza energetica*)

implemented Directive (EU) 2018/844 (and amending Legislative Decree 192/2005), with the objective to promote nearly zero-energy buildings and enhancing the energy performance of the existing building stock. It mandates the development of a long-term strategy aimed at decarbonising the national building stock by 2050, in line with EU objectives (the National Strategy for Building Renovation, see below). The decree moreover established the National Portal on the Energy Performance of Buildings (SIAPE), aimed at bundling data on the composition of the building stock and its energy consumption from various data sources into a single, publicly accessible database (Ministry for Ecological Transition 2021).

Legislative Decree 14 July 2020, n. 73 (*Attuazione della direttiva (UE) 2018/2002 che modifica la direttiva 2012/27/UE sull'efficienza energetica*) implemented the 2018/2002 Directive (EU) (and amending Legislative Decree 102/2014), introducing additional energy efficiency measures, including obligations for large enterprises and incentives for energy retrofit measures. It sets a binding national target to achieve cumulative final energy savings of 51.44 million tonnes of oil equivalent (Mtoe) over the period from 2021 to 2030.

Law 101/2021 (*Conversione in legge, con modificazioni, del decreto-legge 6 maggio 2021, n. 59, recante misure urgenti relative al Fondo complementare al Piano nazionale di ripresa e resilienza (PNRR) e altre misure urgenti per gli investimenti)*: the law established the Complementary National Investment Plan to the PNRR (*Piano Nazionale Complementare, PNC*), which allocates around €30.6 billion of national funds to complement EU-financed PNRR measures. Among its initiatives, the PNC introduced the "Sicuro, verde, sociale" programme, dedicated to the renovation and upgrading of public housing, with a budget allocation of €2 bio.

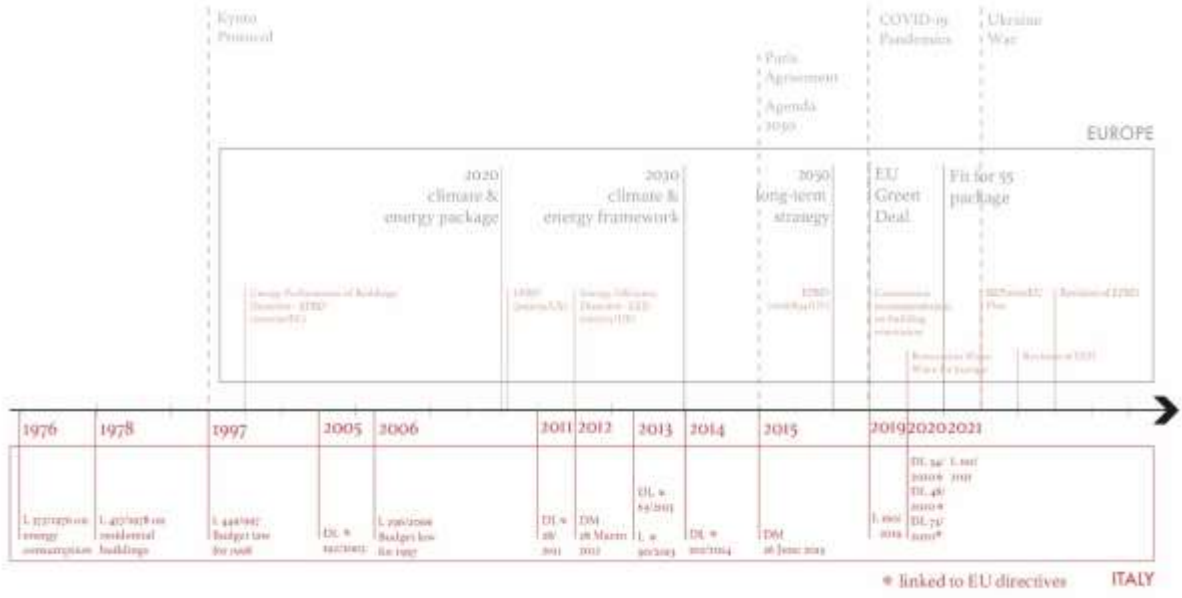

Figure IT4. Timeline illustrating key legislation in Italy and the EU in terms of housing retrofitting, author's elaboration.

Law	Title	Main Contents	Linked to EU Directives	Binding Provisions
Law 373/1976	*Norme per il contenimento del consumo energetico per usi termici negli edifici* / Provisions for the containment of energy consumption for thermal uses in buildings	First national law on building energy consumption. Introduced mandatory thermal insulation for new construction and major renovation, and documentation certifying compliance.	No	mandatory thermal insulation standards and documentation
Law 457/1978	*Norme per l'edilizia residenziale* / Provisions for residential buildings	Defined types of interventions in existing building stock (maintenance, restructuring, etc.).	No	
Law 449/1997	*Legge finanziaria per il 1998* / Budget Law for 1998	Introduced first fiscal incentive for residential renovation (41% tax deduction), but not specifically for energy efficiency.	No	
Legislative Decree 192/2005	*Attuazione della direttiva 2002/91/CE relativa al rendimento energetico nell'edilizia* / Implementation of Directive 2002/91/EC on energy performance in buildings	Introduced mandatory energy performance standards for new buildings and major renovation, introduced EPCs (APE), nZEB for new buildings (public sector: 2018, others: 2021)	Yes – 2002/91/EC	minimum performance standards and EPCs for new buildings and major renovation, nZEB for new
Law 296/2006	*Legge finanziaria per il 2007* / Budget Law for 2007	Introduced Ecobonus (first tax incentive targeting enery retrofit specifically), deductions initially 55%, later 65%.	No	compliance of eligible interventions with minimum technical standards
Legislative Decree 28/2011	*Attuazione della direttiva 2009/28/CE sulla promozione dell'uso dell'energia da fonti rinnovabili* / Implementation of Directive 2009/28/EC on renewable energy	Set national targets for renewable energy share in final energy consumption (17% by 2020) and mimimum renewable energy quotas for new buildings and major renovations.	Yes – 2009/28/EC	mimimum renewable energy quotas in new buildings and major renovations, increased by year
Ministerial Decree 28 December 2012	*Applicazione delle metodologie di calcolo delle prestazioni energetiche e definizione delle prescrizioni e dei requisiti minimi degli edifici* / Application of methodologies for energy performance	Introduced 'Conto Termico' scheme for smaller-scale retrofit measures (replacement of heating, installation of solar panels, upgrading of building envelopes) by private and public actors.	No	no numerical targets, but annual maximum allocation defined
Legislative Decree 63/2013	*Disposizioni urgenti per il recepimento della Direttiva 2010/31/UE* / Urgent measures for implementing Directive 2010/31/EU	Amended 192/2005; introduced Sismabonus to improve earthquake safety (tax deductions from 50 to 85%)	Yes – 2010/31/EU	
Law 90/2013 and Ministerial Decree 26 June 2015	*Conversione e decreto attuativo* / Law conversion and implementing decree	Defined concept of "major renovations" and distinction between first and second level renovations, mandatory nZEB for new and major retrofits since 2015.	Yes – 2010/31/EU	
Legislative Decree 102/2014	*Attuazione della direttiva 2012/27/UE sull'efficienza energetica* / Implementation of Directive 2012/27/EU on energy efficiency	Set national energy savings target (20 Mtoe by 2020), introduced mandatory energy audits for large enterprises, 3% annual refurbishment obligation for public building stock	Yes – 2012/27/EU	binding national targets, audits, public refurbishments
Law 160/2019	*Legge Bilancio 2020* / Budget Law 2020	Introduced Bonus Facciate with 90% deduction for façade upgrades, including insulation; focused primarily on aesthetics.	No	
Legislative Decree 34/2020	*Decreto Rilancio* / Relaunch Decree	Introduced Superbonus 110% with mandatory two-class energy improvement, possibility of credit transfer; extended to public housing in a second step	Yes - EU Recovery and Resilience Facility	energy performance improvement of two classes
Legislative Decree 48/2020	*Attuazione della direttiva (UE) 2018/844* / Implementation of Directive (EU) 2018/844	Promoted nZEB and decarbonisation of the building stock by 2050; established SIAPE.	Yes – 2018/844	mandatory national long-term strategy
Legislative Decree 73/2020	*Attuazione della direttiva (UE) 2018/2002* / Implementation of Directive (EU) 2018/2002	Set binding national cumulative final energy savings target (51.44 Mtoe by 2030); added retrofit obligations and large enterprise duties.	Yes – 2018/2002	cumulative final energy savings target
Law 101/2021	*Conversione in legge del decreto-legge 59/2021* / Conversion into law of Decree 59/2021	Established Complementary National Plan (PNC); included €2 billion programme for renovation of public housing (Sicuro, verde, sociale)	No	

Figure IT5. Relevant laws on renovation and energy retrofitting in Italy, author's elaboration.

4.2 The implementation process

Several tools for the incentivisation and implementation of energy retrofit interventions have been introduced by national legislation. These include strategic policy documents, tax incentives, other financial instruments, and targeted programmes (mostly regional, national, and European), providing non-repayable grants. The most important tools and their implementation mechanisms will be outlined in the following.

Strategic policy documents

In recent years, several strategic policy documents have been developed at the national level, which entail specifications on energy retrofitting of residential buildings in Italy. These include the long-term renovation strategy in line with the EU's Energy Performance of Buildings Directive, the ***Strategia per la Riqualificazione Energetica del Parco Immobiliare Nazionale*** (National Strategy for Building Renovation), developed by the Ministry for Ecological Transition in 2021. The document provides a comprehensive overview of the national building stock and the current state of retrofitting efforts. It moreover outlines policies and actions aimed at stimulating retrofitting initiatives across both the public and private building sectors (Ministry for Ecological Transition 2021).

Another key policy document is the Integrated National Energy and Climate Plan (***Piano Nazionale Integrato per l'Energia e il Clima – PNIEC***), developed by the Ministry for the Environment and Energy Security (*Ministero dell'Ambiente e Sicurezza Energetica*) in 2024, which entails the country's objectives in terms of climate and energy policies along five dimensions: decarbonisation, energy efficiency, energy security, internal energy market, and research, innovation, and competitiveness. It sets national targets for 2030, including to reaching a 30% share of renewable energy in gross final energy consumption and a 43% reduction in primary energy consumption. Furthermore, the plan acknowledges the importance of the building sector in fulfilling these targets through energy efficiency and retrofitting interventions (Ministero dell'Ambiente e della Sicurezza Energetica 2024).

In a longer-term perspective, the **Italian long-term strategy on the reduction of greenhouse gas emissions** (Ministero dell'Ambiente et al. 2021) – with a time horizon set for 2050 – pursues the objective to reach climate neutrality by 2050. Also here, strong emphasis is put on the building sector. Besides tax deductions (discussed in the following section), the strategy entails obligations to foster renewable thermal energy and to integrate renewable energy sources into buildings, as well as support for municipal investments in energy efficiency measures and district heating systems (European Parliament 2024).

Furthermore, a key policy document, as mentioned, is the National Recovery and Resilience Plan (**PNRR – Piano Nazionale di Ripresa e Resilienza**), Italy's strategic framework within the European Recovery and Resilience Facility (RRF), set up to boost economic recovery after the Covid-19 pandemic. In absolute terms, Italy is the largest recipient of RRF funds, receiving €191,48 billion (26,5% of the total) (European Parliament 2022), and is among the countries with the highest relative allocation (10,79% of its 2021 GDP) (European Commission 2023), reflecting both the country's pressing need and ambition to address longstanding structural deficiencies that predate the pandemic (Wolfgring 2023). The PNRR places particular

emphasis on building renovation, allocating €13,95 billion to measures aimed at enhancing the energy and seismic efficiency of residential buildings, implemented under Mission 2: Green Revolution and Ecological Transition, specifically through the Superbonus 110% (M2C3.2) (Governo Italiano 2021). In addition, Italy launched the **National Complementary Investment Plan (PNC)** to supplement PNRR funding in 2021, earmarking €2 billion for the retrofitting of public housing through the *Sicuro, Verde, e Sociale* (Safe, Green, and Social) programme. Overall, upon finalisation (by the end of 2026), the programme targets the energy upgrading of around 4,5 million square metres of public housing, corresponding to about one tenth of Italy's total public housing stock. Around 1,4 million square metres (corresponding to 1/13 of the national public housing surface) will undergo seismic retrofitting, and an additional 450.000 square metres shall be added through the acquisition of new properties (Corte dei Conti n.d.). Funds were distributed to regions based on intervention plans detailing measures, sites, and ownership (by either municipalities or regional public housing providers). The distributed of funds among regions (see Figure IT8) was based on the number of public dwellings, territorial balance, and seismic risk, with at least 50% reserved for southern Italy (ibid.).

Figure IT6. NRRP investments in Mission 2 by regions, author's calculation based on ItaliaDomani 2025.

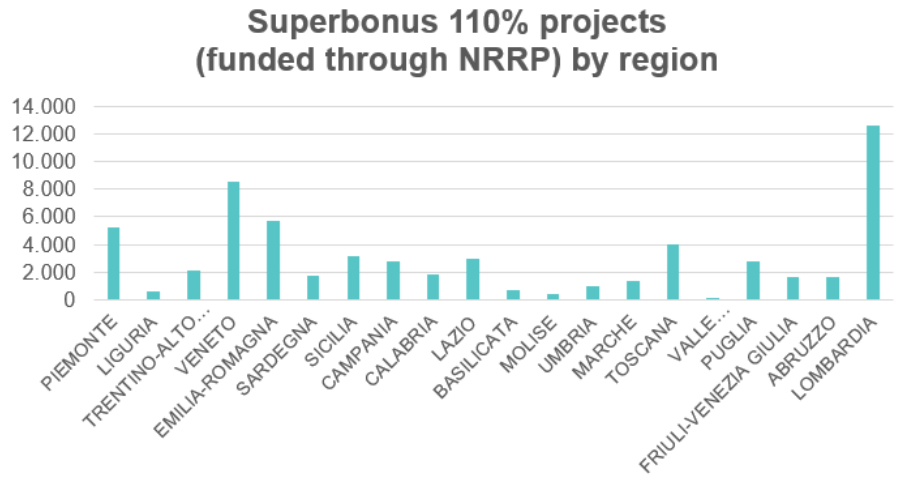

Figure IT7. Number of Superbonus 110% interventions funded through the PNRR by regions, author's calculation based on ItaliaDomani 2025.

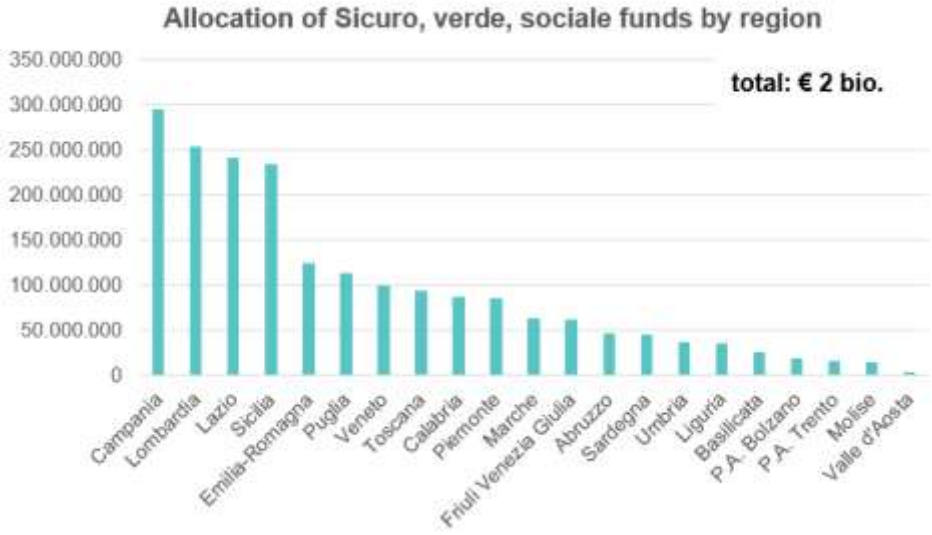

Figure IT8. Allocation of funds from the Sicuro, Verde, Sociale programme (Piano Nazionale Complementare) by regions, author's calculation based on Annex 1 of DPCM 15 September 2021.

Tax incentives

Several tax deduction programmes have been introduced at the national level in Italy, which usually aim to incentivise residential retrofitting. These programmes operate with similar mechanisms, differing mainly in the deduction rates and the timeframes over which the benefits are applied. Typically, specific details and regulations regarding these programmes are outlined in the annual budget laws, which stipulate their scope, eligibility criteria, and applicable deduction rates for each fiscal year. Key instruments, which have meanwhile been concluded, include the **Ecobonus** (aimed at the upgrading of energy efficiency), the **Bonus Facciate** (targeting façade renovations), and the **Superbonus 110%** (for comprehensive and seismic retrofitting). Other programmes, which are still ongoing, include the **Bonus Casa**, targeting

general residential retrofitting, and the **Sismabonus**, focusing on the reduction of earthquake risks.

For some interventions, the combination of different programmes has been possible (e.g., Ecobonus and Sismabonus), building on the premise that a retrofitting intervention can serve as a point of entry to more profound improvements, leveraging synergies and benefiting from piggyback effects. “The idea behind this combined deduction is to exploit the huge potential for improving the efficiency of the building sector while encouraging the seismic retrofitting thereof, using the same ‘trigger point’ represented by the deep renovation of the building, thanks to the economy of scale that can be achieved” (Ministry for Ecological Transition 2021, p. 23).

Most recently, the Superbonus 110% programme has marked a leap in scale in terms of tax-incentivised energy retrofitting, resulting in a substantial increase of government expenditure on “housing and community development” in 2021 and 2022 (see Figure IT9). The programme existed from 2020 to 2023 and entailed the reimbursement of up to 110% of the expenses through tax deductions applied to the invested amount, in a period over four or five years after the investment (Cresme et al. 2024, p. 7). The programme faced stark criticism and was discontinued in 2023. The critiques concerned various aspects, with a key issue being that the scheme failed to benefit actors and segments of the housing stock most in need of renovation. Initially designed to address private actors only, the programme was expanded to the public housing sector only upon persistent advocacy from stakeholders within the sector. This delay, along with specific complexities and obstacles in context with the application to public housing (e.g., legal requirements applying to the public sector, for instance, regarding procurement law, along with differing regional legislative frameworks), have resulted in a low factual application of the instrument to the public housing stock, arguably the one most in need of retrofitting. What had the potential to serve as a transformative tool for large-scale public housing renovation ultimately became a missed opportunity (Wolfgring 2024). In 2023, the national Court of Auditors released an assessment highlighting that the Superbonus benefited disproportionately high-income groups, as emerges from an analysis of 2021 income declarations conducted by ENEA (Corte dei Conti 2023). Recent data moreover show that approximately 73% of the buildings involved (representing 33% of the total investments) had been single-family homes and functionally independent units (ENEA 2024a), which may also include second homes. Moreover, regional divergencies emerged from the analysis, with most interventions having been concentrated in northern (and thus typically economically more prosperous) regions (ENEA 2023; Camera dei Deputati 2023). The Superbonus 110% was moreover criticised for its contribution to producing distortive market effects and for significantly increasing the national debt, as it was designed without a funding cap. By May 2024 (when over 95% of the works had been finalised), investments admitted for tax deduction amounted to €117,7 billion Euros (ENEA 2024).

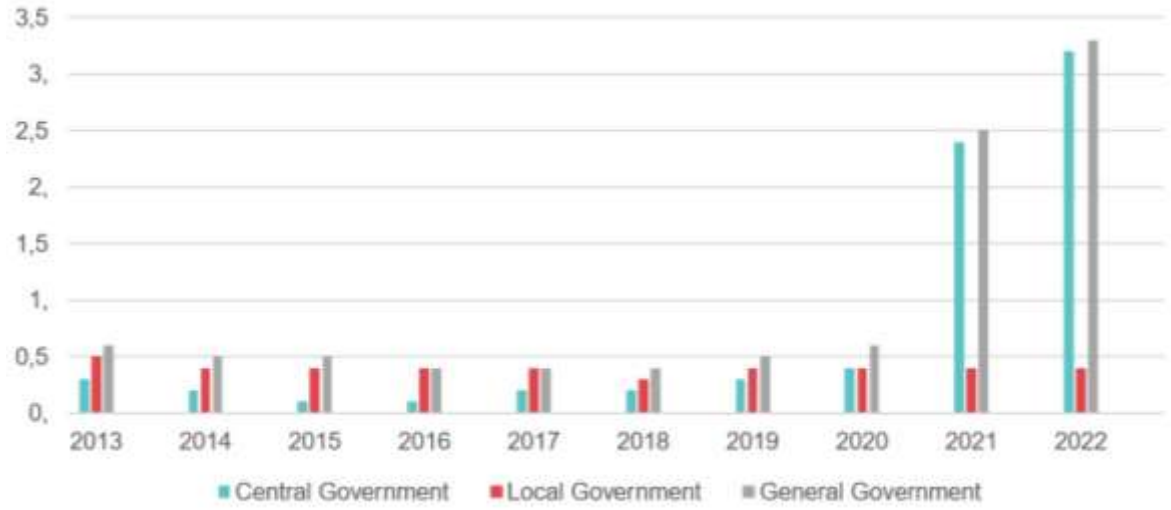

Figure IT9. Public expenditure for "housing and community development" (% of GDP) in Italy from 2013 to 2022 (Bricocoli et al. 2024, data from Eurostat).

Instrument	Eligible Works	Deduction Rate	Eligibility Criteria	Low-Income Support	Duration	Applicable Tenure	Territorial Diversificatio
Ecobonus	Energy-efficiency upgrades (e.g. insulation, windows, boilers, HVAC)	50%–65% (up to 75% for condominiums)	Taxpayers (individuals, condominiums); works must meet technical efficiency standards	No	Ongoing, with yearly extensions	Private owners, tenants, condominiums	Yes – technical requirements vary by climatic zones
Superbonus	Energy retrofitting + linked works (windows, solar panels, etc.)	110% (reduced to 70% in 2024, 65% in 2025)	Primary residence or second homes under specific conditions (no luxury homes); ≥2 energy class improvement; technical certification required	indirect (possibility of credit transfer and invoice discount, reducing upfront payment)	Until 31 Dec 2025 (reduced rates from 2024 onward)	Owners, cooperatives, public housing providers	Yes – Special terms for municipalities hit by earthquakes
Sismabonus	Seismic improvement works (structural strengthening, anti-seismic upgrades)	50%–85% depending on seismic class gain (until 31 Dec 2024), 36-50% (2025-2027)	Buildings in seismic zones 1, 2, or 3; requires seismic class improvement and certification	No	extended at reduced rates until 2027	Owners of residential and productive buildings	Yes – Only in seismic zones 1–3
Bonus Facciate	Renovation and restoration of building façades	60% (was 90% before 2022)	Only for buildings in zones A and B (urban areas); works must be visible from public space	No	Ended 31 Dec 2022 (no renewal)	All owners, no income restrictions	Yes – Only in urban zoning areas A and B
Bonus Casa	General renovation (bathrooms, kitchens, floors, electrical, etc.), including anti-intrusion and renewables	50%	Any taxpayer, works on existing buildings (not new); annual spending cap (€96,000)	No	Ongoing, usually extended annually	Owners, tenants, usufruct holders	No

Figure IT10. Tax incentives on housing retrofit, author's elaboration.

Other financial instruments

Another financial tool promoting energy retrofitting is the **Fondo di Garanzia Mutui Prima Casa** (First Home Mortgage Guarantee Fund), established by law 147/2013 in 2013 (Consap 2025). It can be accessed both for the purchase of buyers' first homes and for energy renovation interventions. It provides a guarantee of typically 50% of the capital for loans related to energy efficiency improvements in residential properties. Specifically, the fund can support interventions aimed at restructuring and upgrading the energy performance of properties designated as primary residences (ENEA 2023). In its most recent extension (2025-2027), the fund addresses vulnerable groups specifically, including persons below the age of 36, single parents with minors, public housing tenants, young couples, and large families (Consap 2025).
Another instrument, the **Fondo Nazionale Reddito Energetico** (National Energy Income Fund), was introduced in 2020 (with Delibera CIPE n. 7). It aims at supporting low-income families in reducing energy costs through renewable energy. With € 200 mio., allocated for the period of 2024 to 2025, it subsidises the installation of photovoltaic systems for residential use, addressing households with a low income (with an ISEE[3] below €15.000, or €30.000 for larger households), and targeting primarily southern regions like Abruzzo, Calabria, and Sicily. The fund, managed by the GSE (Gestore dei Servizi Energetici, see chapter 4.4), operates on a revolving basis and is financed through the economic value generated from the withdrawal of electricity which is not self-consumed by the beneficiary, over a twenty-year period. A key aim behind the fund is to pursue social, economic, and environmental objectives in an integrated way while encouraging the adoption of renewable energy sources (ENEA 2023; Ministry for Ecological Transition 2021; GSE n.d.a).
The **Conto Termico** is a fund promoted by the Italian government and administered by the GSE, financed through a small portion of the energy price (Erba and Pagliano 2021). It can be accessed by the public entities, private actors, and businesses, and finances various interventions to promote energy efficiency and the installation of renewable energy systems, including the replacement of heating systems, the installation of heat pumps and solar thermal systems, and the overall improvement of the energy efficiency of buildings. With an annual budget of €900 million (of which €200 mio. earmarked for public entities and €700 for private actors), it provides grants covering up to 65% of eligible expenses. Applications can be submitted directly to the GSE or through an Energy Service Company (ESCO) (GSE n.d.b) (see chapter 4.3). In several cases, the Conto Termico can be complemented by regional contributions, providing further incentives to access the instrument (EcoBonus n.d.).

[3] *Indicatore della situazione economica equivalente*, an indicator that represents a household's economic situation, considering the income of all household members, their assets, and the household composition using a weighting system.

Instrument	Type	Objective	Eligible Beneficiaries	Benefit	Eligible Interventions	Support for Low-Income Groups	Regional Differences
Fondo di Garanzia Mutui Prima Casa	Guarantee fund	Facilitate access to mortgages for first-time homebuyers (established in 2013)	first-time buyers, from 2025-2027 restricted to fragile profiles (under-36s, low-income families, single parents with minors, public housing tenants, large families)	50% public guarantee on mortgage (up to 90% for large families)	Primary residence mortgage (≤ €250,000)	Priority access and higher guarantee for households with ISEE ≤ €40,000, under-36s, large families	No
Fondo Nazionale Reddito Energetico	Capital grant	Reduction of energy costs for low income households; installation of PV systems	Households with ISEE ≤ €15.000 in energy poverty	revolving fund dotated with € 100 mio. per year for 2024-2025; fixed grant of €2,000, plus (variable) €1,500 per kW installed	Installation of photovoltaic system for domestic self-consumption	Specifically designed for energy-poor households	Yes, of €100 mio. per year €80 mio. are earmarked for southern regions and islands, € 20 mio. for the rest of Italy
Conto Termico 2.0	Reimbursement	Support renewable heating and energy upgrades	Public administrations, private individuals, businesses	40–65% reimbursement on eligible costs; annual budget of €900 mio. (of which €200 mio. for public entities and €700 mio. for private actors)	installation of renewable energy systems, replacement of heating systems, installation of heat pumps and solar thermal systems	No	Yes – some regions co-finance or top up the Conto Termico with regional funds

Figure IT11. Financial instruments regarding housing retrofit, author's elaboration.

Subnational Policies and Programmes

In addition to the above-mentioned tools, various regions and local authorities have adopted policies and programmes (on an ad-hoc basis as well as more strategically) within the framework of their competencies in terms of territorial and housing policies, to invest in the retrofitting of (typically, the public) housing stock and to promote sustainable housing. Examples include Emilia-Romagna (with, for instance, the *Programma di recupero e razionalizzazione degli immobili e degli alloggi di edilizia residenziale pubblica*), Puglia (*Programma dell'Abitare Sostenibile e Solidale Regione Puglia*), and Tuscany (Wolfgring 2024).

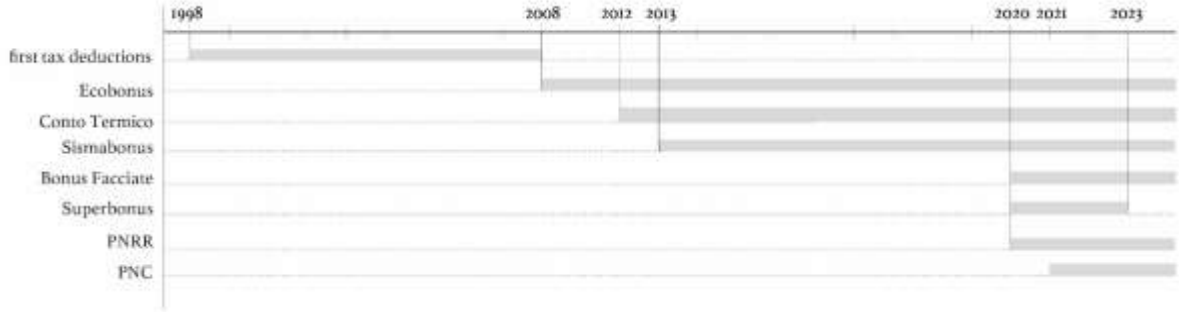

Figure IT12. Timeline of key incentives and programmes of housing retrofit in Italy, author's elaboration.

4.3 Size and role of the market

Italy assumes a rather peculiar position in Europe, with **electricity prices** being among the highest on the continent (Deloitte 2015). In 2024, the average wholesale electricity price amounted to around €100 per megawatt-hour, significantly higher than in Germany (€69) or

Spain (€50) (see Figure IT13) (Reuters 2024). A key reason for this is Italy's large dependence on fossil fuels to generate electricity, particularly natural gas: in 2023, fossil fuels accounted for 55% of the country's electricity production, with natural gas accounting for 45%. This, along with the fact that 95% of Italy's gas derives from imports, renders the country highly susceptible to fluctuations in international gas markets (ibid.). Following the EU's sanctions on Russia in 2022, Italy started to replace gas from Russia (formerly its largest supplier) with imports from other sources, at the cost of higher prices. To somewhat mitigate this burden, Italy's government reduced sales taxes and introduced subsidies to support the expansion of renewable energy generation capacity. However, most of the increased costs have fallen on households through higher energy and electricity bills. In terms of retrofitting, higher electricity costs can have both incentivising or adverse effects: on the one hand, they may encourage retrofitting by increasing cost savings and shortening payback periods, rendering investments more attractive as energy savings quickly offset the initial costs. On the other hand, even with incentives in place, high initial costs of investment remain and constitute a barrier for many households.

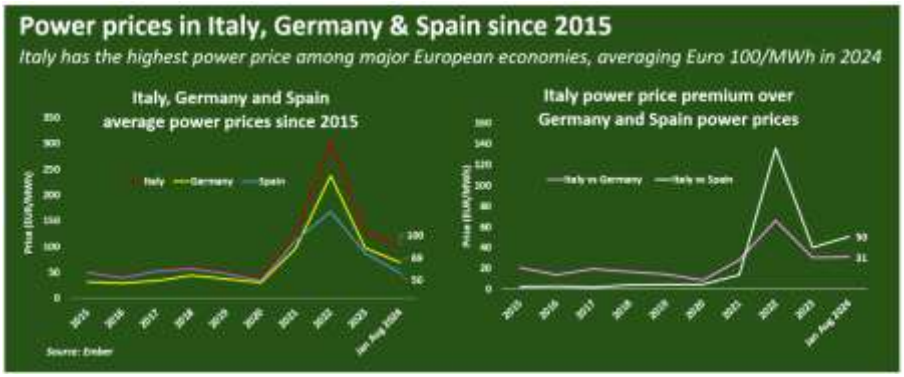

Figure IT13. Power prices in Italy, Germany, and Spain, 2015-2024 (from Reuters 2024, Source: Ember Energy, European electricity prices and costs).

So far, a single national price (PUN – Prezzo Unico Nazionale) has been applied to electricity, a uniform price across the country, calculated as the average price on the electricity market, irrespective of regional variations in production costs or demand. Until 2025, the PUN will be phased out in correspondence with EU directive 2019/944 (the Electricity Directive), aimed at enhancing market integration, increasing efficiency, and better reflecting the real costs of electricity production and distribution in different regions. The PUN will be replaced by zonal pricing, signifying that electricity prices will vary by geographical areas, based on local production costs, demand, and grid conditions (Trio 2024). While this will certainly improve transparency, it might lead to higher costs in areas with less efficient energy production or limited grid infrastructure which may have significant impacts in terms of energy inequality. Reflecting upon what this transition may signify for retrofitting, regional energy cost disparities are likely to influence the extent to which interventions are incentivised or disincentivised. An incentivising effect is to be expected in areas with higher costs, where energy savings have a greater impact. The transition from the PUN to zonal pricing should thus be accompanied by adequate policy measures.

In recent years, average end prices for household **gas consumption** moreover have substantially increased. For households consuming less than 5.000 m³ per year (see Figure IT14), standard offer service tariffs rose by 36,8%, from € 0,604/m³ in 2020 to € 0,826/m³ in 2023. In the same period, free market tariffs (which include commercial offers outside the regulated regime) displayed an even stronger upward trend, increasing from € 0,623/m³ to € 1,057/m³ – a rise of over 69% (ARERA 2023). While the standard offer service is regulated by ARERA (*Autorità di Regolazione per Energia Reti e Ambiente*), the Italian Regulatory Authority for Energy, Networks and Environment, providing a benchmark price set under national oversight, the free market allows suppliers to define their own tariffs, which are often more volatile and reflect changes in procurement and distribution costs more directly.

ANNUAL CONSUMPTION CLASS AND MARKET	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Less than 5,000 m3											
Standard offer service	60,2	56,8	52,8	47,7	48,2	55,8	60,4	51,0	62,3	115,7	82,6
Free market	63,7	62,4	60,1	56,8	56,1	60,3	65,5	62,0	67,9	95,3	105,7
Differential	5,8%	10,0%	13,9%	19,2%	16,5%	8,1%	8,3%	21,8%	8,9%	-17,6%	28,0%
Between 5,000 and 50,000 m3											
Standard offer service	52,2	44,1	44,7	37,8	39,2	46,4	48,9	39,6	49,3	115,8	75,9
Free market	50,9	47,6	46,1	42,8	43,5	48,6	50,9	44,1	58,0	124,7	89,0
Differential	-2,4%	8,0%	3,1%	13,1%	11,1%	4,9%	4,1%	11,1%	17,7%	7,7%	17,3%
Between 50,000 and 200,000 m3											
Standard offer service	50,5	41,9	40,9	36,1	36,1	45,2	44,9	36,7	43,9	117,2	84,5
Free market	43,9	41,4	41,0	37,0	36,3	43,7	44,7	37,3	56,5	122,2	85,0
Differential	-13,0%	-1,1%	0,2%	2,6%	0,5%	-3,4%	-0,5%	1,6%	28,7%	4,3%	0,6%

Source: ARERA, Annual survey on energy sectors.

Figure IT14. Average end prices to household consumers, by consumption class and market type (in c€/m³) (ARERA 2023)

Economically vulnerable households are eligible for social bonuses on electricity and gas bills, regulated by ARERA and provided automatically since 2021. Introduced in 2009 (for electricity) and 2010 (for gas), the bonuses are funded through a solidarity surcharge on all energy users. Eligibility is based on the economic situation of households (an ISEE ≤ €9.530, increased to € 15.000 in 2023 in light of growing prices). Beneficiaries receive a direct discount on their bills, calculated according to household size, location, and type of energy use. The mechanism is coordinated by the INPS (*Istituto Nazionale della Previdenza Sociale*, the National Institute for Social Security. In 2023, 4,5 mio. electricity bonuses and 3 mio. gas bonuses were awarded to households, at an estimated amount of € 1,427 bio. and € 716 mio., respectively (ibid.).

Overall, the topic of energy poverty has gained growing attention in the political discourse in recent years in Italy – in line with similar tendencies at the EU level –, particularly since the 2021 energy crisis. An independent observatory on energy poverty, the OIPE (*Osservatorio Italiano sulla Povertà Energetica*) was established in 2017, with the aim to study and monitor relevant developments in the country (OIPE 2025), predating the creation of the National Energy Poverty Observatory (*Osservatorio Nazionale sulla Povertà Energetica*) in 2022, in line with EU directive EU/2019/944 (SocialWatt 2023). Energy poverty is primarily addressed through welfare mechanisms – such as the aforementioned social bonus on energy and gas bills – rather than being considered a distinct policy domain. The main institutional actors involved are ARERA, which regulates the bonuses, and INPS, which verifies income eligibility. The Ministry of the Environment and Energy Security (MASE) moreover plays a role in

coordinating broader policy strategies, however, no national strategy on energy poverty exists so far. Several Italian municipalities have moreover introduced complementary measures to address energy poverty at the local level. As of 2025, Milan, for instance, is currently developing a strategic Plan for Contrasting Energy Poverty and Precarity (*Piano di Contrasto alla Povertà e Precarietà Energetiche*), after having conducted a participatory process on the theme (Comune di Milano 2025). Additionally, several municipalities have provided targeted support for households with arrears on energy bills or have established energy counters to provide assistance in navigating utility bills and accessing subsidies.

Main further elements of the Italian market framework are energy saving obligation schemes – **Certificati Bianchi or Titoli di Efficienza Energetica (TEE)** –, which were introduced in 2001 in line with the EU Directive on Energy Efficiency and became operational in 2005 (Di Santo and De Chicchis 2019; Erba and Pagliano 2021). General rules and annual savings obligations are set by the Ministry of Economic Development, while the GSE is tasked with monitoring the implementation (ENSMOV n.d.). The scheme requires electricity and gas distributors with over 50.000 users to achieve specific annual energy efficiency targets through the implementation or funding of energy efficiency measures (directly or through third parties), which are then rewarded with White Certificates, certifying the energy savings achieved through the measure (which can include building retrofit). Certificates are only granted for "additional energy savings", i.e., savings which "wouldn't have occurred due to legislative, technological, and market developments" (ibid., p. 458). White certificates are tradable, signifying that companies can fulfil their obligations also by purchasing certificates, a process also administered by the GSE (Ricardo n.d.). They are moreover a market-based instrument that is "not selective about technologies or payees" (Pela 2017, p. 15), which entails that no social targeting mechanism nor the use of specific technologies are foreseen in its application.

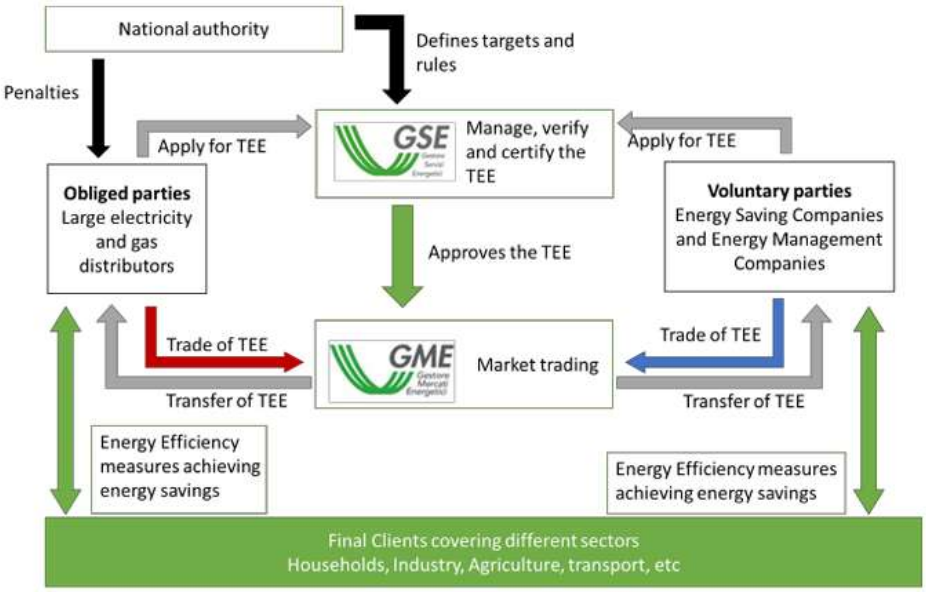

Figure IT15. Key actors involved in the TEE (white certificates) scheme (Ricardo n.d.)

Another market-driven instrument for promoting energy efficiency measures existing in Italy is **Energy Performance Contracting (Contratto di Prestazione Energetica, EPC),** where

Energy Service Companies (ESCOs) finance and implement energy efficiency interventions and recover their investments through the energy savings resulting from these interventions (Pollo 2017). The Italian ESCO market is considered one of the most developed in Europe (Boza-Kiss et al. 2017), with around 1.500 companies registered as ESCOs, of which around 340 actively operate as such (Skenderi 2023). ESCOs are represented by the ASSOESCO (*Associazione Italiana delle Energy Service Company e degli Operatori dell'Efficienza Energetica*), the Italian Association for Energy Service Companies (ASSOESCO 2024). ESCOs have generated around € 3,7 bio. in revenues in 2018, of which 35% constituted energy performance contract services, while 42% derived from energy efficiency and consulting projects, and 23% from the sales of white certificates (BPIE 2020). However, while EPC has become more widespread in the commercial sector in recent years, its use is limited so far in the residential sector (ibid.). A study by the Joint Research Centre of the European Commission (2019) identifies several structural and institutional barriers in further developing the ESCO market in Italy. Among these, the limited availability of suitable financing instruments and a general lack of trust on the part of potential clients are named as key obstacles. Further constraints include ambiguities within the legislative framework, the relatively small scale and high transaction costs of projects, and the procedural complexity associated with EPCs (particularly in the public sector). Limitations in technical capacities and resources at the local government level add a further layer of complexity (ibid.). As regards the residential sector specifically, the high degree of fragmentation in property ownership – with widespread individual homeownership – and the absence of large-scale commercial landlords are likely to be significant additional limiting factors. Most recently, however, as part of the PNRR (Mission 7, I.17 – RePowerEU), the "Public Residential Building Energy Efficiency" measure is aimed at promoting energy retrofitting of public housing through projects managed by ESCOs, which submit proposals and receive incentives via the GSE. Eligible interventions must target public buildings with centralised heating systems and achieve at least a 30% improvement in energy efficiency, financed through a mix of non-repayable grants (up to 65%) and subsidised loans (up to 35%) (GSE n.d.c).

There is evidence that ESCOs – through lobbying and intermediary associations, such as the ASSOESCO – have inserted themselves into the policy discourse, attempting to influence policymaking and achieve favourable regulatory frameworks. Industry groups like ASSOESCO have called for regulatory stability and improved access to incentives, stressing that the lack of coherent rules might undermine Italy's capacity to benefit from the energy transition (AGICI 2025). Such advocacy has contributed to the integration of ESCOs into policy instruments, like the PNRR (GSE n.d.c). Moreover, the evolution of the White Certificate scheme from its introduction in 2001 to today reflects that stakeholder influence has been relevant: its design has been repeatedly revised in attempts to increase the economic attractiveness of the scheme, simplify procedures, and expand eligibility (Di Santo and De Chicchi 2019).

Finally, in recent years, **green mortgages** have appeared as a private financial instrument in Italy - these are loans offered at reduced interest rates to incentivise the purchase of energy-efficient residential property (which must fulfil specific energy qualities, usually being classified in energy categories A and B) as well as renovation measures (achieving energy savings of at least 30%) (ENEA 2023). While not being very widespread in Italy yet, both demand and supply of these loans have increased in recent years, as a study commissioned by Banca d'Italia

(Abate et al. 2024) demonstrates. In 2022, green mortgages have accounted for a total value of €3,5 bio., reaching a share of around 10% of all mortgages in the country (Ansa 2023), a proportion reached also in 2024 (La Repubblica 2024). The analysis moreover shows that Italian banks currently offering green mortgages or planning to do so in upcoming years represent over 90% of the total assets included in the RBLS (Regional Bank Lending Survey), a survey conducted by Banca d'Italia in 2023 (Abate et al. 2024).
Italy moreover is a partner in the **European Energy Efficient Mortgages Initiative (EEMI),** which aims at providing a standardised framework for green mortgages across Europe. The EEMI has established national market hubs in various European countries, among which Italy, with the aim to investigate the implementation of energy efficient mortgages across different European jurisdictions (EEMI n.d.).

4.4 The multi-level governance process

Energy retrofitting in Italy is operated through a multi-level governance framework encompassing the European, national, regional, and local levels. Italy has aligned to the overarching EU legislative and policy framework – primarily the Energy Performance of Buildings Directive (EPBD) and the Renewable Energy Directive – through the stipulation of various laws and decrees (as outlined in chapter 4.1). Furthermore, Italy has (and continues to) benefit from EU funds for energy retrofitting programmes, first and foremost through the European Regional Development Fund (ERDF) which, in the 2014-2020 ESIF period, has put an emphasis on subsidising affordable housing, with a specific focus on improving energy efficiency. In this period, Italy received € 284 million for investments in housing infrastructure and € 41.3 million for energy efficiency renovations through the ERDF (Lakatos 2018).

The **Ministero delle Infrastrutture e dei Trasporti (MIT)** (Ministry of Infrastructure and Transportation) is a key actor at the national level as it defines, funds and coordinates housing policies and programmes. As the main ministry with competences on urban planning and housing, it sets the overall legislative and policy framework for both new developments and renovation strategies in private and public housing which are targeting the enhancement of energy efficiency as a core objective. Another key actor is the **Ministero dell'Ambiente e della Sicurezza Energetica (MASE)** (Ministry of the Environment and Energy Security) which defines national policies on environmental and energy-related themes as well as technical standards and administers the implementation of the National Energy and Climate Plan. Another important stakeholder is the **ENEA (Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile)**, the National Agency for New Technologies, Energy, and Sustainable Economic Development – a public entity subject to oversight by the MASE, acting as the national point of reference for energy retrofitting. Its tasks include research and development, the collection of data and provision of information on relevant developments in the respective sectors. It moreover provides support to the national government in designing and implementing policies, as well as in managing specific programmes (ENEA 2024b). In 2016, ENEA developed the **SIAPE (Sistema Informativo sugli Attestati di Prestazione Energetica)**, the national database (established with Interministerial Decree of 26 June 2015) for collecting energy performance certificates (APEs), supplied with data provided by the regions (Ministry for Ecological Transition 2021). In 2023, the database contained over 5 million APEs, most of which (4,4 mio., 87%) concern the

residential stock, providing thus valuable insight into the energy performance of the country's housing stock (Cresme et al. 2024). Moreover, a key auxiliary actor at the national level is the **Gestore dei Servizi Energetici (GSE**), a state-owned company (owned by the Ministry of Economy and Finance and overseen by the MASE) established in 1999 with the aim to promote the development of renewable energy and energy efficiency (MASE 2024b). This entails, for instance, the management of incentives and funding mechanisms, such as the Superbonus 110% and the Conto Termico.

Regional governments are responsible for applying national laws to regional contexts and overseeing their implementation, while they furthermore have specific mandates over housing policies and territorial governance. They have the possibility to exceed national standards by developing additional energy efficiency policies, more stringent building codes, or further incentives according to political priorities (for instance, the establishment of and provision of funding for specific renovation programmes). Furthermore, some regions have introduced the possibility of increasing building volumes when retrofitting of residential buildings is provided (Bonifaci and Copiello 2018). Regional governments are moreover tasked with the distribution of EU and national funds earmarked for regional energy retrofitting programmes. Moreover, some regions have defined comprehensive energy and climate policies and developed respective strategic plans; these include, among others, Lombardy (with the Programma Regionale Energia Ambiente e Clima – PREAC, Regione Lombardia 2024), and Emilia-Romagna (Strategia Regionale Agenda 2030 per lo sviluppo sostenibile, Regione Emilia-Romagna 2024).

At the local level, **municipalities** are responsible for issuing construction permits and overseeing compliance with regional and national regulations. Similarly to regions, it is at the single municipalities' discretion to design priorities according to political and strategic objectives – and thus, for instance, to develop tailor-made local retrofitting policies and programmes (an example for which has been the "Mille Case per Bologna" programme, Wolfgring 2024). Cities can moreover choose to adhere to voluntary policy initiatives such as the "Covenant of Mayors for Climate and Energy", which aims to encourage and support municipalities in the development and implementation of comprehensive strategies to adapt to climate change (European Commission n.d.a).

Access to housing, housing costs and housing affordability, if ever, are managed by the welfare departments of public administrations and operate largely independently from retrofitting policies. As a result, these policy areas are rarely aligned, with little political or operational overlap (Bricocoli et al. 2025). For instance, first data and qualitative insights on the uptake of the Superbonus scheme indicate that the instrument has not benefited those most in need of economic support and has instead favoured already economically well-off regions (as no positive discrimination mechanisms in favour of low-income groups or disadvantaged areas were implemented). Beyond the "spatially generic" approach of retrofitting bonuses, as identified by Daglio and Zanfi (2023), there is also a clear social blindness in the design and implementation of these policies. Overall, the impacts – both positive and negative – of retrofitting policies on housing (in)equalities in Italy remain largely unexplored, having only recently become a subject of academic interest, while still being largely absent from the policy sphere.

Overall, in Italy, horizontal governance remains a key challenge, with limited strategic alignment between housing, ecological transition, and welfare policies. This disconnect is visible in the lack of coordination between retrofit interventions and housing affordability policies, which are typically governed and implemented by separate institutional actors and without shared instruments. Moreover, cooperation between municipalities is largely voluntary and varies widely: while some cities (such as Milan and Reggio Emilia) have attempted to align their climate strategies through international frameworks like the Covenant of Mayors, others lack formal mechanisms of exchange.

Actor	Scale	Type	Role + Function
Ministero delle Infrastrutture e dei Trasporti (MIT)	National	Public (political + technical)	Defines, funds, and coordinates housing and retrofit policies and territorial planning framework; sets national legislative framework
Ministero dell'Ambitente e della Sicurezza Energetica (MASE)	National	Public (political + technical)	Responsible for environmental and energy policies; oversees National Energy and Climate Plan; oversees ENEA and GSE
ENEA (Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile)	National	Public (research + implementation)	National point of reference for energy retrofitting, research and development, data collection, policy support to the government; manages SIAPE database; supports programme implementation
GSE (Gestore dei Servizi Energetici)	National	Public (state-owned company)	Manages incentives and funding (e.g. Superbonus, Conto Termico); promotes energy efficiency
Regional Governments with various setups (departments for housing policies, territorial governance, energy and environmental policies)	Regional	Public (political + technical)	Implementation of national laws and policies; stipulation of regional laws and policies in terms of housing, territorial governance, regeneration; design of regional programmes; programmation and distribution of national and EU funds
Municipal Governments with various setups (departments for housing, urban planning, welfare)	Local	Public (political + technical)	Implementation of regional policies; urban planning; issuing of permits and ensuring of compliance; administration of welfare support; design of local policies and programmes; can join voluntary frameworks like Covenant of Mayors

Figure IT16. Key actors and tasks in the governance of housing retrofit, author's elaboration.

4.5 Achievements, assessments, and challenges

Over the past three decades, Italy has implemented various policies and programmes aimed at improving energy efficiency in the residential sector, with some positive results. While comprehensive data regarding the overall extent of interventions and investments during this period is not available, the fact that a substantial share of the country's residential stock is still in the lowest energy performance classes highlights that a lot remains to be done. As stated in the *Strategia per la Riqualificazione Energetica del Parco Immobiliare Nazionale* (Ministero

per lo Sviluppo Economico et al. 2020), the prospective annual retrofitting rate in the residential sector has been set for 1,2% for the period of 2030-2050 (an increase compared to 2020-2030, where it has been set at 0,8%). A substantial increase in the mid- to long-term is evidently required to ensure that decarbonisation targets can be achieved.

Concerning the various "bonus edilizi" (like the Ecobonus, Superbonus, etc.), Zanfi et al. (2021) have highlighted that while their implementation has overall produced some positive results, interventions funded through these bonuses have generally been small-scale and sporadic. Deep, comprehensive retrofitting, which could improve energy efficiency and contribute to broader sustainability goals more substantially, has been rare. The authors moreover stress that these programmes have been distributed indiscriminately, without consideration for setting priorities and for specific regional or local contexts. This has resulted in investments being concentrated in economically advantaged regions with robust real estate markets and more proactive recipients, which risks exacerbating territorial inequalities by failing to address disadvantaged areas and the more energy-inefficient housing stock. To address this shortcoming, Zanfi et al. (ibid.) suggest adopting a more territorialised and targeted approach to financing retrofitting instead of the current "spatially generic" approach, in order to guarantee a more efficient and rational way of allocating public resources. They moreover recommend integrating these schemes with policies aimed at addressing social, economic, and environmental inequalities.

This reflects one of the key elements of criticism of retrofitting schemes, namely that they perpetuate social inequity among the recipients. In line with this, researchers (Daglio and Zanfi 2023; Bricocoli et al. 2025) have pointed out that the available instruments have had a limited impact on the residential stock most in need of renovation, thus failing to address systemic issues effectively. More in general, this concerns the country's public housing stock, a segment long neglected in terms of targeted and comprehensive retrofitting. Only in recent years, this issue has received growing attention at the political agenda, and some programmes have been set up accordingly (Wolfgring 2024) (for further details, see also chapter 6 on densification).

Other issues contributing to the limited success of retrofitting interventions on a broader scale stem from the lack of convergence and effectiveness of legislation and incentives, as highlighted by Daglio and Zanfi (2023). Moreover, small-scale governance issues, such as fragmented ownership within condominiums, have significantly hindered collective decision-making processes required for renovations (Bricocoli et al. 2025). The economic crisis further exacerbated the situation by discouraging long-term investments with delayed returns of 10–20 years (Daglio and Zanfi 2023).

When it comes to private actors, there is limited willingness to adopt new technologies and implement energy-saving measures, particularly in the context of deep renovation. This reluctance is due to various factors: difficulties in accessing credit – as deep renovations usually require significant financial investments – and the inconvenience such renovations cause for tenants, often for an extended period of time (Ministry for Ecological Transition 2021). Daglio and Zanfi (2023) as well as Gentili and Hoekstra (2019) moreover outline that territorial disparities in real estate values have a significant impact on renovation efforts. In less attractive areas (such as inner areas and parts of southern Italy), lower property values discourage owners to invest in retrofitting, as the limited potential for returns through rents undermines the

financial feasibility of such endeavours, further contributing to an increase in properties left vacant.

Another point of criticism regards the fragmentation of instruments and incentives in the retrofitting sector (Bricocoli et al. 2025). The effectiveness of public spending could be significantly improved through the adoption of an integrated, coordinated, and simplified regulatory framework, which would enhance both time and cost efficiency. This would enable to better use the "'window of opportunity', i.e. unavoidable or already scheduled extraordinary maintenance works to which energy efficiency or earthquake protection could be linked" (Ministry for Ecological Transition 2021, p. 48). In line with this, procedures should be simplified, and access to both information, tools, and funding should be improved to make it easier for both citizens and public actors to engage in retrofitting activities (ibid.).

Dimension	Measured Impacts	(Potential) Negative Effects	Opportunities
Territorial equity	Substantial investments through recent national schemes: PNRR, including Superbonus and PINQuA (where prioritisation of southern regions exists); PNC (including Sicuro, verde, sociale)	Concentration of interventions in wealthier regions with strong housing markets (Superbonus); potentially increasing regional inequalities	Introduce targeted funding criteria benefitting low-income groups and disadvantaged regions
Beneficiaries	Superbonus largely reaching middle-class owners; public housing retrofit through specific programmes	Superbonus: lack of prioritisation for vulnerable households, public housing stock remained largely excluded; low-income and tenant households not significantly reached	Integration of retrofitting schemes with social policies (e.g., income-based eligibility, support for renters and public housing)
Scale of renovation	Mostly small-scale interventions (increase of 2 energy performance classes)	deep retrofits are rare	Incentivise deep retrofits through tailored funding and support structures for access and implementation
Access to financing	High uptake among actors with large tax capacities, access to resources and information, governance capacities	Low-income and marginalised households face credit and liquidity barriers	Provision of public guarantees, targeted subsidies, and simplified access for low-income groups
Governance	Recent schemes at the national level (PNRR); additionally fragmented regional and local investments	Fragmentation of instruments; lack of vertical and horizontal governance	strenghten horizontal governance at all scales (housing, ecological transition, and social policies)
Market dynamics	Incentives (particularly Superbonus) triggered private market activities	distortive market effects; national debt increase; limited investments in low-demand areas	combination of retrofitting with broader regeneration, territorial governance and mobility strategies (e.g., in inner and southern areas)
Public housing retrofit	recent programmes linked to the PNRR (Sicuro, verde, sociale and PINQuA)	investments remain insufficient; no strategic perspective post-PNRR schemes	development of a medium- to long-term strategy at the national scale; strengthening of technical and financial capacities of public housing providers and municipalities
Information & accessibility	Creation of national databases (e.g. SIAPE), regional or metropolitan housing observatories	fragmentation, lack of data, information, and coordination between scales of governance	Streamlining of procedures, bundling of information at a central level, establishment of local information counters/one-stop-shops

Figure IT17. Summary table on impacts of and potential opportunities linked to energy retrofitting, author's elaboration.

5 Nature Based Solutions

5.1 The policy cycle: emergence of the issue and policy decisions

In the Italian policy context, the terminology associated with Nature-based Solutions has evolved gradually, reflecting broader European developments. Early planning instruments referred, rather generically, to "public green" ("verde pubblico", as used in Decree 1444/1968), while later on, the concept of "green infrastructure" ("infrastrutture Verdi") became increasingly widespread, particularly after the EU's Green Infrastructure Strategy of 2013 – in its annual report from 2016, the Italian SNPA (Sistema Nazionale per la Protezione dell'Ambiente) dedicated a chapter to the topic (SNPA 2016). The reference to "ecosystem services" ("servizi ecosistemici") emerged in scientific and technical documents – for instance, in a technical report published by the Ministero dell'Ambiente e della Tutela del Territorio e del Mare (2009) – rather than in legislation. The term "Nature-based Solutions" itself appeared in national strategic documents only from the late 2010s onward, including in the Strategia Nazionale del Verde Urbano (2018), the Piano per la Transizione Ecologica (2022), and the Strategia Nazionale per la Biodiversità al 2030 (2023), where NBS are presented as tools for increasing biodiversity and resilience, climate change adaptation, and air quality. This discursive progression – from public and urban green to ecosystem services and nature-based solutions – reflects a gradual shift in Italian policymaking from sectoral greening policies to a more integrated approach of environmental governance (OECD 2023).

Considering Nature-based Solutions (NBS) as actions to protect, manage, and restore natural and modified ecosystems in urban areas, the first key moment in Italy has been the adoption of **Ministerial Decree n. 1444/1968**. The decree, by setting legally binding standards of public services for urban neighbourhoods, states that residential settlements should have nine square meters of "green areas" (including, however, sports facilities) per inhabitant. Several scholars (Barbieri 2008; Moccia and Arena 2021, Laboratorio Standard 2021) have criticised the law for its purely quantitative approach, advocating for a more comprehensive perspective which also considers qualitative parameters. Standards were often applied in new developments, setting the conditions for the creation of large urban parks, especially in new peripheral residential areas, while their application remained largely unmet in existing neighbourhoods. Paradoxically, standards were mostly applied in greenfield developments, as land take figures have remained high throughout Italy in past decades. Between 1989 and 2018, an annual average of 260 square kilometres of green or agricultural land was sealed – as of 2018, 7,5% of the Italian surface is anthropised (Arcidiacono and Ronchi 2021). The annual progression of greenfield development (and thus land take) slowed down from the early 2000s onwards, mainly due to the economic crisis (ibid.).

Another early regulation of relevance has been adopted in 1987, when Italy introduced its first National Forestry Plan (*Piano Forestale Nazionale*), approved by the **Interministerial Committee for Economic Planning (CIPE) on December 2, 1987**, and developed in accordance with **law n. 752/1986** ("Multi-year law for the implementation of programmed interventions in agriculture"). The Forestry Plan was significant as it was the first national document to acknowledge the sector's specific objectives and distinctiveness, separate from agricultural objectives (CNEL 2000). In 1992, moreover, **law 113/1992** (*Obbligo per il comune*

di residenza di porre a dimora un albero per ogni neonato, a seguito della registrazione anagrafica) stipulated that municipalities with a population of over 15.000 inhabitants must plant a tree for every child newly registered in the civil registry, intended to promote environmental awareness while linking the development of green spaces to demographic changes. While this in principle is a legally binding provision, it lacks effective enforcement mechanisms. The law was later amended with **law 10/2013** (*Norme per lo sviluppo degli spazi verdi urbani*), introducing additional provisions to encourage the development of public green areas. This included the creation of a Committee for the Development of Public Green Areas (the *Comitato per lo sviluppo del verde pubblico*), with the aim of monitoring and proposing measures and fostering the development of green belts. In 2018, the committee published the National Strategy for Urban Areas (*Strategia Nazionale del Verde Urbano*), a non-binding strategic document, stressing the importance of urban forestation and other nature-based solutions in a perspective of health and wellbeing of citizens (Ministero dell'Ambiente n.d.).

While, as demonstrated, environmental issues were on the country's political agenda already in the 1980s, they gained more explicit attention in the 1990s, following the adoption of legislation at the EU level. In 1997, Italy transposed Directive 92/43/EEC of the European Council (the Habitats Directive) into national law by **presidential decree 357/1997** (*Regolamento recante attuazione della direttiva 92/43/CEE relativa alla conservazione degli habitat naturali e seminaturali, nonché della flora e della fauna selvatiche*), stipulating the establishment of obligations for the conservation of natural and semi-natural habitats, as well as wild flora and fauna, leading to the creation of the Natura 2000 network of protected areas within Italy. Today, Italy has 2.646 Natura 2000 sites convering a land area of around 5,8 mio. hectares (19,4% of the national territory), and around 2,3 mio. hectares at sea (6,4% of the Italian water surface) (ISPRA n.d.c).

The early 21st century then introduced significant new legislation at the national level concerning the protection of landscapes and the environment, including **Legislative Decree n. 42/2004** (*Codice dei beni culturali e del paesaggio* – Code of Cultural Heritage and Landscape), which mandates regions to set up regional landscape plans (in which regions must identify areas of interest in terms of landscape and define measures for their protection, enhancement, and management), and **Legislative Decree n. 152/2006** (*Codice dell'Ambiente* – Code of the Environment), establishing binding national guidelines for environmental protection, including the sustainable management of natural resources and the promotion of green interventions. In 2010, the EU's Marine Strategy Framework Directive (2008/56/EC) was furthermore implemented in Italy through **Legislative Decree n. 190/2010**, which aimed to achieve and maintain a good environmental status of marine waters by 2020, promoting an ecosystem-based approach to the management of human activities impacting the marine environment.

In the past decade, a series of policy documents concerning environmental issues has been adopted in Italy, touching upon the topic of nature-based solutions. Explicit reference to "green infrastructures", for instance, is made in the **2017 Bologna Charter for the Environment**, signed by Italian metropolitan cities, and inspired by the 2030 Agenda by the United Nations adopted in 2015 (Gasparrini and Terracciano 2021). Also in 2017, the **National Strategy for Sustainable Development** (*Strategia Nazionale per lo Sviluppo Sostenibile – SNSvS*) was adopted (and later, in 2022, updated), intended to establish a national reference framework for

the planning and evaluation of environmental and territorial matters (MASE 2022a). Another important strategic document is the **National Strategy for Biodiversity for 2030** (*Strategia Nazionale per la Biodiversità al 2030*), adopted by the Ministry for the Environment and Energy Security (MASE) with ministerial decree n. 252/2023. It defines objectives and actions for the safeguarding of biodiversity in Italy, emphasising the importance of ecosystem-based approaches and nature-based solutions to address environmental challenges (MASE 2025). **The National Plan for the Adaptation to Climate Change** (*Piano Nazionale di Adattamento ai Cambiamenti Climatici – PNACC*) was adopted by the MASE (2023) in the same year, a strategic plan promoting the adoption of NBS as well as ecosystem-based services as important tools of climate change adaptation and for the enhancement of territorial resilience. The **National Integrated Plan for Energy and Climate** (*Piano Nazionale Integrato per l'Energia e il Clima*), first introduced in 2020 in compliance with EU regulation 2018/1999, and revised in 2024 (MASE 2024c), promotes green infrastructure as carbon sinks and as an important part of the country's strategy for achieving carbon neutrality. Another significant development was the adoption of the **National Plan for the Ecological Transition** (*Piano per la Transizione Ecologica – PTE*) in 2022, aimed at coordinating national policies to guide Italy towards sustainable development, in alignment with the European Green Deal and the United Nations 2030 Agenda (MASE 2024a). The plan explicitly references NBS to enhance the natural character of urban areas, particularly through river and wetland restoration and measures to counter coastal erosion and sets the target of expanding protected green areas from 10,5% to 30% of the national territory and increasing areas under 'strict' protection from 3% to 10% by 2030.

While all these strategic documents are important for promoting environmental goals and tackling climate change, they have no binding legislative power. Hence, despite the existence of innovative national and regional frameworks and instruments, scholars have expressed dissatisfaction with greening policies in Italy, as will be further outlined in the following.

In late 2024, the EU's Nature Restoration Law was adopted, setting binding targets to restore degraded ecosystems with the aim to restore 20% of the EU's degraded ecosystems by 2030 and all by 2050 (European Commission n.d.b). As of February 2025, Italy is in the process of developing its National Restoration Plan (due by September 2026) to comply with the regulation. Moreover, in 2024, Italy created the Italian Network for Ecological Restoration (INER/RIRE) to support the implementation of the Nature Restoration Regulation, bringing together experts from academia, public institutions, businesses, and NGOs (SER Europe 2024).

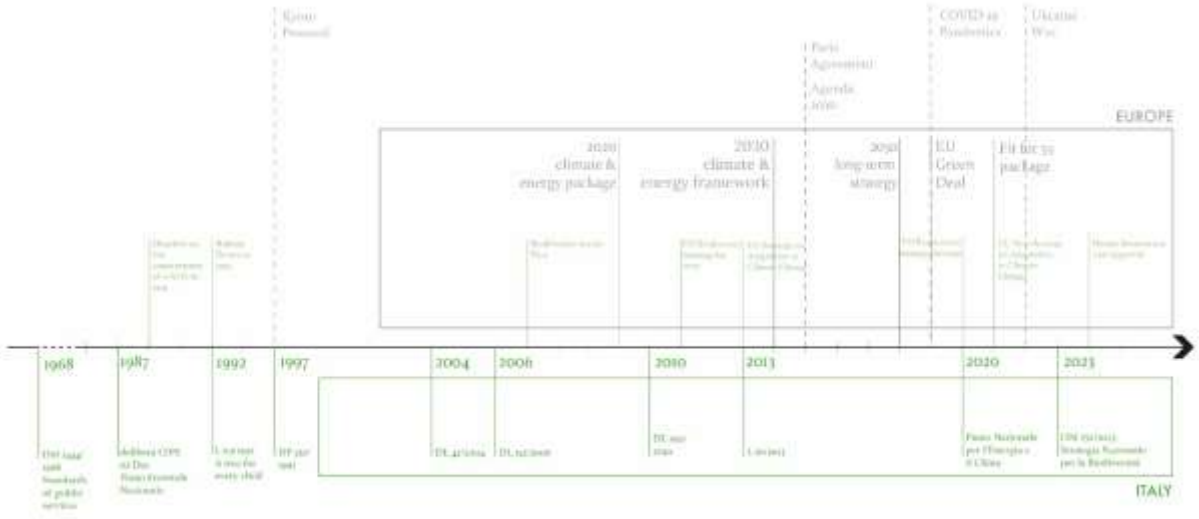

Figure IT18. Timeline illustrating key regulations in Italy affecting NBS, author's elaboration.

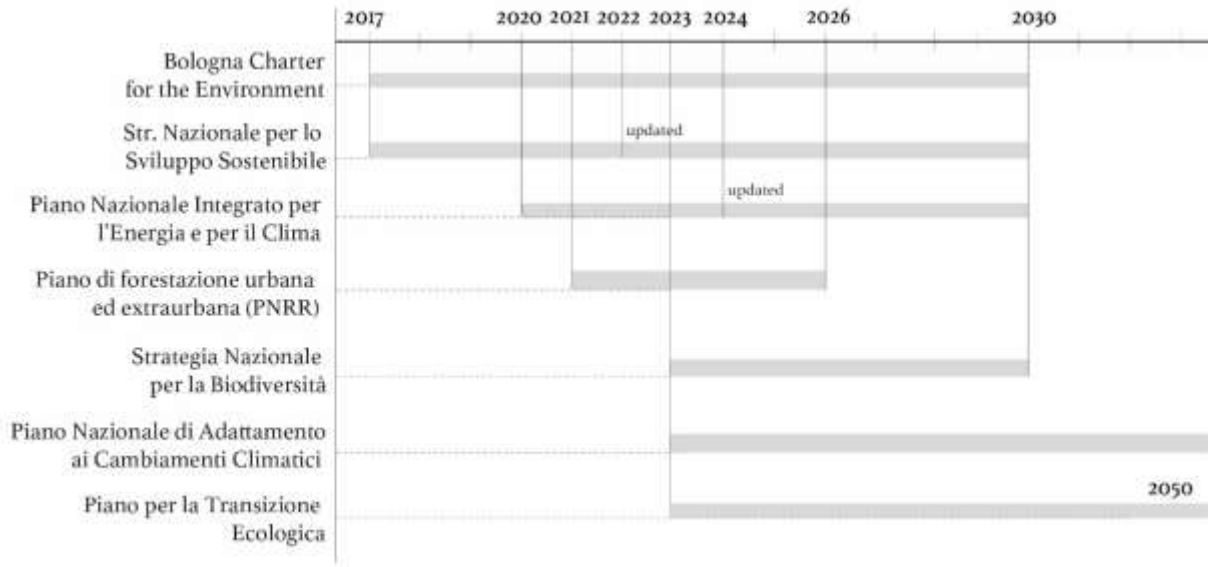

Figure IT19. Strategic documents including provisions on NBS, author's elaboration.

5.2 The implementation process

The implementation and governance of nature-based solutions in Italy is based on a mix of regulatory, financial, and support tools. Regulatory tools, as outlined earlier, are so far limited and fragmented: while planning standards entail the provision of green areas (understood in a broader sense, including also sports facilities), most references to NBS appear in non-binding strategic documents. Financial tools have recently been provided under the PNRR, which allocates substantial funding for urban forestation, ecological restoration, and the

enhancement of biodiversity. Support tools include national strategies (e.g. the *Strategia Nazionale per la Biodiversità al 2030*) and platforms like the NBS Italy Hub, which bundle, provide, and disseminate knowledge and link national policies to wider EU goals. NBS are not integrated into housing policies and thus do not differentiate between housing tenures, resulting in interventions that are tenure-neutral and often disconnected from broader questions of housing equity (Bricocoli et al. 2025).

The implementation of objectives set through strategic documents and plans – often driven by EU agreements, as outlined above – encounters challenges in in Italy, especially regarding greening measures. Maggauda et al. (2020, p. 4) argue that "despite the expectations raised by greening as a tool to produce environmental public goods, their territorial allocation is a key problem in Italy. Greening measures have not significantly shaped the Italian context due to land ownership fragmentation and average size generally well below the 10-hectare threshold". Moreover, as underlined by Arcidiacono and Ronchi (2021), the absence of a broader planning framework beyond the municipal level limits the integration of an ecosystem-service logic into the planning system, which often is only present in the form of recommendations. At the local level, **municipal climate adaptation plans** exist in most major cities – with Bologna having been the first Italian city to develop this document in 2015 (De Luca et al. 2021).

The past decades also saw the proliferation of **citizens' and local initiatives** linked to greening and forestation (such as Alberitalia, Forestami, Mosaico verde, Forestiamo insieme l'Italia, Bosco del Molino, TreeTime, Think Forestry). The first pioneering experience of urban forestry – "Boscoincittà" – was promoted in Milan in 1974, initiated and implemented by thousands of volunteers coordinated by Italia Nostra, an NGO engaged in the protection, promotion and valorisation of cultural heritage (Italia Nostra 2023). "Forestami" is a project promoted by Politecnico di Milano in 2018, foreseeing partnerships with public administrations, private foundations and social cooperatives that so far have planted 45.000 trees covering 20 hectares across the metropolitan city of Milan (Forestami n.d.).

Most recently, the National Recovery and Resilience Plan (NRRP) has dedicated €1.69 billion to the launch of some pilot NBS measures to be completed by 2026 under Mission 2, Component 4 (*Tutela del territorio e della risorsa idrica*). The most relevant are: i) the digitalisation of national parks; ii) the renaturalisation, ecological restoration and reforestation of areas in the Po river valley and Delta; (iii) the conservation and promotion of urban biodiversity in Italy's 14 metropolitan areas; and iv) the conversion to biological or agroecological agriculture of agricultural land in all protected areas. The pursuance of these objectives is supported by additional resources from other programmes (e.g. the "Life" programme) and is therefore expected to continue through 2030 and beyond. Regarding urban biodiversity, the PNRR mainly foresees the planting of between 4,5 and 6,6 million trees in urban forestation actions and the promotion of ecological corridors in the 14 metropolitan areas of the country, through Investment 3.1 – Protection and enhancement of urban and suburban greenery, with a funding of € 210 million (later increased to € 330 million). The "**Plan of Urban and Suburban Forestation**" (*Piano di forestazione urbana ed extraurbana*), dedicated to this objective, was approved in 2021. It includes an investigation of the metropolitan cities, stating that "The feasibility of the entire investment, as well as the feasibility of the objectives that emerged from the National Biodiversity Strategy 2030 and COP26 is evidently linked to the

availability of land" (MASE 2021, p. 62). The plan does not primarily focus on small-scale interventions (such as trees and greening on streets) but prioritises larger-scale afforestation efforts in contiguous areas within the territory of the metropolitan cities. In order to reach a broad territorial coverage (while earmarking 50% of the funds for southern regions, IFEL 2022) all metropolitan cities were strongly invited to submit a minimum of five project proposal foreseeing the afforestation of at least 150 hectares, while pursuing the following principles: the protection of biodiversity to ensure the full functionality of ecosystems; the increase of surface area and enhancement of the ecosystem functionality of green infrastructures within the built environment; and the improvement of citizens' health and well-being. In 2020 and 2021, 72 projects have been admitted for funding, of which 24 in southern regions and islands, 15 in central regions, and 33 in northern regions, supporting the planting of a total of 365.049 trees and shrubs across the national territory (MASE 2021). While the forestation plan focuses on larger interventions, smaller- and medium-sized measures, to be proposed by municipalities, are eligible for funding within the wider framework of the PNRR. Medium-sized fundable public works include the securing of parts of territories at hydrogeological risk; the securing of roads, bridges and viaducts; structural safety and energy efficiency of buildings, with priority for school buildings and other facilities owned by the authority, and of the systems of public lighting. Small-sized fundable public works include the enhancement of energy efficiency of public lighting, publicly owned buildings and public housing, as well as the production of facilities for the production energy from renewable sources; "sustainable spatial development" including interventions in the areas of sustainable mobility, structural safety of schools and other public buildings, and the removal of architectural barriers. Interventions are proposed by municipalities.

While the focus in the provision and funding for and the implementation of NBS is on urban and peri-urban areas, some programmes touching upon NBS exist that target rural areas. One of these, included in the PNRR – under Mission 1, Digitalisation, Innovation, Competitiveness, Culture and Tourism – is the investment on the "Protection and Enhancement of Rural Architecture and Landscape" *(Tutela e valorizzazione dell'architettura e del paesaggio rurale")* (M1C3 – I.2.2), funded with €600 million. While not being directed explicitly at ecological recovery, it supports the improvement of rural landscapes, traditional agricultural structures, and the restoration and functional reuse of historic rural buildings. It provides funding for structural repairs, energy efficiency upgrades, and small-scale tourism infrastructure. The programme is open to public, private, and third-sector entities and foresees the completion of 3.900 interventions by 2025 (Ministero della Cultura 2025).

5.3 Size and role of the market

In many cases, new parks and green areas are provided by private developers based either on the requirements defined in the planning standards of Ministerial Decree n. 1444/1968 (as mentioned earlier) and – increasingly – on negotiated planning agreements (such as *accordi di programma* or *accordi urbanistici*) between developers or landowners and municipalities, which often include the production of private, public or semi-public green areas. In practice, the fulfilment of requirements determined through planning standards often falls short of the objective to produce public spaces, as green areas are often realised as semi-private enclaves

adjacent to new developments, typically used by residents only and thus offering little benefit to the wider public.

Overall, while the planning and implementation of NBS remains largely a responsibility of public actors, there is a growing market interest in the topic, accompanied by an increasing involvement by the private sector. A report by Etifor[4] and the Università degli Studi di Padova (2024, 3) highlights that 45% of (71) surveyed Italian companies acknowledge the risks and opportunities related to climate change and biodiversity loss, indicating a growing corporate awareness for and economic interest in the topic: "The private sector plays a fundamental role in both the loss and protection of biodiversity: Companies contribute to biodiversity loss, but at the same time, they heavily rely on ecosystem services provided by nature. Since 55% of global GDP depends on nature, the private sector has a direct interest in adopting a 'nature positive' strategy". In line with this, nature-based solutions and the incorporation of biodiversity into business planning, the authors stress, can be "a vital asset for long-term economic sustainability", providing "new opportunities for growth and innovation" (ibid., 36). To capture this potential, the authors propose tax incentives, public-private partnerships, and clearer regulatory guidelines (ibid.).

Financial instruments in the field of sustainable business practices include **green bonds, sustainability-linked bonds, and biodiversity credits** (ibid.). Green bonds, designed to fund projects with an environmental focus (renewable energy, energy efficiency, sustainable mobility, waste management), have already gained significant traction in the Italian market, being also used to support Italy's sustainability commitments within the framework of the EU Green Deal. Sustainability-linked bonds (SLBs) differ from green bonds in that their financial and structural characteristics, such as interest rates, are directly tied to specific sustainability performance targets. Companies issuing these bonds commit to measurable environmental or social objectives, and if they fail to meet their targets, they may face financial penalties. Biodiversity credits, which operate in a similar way as carbon credits, allow businesses and investors to fund projects that achieve measurable biodiversity improvements. While the concept is still emerging in Italy, there is a growing interest in using these credits as a mechanism to finance conservation efforts (ibid.).

The growing interest in nature-based solutions has been accompanied by the emergence of intermediary actors operating across research, consultancy, and policy (like Etifor, mentioned above) working with both private companies, public authorities, and academic institutions to advise on policy frameworks, promote business models, and advocate for fiscal incentives. Similarly, the Nature-based Solutions Hub (as will be further outlined below) is an intermediary actor bringing together municipalities, consultants, and researchers to exchange technical guidance, indicators, and implementation tools. While such actors do not intervene directly in legislation, they play an increasingly important role in shaping the conditions under which nature-based solutions are defined and integrated into policymaking.

[4] Etifor is a spin-off company of the University of Padua, specialising in the economics of ecosystem services, sustainable land management, and nature-based solutions (NBS). It operates at the intersection of environmental consulting, applied research, and policy advisory.

5.4 The multi-level governance process

At the national level, the governance of the policy field of NBS involves various key actors: first and foremost, the **Ministry of the Environment and Energy Security** is responsible for environmental policies, including NBS, and their integration into strategic policy frameworks, in coordination with commitments determined at the EU level. The ministry moreover oversees the **Italian Institute for Environmental Protection and Research** (*Istituto Superiore per la Protezione e la Ricerca Ambientale – ISPRA)* – a public research body established by law 133/2008, tasked with the conduction of research and the provision of technical-scientific support on environmental protection, biodiversity conservation, and sustainable development (ISPRA n.d.a). It publishes regular reports on various topics, including the report on "Land Consumption, Territorial Dynamics, and Ecosystem Services", which contains data on soil consumption and land use changes, informing policymakers and the wider public (ISPRA n.d.b). Other relevant institutional actors include the **Ministry of Agriculture, Food Sovereignty and Forests**, which oversees policies with potentially significant impacts on biodiversity, soil conservation, and water management, and the **Ministry of Infrastructure and Transport**, whose agendas touch upon NBS as well. Another key actor in terms of NBS is the **CNR** (*Consiglio Nazionale delle Ricerche*), the National Council for Research, which has established the country's **Nature-based Solutions Hub** in 2024. This occurred upon initiative and co-financed by the European Commission, which encouraged the development of such hubs across the member states, with the objective to bring together various stakeholders (public administrations, researchers, businesses) to gather information and promote new initiatives focused on nature-based solutions (Network Nature 2023). Furthermore, the **National Biodiversity Future Center**, funded by the Ministry of Universities and Research with Next Generation EU funds, was established recently as a research and innovation hub dedicated to the conservation, restoration, monitoring, and enhancement of Italian and Mediterranean biodiversity. It bundles around 2.000 scientists from various institutions and provides a platform for research in six thematic categories, among which the sea, land, wetlands, and cities (NBFC 2023).

At the **regional level**, NBS – implicitly, as part of environmental policies more widely – are typically situated within departments responsible for environmental agendas. Several regions have developed strategic **policy documents** on sustainable territorial development, biodiversity, and climate change mitigation. An example is Lombardy, which has defined "smart and nature-based solutions for the urban environment" as a strategic focus and instrument to enhance both environmental and social well-being (Regione Lombardia 2021) and stresses the importance of forestation and NBS in fostering climate change mitigation in cities (Regione Lombardia 2022). As regards supralocal planning instruments, the situation varies between regions: differently from **regional landscape plans** (*Piani Paesaggistici Regionali, PPR*), the definition of **regional territorial plans** (*Piani Territoriali Regionali, PTR*) is not mandatory, as responsibilities for territorial planning largely fall within the competencies of the regions, while landscape, as part of the country's cultural heritage, falls within national responsibility. This leads to a situation in which landscape plans in some cases compensate the absence of territorial plans as Marson (2019, p. 18) has underlined: "Practically, the void of recent regional planning tools going beyond purely functional schemes smooths the potential conflicts with

other recent plans, making landscape plans the new reference for spatial planning (*pianificazione territoriale*) at the regional scale".

In addition to regional plans, territorial plans moreover exist, in many yet not all cases[5], at the **metropolitan/provincial level**, with **Provincial Territorial Coordination Plans** (*Piani Territoriali di Coordinamento Provinciale, PTCP*). The metropolitan – as an intermediary – level, as highlighted by Moccia and Arena (2021, p. 103), would be "the most adequate to plan ecologic connections and to upgrade landscape because of the link between regional and municipal planning", however, this potential so far remains largely unexploited. Thus, vertical governance is often weakened by missing links across tiers, both in terms of policymaking and implementation.

Specific actions and projects, however, are carried out at the **municipal level**, which is primarily responsible for planning and implementing territorial development. This occurs "within a planning system in which diverse territorial planning levels (provincial, metropolitan and regional) have never had the strength or efficacy to guide, coordinate or influence decisions on local land-use planning" (Arcidiacono and Ronchi 2021, p. 5). Alongside **Territorial Governance Plans (PGTs)**, the key tools of municipalities for managing green infrastructure include the **Green Census** (*Censimento del Verde*), the **Green Regulation** (*Regolamento del Verde*), and the **Green Plan** (*Piano del Verde*). While municipalities thus operate at the most concrete level of implementing NBS, horizontal governance across departments (urban planning, environmental issues, and mobility) is typically siloed and fragmented. Moreover, coordination between municipalities is often limited, despite the potential of inter-municipal or metropolitan planning.

Horizontal governance among non-institutional actors, on the other hand, appears to be more dynamic: national NGOs (e.g. Legambiente), research bodies and knowledge platforms (such as the NBS hub) play an increasingly important role in gathering and disseminating knowledge, experimentation, and advocacy.

[5] The adoption of a PTCP is mandatory in some regions (where stipulated by regional law), including Lombardy and Emilia-Romagna.

Actor	Scale	Type	Role + Functions
Ministry of the Environment and Energy Security (MASE)	National	Public (political + technical)	Responsible for environmental, energy, and climate policies, including NBS; implementation of the National Energy and Climate Plan; oversees ENEA and GSE
Ministry of Agriculture, Food Sovereignty and Forests (MASAF)	National	Public (political + technical)	Oversees policies affecting land use, biodiversity, and forestry
Ministry of Infrastructure and Transport (MIT)	National	Public (political + technical)	Develops infrastructure policies with potential relevance to NBS
ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale)	National	Public (technical + research)	Conducts research and technical-scientific support on environmental protection, biodiversity, conservation, and sustainable development; publishes annual reports
CNR – Consiglio Nazionale delle Ricerche	National	Public (research)	Established the NBS Italy Hub and related research and implementation on NBS; coordinates researchers; provides scientific foundations for NBS
National Biodiversity Future Center	National	Public (research)	Coordinates research and biodiversity monitoring, dedicated to conservation, restoration, enhancement of biodiversity; provides an innovation platform
Regional Governments (Environmental Departments)	Regional	Public (political + technical)	Implement national policies; develop own legislation, policies and strategic documents on environmental issues; regional landscape plans; regional territorial plans
Metropolitan Cities / Provinces	Supralocal	Public (political + technical)	Responsible for Provincial Coordination Plans (PTCP), intermediary between regions and municipalities, but little formal competencies; potential role in coordinating supralocal ecologic networks and urban-rural integration
Municipal Governments (Environmental Departments)	Local	Public (political + technical)	Implement regional policies; develop local policies (e.g., Climate Adaptation Plans); planning and implementation of local green infrastructure and forestation; instruments: PGT, censimento verde, regolamento del verde, piano del verde
Legambiente	National/local	Civil society	Environmental NGO promoting NBS, sustainability, and green policies; awareness raising and lobbying; publishes annual reports
Italia Nostra	National/local	Civil society	Promotes protection and enhancement of natural and cultural heritage

Figure IT20. Key actors and tasks in the governance of NBS, author's elaboration.

5.5 Achievements, assessments, and challenges

The current discourse on nature-based solutions (NBS) in Italy, as well as the most recent funding mechanisms, are predominantly focused on urban areas and metropolitan cities. However, NBS are also implemented in rural areas and smaller municipalities, albeit in less visible ways – these interventions tend to be underreported and often appear under more

specific labels (e.g., agroecology, water retention, ecological restoration, etc.) rather than being explicitly framed and communicated as NBS. Overall, little strategic documentation is available as to the factual achievements of NBS and other greening initiatives in a long-term perspective, and systematic national reporting remains limited. This changed somewhat with the first publication of the annual report of the Committee for the Development of Public Green Spaces (under the auspices of the MASE) in 2017. The edition from 2022 (MASE 2022b) shows that substantial achievements have been made in the past decade in terms of NBS and greening measures in urban areas, most likely linked to the adoption of relevant laws as mentioned earlier, specifically law 10/2013 (*Norme per lo sviluppo degli spazi verdi urbani* – Regulations for the Development of Urban Green Spaces). This regards, for instance, urban forestation interventions (see Figure IT21), which grew notably from 2013 onwards, especially in the core cities of metropolitan areas.

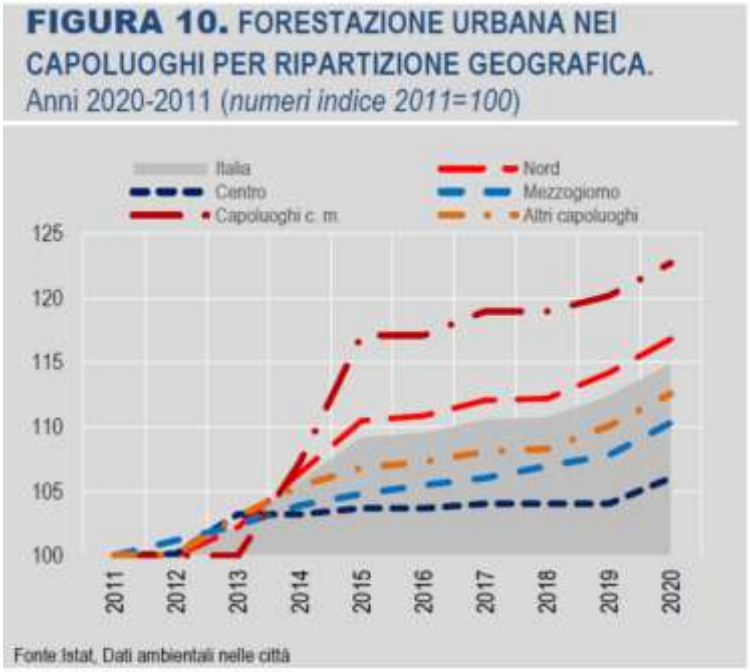

Figure IT21. Development of urban forestation interventions in core cities, 2011-2020 (ISTAT 2020).

Figure IT22 presents key indicators related to the implementation of law 10/2013 – referring to provincial capitals and capitals of metropolitan cities – in the years 2014, 2019, 2020, and 2021, which display notable increases throughout in most cases. This includes the participation of municipalities in the National Tree Day (Art. 1), which grew from 55,3% in 2014 to 75,2% in 2021. The number of trees planted for each newly born or adopted child (Art. 2) also shows a rising trend, with a significant increase from 27.923 in 2014 to 74.116 in 2019, and remaining high in 2021 at 69.029. The share of municipalities with balance sheets of trees (Art. 2-3) grew from 20,2% in 2014 to 55% in 2021. Other key indicators, such as the census of green areas, the share of municipalities with a green regulation, and adopted green plans, also show progressive increases, with census coverage reaching 92,7% in 2021 and green regulation reaching 66,1%, compared to 70,6% and 46,8% in 2014, respectively. Overall, the data indicate that the adoption of law 10/2013 has contributed to increasing municipal efforts in terms of urban greening and that local governments have been quite effective in enforcing the

required measures. However, while clearly a lot has been done in terms of local green governance, the expansion of urbanised green areas per 100 m² of urbanised space as well as the available green space per inhabitant have seen only modest increases over these years.

Year	Municipalities involved in the National Tree Day - Art.1 (% and n.)	Trees planted for each child - Art. 2 (% and no.)	Balance sheets of trees - Art. 2-3 (%)	Urbanized green areas - Art. 4 (m2 x 100 m2 /sup. urb.	Promotion of initiatives Art. 6 (%)	Census of green areas (%)	Green regulation (%)	Green plans adopted (no.)	Risks of Tree Fall (%)	Urban green space availability (m2 per inhabitant e)
2014	55,3 (%) 57 (n.)	28,4 (%) 27.923 (n.)	20,2 (%)	8,25	26,6 (%)	70,6 %	46,8 %	7	22,9 (%)	31,3
2019	69,7 (%) 76 (n.)	51,4 (%) 74.116 (n.)	45,9 (%)	8,47	49,5 (%)	90,8 (%)	57,8 %	8	73,4 (%)	31,8
2020	58,7 (%) 64 (n.)	41,3 (%) 80.968 (n.)	50,5 (%)	8,51	52,3 (%)	90,8 (%)	62,4 %	8	76,1 (%)	32,1
2021	75,2% 82 (n.)	50,5 (%) 69.029 (n.)	55,0 (%)	8,55	57,8 (%)	92,7 (%)	66,1 %	11	78 (%)	32,5

Figure IT22. Relevant indicators as stipulated in law 10/2013, years 2014, 2019, 2020, 2021, referring to capitals of provinces/metropolitan cities, modified by author (MASE 2022b).

Nevertheless, as Figure IT23 shows, the number of urban greening initiatives in existing and new buildings has increased significantly from less than 30 to over 60 between 2014 and 2021. Both the greening of existing buildings (*Rinverdimento aree verdi su edifici esistenti*) and the greening of newly constructed buildings (*Rinverdimento aree verdi nuova edificazione*) show a gradual increase, while vertical greening of buildings (*Rinverdimento verticale degli edifici*) and the transformation of roof terraces into green roofs (*Trasformazioni di lastrici solari in giardini pensili*) are interventions happening rarely, and displaying only slight fluctuations over the years.

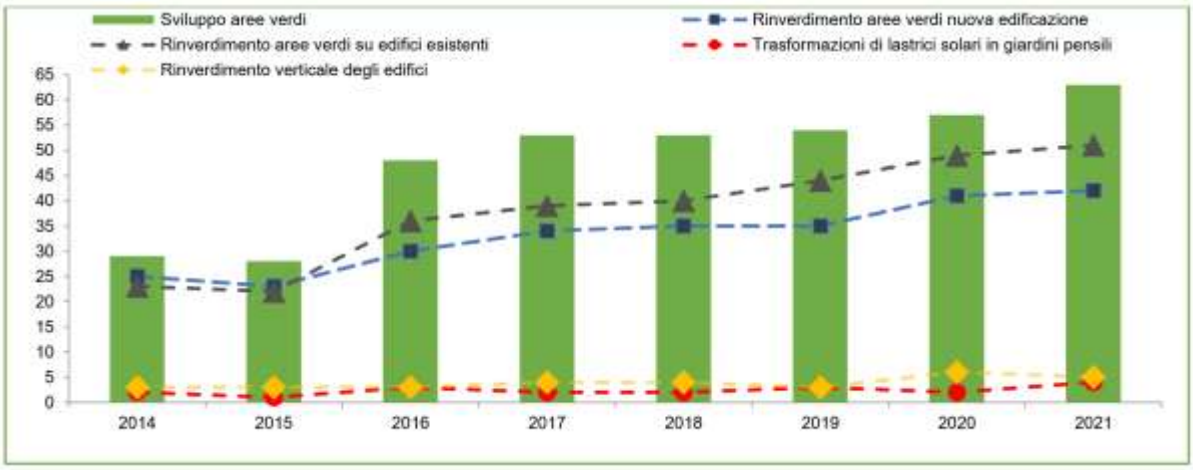

Figure IT23. Number and types of initiatives of urban green spaces (in existing and new buildings) in capitals of provinces/metropolitan cities (law 10/2013), 2014-2021 (MASE 2022b).

Further data show that by 2021, 93% of provincial and metropolitan capitals had carried out a Green Census (*censimento del verde*), however, only 55% of these covered the entire municipal territory, and only 68% contained georeferenced data (see Figure IT 24). Moreover, while two-thirds have adopted Green Regulations (*regolamento del verde*), only a minor share (7,3%) has established a Green Plan (*Piano del Verde*).

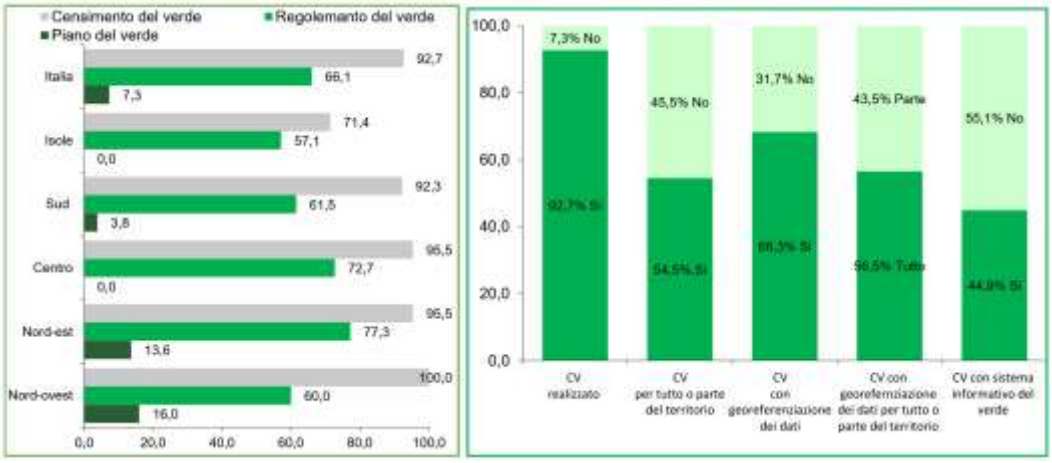

Figure IT 24: Instruments of green planning and governance in provincial/metropolitan capitals, 2021 (%) (left); Green census by characteristics in core cities, 2021 (%) right) (Source: MASE 2022b)

Overall, housing policies and environmental policies in Italy are not strongly correlated, however, clearly some intersections exist. This started from the introduction of standards in residential areas, which mandated the establishment of green spaces. Urban regeneration – which typically involves also the rehabilitation of green areas – and housing regeneration often go hand in hand, as demonstrated by various integrated programmes adopted in Italy (on this, see also chapter 6). While these programmes reflect a growing alignment between environmental and housing policies overall, there is no direct link between environmental policies, including NBS, and housing affordability policies. This gap exists both at the regulatory and strategic levels, meaning that while sustainability considerations are

increasingly incorporated into urban planning, they are not yet considered in terms of their impacts on housing affordability and inequality.

Dimension	Measured Impacts	Potential Negative Effects	Opportunities
Urban forestation	Stronger growth in urban forestation in northern regions and metropolitan cities; growth below national average in southern, central and non-metropolitan core cities	Disparities between regions	Targeting support to underserved regions; identifying existing best practices
Law 10/2013	Trees planted more than doubled; participation in National Tree Day increased; urbanized green areas and urban green space availability almost stagnant; green census and green regulations increased significantly	stagnation in green space per inhabitant; potentially focus on administrative compliance rather than substantial improvements	Expanding engagement through targeted funding
Types of initiatives of urban green spaces	substantial increase in initiatives of urban green spaces on existing and new buildings; minor growth in vertical and rooftop greening	Limited uptake of vertical greening or green roofs	Supporting pilot projects; disseminating best practices
Green census coverage	Only 54.5% covered the full territory; 68.3% included georeferenced data	Incomplete and inconsistent data limits planning and monitoring	Enhancement of integration with GIS and planning tools to support strategic action
Links to housing and regeneration	Some alignment with regeneration projects, but no direct linkage to affordability or tenure differentiation	lack of integrated projects and programmes between housing, NBS, and social policies	Bridging environmental and housing policies with integrated urban development frameworks

Figure IT25. Summary table on measures impacts, potential negative effects, and opportunities of NBS, author's elaboration.

6 Densification projects

6.1 The policy cycle: emergence of the issue and policy decisions

The first interventions in Italy relevant in terms of urban densification have been experiences of the regeneration of historic centres which have resulted in increased urban densities, first as part of post-war reconstruction efforts, and later through dedicated programmes starting from the 1970s onwards, where the adaptation of buildings and housing to higher quality living standards has led to additive densification interventions. Urban renewal policies such as the *Piani di Recupero* (Recovery Plans) in the late 1970s (introduced by **law 457/1978**) and 1980s as well as the URBAN programme in the 1990s played a key role in this process, promoting regeneration while addressing housing needs and the functional adaptation of historic urban fabrics. More recently, the debate on the compact city and sustainability – shaped by European policies and reinforced by the widespread concept of the 15-minute city – has framed urban density as a strategic response to demographic growth and attractiveness while at the same time aiming to safeguard land consumption and curb urban sprawl. However, in Italy there exists no designated legislation nor a strategic framework on urban densification as such (neither at the national nor regional levels), and the term itself appears rarely. Despite this, it can be identified as an implicit policy objective in various legal and strategic documents that address urban regeneration (*rigenerazione urbana*) more widely, which promote the transformation of the urban fabric, the reuse and transformation of dismissed or underused

built-up urban areas or buildings (often non-residential stock into residential or mixed-used neighbourhoods), implying thus often urban densification measures. This connection is particularly relevant as several regions have integrated the objective of soil protection into their regional territorial laws – such as Emilia-Romagna (LR 24/2017), Lombardy (LR 31/2014), and Umbria (LR 1/2015)[6] – linking the reuse of urban land with strategies to limit further land take by promoting development within already urbanised perimeters. In the case of Emilia-Romagna and Lombardy, the provisions are legally binding: the former sets a cap on new land take at 3% of the urbanised surface as of 2017, with a progressive target of zero net land consumption by 2050; the latter establishes the goal of achieving net-zero soil sealing by 2050 and mandates an ecological balance mechanism, requiring new land consumption to be offset by regeneration measures.

Densification in urban areas is therefore typically achieved through large-scale urban redevelopment projects, often involving former industrial or other brownfield sites, such as dismissed military facilities or abandoned railway yards, implemented through the application of specific urban planning tools defined at the national, regional, and local levels (see next chapter). While urban regeneration in Italy has traditionally focused on larger cities, recent years have seen a growing interest in the regeneration of smaller municipalities and peripheral territories, reflected in the development of a National Strategy for Inner Areas (*Strategia Nazionale per le Aree Interne, SNAI*) in 2013. These areas, often in mountainous regions, are characterised by demographic decline, a poor provision of services, and vacancies in the building stock. However, in such contexts, regeneration rarely corresponds to densification, but interventions typically focus on qualitative reuse – for instance, the conversion of disused public buildings or the redevelopment of degraded areas – without significantly altering densities.

Overall, and in line with developments with many other European countries, the understanding of urban and regional planning has evolved substantially since the first national law was adopted in 1942 (**law 1150/1942** – the *Legge Urbanistica*, which is formally still in place, though it has undergone various modifications since then). The focus has gradually shifted from a connotation of urban planning and development as processes to design and implement the expansion of the built environment (prevailing in the first decades of the post-war era) to, more recently, the promotion of the regeneration and transformation of the existing built heritage in a perspective of sustainable land use and a reduction of soil consumption (Gorlani 2022). This has occurred in line with an acknowledgment of the fact that a relevant share of the post-war built heritage is reaching a state of obsolescence (Lanzani 2024). Today, *rigenerazione urbana* is a widely discussed term and concept in Italy both in academic, political, and everyday contexts, however, there is no clear definition or consensus on its objectives, scope, or methods of intervention. It remains a "blurred yet increasingly pervasive field", with “regeneration” largely replacing the term of “urban planning” (*urbanistica*) – a shift which becomes evident also in the renaming of public administration departments, aligning with this concept (Lanzani 2024). In recent years, efforts have been made to develop a national perspective on urban regeneration (Ombuen et al. 2016; Palazzo and Cappuccitti 2024) aimed at mitigating this conceptual vagueness and at establishing a shared framework on urban regeneration interventions. This was attempted at the regulatory level, with the proposal of a

[6] The regions in which the Italian case study cities of this project are situated.

bill (no. 1131) in 2019, which, however, in the first attempt did not pass and is said to be currently under preparation. Urban regeneration interventions are thus largely regulated at the regional scale, with provisions being either integrated into territorial governance legislation or through specific regional laws dedicated to the matter (as will be further outlined in chapter 6.4).

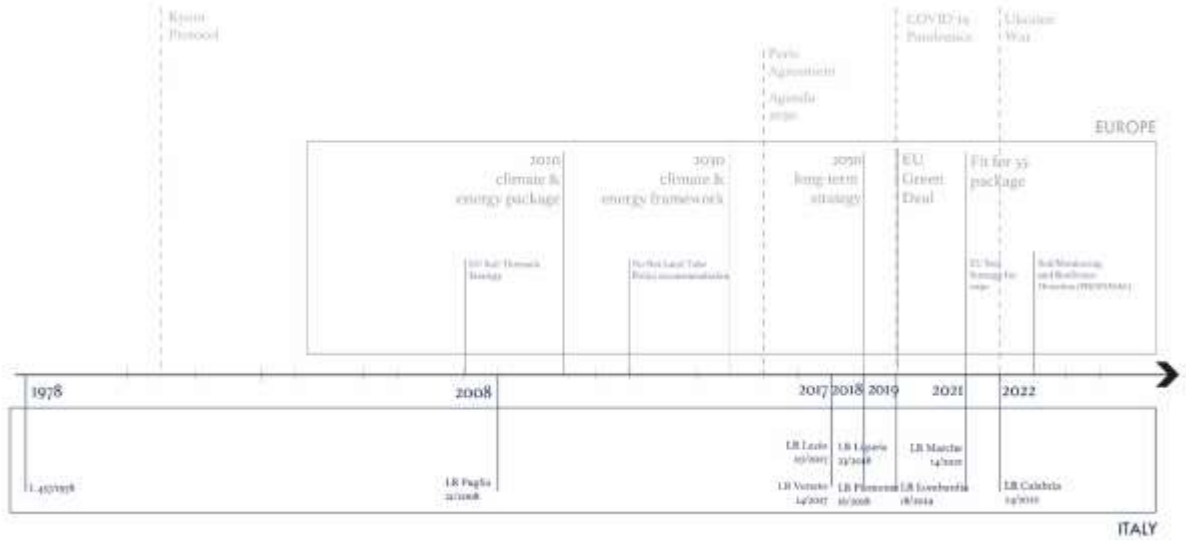

Figure IT26. Timeline illustrating key regulations in Italy and the EU affecting urban regeneration, author's elaboration.

6.2 The implementation process

In operational terms, various tools and strategies exist which result in urban densification. A widely used practice in Italy involves the redevelopment of vacant or underused urban areas, such as former railway yards – exemplified by the several yards undergoing redevelopment in Milan and several other cities. These projects typically result in the transformation into mixed-use neighbourhoods, integrating residential, office, commercial, and public spaces. It is noteworthy that in most cases, investment in housing has become a major driver of these market-led redevelopments. While there is no single national procedure regulating such interventions, they are often promoted through negotiated planning agreements between public authorities and private developers (based on instruments like *Programmi Integrati di Intervento*, *Accordi di Programma*), and financed through a mix of private and public (usually national or regional) contributions. Another common approach involves the demolition and reconstruction of residential buildings with increased volumes, regarding both the private and public housing stock. This is a "plot by plot" process, often implemented at the building level and without an overall planning framework which would ensuring public benefits or steer outcomes (Bricocoli et al. 2025).

Moreover, regeneration has been incentivised since the 1990s through (national) integrated programmes, such as the **Contratti di Quartiere (I and II),** and, currently, the **PINQuA** (*Programma Innovativo per la Qualità dell'Abitare* – National Innovative Programme for the Quality of Housing). However, within the framework of most of these programmes,

densification was rarely explicitly foreseen (an exception is the PINQuA, as further outlined below). Instruments to implement urban densification measures thus include both ordinary urban planning tools and punctual programmes, as shall be briefly outlined in the following.

Urban planning tools that directly or indirectly impact on urban densification are defined in territorial governance legislation and specified in territorial governance plans and thus vary both between regions and municipalities. Territorial governance in Italy operates at multiple scales through respective plans, namely regional (*Piani Territoriali Regionali*), metropolitan or provincial (*Piani Territoriali Metropolitani/Provinciali*), and local ones (*Piani di Governo del Territorio, PGT*). While regional and metropolitan plans in some cases outline broader strategies for urban regeneration, the implementation of specific measures is primarily the responsibility of municipalities through the definition of **PGTs** (Cotella 2021). Local governance tools outlined in the PGT, which must align with the legislative framework stipulated at the regional level, thus play a key role in urban regeneration and densification processes. These tools include: the **change of use/destination** – municipalities can authorise changes in land use in order to enable residential densification, particularly where the construction of public or social housing is concerned; **volumetric increases** are foreseen in several cases where a social, environmental or other public benefit (including, but not limited to social housing) is generated through urban regeneration measures; several local planning provisions moreover foresee a **simplification and acceleration of administrative procedures and financial incentives** in the case of interventions resulting in urban regeneration (which may include a reduction of procedural costs, municipal taxes, and urbanisation fees – the *oneri di urbanizzazione*) (Bricocoli et al. 2025).

Furthermore, various **integrated programmes** to incentivise and implement urban regeneration (often entailing densification) have been launched in Italy in the early 1990s, inspired by similar policies at the European Union level (particularly the Urban Pilot Projects and the Urban I and II programmes). The season of these '**complex programmes'** (*programmi complessi*) started with the **PII** (*Programmi Integrati di Intervento*), to be promoted by municipalities "in order to upgrade the urban, building and environmental fabric" – thereby specifying for the first time the multidimensional nature of such programmes – and the **PRIU** – *Programmi di Riqualificazione Urbana*, both of which were introduced by the national law 179/1992 (Wolfgring 2024; Capriotti and Santangelo 2021). Important programmes that followed are the **PRU** – *Programmi di Recupero Urbano* (law 493/1993), and, focused on the regeneration of public housing neighbourhoods, the **Contratto di Quartiere (CdQ)** (neighbourhood contracts) programme, introduced in 1997 and extended for a second iteration in 2001. The programme explicitly provided for the possibility to use funds for the requalification and new construction of housing and services (Storto 2018), resulting thus not necessarily in residential densification, but in several cases (as has occurred, for instance, in the case of the CdQ Le Piagge in Florence, Wolfgring 2024). Public funding allocated through the programme amounted to over €300 million for the CdQ I (Storto 2018) and €800 million for the CdQ II (Camera dei Deputati 2017).

A currently ongoing programme funded through the PNRR is the **PINQuA**, the National Innovative Programme for the Quality of Housing, endowed with €2.8 billion. It addresses municipalities with more than 60.000 residents, metropolitan cities, and regions, and is aimed at enhancing the quality of housing and urban spaces. It focuses on the regeneration of

housing and furthermore specifies the increase of the public and social housing stock as a designated objective, aiming to achieve "a high strategic impact on the national territory" (Governo Italiano 2021, p. 214). Densification is explicitly mentioned as an objective of the programme, drawing on the 15-minute city model in pursuing the broader aim of reducing soil consumption as well as increasing resilience to climate change and the availability of green spaces, specifically in areas of high residential pressure (MIMS 2022). However, whether the programme will effectively produce the desired outcomes in terms of densification remains to be seen after its finalisation (scheduled for the end of 2026).

Overall, integrated programmes have typically entailed objectives of retrofitting as well as greening. For instance, both the Contratti di Quartiere and the PINQuA have funded interventions aimed at improving the energy efficiency of buildings through retrofitting measures, and have supported the inclusion of green public spaces, sustainable mobility, and the use of nature-based solutions. Integrated programmes of urban regeneration thus are frequently linked to broader environmental and energy policy goals.

Figure IT27. Key programmes of urban regeneration in Italy, 1990s-today, author's elaboration.

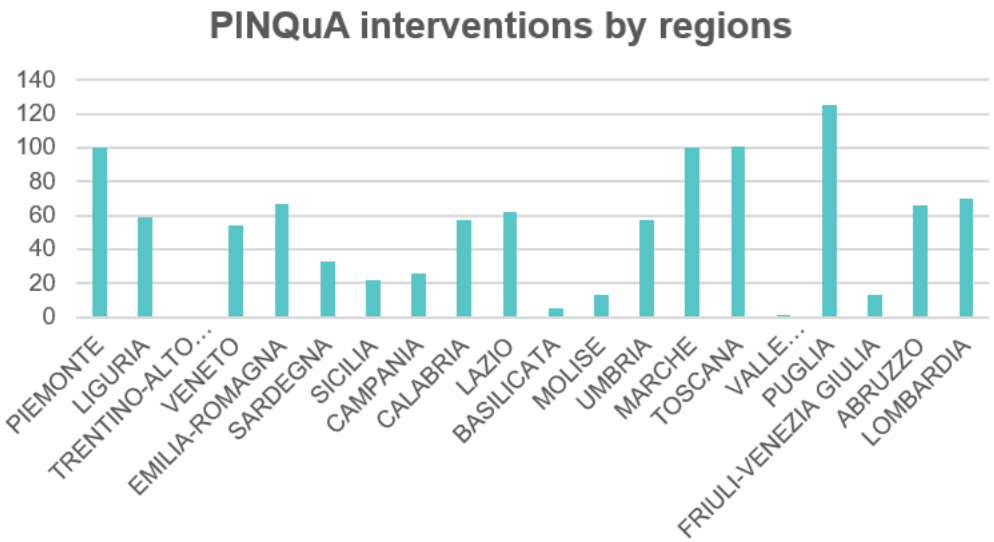

Figure IT28. PINQuA interventions by regions, author's calculation based on Italia Domani 2025.

6.3 Size and role of the market

Large-scale regeneration projects (e.g., on railway yards and brownfield sites) in Italy are typically market-oriented interventions, relying on private developers' initiative and substantial private investment, as large margins of return can be achieved. Such projects typically involve national as well as international real-estate developers, the mobilisation of capital through investment funds and investment companies. The role of finance has significantly changed the overall profile of urban regeneration projects in terms of the acquisition of properties as well as in terms of orienting and driving the timing and perspective of the redevelopment. The debate around private and public partnerships and the role of the public actor in urban planning has significantly been focusing on such major projects, in which private investors have often played a core role. While these interventions contribute to densification, they often lead to rising market prices, as they primarily address more affluent populations, especially in attractive cities (Bricocoli et al. 2025). Given that the residential dimension often constitutes a key function in these redevelopments, the proportion of social or public housing is generally low or non-existing, as developers usually prefer to pay the corresponding value to the city instead of integrating a variety of housing profiles. These dynamics are further reinforced by the role of real estate lobbies and business associations (such as ANCE – *Associazione Nazionale Costruttori Edili*), which aim to promote and achieve investor-friendly regulations. Such actors often engage in consultations and advocacy with political parties and ministries, pushing for legislative changes that streamline planning procedures, reduce obligations, or expand volumetric allowances in urban redevelopment. In several cases, the public has assumed the role of an "enabler in the financialization of real estate markets", adopting "controversial market-led urban policies" (Bortolotti 2023, p.1). As Bortolotti further outlined (ibid.), local authorities tend to implement planning frameworks which facilitate direct investment by semi-public and public development companies. These entities, as well as semi-public firms, play a key role in large-scale urban projects. This has led to an increasing assetization of public land, while often incorporating provisions for public services or infrastructures (e.g., mobility or social housing). This approach reflects similar developments in other major global cities (Fainstein 2008; Tasan-Kok 2021), where public investment serves as a catalyst for attracting financial capital and enhancing global competitiveness.

6.4 The multi-level governance process

As mentioned, there is no national legislation on urban regeneration, and attempts to design a regulatory framework have so far proven unsuccessful. However, in terms of vertical governance, several institutional levels play distinct roles. At the national level, the **Ministero delle Infrastrutture e dei Trasporti (MIT)** (Ministry of Infrastructure and Transport) plays a key role in governing urban regeneration (and thus implicitly densification), specifically through the **subordinate General Directorate for Housing and Urban Redevelopment** (*Direzione generale per la casa e la riqualificazione urbana*). It oversees the development and implementation of policies related to infrastructure, transport, and housing, which are integral parts of regeneration projects. The ministry has, for instance, funded and been involved in various projects aimed at reducing social and physical deterioration of (public and other) housing neighbourhoods.

At the regional scale, there are broad divergencies in terms of urban regeneration legislation and policies: while most **regional governments** have (to some degree) integrated provisions on urban regeneration into their legislation on territorial and urban planning and governance, some – including Puglia (LR 21/2008), Lazio (07/2017), Veneto (14/2017), Liguria (23/2018), Piemonte (16/2018), Lombardy (18/2019), Marche (14/2021), and Calabria (24/2022) – have adopted specific **urban regeneration laws** (Cellamare 2020). In Lombardy, for instance LR 18/2019 (*Misure di semplificazione e incentivazione per la rigenerazione urbana*) supports urban regeneration processes through the reduction of urban planning fees and the simplification and acceleration of administrative procedures. However, also in regional laws, the term "densification" rarely appears. An exception is the law of Emilia-Romagna (LR 24/2017, *Disciplina Regionale sulla Tutela e l'Uso del Territorio*), where densification is explicitly named as a potential intervention for reuse and urban regeneration (Colavitti and Serra 2023), concerning both public and private spaces and buildings. As instruments for implementing urban regeneration, integrated programmes are defined in various laws, understood as coordinated sets of interventions aimed at addressing both physical and socio-economic shortcomings in a comprehensive way. Integrated programmes bundle multiple objectives, bringing together both various stakeholders – typically both public and private – as well as diverse sources of funding. In some of these programmes, such as the PINQuA, urban densification is explicitly incentivised. Some regional laws (like LR 21/2008 of Puglia, *Norme per la Rigenerazione Urbana*) impose a legal obligation on municipalities to establish programmatic documents on urban regeneration, which must identify areas where urban regeneration interventions are to be implemented and outline the types of interventions to be pursued, which may include densification measures.

At the **municipal level**, densification is governed through local planning instruments (which may have different terminologies according to the different regions (*Piano di Governo del Territorio*/Territorial Governance Plan (PGT) in Lombardia or *Piano Urbanistico Generale*/General Urban Plan (PUG) in Emilia Romagna), which in many cases entail provisions for urban regeneration, identifying areas in which densification is foreseen, defining regulations for increasing building densities, and stipulating conditions under which changes in land use are permitted for the reuse of dismissed of underutilised areas and buildings. While regeneration interventions generally take place within the broader framework set in these territorial planning instruments, the concrete project is typically an outcome of a negotiation process between the municipality and the developer. Here, divergencies exist between territorial contexts: while larger municipalities and metropolitan cities are more likely to have the administrative and financial capacity as well as the attractiveness to draw private investment and negotiate with private actors, smaller towns and inner areas often lack adequate resources, coherent strategies, and bargaining power to implement urban regeneration or densification interventions.

Actor	Scale	Type	Role + Function
Ministero delle Infrastrutture e dei Trasporti (MIT)	National	Public (political and technical)	Defines national priorities and allocates funding for infrastructure, transport, and housing; supports regeneration initiatives.
Direzione generale per la casa e la riqualificazione urbana (MIT)	National	public (technical, subordinated to the MIT)	Implements national policies for housing and regeneration; supports urban regeneration through specific projects and funding.
Regional governments with various setups (in some cases, regional commissary and department for urban regeneration)	Regional	Public (political and technical)	Development of legislation on land use and urban regeneration (urb. reg. laws in 8/20 regions); defines obligations for municipalities through regional laws; provides funding.
Municipalities with various setups (in some cases, deputy mayors and departments for urban regeneration)	Local	Public (political and technical)	Implements regeneration and densification measures; defines zoning and building regulations in local plans (PGT/PUG); authorises land use changes.

Figure IT29. Key actors and tasks in the governance of urban regeneration, author's elaboration.

6.5 Achievements, assessments, and challenges

There is no distinct agenda on urban densification in Italy; rather, it is implicitly included within the broader framework of the discourse and policies on "rigenerazione urbana" and the reduction of soil consumption, stipulated in several regional territorial governance laws. However, both the discourse and policies on urban regeneration display a clear bifurcation, with contrasting logics and narratives: on the one hand, urban regeneration revolves around peripheral and deteriorated urban areas, typically involving the public housing stock, where public intervention is deemed necessary in order to mitigate physical, social, and economic shortcomings (Wolfgring 2024). Such regeneration efforts are typically financed through public (European, national, or regional) funds and implemented via targeted programmes. In these contexts, residential densification is usually not an explicit policy objective – though in the more recent past, it has occurred incidentally –, but the emphasis is rather on managing and improving the existing built environment, enhancing infrastructure, and tackling socio-economic challenges. On the other hand, urban regeneration is pursued as a process of valorisation and financialisation, highlighting opportunities and potentials (instead of shortcomings), particularly where large-scale, market-driven redevelopment projects are concerned (as, for instance, in dismissed brownfield sites). In these cases, residential densification usually takes place, but it does not necessarily lead to increased housing accessibility or affordability. On the opposite, urban regeneration has often fuelled gentrification, contributing to the displacement of lower-income residents and intensifying pressures on local housing markets. As Arturo Lanzani (n.d., p.3, own translation) highlighted, "[…] what we have done is shift the geography of social distress – displacing it from areas where the real estate market has boomed to other parts of the city that have experienced a downturn, leading to a concentration of hardship". Prominent recent examples underline how

market-oriented densification has primarily benefited affluent populations, reinforcing socio-spatial inequalities instead of alleviating them. Lanzani (2024) moreover criticises the often ambiguous and superficial ecological framing of urban regeneration, highlighting that vague references to sustainability may contribute to greenwashing. While acknowledging that ecological concerns are (and should remain) central to regeneration efforts, he emphasises that many regeneration policies have demonstrated to be inadequate, adopting approaches which neglect the social implications of interventions.

7 Summary and discussion of results

Over the past two decades, Italy has undergone significant transformations in its environmental and energy policy (EEP) landscape, shaped by both supranational frameworks (EU directives, Green Deal, and the Recovery and Resilience Facility) and domestic economic and policy developments.

At the national level, the EEP framework has been driven primarily by economic incentives, fiscal mechanisms, and European directives. Italy's policies supporting building renovation began in the late 1990s with nationally driven tax incentives aimed at stimulating the construction sector and reducing tax evasion, without explicit reference to energy efficiency. Law 449/1997 marked the first such intervention, and while the 2007 Ecobonus introduced support for energy-saving measures, it did so without imposing specific performance targets. The European Union's influence became decisive starting with the Energy Performance of Buildings Directive (2002/91/EC), which required member states to implement energy performance measures. This led to a gradual evolution (starting from the adoption of Legislative Decree 192/2005) towards aligning national policies with EU energy efficiency goals. From that point on, successive EU directives were transposed through national legislation, introducing binding national targets, renewable energy quotas for buildings, and energy savings obligations. So, while Italy initiated renovation incentives independently, the EU became a key driver in directing the scope, ambition, and regulatory framework of energy retrofitting policy in the following decades.

In past years, legal and policy frameworks have been influenced by an increasing emphasis on sustainability, soil protection, and urban regeneration instead of new construction. Several regions have adopted legislation aimed at reducing soil consumption, introducing binding targets or caps, and promoting the reuse of already urbanised land. While "urban densification" as a term is neither used nor clearly defined in Italy, it has implicitly emerged as part of the broader discourse on urban regeneration. Urban regeneration is being promoted and implemented by both private actors (in the form of market-led valorisation strategies) and public actors (through targeted programmes aimed at regenerating deteriorated neighbourhoods, often characterised by a substantial presence of public housing), with a variety of effects that need to be locally and contextually analysed and evaluated (Bricocoli et al. 2025).

On an institutional level, environmental, energy, housing, and regeneration objectives are operationalised through a complex multilevel governance framework. The Ministry of Infrastructure and Transport (MIT), through its Directorate for Housing and Urban Regeneration, plays a key role in the areas of housing and urban regeneration more narrowly,

particularly through national programmes such as the PINQuA. The Ministry of the Environment and Energy Security (MASE), on the other hand, is responsible for environmental, energy, and climate policies, including nature-based solutions (NBS). Significant challenges exist in both the horizontal and vertical levels of governance, encompassing the fragmentation of competencies, siloed logics and limited cooperation in policymaking and, even more so, at the operational level, and at times diverging institutional priorities and interests. The actual implementation of the policy fields investigated – housing retrofit, nature-based solutions, and densification/urban regeneration – takes place largely at the regional and municipal levels, where capacity and institutional strength vary considerably, producing thus very different outcomes.

Furthermore, contextual factors such as a highly outdated and fragmented housing stock, widespread vacancies in inner areas, and regional disparities in administrative and technical capacities significantly influence both the necessity for and the implementation of environmental and energy policies (EEPs) and interventions. The legacy of disinvestment over the last decades – particularly concerning the public housing sector, as a result of policy decisions and austerity measures – further amplifies both the need for and the challenges of applying EEPs in a targeted and context-sensitive way.

Concludingly, Italy's EEP trajectories reflect a complex interplay of economic stimulus, normative framing around land protection and sustainability, institutional fragmentation, and spatial inequalities. These dynamics result in ambitious but uneven policy outcomes, with significant implications for housing quality, accessibility, and territorial cohesion.

As regards relations and trade-offs between EEPs and housing policies, the Italian case demonstrates that while EEPs have – particularly in the recent past, linked to the EU Recovery and Resilience Facility – increased in relevance and mobilised substantial public and private resources, their impacts remain uneven and often regressive (Bricocoli et al. 2025). Most recently, the Superbonus 110% (introduced in 2020 as part of the National Recovery and Resilience Plan) provided ample tax deductions for energy retrofitting in residential buildings. While resulting in the renovation of a substantial number of residential (particularly, privately owned) buildings, the scheme displayed uneven effects and revealed socio-spatial disparities, disproportionately favouring middle- and high-income homeowners with sufficient tax capacity and access to finances. In contrast, public housing tenants and low-income households have been largely excluded, due both to economic barriers (such as a lack of upfront capital or insufficient tax capacity) and informational or procedural obstacles. The unequal distribution of benefits has also manifested spatially, reflected in a stronger uptake and implementation in wealthier northern regions and urban areas with higher institutional and technical capacities. Smaller municipalities often lack the administrative expertise or human resources required to manage complex, large-scale programmes. Moreover, the short timeframes of recent programmes – linked to the availability of post-pandemic recovery funding – have exacerbated existing governance inequalities, favouring actors with a pre-existing capacity to navigate complex procedures and resources for developing projects at short notice.

Urban regeneration is typically achieved either through market-led projects (often on former industrial or railway sites), targeting real estate valorisation, or through public programmes aimed at regenerating deteriorated neighbourhoods, often characterised by a large presence of public housing. While the first model often comes at the expense of affordability, public-led

interventions in neighbourhoods with low-income and otherwise disadvantaged groups can promote the redistribution of the positive effects of EEPs and regeneration more widely.

Overall, the analysis demonstrates that while Italy has developed a wide range of instruments and programmes encompassing housing retrofit, nature-based solutions, and urban regeneration policies, these are not yet aligned with a coherent housing strategy that includes the objectives of territorial and social justice. Further investigating this misalignment will be central to the ReHousIn project's ongoing comparative work.

8 Reference list

Abate, L, Lionetti, V, Michelangeli, V (2024) Is the Italian green mortgage market ready to take off? Questioni di Economia e Finanza. Occasional Papers. Banca d'Italia.

ANSA (2023) Mutui: quelli verdi quasi il 10% in Italia, durata media 30 anni. [URL: https://www.ansa.it/ansa2030/notizie/finanza_impresa/2023/03/09/mutui-quelli-verdi-quasi-il-10-in-italia-durata-media-30-anni_c1b06eaa-48b0-4aad-bd44-adf2ad5002bf.html?]

ARERA (2023) Annual report on the state of services and activities carried out in 2023 [URL: https://www.arera.it/fileadmin/EN/publications/annual_report/summary_2023.pdf.pdf]

Arcidiacono, A, Ronchi, S (2021) 'Challenges for Contemporary Spatial Planning in Italy. Towards a New Paradigm'. In Arcidiacono A, Ronchi S (eds.) Ecosystem Services and Green Infrastructure Perspectives from Spatial Planning in Italy, 1-16.

AGICI (2025) Rassegna stampa – Accelerare gli investimenti per la transizione energetica. Il ruolo chiave delle ESCo [URL: https://agici.it/rassegna-stampa-accelerare-gli-investimenti-per-la-transizione-energetica-il-ruolo-chiave-delle-esco/]

ASSOESCO (2024) ASSOESCO [URL: https://www.assoesco.org/]

Barbieri, C (2008) Costruire la città pubblica: nuovi bisogni e nuove risposte. In: Galluzzi P, Vitillo PG (eds) Rigenerare le città. La perequazione urbanistica come progetto. Maggioli Editore, Santarcangelo di Romagna, 91–94.

Bonifaci, P, Copiello, S (2018) Incentive Policies for Residential Buildings Energy Retrofit: An Analysis of Tax Rebate Programs in Italy. In Bisello A, Vettorato D, Laconte P, Costa S (eds.), Smart and Sustainable Planning for Cities and Regions, 267-280.

Bortolotti, A (2023) 'State enabling engines in real estate financialization. Practices and instruments addressed by the Milanese local government', Astrid Rassegna 16/2023: 1-26.

Boza-Kiss, B., Bertoldi, P., and Economidou, M. (2017) Energy Service Companies in the EU: Status review and recommendations for further market development with a focus on Energy Performance Contracting. JRC Publications Repository. https://doi.org/10.2760/919473.

BPIE (2020) Status of Energy Performance Contracting. Italy. [URL: https://www.bpie.eu/wp-content/uploads/2020/10/BPIE-AmBIENCe-Factsheet-Italy-06203.pdf]

Bricocoli, M, Peverini, M, and Wolfgring, C (2025) Report on the Policy Labs 1 conducted as part of the ReHousIn (Reducing Housing Inequalities) project. Unpublished report. Department of Architecture and Urban Studies, Politecnico di Milano.

Bricocoli, M, Caresana, L, Peverini, M, Wolfgring, C (2024) National report on housing inequalities – Italy. Deliverable 2.1, "Contextualized analysis of the housing situation

– Papers on (sub)national trends". ReHousIn: Contextualized pathways to Reduce Housing Inequalities in the green and digital transition. [URL: https://rehousin.eu/sites/default/files/media/documents/National%20report%20on%20housing%20inequalities%20Italy_Re HousIn%20project.pdf]

Camera dei Deputati (2017) Commissione parlamentare di inchiesta sulle condizioni di sicurezza e sullo stato di degrado delle città e delle lore periferie. Relazione sull'attività svolta della commissione. [URL: https://inchieste.camera.it/sicurezza/documenti.html?leg=17&legLabel=XVII%20legislatura]

Capriotti, P, Santangelo, A (2021) 'Rigenerare e abitare. Il ruolo delle Aziende casa nel quadro delle norme regionali', Archivio di Studi Urbani e Regionali, LII, 130: 53-77.

Cellamare, C (2020) La rigenerazione senza abitanti. In Storto, G, De Lucia, V (eds.), Territorio senza governo, Tra Stato e regioni: a cinquant'anni dall'istituzione delle regioni. Roma: Derive Approdi, 205-228.

CNEL (2000) L'evoluzione della politica forestale italiana dalla legge Serpieri alle sfide europee: obiettivi e strategie. [URL: https://www.unirc.it/documentazione/materiale_didattico/1462_2015_392_23188.pdf]

Colavitti, A., Serra, S. (2023) 'Planning regulation and land value capture in Italy between traditional approaches and new perspectives', City, Territory, and Architecture 10:16, https://doi.org/10.1186/s40410-023-00202-8.

Comune di Milano (2025): Piano per il Contrasto alla Povertà e Precarietà Energetiche [URL: https://www.comune.milano.it/aree-tematiche/ambiente/energia/piano-per-il-contrasto-alla-poverta-e-precarieta-energetiche]

Conte, V, Anselmi, G (2022) 'When large-scale regeneration becomes an engine of urban growth: How new power coalitions are shaping Milan's governance', Environment and Planning 54(2), 10.1177/0308518X221100828.

CONSAP (2025) Fondo Prima Casa [URL: https://www.consap.it/fondo-prima-casa/]

Corte dei Conti (2023): Rapporto 2023 sul coordinamento della finanza pubblica. [URL: https://www.corteconti.it/Download?id=36c5564e-cb8d-40b4-9820-4a84a346fc39].

Corte dei Conti (n.d.): Piano Complementare. Scheda progetto Sicuro, Verde, Sociale. [URL: https://www.senato.it/application/xmanager/projects/leg18/attachments/documento_evento_procedura_commissione/files/000/374/001/18._Sicuro_verde_e_sociale.pdf]

Cotella, G (2021) Country Profile of Italy. Hannover. = ARL Country Profiles. [URL: https://www.arl-international.com/knowledge/country-profiles/italy/rev/3770]

Cresme, Fondazione Symbola, ANCE Milano, Lodi, Monza e Brianta, and European Climate Foundation (2024) Il valore dell'abitare. La sifda della riqualificazione energetica del patrimonio edilizio italiano. Available for download via [URL: https://symbola.net/ricerca/il-valore-dellabitare/]

Daglio, L, Zanfi, F (2023) 'Unfreezing and Putting to Work Adaption and Social Perspectives for Italy's Post-War Middle-Class Condominium Stock'. Draft version. Accepted for publication in Benbernou A, Reynaud A, and De Togni N (eds.), Middle-class Mass Housing between History and Evolution: European Stories, Paris, l'Harmattan (Habitat et société collection).

D'Amia, G (2015) 'Il Macello di Porta Vittoria: un'attrezzatura urbana nella Milano del primo Novecento', Territorio 74: 113-122.

De Luca, C, Martin, J, Tondelli, S (2021): Ecosystem Services Integration into Local Policies and Strategies in the City of Bologna: Analysis of the State of the Art and Recommendations for Future Development. In Arcidiacono A, Ronchi S (eds.), Ecosystem Services and Green Infrastructure Perspectives from Spatial Planning in Italy, 127-139.

Di Santo, D and De Chicchis, L. (2019) White certificates in Italy: will it overcome the huge challenges it has been facing in the last three years? [URL: https://www.dariodisanto.com/wp-content/uploads/2019/07/3-59-19_Di-Santo.pdf]

Ecobonus (n.d.) Bandi Regionali Conto Termico GSE [URL: https://www.eco-bonus.it/servizi/servizi-bandi-regionali-conto-termico/]

EEMI (n.d.) Roll out across EU markets [URL: https://energyefficientmortgages.eu/roll-out-across-eu-markets/]

ENEA (2024a) Super Ecobonus 110%. 31 maggio 2024. [URL: https://biblus.acca.it/download/report-enea-superbonus-al-31-maggio-2024/?wpdmdl=226160&refresh=66783ccd7f2441719155917]

ENEA (2024b) About us [URL: https://www.enea.it/en/enea-agency.html]

ENEA (2023) Analisi e risultati delle policy di efficienza energetica del nostro paese. Rapporto Annuale Efficienza Energetica. 2023. Available for download via [URL: https://www.efficienzaenergetica.enea.it/pubblicazioni/raee-rapporto-annuale-sull-efficienza-energetica/rapporto-annuale-sull-efficienza-energetica-2023.html]

ENSMOV (n.d.) Italy. White Certificates Scheme [URL: https://energysavingpolicies.eu/wp-content/uploads/2023/05/Italy_Factsheet_ENSMOV_EEOS_final.pdf]

Erba, S and Pagliano, L (2021) La transizione energetica del patrimonio: comfort, equità, riduzione dell'uso di energia. In Coppola A, Del Fabbro M, Lanzani A, Pessina G, Zanfi F (eds.), Ricomporre i divari. Politiche e progetti territoriali contro le disuguaglianze e per la transizione ecologica, 135-149.

Etifor and Università degli Studi di Padova (2024) Biodiversity and the private sector in Italy. Trends, policies and financial instruments [URL: https://www.canaleenergia.com/wp-content/uploads/2024/10/Report-Etifor-BIODIVERSITY-AND-THE-PRIVATE-SECTOR-IN-ITALY.pdf]

European Commission (2023) Recovery and Resilience Scoreboard. [URL: https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/index.html]

European Commission (n.d.a) Why a covenant of mayors? [URL: https://eu-mayors.ec.europa.eu/en/about]

European Commission (n.d.b) Nature Restoration Law [URL: https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-law_en]

European Parliament (2024) Italy's climate action strategy. [URL: https://www.europarl.europa.eu/RegData/etudes/BRIE/2024/767178/EPRS_BRI%282024%29767178_EN.pdf]

European Parliament (2022) Italy's National Recovery and Resilience Plan. Latest State of Play [URL: https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698847/EPRSBRI2021698847EN.pdf]

Fainstein, S (2008) 'Mega-projects in New York, London and Amsterdam', International Journal of Urban and Regional Research Vol. 32, Issue 4: 767–84.

Forestami (n.d.) Forestami [URL: www.forestami.org]

Gasparrini, C, Terracciano, A (2021) Messina. Green and Blue Infrastructures for the Re-urbanisation of the City. In Arcidiacono A., Ronchi S. (eds.), Ecosystem Services and Green Infrastructure Perspectives from Spatial Planning in Italy, 181-200.

Gentili, M, Hoekstra, J (2019) 'Houses without people and people without houses: a cultural and institutional exploration of an Italian paradox', Housing Studies 34(3): 425-447.

Gorlani, M (2022) 'Il profilo costituzionale della rigenerazione urbana come nuova prospettiva della pianificazione territoriale', Queste Istituzioni 3: 35-56.

Governo Italiano (2021) Piano Nazionale di Ripresa e Resilienza [URL: https://www.governo.it/sites/governo.it/files/PNRR.pdf]

GSE (n.d.a) Reddito Energetico [URL: https://www.gse.it/servizi-per-te/fotovoltaico/reddito-energetico]

GSE (n.d.b) Conto Termico [URL: https://www.gse.it/servizi-per-te/efficienza-energetica/conto-termico]

GSE (n.d.c) Misura PNRR M.7 – I.17 per l'efficientamento energetico dell'edilizia residenziale pubblica [URL: https://www.gse.it/servizi-per-te/attuazione-misure-pnrr/efficientamento-edilizia-residenziale]

Housing Europe (2023) The State of Housing in Europe 2023 [URL: https://www.stateofhousing.eu/#p=1]

IFEL (2022) Scheda bando [URL: https://pnrrcomuni.fondazioneifel.it/bandi_public/Bando/243]

ISPRA (n.d.a) The Institute [URL: https://www.isprambiente.gov.it/en/istitute/index]

ISPRA (n.d.b) Soil consumption, territorial dynamics and ecosystem services. Edition 2017 [URL: https://www.isprambiente.gov.it/en/publications/reports/soil-consumption-in-italy-1]

ISPRA (n.d.c) 12. Aree tutelate [URL: https://indicatoriambientali.isprambiente.it/sites/default/files/pdf/Ambiente%20in%20Italia%202024/12%20Aree%20tutelate.pdf]

ISTAT (2020) I cambiamenti climatici: Misure statistiche | Anno 2020 [URL: https://www.istat.it/it/files/2022/03/Cambiamenti-climatici_2020.pdf]

Joint Research Centre of the European Commission (2019) Energy service market in the EU. Status review and recommendations 2019 [URL: https://op.europa.eu/en/publication-detail/-/publication/90074566-22d7-11ea-af81-01aa75ed71a1/language-en]

Italia Domani (2025) Localizzazione dei progetti del PNRR [URL: https://www.italiadomani.gov.it/content/sogei-ng/it/it/catalogo-open-data/localizzazione-dei-progetti-del-pnrr.html]

Italia Nostra (2023) Boscoincittà [URL: https://www.boscoincitta.it/]

Laboratorio Standard (2021) Diritti in città. Gli standard urbanistici dal 1968 ad oggi. Bari: Donzelli.

Lakatos E. (2018) A Mid-Term Analysis of the Impact of Structural Funds on Public, Cooperative and Social Housing in 2014-2020. The Implementation of the European Structural and Investment Funds for Housing Projects in the European Union. Brussels: Housing Europe.

Lanzani, A (n.d.) La rigenerazione come fattore di qualità urbana (appunti da una riflessione) [URL: https://territorio.regione.emilia-romagna.it/urbanistica/formazione-ed-eventi/corsi-formazione/rigenurb/documenti-valutare-la-rig-urbana/arturo-lanzani_la-rigenerazione-come-fattore.pdf/@@download/file]

Lanzani A (2024) Rigenerazione urbana e territoriale al plurale: Itinerari in un campo sfocato. Milano: FrancoAngeli.

La Repubblica (2024) Il 2024 anno dei mutui green, 10% del totale erogazioni [URL: https://finanza.repubblica.it/News/2024/10/21/il_2024_anno_dei_mutui_green_10percento_del_totale_erogazioni-119/]

Magaudda, S., D'Ascanio, R., Muccitelli, S., and Palazzo, A. L. (2020) 'Greening' Green Infrastructure. Good Italian Practices for Enhancing Green Infrastructure through the Common Agricultural Policy', Sustainability 12(6): 2301.

Marson, A (2019) ‘The case of landscape planning in Italy’, Ri.Vista 02: 16-23.

MASE (2025) Strategia Nazionale per la Biodiversità al 2030 [URL: https://www.mase.gov.it/pagina/strategia-nazionale-la-biodiversita-al-2030]

MASE (2024a) Piano per la Transizione Ecologica [URL: https://www.mase.gov.it/pagina/piano-la-transizione-ecologica]

MASE (2024b) GSE SpA [URL: https://www.mase.gov.it/pagina/gse-spa]

MASE (2024c) Piano Nazionale Integrato per l'Energia e il Clima [URL: https://www.mase.gov.it/sites/default/files/PNIEC_2024_revfin_01072024%20errata%20corrige%20pulito.pdf]

MASE (2023): Piano Nazionale di Adattamento ai Cambiamenti Climatici [URL: https://www.mase.gov.it/sites/default/files/PNACC_DOCUMENTO_DI_PIANO.pdf]

MASE (2022a) Strategia Nazionale per lo Sviluppo Sostenibile [URL: https://www.mase.gov.it/sites/default/files/archivio/allegati/sviluppo_sostenibile/SNSvS/SNSvS22_aggiornata_completa.pdf]

MASE (2022b) Comitato per lo Sviluppo del Verde Pubblico. Relazione Annuale. [URL: https://www.mase.gov.it/sites/default/files/archivio/allegati/comitato%20verde%20pubblico/relazione_csvp_2021_2022.pdf]

MASE (2021) Piano di Forestazione Urbana ed Extraurbana. [URL: https://www.mase.gov.it/portale/documents/d/guest/pnrr_piano_forestazione-pdf]

MIMS (2022) Programma Innovativo Nazionale per la Qualità dell’Abitare. Progetti e prime evidenze [URL: https://www.mit.gov.it/nfsmitgov/files/media/notizia/2022-04/Rapporto_Pinqua_web.pdf]

Ministero dello Sviluppo Economico, Ministero dell’Ambiente e della Tutela del Territorio e del Mare, Ministero delle Infrastrutture e dei Trasporti (2020) Strategia per la riqualificazione energetica del parco immobiliare nazionale. Documento per la consultazione pubblica [URL: https://www.mimit.gov.it/images/stories/documenti/STREPIN_2020_rev_25-11-2020.pdf]

Ministero dell’Ambiente e della Sicurezza Energetica (2024) Piano Nazionale Integrato per l’Energia e il Clima [URL: https://www.mase.gov.it/portale/documents/d/guest/pniec_2024_revfin_01072024-pdf]

Ministero dell’Ambiente e della Tutela del Territorio e del Mare, Ministero dello Sviluppo Economico, Ministero delle Infrastrutture e dei Trasporti, Ministero delle Politiche agricole, Alimentari e Forestali (2021) Strategia Italiana di lungo termine sulla riduzione delle emissioni dei gas a effetto serra [URL: https://faolex.fao.org/docs/pdf/ita212678.pdf]

Ministero dell'Ambiente (n.d.) Strategia nazionale del verde urbano [URL: https://www.mase.gov.it/sites/default/files/archivio/allegati/comitato%20verde%20pubblico/strategia_verde_urbano.pdf]

Ministero dell'Ambiente e della Tutela del Territorio e del Mare (2009): Verso la Strategia Nazionale per la Biodiversità. Esiti del tavolo tecnico. Definizione del metodo per la classificazione e quantificazione dei servizi ecosistemici in Italia [URL: https://www.isprambiente.gov.it/files/biodiversita/SERVIZI_ECOSISTEMICI.pdf]

Ministero della Cultura (2025) M1C3 – Investimento 2.2 "Tutela e valorizzazione dell'architettura e del paesaggio rurale" [URL: https://pnrr.cultura.gov.it/misura-2-rigenerazione-di-piccoli-siti-culturali-patrimonio-culturale-religioso-e-rurale/2-2-tutela-e-valorizzazione-dellarchitettura-e-del-paesaggio-rurale/]

Ministry for Ecological Transition (2021) Strategy for Retrofitting of National Building Stock. Italy [URL: https://energy.ec.europa.eu/system/files/2021-12/2020_ltrs_italy_-_en.pdf]

Moccia, F, Arena, A (2021) The Green Infrastructure Instrument for the Metropolitan Area of Naples: Experimentations Through Local Planning. In Arcidiacono A., Ronchi S. (eds.), Ecosystem Services and Green Infrastructure Perspectives from Spatial Planning in Italy, 101-111.

NBFC (2023) Il progetto NBFC [URL: https://www.nbfc.it/en/project]

Network Nature (2023) The Italian Hub for Nature-based Solutions is finally ready [URL: https://networknature.eu/italian-hub-nature-based-solutions-finally-ready]

OECD (2023) Developing an Integrated Approach to Green Infrastructure in Italy, OECD Public Governance Reviews, OECD Publishing, Paris [URL: https://doi.org/10.1787/d84bb8e4-en]

OIPE (2025) Osservatorio Italiano Povertà Energetica [URL: https://oipeosservatorio.it/]

Ombuen, S, Calvaresi, C, De Leo, D, Fioretti, C (2016) Oltre le periferie: Verso una strategia nazionale per la rigenerazione urbana. In: Le agende urbane delle città italiane. Sintesi del rapporto sulle città 2016. Urban@it. [URL: https://www.urbanit.it/wp-content/uploads/2016/11/Sintesi_del_Rapporto_2016-03.pdf]

Palazzo, AL, Cappuccitti, A (2024) Rigenerazione urbana. Sfide e strategie. Roma: Carocci.

Pela A (2017) The Italian White Certificates scheme [URL: https://iea.blob.core.windows.net/assets/imports/events/251/S3PelaGSE_MBIppt_Pela3Revised2.pdf]

Pollo, R (2017) The Housing Retrofit Market in Italy: Constraints and Barriers to Development. In Sayigh, A (ed.) Mediterranean Green Buildings & Renewable Energy. Springer, Cham. https://doi.org/10.1007/978-3-319-30746-6_59.

Regione Lombardia (2024) Scheda informativa Programma Regionale Energia Ambiente e Clima (PREAC) [URL:

https://www.regione.lombardia.it/wps/portal/istituzionale/HP/DettaglioRedazionale/istituzione/direzioni-generali/direzione-generale-ambiente-e-clima/preac-programma-regionale-energia-ambiente-e-clima/preac-programma-regionale-energia-ambiente-e-clima]

Regione Lombardia (2022) Strategia Regionale per la biodiversità. Linee prioritarie [URL: https://www.sviluppposostenibile.regione.lombardia.it/it/attachments/file/view?hash=e657b754ca0b2040c089470186dc9c23&canCache=0]

Regione Lombardia (2021) Verso la Strategia regionale per lo Sviluppo Sostenibile [URL: https://www.sviluppposostenibile.regione.lombardia.it/it/attachments/file/view?hash=3430263333419f6053325105d7a73572&canCache=0]

Regione Emilia-Romagna (2024) Agenda 2030 [URL: https://www.regione.emilia-romagna.it/agenda2030/documenti/eng_ag-1-doc.pdf/%40%40download/file/ENG_AG~1.DOC.pdf]

Reuters (2024) Italy power costs stay sky high despite clean energy push [URL: https://www.reuters.com/business/energy/italy-power-costs-stay-sky-high-despite-clean-energy-push-2024-09-20/]

Ricardo (n.d.) Italian Energy Efficiency White Certificate Scheme [URL: https://esc-production-2021.s3.eu-west-2.amazonaws.com/2021/09/Italy-White-Certificate-Scheme-Case-Study-FINAL.pdf]

Salvia, G, Morello, E, Rotondo, F, Sangalli, A, Causone, F, Erba, S, Pagliano, L (2020) 'Performance Gap and Occupant Behavior in Building Retrofit: Focus on Dynamics of Change and Continuity in the Practice of Indoor Heating', Sustainability 12: 5820.

SER Europe (2024) Italy Launches National Network for Ecological Restoration to Support EU Nature Restoration Goals [URL: https://ser-europe.org/2025/02/04/italy-launches-national-network-for-ecological-restoration-to-support-eu-nature-restoration-goals/]

Skenderi, M (2023) The ESCO market in Italy and Germany; overview and areas of improvement [URL: https://www.sciencespo.fr/psia/chair-sustainable-development/2023/09/13/the-esco-market-in-italy-and-germany-overview-and-areas-of-improvement/]

SNPA (2016): Qualità dell'Ambiente Urbano. XII Rapporto. Edizione 2016. [URL: https://www.isprambiente.gov.it/public_files/XII_RAPPORTO_AREE_URBANE/XII_RAU_Volume_completo.pdf]

SocialWatt (2023): Country Factsheet [URL: https://socialwatt.eu/sites/default/files/news/SocialWatt_CountryFactsheet_ITALY_final.pdf]

Storto, G (2018) La casa abbandonata. Il racconto delle politiche abitative dal piano decennale ai programmi per le periferie. Roma: Officina Edizioni.

Tasan-Kok, T (2021) ‘New relational understandings of city building. Reading the city through dynamic landscapes of governance’, Transactions of the Association of European Schools of Planning, 5 [URL: https://orcid.org/0000-0003-4902-6650]

Trio (2024) Italy to phase out PUN in 2025 [URL: https://www.trioadvisory.com/resources/italy-phase-out-pun-2025]

Ufficio Parlamentare di Bilancio (2023) Audizione della Presidente dell’Ufficio parlamentare di bilancio nell’ambito dell’indagine conoscitiva sugli effetti macroeconomici e di finanza pubblica derivanti dagli incentivi fiscali in materia edilizia. [URL: https://www.upbilancio.it/wp-content/uploads/2023/03/Audizione-incentivi-fisc_edil.pdf]

Wolfgring C (2024) Regenerating public housing, regenerating cities. Trieste, Bologna, Firenze, Bari, Catania. Dissertation, Politecnico di Milano, Department of Architecture and Urban Studies.

Wolfgring (2023) ‘Public housing and the PINQuA in Italy’, Urban Research & Practice, DOI: 10.1080/17535069.2023.2219582.

Zanfi, F, Daglio, L, Perrone, A, and Rusci, S (2021) Bonus Edilizi: Diversificazione e integrazione con politiche urbane e territoriali. In Coppola A., Del Fabbro M., Lanzani A., Pessina G., Zanfi F. (eds.), Ricomporre i Divari, 149-161.

Annex

Policy Labs

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3 April 2025, Assisi, town hall

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- Francesco Berni, Experto, Assisi
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- Alessandra Guidotti, City of Assisi, Urban Planning Department, Manager
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- Matteo Lanfaloni, PhD candidate, Università di Perugia
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- Alessio Mariucci, Expert, Assisi
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- Elena Toccaceli, ATER Umbria – Umbria Public Housing Company, Manager
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- Giordana Ferri, Fondazione Housing Sociale, Executive Director
- Vincenzo Gaglio. Architect, Milano
- Vittorio Gimigliano, ACER Reggio Emilia, Public Housing Company, Project coordinator
- Riccardo Gini, Parco Nord Milano, Director
- Fabio Lepratto, DAStU, Politecnico di Milano,
- Serena Maioli, ARTER Emilia-Romagna, Unità EcosistemI Urbani Director
- Lucia Mantegazza, ANCI Association of Local governments of Lombardia, VicePresident and Mayor of Gessate
- Matteo Mognaschi, Aler Milano - Public Housing Company, President
- Barbara Negroni, Comitato per lo sviluppo del verde pubblico (MASE) and Mayor
- Roberta Pavarini, CCPMC – Housing Cooperative, President
- Giulia Ragnoli, City of Milano, Central Direction, Staff City Operation Manager
- Nicola Russi, DAStU Politecnico di Milano
- Stefano Salata, DAStU Politecnico di Milano
- Andrea Scaleggi, La Cordata - Housing Cooperative
- Anna Tagliaferri, City of Milano, Housing Department
- Lina Scavuzzo, Lendlease, Development Director
- Sara Travaglini, DAR Casa – housing cooperative, President
- Federico Zanfi, DAStU Politecnico di Milano

Interviews

- Davide Bedogni, Centro Cooperativo di Progettazione, Reggio Emilia, 16 June 2025
- Marco Corradi, ACER Reggio Emilia, Reggio Emilia, 17 July 2025
- Giulia Datola, DAStU Politecnico di Milano, Milan, 29 April 2025
- Alessandra Oppio, DAStU Politecnico di Milano, Milan, 29 April 2025
- Marta dell’Ovo, DAStU Politecnico di Milano, Milan, 29 April 2025
- Mariachiara Pastore, DAStU Politecnico di Milano, Milan, 28 February 2025