

Energy as a standard: a proposal for updating the Italian legislation

Roberto De Lotto, PhD

Associate Professor of Urban and Regional Planning

University of Pavia, Department of Civil Engineering and Architecture, Urban Project Laboratory - via Ferrata 3, 27100 Pavia (Italy) – roberto.delotto@unipv.it

KEYWORDS: public utility, urban standards, energy management, energy provision, legal framework

ABSTRACT

Under Italian legislation, every private development project must yield benefits for the public. This is nationally mandated through (a) the payment of urbanization fees and (b) the allocation of a specific area of land for public use, as outlined in Ministerial Decree 1444/68. The rationale behind requiring contributions to public capital includes (I) supporting the creation and upkeep of public infrastructure and facilities, (II) acquiring land for the construction of new amenities, and (III) integrating private real estate developments into a larger system that enhances overall quality.

Given that the definition of public utility has evolved over more than 50 years, this paper argues for a contemporary approach where the provision of energy—a critical resource today—could supplement or even replace the transfer of land from private to public entities in cases where existing public lands sufficiently meet current needs.

This position paper contends that the Italian legislative framework requires updates to encompass modern essentials like energy provision within the concept of public interest

INTRODUCTION

This contribution is a 'position paper' in which the author proposes a new interpretation of the so-called 'standard', building upon the existing Italian legislative framework. The practical applications that could emerge from this proposal will be explored in the subsequent phases of the research the author is currently undertaking.

Italian national legislation, which experienced a significant phase of innovation starting in the 1960s (Campos Venuti and Oliva, 1993), mandates that for every private intervention in urban and territorial systems, private stakeholders must make two distinct contributions to the public: primary and secondary urbanization. Primary urbanization, the 'backbone' of the city, consists of the essential infrastructure that enables land development, such as roads, sewage systems, water management systems, electrical networks, gas networks, and telecommunication networks. Secondary urbanization, also known as 'standards', pertains to the public services and facilities that complete the urban environment. This is compensated through monetary payments and land transfers. The 1977 Law, known as Bucalossi, established that each building project, from the expansion of existing structures to new developments, must include a payment to the public entity, reflecting the impact each intervention has on municipal services and facilities.

The cornerstone of Italian urban planning, Law 1150 of 1942, was enacted during a period of rapid urban development, spurred by the Marshall Plan and subsequent national economic policies from the end of World War II to the mid-1970s (Saraceno, 1969). However, this law was not properly implemented for several reasons, including 'reconstruction plans' (Erba, 2001) and widespread unauthorized construction (De Biase, Losco, Petrella, 2019). After two decades of intensive building activity, it became apparent that public services were significantly lacking in both quantity and quality. Consequently, the 1968 Decree No. 1444 introduced a requirement for a quantified contribution of land, termed as 'standard', measured in square meters or hectares, that each urban transformation must allocate to the municipality. These urban standards are categorized into: green and sports areas (50%), educational facilities (25%), parking (14%), and services of common interest, such as religious, social, sanitary, and administrative services (11%).

Today, the relationship between public and private sectors is governed by (a) monetary contributions as stipulated by Law 10/1977 and its amendments, and (b) the transfer of land from private to public entities. The latter was refined by regional legislation that increased the required 'standard', and in the Lombardy Region, Law No. 12 of 2005 specifies that this amount must be at least 18 sqm per inhabitant, with municipalities having the discretion to require more. This law also introduced qualitative criteria for evaluating public facilities (Article 9 of Law 12/2005), such as quality, accessibility, and usability, and recognized private services as equivalent to

public ones under formal agreements. This approach enhances the range of services considered as essential urban facilities to meet the widespread needs of citizens.

The paper highlights the need to pay particular attention to emerging needs not previously considered essential by legislation. It begins with an overview of the current Italian legal framework, then moves to discuss new paradigms in contemporary urban development, such as flexibility and smartness. The author then addresses energy as a fundamental need in both current and future contexts, culminating in a proposal to integrate this modern understanding into the existing regulatory framework.

RELEVANT STUDIES ABOUT CONCEPT AND APPLICATION OF THE STANDARD

The aesthetics of the city are closely linked to the quality, accessibility, and aesthetic value of both collective and private urban spaces, regardless of the ownership system in place (Romano, 1993, 2010, 2013). Italian legislation clearly distinguishes between public and private property systems, without allowance for other legal regimes (Moroni, 2013). In Italy, most collective spaces are legally public, with the responsibility for their provision and maintenance resting on public authorities. Given that the majority of building initiatives are private (apart from public housing programs established by Law No. 167 of 1962), defining the mutual relationship between public and private entities is essential.

Over the last fifty years, the debate on the concept and application of urban planning standards has significantly deepened. Topics of discussion have included the measurement of green spaces per capita (Coderoni and Pagliacci, 2017), the minimum required public spaces in urban plans (de Biase, Losco, 2018), the transformation of quantitative parameters into performance indexes (Mazzeo et al., 2019), and comparisons of different European legislations (Caldarice, 2018). Furthermore, every urban planning professional manual includes guidelines and algorithms to assess the obligations of private interventions towards public benefits (Falco, 1993; Tosi, 2018). Recent reviews of the standards within Italian urban planning legislation have been undertaken. For instance, scientific research conducted in 2018 by various Italian scientific societies—such as the "Fifty years of urban standards (1968-2018). Balance, open questions and hypotheses towards a possible reform" by the Italian Society of Urban Planners (SIU) (Renzoni, 2018), "After 50 years of standards in Italy. Towards ways of reform" by the National Institute of Urban Planning (INU), and the "Urban standards: renewal proposals" event organized by the National Center for Urban Studies (CeNSU) in Lombardy, which led to the publication of a book (Richiedei, 2020)—highlighted the topic.

In 2021, a unified commission consisting of members from SIU, INU, and CeNSU, named "Towards a law of principles for territorial governance, for an urban planning reform," focused on revising the Italian urban planning law, particularly addressing "Territorial equipment (Standard)".

These studies and contributions reveal that the scientific community recognizes the changing needs of people and cities, although the concept of public utility remains closely tied to the provision of physical elements, such as land surfaces. Additionally, a disparity in the availability of public spaces between the northern and southern parts of Italy has been noted, with municipalities in the north typically having more public spaces than the legislative minimum, whereas those in the south have less.

The practical and legal aspects of standards have been explored both as independent elements and within the complex legislative framework of Italy, which comprises numerous national and regional laws but lacks an updated overarching legislation.

FLEXIBILITY AND SMARTNESS: KEYWORDS FOR THE PRESENT AND FUTURE CITIES

One interesting topic emphasized by the concept of a smart city is the contrast between the slow pace of city modifications (Sennett, 2000) and the rapid advancement of technological urban production. In this context, the symbolic value of certain city elements depends as much on their historical stratification as on the ideals they represent. For example, the financial power symbolized by high-rise buildings in cities like London and Milan can parallel the role of historical buildings.

Regarding flexibility, complexity, and uncertainty, Portugali (2000) defines cities as dual-complex systems, comprising both the artificial components (from bridges to bolts, detailed yet complex) and the urban agents (those interacting with and transforming these components for their livelihood and survival).

Thus, cities are shaped by the actions of urban agents on the artificial components and their interconnections, or as Bertuglia and Staricco (2000) put it, by the system's organization. For such a complex system, organization is a fundamental trait, making it a constituent property of the system (Gargiulo and Papa, 1993).

In contemporary cities, organization is steered by public power through a regulatory system. Planning is the outcome of analyzing urban phenomena, relating this analysis to political ambitions, and defining a scenario (Schoemaker, 1995) to be realized through practical actions (De Lotto, 2022). Once a city's future scenario is outlined, it is typically approved by public administration at various levels (national, regional, municipal), placing the onus on them to address the emergent needs and queries of citizens, users, and institutions. In such a dynamic and uncertain environment, planning is inherently challenging.

Moroni and Chiffi (2022) recently discussed decision-making under uncertainty, noting that urban issues are often 'wicked'—lacking detailed definition, a clear endpoint, and frequently unfolding alongside their resolution (Balint et al., 2011).

They categorize decision-making conditions as follows: i. In certainty, events and their outcomes are predictable and specific. ii. In risk, events are known, but outcomes are probabilistic. iii. In severe uncertainty, outcomes and probabilities are indeterminate or unknown (Moroni and Chiffi, 2022, p. 239).

Uncertainty arises when answers to specific questions are elusive (Floridi, 2015), necessitating high flexibility and the exploration of multiple, uncertain scenarios.

Urban planning encompasses spatial decisions made by public entities like municipalities, affecting both public and private spaces. This highlights the diverse nature of public decisions and the importance of a flexible approach to cater to urban actors' needs.

The notion of the 'smart city' has evolved from recognizing the potential of innovative technologies to transform the urban fabric (Fistola, 2013). This concept, which predates the last two decades of the 20th century, gained traction as ICTs began to close physical distances, prompting a reimagining of urban spaces beyond physical limits.

Despite considerable focus on urban smartness over the past decade, a consensus on its definition remains elusive, likely due to the ongoing evolution of the underlying technologies. The literature identifies a 'smart' city as one excelling in specific areas, including Environment, Mobility, People, and Living, which directly impact traditional urban standards. For instance, environmental quality is linked to green space, and mobility infrastructure is foundational to urban planning, as established in Decree 1444/68.

The 2014 report “Mapping Smart Cities in the EU,” commissioned by the European Parliament’s Industry, Research, and Energy Committee, evaluated cities developing smart initiatives based on certain success indicators across the aforementioned areas (AA.VV., 2014).

Originally, the concept of a smart city was rooted in hard infrastructure like IoT devices and sensors. However, it has since expanded to encompass a broader urban definition that includes *urbs* (physical space), *civitas* (inhabitants), and *polis* (governance) (Romano, 2013).

Technological infrastructure, by providing and processing information, aims to address uncertainties requiring data. Initial global enthusiasm for smart cities was high, seen as a panacea for intractable urban and social issues. Yet, it became apparent that technology alone is insufficient without the engagement of 'smart' citizens.

Recent excitement around Artificial Intelligence (AI) reflects its potential to unearth new knowledge through identified patterns and support decision-making and

governance, though it cannot render decision-making wholly deterministic (Zamponi and Barbierato, 2022).

In conclusion, flexibility and smartness in urban contexts are intrinsically linked to the nature of decision-making within cities.

A FLEXIBLE APPROACH IN STANDARDS' DEFINITION TO EMBRACE NEW EMERGENT NECESSITIES

As stated in the previous chapters, as the needs of people evolve over time, it becomes increasingly necessary to adopt a flexible approach to urban studies and the definition of regulations (De Lotto, 2022; Moroni, 2013). When identifying what truly constitutes a need for citizens and city users, a flexible approach is essential, both in recognizing demands and in determining how to address them, from both practical and regulatory perspectives.

Legislative updates are less frequent than practical applications, hence it is important to note that: 1) an overly precise and detailed legislative system can hinder the potential for practical innovations; 2) an excessively vague definition of public duties for private entities could undermine the provision of public services; 3) a legislative framework that facilitates case-by-case agreements between public authorities and private stakeholders aligns well with a vision of flexibility.

Before establishing specific rules, I propose, in light of the scholarly work on standards in recent years (referenced in Section 2), that the legal framework should acknowledge the diverse range of citizens' needs. These needs, which may vary based on local conditions, are not solely physical but also include 'intangible services,' with energy being the most prominent among them.

Several issues warrant discussion, such as the statistical relevance, ontological meaning of need, and the obligation of the public sector to address collective inquiries. However, as these topics do not constitute the main focus of this paper, they will be explored in further research.

Another point of consensus is that, with the advent of smart cities and smart citizens, many needs elicit intangible responses. Thus, quantifying standards in square meters represents a significant limitation. To address this issue, it is noteworthy that the law allows for the equivalence between any offered service and the basic standard through economic valuation. The practical approach involves determining the cost of the required standard and defining the necessary services/facilities at an equivalent cost, potentially spread over a certain period.

The greatest extent of flexibility currently afforded by the legislative system is the monetary valuation of standards.

A critical aspect of considering standards solely as a spatial commodity arises in municipalities where the quantity of standard exceeds the legal minimum. In Northern Italy, municipal challenges are more closely related to the maintenance costs of public real estate than meeting the specific needs of citizens. Given the expenses associated with maintaining green spaces, roads, and renovating public buildings from the sixties and seventies (e.g., schools, libraries, administrative offices), acquiring additional land for public use poses a financial burden for future budgets.

Acknowledging the current needs of citizens, stakeholders, and urban areas as a whole, access to energy is of paramount importance (De Franco, Moroni, De Lotto, 2023; De Lotto, Micciché, et al., 2022). Additionally, the maintenance costs of public infrastructure in terms of energy are increasing, necessitating a focus on achieving the decarbonization goals set forth in international forums such as the COP meetings. The EU has outlined new models for energy production and distribution at both the European and member state levels (EC, 2015; EC 2021). Renewable Energy Communities (RECs) are viewed as the optimal solution to reduce Italy's dependence on foreign energy sources and decrease CO₂ emissions (IEA 2019; IEA, 2021).

AN ORIGINAL PROPOSAL: ENERGY AS STANDARD

Defining a comprehensive and statistically relevant list of potential needs is particularly challenging and risks being confined to transient necessities. As mentioned earlier, a more suitable approach to the new standard definition, one that aligns with the desired flexibility, involves moving away from a precise enumeration of goods. Instead, it establishes basic principles that each Municipality (or public bureau) can adapt to practical decisions on a case-by-case basis. Within this framework, the standard could, for example, prioritize the provision of energy for public buildings over a specific square meterage of green space.

Given that the initial step involves defining performance indices rather than specific quantities, I propose the following themes:

- a) Define a range of economic value to be transferred to the public, measured as a percentage of the absolute rent from the real estate initiative (as determined by the public), to gauge the 'urban footprint' of each private initiative;
- b) Quantify in kW or kWh the amount of public energy that the private sector must supply, in accordance with point a);
- c) Increase the percentage of kW (or kWh) if the energy is temporarily produced from non-renewable sources;
- d) Allow private entities the autonomy to select the most suitable technology, distribution network, and level of public network utilization.

Comments on the aforementioned aspects:

- Point a) is not detrimental to private initiative but quantifies the public's share of private real estate gains and the return such initiatives should provide, considering the utilization of public facilities. This enhances urban space quality, potentially increasing real estate values. Alternatively, public bureaus can assess the construction scope based on energy needs derived from previous maintenance balances of public buildings. Thus, public-private initiatives begin with a balance between public demands and private opportunities, rather than predetermined quantitative targets.
 - Regarding point b), it's crucial to shift the metric from spatial and localized measures (like square meters) to something intangible yet quantifiable, such as kWh. The appropriate territorial scale for system requirements remains unknown, and solely spatial elements may prove ineffective or harmful.
 - For point c), advancing toward decarbonization goals is essential. However, private initiatives may need time to establish new clean energy facilities. During this interim, the energy provided should incur a surcharge.
 - Point d) encourages technological competition between major providers (including public-private entities) and local businesses. This competition can introduce new market possibilities, opportunities, networks, and smart grids, currently beyond public bureau predictions. A win-win strategy emerges as stakeholders meet public performance demands, simultaneously enhancing their profitability.
- Transitioning from the current legislative framework to a new one, as outlined in sections 1 and 2, will undoubtedly be complex. Nonetheless, I am confident that embracing new possibilities and approaches will assist the urban community in embracing innovations for a more flexible and smarter city

ACKNOWLEDGEMENTS

For the development of this contribution, I wish to thank the following scholars and professionals with which I had meetings and discussions about the research topic: Prof. Stefano Moroni, Eng. Augusto Allegrini, Prof. Calogero Micciché, Geom. Carlo Cerizza.

For the literature review of Chapter 2., I wish to thank the colleagues who participated to the PRIN 2022 research proposal: “Planning adaptive and flexible public spaces for urban resilience”. The heads of the Project Units were: Anna Richiedei (University of Brescia), Elisabetta Maria Venco (University of Pavia), Francesco Rotondo (Polytechnical University of Marche), Marichela Sepe (National Research Council).

REFERENCES

- AA.VV., (2014). Mapping the smart cities in the EU, *European Union, 2014*
- Balint, P. J., Stewart, R. E., Desai, A., and Walters, L. C. (2011), *Wicked Environmental Problems*. Washington: Island Press. <https://doi.org/10.5822/978-1-61091-047-7>.
- Bertuglia, C.S., Staricco, L. (2000). *Complessità, Autoorga-Nizzazione, Città*. Franco Angeli Edizioni, Roma.
- Caldarice, O., (2018). *Reconsidering Welfare Policies in Times of Crisis. Perspectives for European Cities*, Springer Cham.
- Campos Venuti, G., e Oliva, F. (1993) (Eds.). *Cinquant'anni di urbanistica in Italia. 1942-1992*. Roma-Bari: Editori Laterza.
- Coderoni, S., Pagliacci, F., (2017). The territorial dimension of environmental sustainability in Italy along the urban–rural continuum, *Journal of environmental planning and management*, 2017; 61 (8): 1318-1339. doi:10.1080/09640568.2017.1348939
- de Biase, C., Losco, S., Petrella, B., *Urban abusiveness, planning and redevelopment in the Metropolitan city of Naples*, in F. Calabrò, L., Della Spina, C. Bevilacqua (Eds.), *New Metropolitan Perspectives. Local Knowledge and Innovation Dynamics Towards Territory Attractiveness Through the Implementation of Horizon/E2020/Agenda2030 – Volume 1*, Springer, Berlin
- de Biase, C., Losco, S. (2018). *Generational Equity in Italian Urban-Planning: Urban Standards*. In: Mondini, G., Fattinanzi, E., Oppio, A., Bottero, M., Stanghellini, S. (eds) *Integrated Evaluation for the Management of Contemporary Cities*. SIEV 2016. Green Energy and Technology. Springer, Cham. https://doi.org/10.1007/978-3-319-78271-3_38
- De Franco, A., Moroni, S., De Lotto, R. (2023). *Energy Communities in Smart Urban Ecosystems. Institutional, Organisational, Psychological, Technological Issues*, in Sokolowski, M.M., & Visvizi, A. (Eds.). *Routledge Handbook of Energy Communities and Smart Cities (1st ed.)*. Routledge. <https://doi.org/10.4324/9781003280118>
- De Lotto, R., (2022). *Elementi della città flessibile*. Maggioli Editore, Santarcangelo di Romagna.
- De Lotto, R., Micciché, C., Venco, E.M., Bonaiti, A., De Napoli, R. (2022). *Energy Communities: Technical, Legislative, Organizational, and Planning Features*. *Energies*, 2022, 15, 1731. <https://doi.org/10.3390/en15051731>
- European Commission. SWD (2015) 141 Final: *Best Practices on Renewable Energy Self-Consumption*, European Commission: Brussels, Belgium.
- European Commission. COM (2021) 950 Final: *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and*

the Committee of the Regions. State of the Energy Union 2021—Contributing to the European Green Deal and the Union’s Recovery (Pursuant to Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action); *European Commission: Brussels, Belgium, 2021*

Erba, V. (2001). *Strumenti urbanistici per interventi di qualità*, Franco Angeli, Milano.

Falco, L., (1993). I "nuovi" standard urbanistici, *Edalo*

Fistola, R. (2013). *Smart City. Riflessioni sull'intelligenza urbana*, TeMa – Journal of Land Use, Mobility and Environment, 6(1), 47-60.

Floridi, L. 2015. "The Politics of Uncertainty." *Philosophy & Technology*, 28(1): 1–4.

Gargiulo, C., Papa, R., (1993). "Caos e caos: la città come fenomeno complesso", Per il XXI secolo: una enciclopedia e un progetto. Università degli Studi di Napoli Federico II, pp. 297-306.

Gaeta, L., Janin Rivolin, U., Mazza, L. (2017). *Governo del territorio e pianificazione spaziale*, Città Studi Edizioni, Torino.

Giffinger, R., Fertner, C., Kramar, H., Kalasek, R., Pichler-Milanovic, N., Meijers E. (2007). *Smart cities. Ranking of European medium-sized cities*, Final Report, Centre of Regional Science, Wien UT.

Komninos, N., (2002), *Intelligent Cities: Innovation, Knowledge Systems And Digital Spaces*, Spon Press, London.

IEA (International Energy Agency). *World Energy Outlook—Topics—IEA*. 2019. Available online: <https://www.iea.org/topics/world-energy-outlook> (accessed on 7 February 2022)

IEA (International Energy Agency). *World Energy Outlook—Topics—IEA*. 2021. Available online: <https://www.iea.org/topics/world-energy-outlook> (accessed on 7 February 2022).

Mazzeo, G., Zucaro, F., Morosini, R., (2019). *Green is the colour. Standards, equipment and public spaces as paradigm for the Italian sustainable city*. TeMA - Journal of Land Use, Mobility and Environment. 12. 31-52. 10.6092/1970-9870/5836.

Moroni, S. (2013). *La città responsabile*. Carocci, Roma.

Moroni, S., Chiffi, D. (2022). *Uncertainty and Planning: Cities, Technologies and Public Decision-Making*, *Perspectives on Science*, 30 (2).

Portugali, J., (2000). *Self-Organization and the City*, Springer-Verlag Berlin Heidelberg, ISBN978-3-540-65483-4, <https://doi.org/10.1007/978-3-662-04099-7>

Renzoni, C., (2018). *Cinquant'anni di standard urbanistici (1968-2018)*. *Radici, Territorio* 84/2018, pp 21-23, DOI: 10.3280/TR2018-084003

- Richiedei, A., (eds), (2020), Standard urbanistici: proposte di rinnovamento, *Maggioli Editore, Santarcangelo di Romagna*
- Romano, M. (1993). L'estetica della città europea. Forme e immagini, *Torino: Einaudi*.
- Romano, M. (2010). Ascesa e declino della città europea. *Milano: Raffaello Cortina Editore*.
- Romano, M. (2013). Liberi di costruire. *Torino: Bollati Boringhieri*.
- Saraceno, P. (1969). Ricostruzione e pianificazione, *Laterza, Bari*.
- Sennett, R. (2000). The Corrosion Of A Character: The Personal Consequences Of Work In The New Capitalism. *W.W. Norton & Company, New York*.
- Schoemaker, P.J.H. (1995). Scenario planning: a tool for strategic thinking. *Sloan management review*, 36(2). *Cambridge, Mass.: Massachusetts Institute of Technology*.
- Shapiro, J. M. (2008). Smart cities: quality of life, productivity, and the growth effects of human capital, *The Review of Economics and Statistics*, 88(2), 324-335.
- Tosi, M. (2018). Manuali impliciti, *Territorio*, 84/2018, pp 55-58, DOI: 10.3280/TR2018-084007
- Van Soom, E. (2009). Measuring levels of supply and demand for e-services and e-government: a toolkit for cities, *Smart Cities Research Brief*, 3.
- Zamponi, M. E., Barbierato E., (2022). The Dual Role of Artificial Intelligence in Developing Smart Cities, *Smart Cities* 5(2): 728-755. <https://doi.org/10.3390/smartcities5020038>.

Cited Italian Laws

Law 17 August 1942, n. 1150, Urban Planning law

Law 18 April 1962, n. 167, Arrangement for the acquisition of land for public housing

Decree 2 April 1968, n. 1444, Limits to distances, density and heights of the buildings and relation between private buildings and public services

Law 28 January 1977, n. 10, Rules about soil buildability

Lombardy Region, Regional Law 11 March 2005, n. 12, Law for urban and regional government

SHORT AUTHOR BIOGRAPHY:

The Author is associate professor at University of Pavia, Department of Civil Engineering and Architecture. His research interests include public participation in planning, data analysis and management, environmental planning and assessment. He has published more than 150 scientific products. He has been Executive Councilor for Urban Planning in Segrate Municipality (Milan, Italy).