

# Urban redevelopment and energy saving

## The case of the incentives in Italy, between risks and opportunities

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**Abstract**— Building construction consumes energy and materials. Even if the scientific community has developed two main voluntary protocols of building construction evaluation (BREAM and LEED), the authors argue that one of the main factors that could be incisive for a better environmental sustainability is to stimulate all possible initiatives, including the reuse of recyclable building materials, that currently, is a modest application. Based on this, the paper is organized in two parts. The first is an analysis of the Italian situation with regard to urban redevelopment and energy saving, considering the number of initiatives and costs handed out for each region. The second evaluates and proposes new insights on the basis of the obtained results.

**Keywords**—urban development, energy saving, Italy, building construction evaluation

### I. Introduction

After the negative trend of the Italian construction sector started in 2005 that has weighed on the quality of city life, on social cohesion and on growth potential, we can see a positive glimmer (ANCE dated February 11, 2015 - [www.ance.it](http://www.ance.it)). In fact, although the economic crisis has not appeared as something of transitory in this field (Fregolent, 2014 [1]), investments in the housing stock redevelopment from 2008 to 2014, showed an increase in production levels of 18.5%, most likely due to the extension of the institutional strengthening of tax incentives for building renovations and energy saving. Following the above, the recent national and international urban redevelopment and building shows several signals that promote an urban sustainable development [2], also as a result of institutional incentives. According to Fregolent (2014) "the connection between planning (strategy) environmental sustainability (tool) and urban regeneration (objective) [...] can generate a new season of building work, in order to trigger virtuous mechanisms of regeneration in the 'existing city' (Fregolent, 2014). The authors are aware that a real change in relation to urban regeneration can occur, if the State and local governments intervene on stronger policies , encouraging synergies between public and private

projects. Within this context, one of the main factors that could combine a visible change in the relationship between planning, environmental sustainability and urban regeneration is to start from the bottom. In other words, public administrations have also to stimulate all possible initiatives, including the reuse of recyclable building materials [3], that currently, is a modest application. In this sense, understanding the role that the building and energy certifications can obtain, becomes critical. Certainly, the building certification allows an overall evaluation of the impact of construction on the environment taking into account all the stages of life of a given building manufacturing: from construction to sale or to conversion. In this regard, the scientific community has developed two main protocols of evaluation: the first is based on qualitative methodologies (in scores); the second on the quantitative quantification of impacts based on LCA (Life Cycle Assessment [4]), that refers to the individual components. The result of this opposite vision is also found at world level. In fact, currently only two protocols were adopted on a voluntary basis, referred to the scoring system of BREAM - [5] and of LEED - The Leadership in Energy and Environmental Design) [6]. Specifically, LEED certification appears as a flexible and articulated system that provides differentiated formulations for new construction (Building Design & Construction - Schools - Core & Shell), for existing buildings (EBOM - Existing Buildings Operations & Maintenance), for homes (GBC Italy Home) and for urban areas (ND - Neighborhood) while maintaining a consistent background setting among the various contexts. This international certification is a verification by a third party, that is independent of the performance of a whole building (or part of it) and / or urban areas. It is finalized to the certification of the environmental protection and constitutes an healthy place to live and work.

### II. Benefits of the LEED Certification

In this sense, obtaining LEED certification allows to obtain both economic and environmental benefits, such as:

1. Establish a common standard of measurement of "green buildings", defined as buildings with a low environmental impact;
2. Provide and promote an integrated design that covers the entire building;
3. Give recognition to those who create virtuous performance in the construction field;
4. Stimulate competition on the theme of environmental performance;
5. Establishing a market value with the creation of a brand, recognized worldwide;
6. Helping clients and increase their awareness of the importance of green building;

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7. Transform the market and the construction sector.
8. The reduction in operating costs, increasing the value of the property.
9. Reducing waste sent to landfills.
10. The energy and water saving.
11. The development of safer and healthier buildings
12. Creating compact communities and accessible with good access to neighborhood services and transit
13. The protection of natural and agricultural resources, encouraging urban development in areas already populated.
14. The reduction of harmful emissions of greenhouse gases.
15. The opportunity to take advantage of tax breaks, subsidies of zoning, and other incentives.

The demonstration of the commitment of the owner to environmental stewardship and social responsibility. Only with a large effort of integrated planning and coordination, it is possible to create a harmonious building in all areas mentioned above. Competitive advantages for those who adopt the LEED standards, whether professionals or companies, are identifiable mainly in the big final quality of the product, in saving costs, which translate into positive social factors, certainly not negligible [7].

The LEED certification, in fact, provides to the market a shared approach, on which to base decisions and a measurable standard for every considered aspect. However, the LEED certification does not have legal obligations, and therefore does not fully express its power. In this sense, delaying policies or actions activatable at national level for sustainable urban regeneration – on the model of the National Energy Plan - can postpone to set important goals . The model of the National Energy Plan has a significant effect on the regeneration and leaves the choice of the individual citizen, that stimulated by financial incentives, alone takes decisions designed to meet their needs, without affecting lines and objectives of urban social and environmental type [8].

### III. *Evaluation of the process*

Cities are the subject of profound evolutionary processes that change radically the structure and shape based on new principles and logical development. The transformation process brings into play the resources economic, political and social response to the question of improving the living conditions and services, development of the economy and employment to people more and more numerous and heterogeneous. Today we discuss a lot of smart city, where mainly the concept is associated with the concept of smart growth. The welfare of the citizen has a fundamental role, but must fit in a system to facilitate the citizen himself in the movements, reducing the distance between his home and the workplace, reducing the costs of real estate and cost of living in the neighborhood where he resides. Reducing the impact on the surrounding environment and hence the quality of life, it appears among the main objectives for growth in the current paradigm of smart cities. Although the international crisis has had effects that are manifested in

different forms and levels and is doing a lot of damage, there is an economy of 'building' green '. Data proves it: it has grown from a + 2% in 2005 to + 10-12% in 2008, and is expected to remain at 20-25% by 2014 (McGraw Hill Construction, 2009). The containment of energy and pollution are now the hairs around which we build the future not only in industrialized countries, but also of those in the developing world. One increasingly international interventions in common the prevailing approach "build or rebuild saving". In Italy, this approach is applied instead almost exclusively with regard to the containment and self-generation energy, leaving no secondary aspects of environmental sustainability (Agency informs - updated Jan 2015 [http://www.casa.governo.it/allegati/guida\\_ristrutturazioni\\_edilizie\\_gen\\_2015.pdf](http://www.casa.governo.it/allegati/guida_ristrutturazioni_edilizie_gen_2015.pdf)). In particular they are among the tax incentives (Irpef – Italian Income Tax) promoted by the Italian government, the following categories:

1. those indicated in letters a), b), c) and d) of Article 3 of Presidential Decree 380/2001 (servicing, maintenance, preservation and restoration, building renovation), made of all the common parts of residential buildings;

2. those necessary for the reconstruction or restoration of the property damaged by natural disasters, but these jobs do not fall into the categories mentioned in the previous points, provided that it has been declared a state of emergency;

3. those relating to the construction of garages or parking spaces appurtenant, even in common ownership;

4. those related to the elimination of architectural barriers, involving lifts and elevators (for example, the construction of a truck outside the house):

5. those for the construction of an instrument that, through communication, robotics and all other means of advanced technology, is likely to encourage internal mobility and external housing for people with severe disabilities, in accordance with Article 3 , paragraph 3 of Law 104/1992. The deduction is responsible only for expenses incurred for delivery of actions on buildings, while not up to the costs incurred in connection with the simple purchase of instruments, although designed to facilitate communication and internal and external mobility. Therefore, by way of example, not falling in facilitating the phones in hands free, touch screens, computers, keyboards expanded. These assets, however, can be classified in the category of subsidies and technical information for which, under certain conditions, there is the personal income tax deduction Irpef of 19%;

6. those of asbestos rehabilitation and execution of works aimed at preventing domestic accidents. With regard to home security, does not give the right to deduct the purchase simple, even for replacement of equipment or appliances equipped with safety mechanisms, such as this case does not constitute an intervention on real estate not for any deduction for buying a kitchen automatic shutdown, which replaces a traditional stove). The facilitation competes, however, even for the simple repair of installations insecure realized on property (for example, the replacement of the gas pipe or the repair of a socket poorly functioning). Among the works agevolabili fall the installation of equipment for detecting the presence of

inert gases, the assembly of glasses anti-injury, the installation of the handrail;

7. those relating to the adoption of measures to prevent the risk of potential illegal acts by third parties. For "unlawful acts" are as criminal offenses (eg, theft, assault, kidnapping and any other offense whose implementation involves the infringement of rights protected by law). In such cases, the deduction is applicable only to the costs incurred for delivery of actions on real estate. Does not fall in facilitating, for example, the contract with a monitoring;

8. those aimed at the wiring of buildings, to reduce noise, the achievement of energy savings, the adoption of security measures static and earthquake resistant buildings, execution of internal works.

These works are very important and fundamental for building urban renewal, whose territorial effects are little known. In other words are actions that tend to sustainability but according to a vision oriented smart city and not to a vision smart region [9] [10]. To better understand the sequence of incentives nationwide, is provided below the table 1 indicates the years, the rate, and percentage limits to recovery of the housing stock.

TABLE I. INTERVENTIONS OF RECOVERY PROPERTIES –SYNTHESIS

Interventions of recovery properties –Synthesis			
Years	rate	percentage	Limits
01.01.98 – 1.12.99	5 o 10	41,00%	lire 150,000,000 per property or person
01.01.00 – 31.12.01	5 o 10	36%	lire 150,000,000 per property for person
01.01.02 – 31.12.02	10	36%	euro 77,468.53 per property for person
01.01.03 – 31.12.03	10	36,00%	euro 48,000.00 per property for person
01.01.04 – 31.12.05	10	36,00%	euro 48,000.00 per property for person
01.01.06 – 30.09.06	10	41,00%	euro 48,000.00 per property for person
01.10.06 – 31.12.06	10	36,00%	euro 48,000.00 per property
01.01.07 – 31.12.11	10	36,00%	euro 48,000.00 per property
01.01.12 – 25.06.12	10	36,00%	euro 48,000.00 per property
26.06.12 – 31.12.14	10	50,00%	euro 96,000.00 per property
01.01.15 – 31.12.15	10	50,00%	euro 96,000.00 per property

The promotion began in 1998 and is still ongoing, albeit with rates, percentages and limits vary from year to year. But two initiatives look attractive: the first since 2006 with the deduction related to the property and not to the person, the second from 2009 began the systematic monitoring (tax year 2008). These initiatives, necessary, although late have allowed to associate the incentives to property used for regeneration and at the time of measuring the phenomenon both in terms of frequency and in terms of amounts.

Statistical analysis of Irpef by the personal income tax -

the historical trend - Statement 2014 (tax year 2013) - statements 2009 (tax year 2008) [5] although referring to a period in respect of declarations partial (deductions in 1998 (tax year 1997), can show the first important considerations

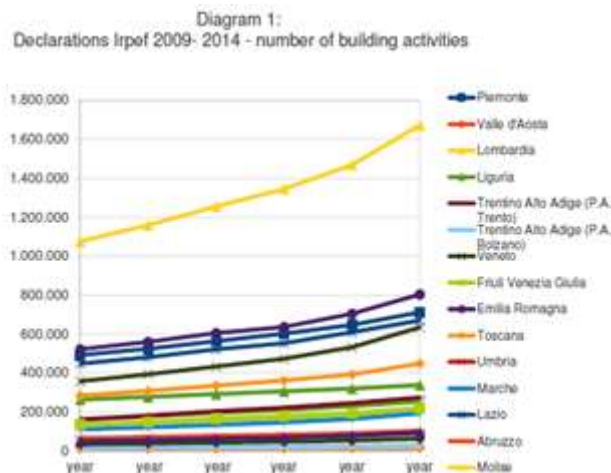


Figure 1. Declaration Irpef 2009/2014. Number of buildings activities

Diagram 2 -Declaration Irpef 2009-2014 - numbers of interventions in Sardinia

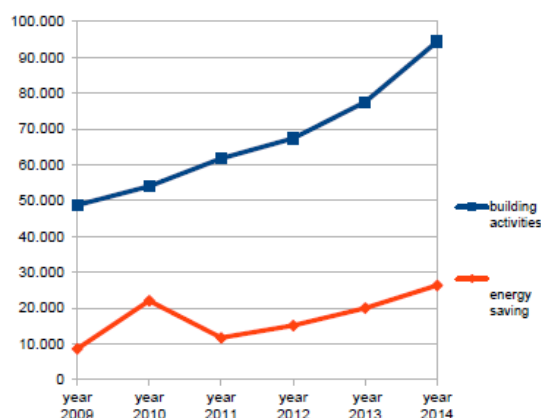


Figure 2. Declaration Irpef 2009/2014. Number of interventions in Sardinia

Firstly we can see the difference between north and south Italy, and in particular the virtuosity of Lombardy for the number of procedures performed. Instead, Sardinia is among the last in the standings and at the same time presents a modest affection to the instrument. In fact, the number of operations for the years 2009-2014 with respect to the real estate and energy improvements in Sardinia are showed in figure 2:

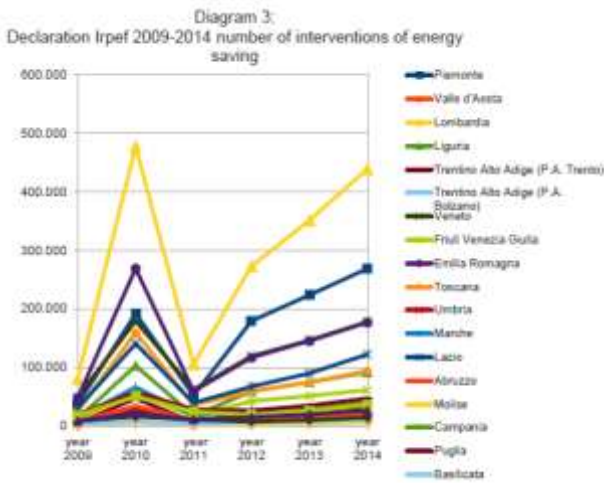


Figure 3. Declaration Irpef 2009/2014. Number of interventions of energy saving

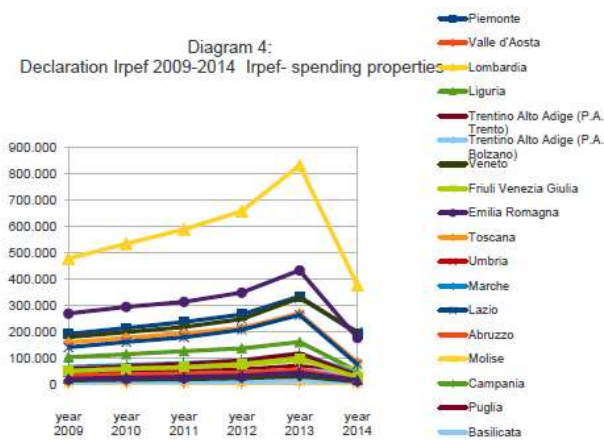


Figure 4. Declaration Irpef 2009/2014. Spending Properties

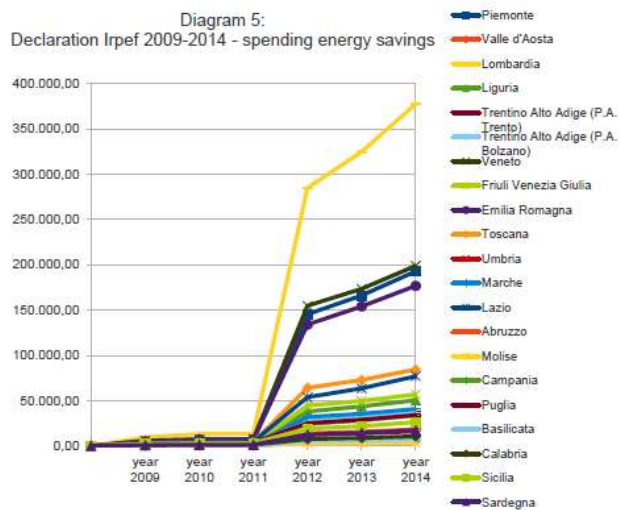


Figure 5. Declaration Irpef 2009/2014. Spending Energy savings

Furthermore, we can see that the amounts against the increase in the tax deduction from 20% to 55% have created a clear incentive for investments for improving performance referring to real estate. This tool deduction stands significantly to urban regeneration and improving

building energy as enshrined within the City Urban Planning (PUC) and the Strategic Planning Municipal (PSC). However, the lack of incentives in its various forms, within the PUC and PSC, decreases their effectiveness. Unlike the institutional tools intended to encourage restructuring and improving energy related to taxes, even if they have still forse è meglio il participio passato?? roomed for improvement, they showed a gradual positive result. Even more marked in northern Italy, but certainly considerable positive for other regional contexts. These instruments of taxation assume even greater importance in light of the increasingly central role that marked the city is acquiring in the process of economic development, environmental and social, becoming one of the main focal points of policies and economic strategies [11]. Although globalization has brought the focus of the city such as generators of wealth, employment opportunities and productivity growth, real drivers of their national economies. In this sense, the European Union, as part of the Lisbon Strategy, recognizes urban areas as a driving force of economic dynamism, and the guidelines of the regional development policy identified in the 2007-2013 city one of the priorities on which they are passing intervene member states, in the belief that a strong impact on the lives of more than half of its citizens [12]. The data and related assessments as above represented at the same time allow to measure even partially, the phenomenon of urban metabolism, intended as a flow of energy and materials through an "ecosystem" urban, featuring urban growth [13], according to the evolving interpretation of A. Wolman. (1965) [14]; Pincetl S. (2012) [15]; M. Costa and B. Lino (2015) [16]. In this regard there is an Italy that has different speeds of the initiatives to upgrade and more generally to strengthen the concept of the city in more modern view, which according to the theory of Geoffrey West [17] is to be considered a real urban organism. Particularly with increasing size of urban (meaning also the redevelopment of existing buildings) will generate ideas at a faster pace than the smaller ones.

In other words, creativity, innovation, patents, investments and research, and development, follow the law of power a quarter of Max Kleiber [18], but with a positive sign. Namely, the cities ten times larger than another are not 10 times more innovative, but 17 times. A city 50 times the size of a small town is 130 times more innovative. The urban population growth is a major topical issue worldwide, the city-factory of China to the sprawling slums and slam (Latin America, India, etc.) up to our national context, characterized by linear cities and an urban renewal resulting from events at maturity (Olympic Games, expo, tax exemptions). All indicators examined from West show that when the size of a city doubled, the increase in resources necessary, from raw materials to energy is only 85 per cent. Even the influential theory of J. Jacobs (2009) [19] in the same direction "When we are together, people become more productive and innovative." And since our way of life is unsustainable, each new resource is used up more quickly. This means that the cycle of innovation must accelerate constantly, and that each new discovery helps us for a shorter period. The result is that the cities intensify not only the rhythm of life, but also the speed with which they change. In this situation, Italy is in an intermediate, or

cities grow and become as a result of events at maturity (2006 Turin Olympics, Expo 2015 Milan, European City of Culture in 2016 Matera), ie without external stimuli do not grow - regenerate. Certainly the demographic and the economic and financial aspect uncertainty does not help, and at the same time distance us from the goals of smart city and region. In this context, the intervention of the tax deduction is the only real instrument of stimulus at which we must make the improvements so that it can be more incisive and in terms of credibility and town both in terms of environmental sustainability, it is at present only refers to the energy aspects.

#### IV. Proposal and conclusions

Following the framework previously presented, featuring a scene of Stimulated by the central government, that of the tax benefit applied to the redevelopment of the real estate and energy saving, is the lever of social awareness at the national level. In this sense it can be said to have had overall beneficial effects, although different from region to region. However, its apparent limit is given by the close link with the Law of Financial stability and therefore susceptible to change from year to year. This uncertainty has led to believe that they would propose a scenario for the next 5-10 annuity, always based on the stimuli, as the only systems in which citizens are still fond (figures 1,3,4,5). The proposal, simple and above all consistent with the objectives of sustainability [20], relates to the introduction of LEED certification for the redevelopment of real estate.

years	rate	percentage	Limits
01.01.16 - 31.12.20	5 o 10	50,00%	euro 96,000.00 per property with LEED certification
	5 o 10	36%	euro 96,000.00 per property without LEED certification

TABLE II. 019-2020 IRPEF PROPOSAL –SYNTHESIS

Only with this condition should benefit from the maximum tax deduction for all other interventions there may be some intermediate conditions. Doing so would follow a line of action already plowed by the Government, and in some ways already assimilated in many Italian regions, the effects of which for the first time would not only fiscal but also environmental. It would introduce a re-growth which implicitly contains objectives of environmental sustainability refers not only to the city, as a place of destination of the interventions, but more generally to the local context within which propagate urban environmental effects.

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[6] LEED It is a US system of classification of energy efficiency and the ecological footprint, provides a set of measurement standards to evaluate environmentally sustainable buildings. Also in the state of Nevada, the building materials for a building with LEED certification are exempt from local taxes. The state of Michigan has considered the application of only one tax base for buildings with LEED certification. Other local governments have adopted incentives for LEED program, such as a credit on taxes, or a lowering them, the reduction of fees, priority or acceleration permits, technical assistance at no cost or reduced subsidies and low-interest loans; or urban and territorial policies based on tax exemption.

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