Rules, language and energy. The evolution of a conscious design culture.

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Abstract

In recent years have we have witnessed a consolidation, a very slow and gradual evolution of design culture which is energetically conscious thanks to certain particularly stringent and effective drivers. This phenomenon has been more or less physiological and spontaneous differing from the regional and productive contexts from which it developed, but the phenomena that have supported and promoted it are usually the same at the continental level. Certainly, the increased cost of energy from renewable sources contributed to it and the resulting impoverishment of the end users who must bear the burden, the development of technologies for better and more integrated systems for energy production in the technical elements of buildings, the improvement of performance in energy terms of materials and building product components. In this context, in recent years several addressing measures used both on a continental and national scale, which led to the development of a body of law, articulated on local level in a very widespread way, causing a drastic review of the standard procedures of planning/design and construction practices of the building/facility system as a whole.

The evolution of a conscious design culture.

The first legislative instruments published after the EEC Directive 2002/91/EC on energy performance of buildings, not always coordinated with each other, tackled head-on the problem of reduction of energy consumption concerning the management of the winter season, or a reduction of energy loss due to low efficiency of production facilities and distribution of heat and especially to the poor insulation of the technical elements of the building. Later began contemplation of reducing energy consumption for the summer season, or a reduction of costs associated with air-conditioning/cooling and thus the reduction of energy consumption in countries located warm temperate regions. These regulatory environments, more or less ambitious in their objectives to change the context in which they found themselves and operated, did not generate the desired effect immediately, even in the most virtuous reality, due to two unavoidable factors: the first is the traditional resistance of the operators the construction industry to experiment with new technology and the second, more importantly, is the heavy dowry represented by the size and condition of existing housing stock. In most European countries, the percentage of new housing construction in one year does not exceed 5% in relation to the existing one, in some countries, such as France, the economic impact of interventions on newly built constructions represents 50% of the total turnover in the construction sector. This has led to a very slow affirmation of a new operational culture related to renewed indications or regulations set forth by the European and national, which fortunately in recent years is yielding its first fruit visible and verifiable in terms of performance and quality assessment architectural and urban achievements completed.

It is possible to also find another type of indirect driver, which has strongly influenced the enlargement of the basis of market acceptance of certain technical solutions and plants, or the demand for higher and more diffused levels of comfort inside buildings, these are the residential ones that are intended for productive activities. Therefore, a new quality request that implies an dissatisfaction on behalf of the users with reference to the current building stock and since, when it comes to the quality of an architectural or urban project, we must speak of its level of quality, a level of compliance responding to the need that generated it,
this gap between demand and supply is mainly due to changing needs and requirements of end users that have not been collected and interpreted in time by production operators.

The construction market is developed for a long time without paying attention to the real needs of end users, offering building products trivialized on traditional models, very innovative and very conservative compared to a capability and culture that is design oriented and relatively consolidated and never technically risky. Continued to be put on the market were buildings measured by production only in terms of the relationship between construction cost and value of market positioning, without assessing the cost of management and operation. In many contexts, the factor that had the greatest impact on the exchange value of the property was not its intrinsic quality, whether it be environmental or functional, but its advantageous position, or its location.

This trend has held up until the explosion of the recent economic and financial crisis that has more or less directly affected all productive sectors of developed economies, drawing a fierce selection of players in the market, declaring the closure of a positive construction cycle in Italy that had lasted since 1995.

In Italy this phenomenon was particularly evident in the housing sector, despite the fact that the housing market continues to always report an emergency situation due to the large gap between demand and supply of housing – particularly in social housing market - while a need for social housing at considerably low costs and capable of generating new situations deep poverty and social marginalization, the housing market of the middle and upper levels has prospered with growth factors highly relevant to the private market and at range of supply and demand still solvent.

Whether facing the social needs of a quantitative nature or in the case of a qualitatively more complex question in the private sector, the market responds with a trivial and flat offer regarding technological definitions that are very traditional and with solutions that are typologically blocked - in part by current regulations - such as offering only value-added extra facility spaces or equipment. In the face of this picture of the relationship between demand and supply of homes on the market that it is possible to define that the quantity needs arise from the perception of the quantitative inadequacy of existing housing stock, while the demand for quality stems from an awareness of the need to establish a new relationship also with the surrounding environment, building scale and complex settlement. This gap between supply and demand in recent years has generated a significant increase of unsold housing stock, because it was not absorbed by the market demand for inadequate performance, a functional inadequacy, location inadequacy or an erred market placement, or still yet the inability of potential buyers to get credit at the time of purchase.

The general economic crisis has refined the critical selection of buyers and awareness of leave for good quality response that you purchase, whether the dwelling or structure instrumental in its production. The survey carried out by Cresme for the preparation of the Report SAIENERGIA 2009, showed how factors such as thermal insulation, comfort noise, orientation of buildings, the provision of advanced engineering solutions, are no longer foreign to the widespread culture of end users and above these factors begin to affect market choices and lives of those who are preparing to choose their own home or workplace.

It is clear that when energy efficiency and performance of building products, understood in the widest sense of the term, is one of the conditioning factors of its market positioning and its rating, it means that we are facing an environment mature and consolidated kept alive by a growing culture of widespread energy sustainability and economic choices that are implemented by each trader in the market. This applies to the individual who is about to choose his residence, as the collective or public entity that undertakes a complex building initiative. Obviously we are not in these conditions but all the indications are that the gradual maturation of the application also will force the industry to evolve more reluctant to work for a better and more qualified offer of building production.

In this context, the role of legislation, the institutional impetus that the government can exercise leadership through addresses and directions in performance on the final quality of the built environment is fundamental and critical to trigger a virtuous cycle of improvement in the average standard of buildings and urban environment created.

**Dynamics of the built environment governance**

The dissemination of tools such as guidelines or industry codes of practice, standardized protocols or technical recommendations, allows the government to exercise, consistent with its technical and economic
resources, to exercise oversight functions and policy of building public policy areas such as social housing, the residential student housing to health and education, succeeding also significantly affect the production of private housing.

In areas where the government fails to act without the participation of private capital, or where it is also important to target interventions on private environmental quality standards controlled and consistent in the absence of detailed technical plans of action (brief) administrations ever more often they use documents and support the design, to be made effective, are associated with implementing or planning instruments to traditional local building regulations in order to entrench their effectiveness on the ground.

This new generation of tools for directing planning activity in interventions, that are also useful in the control phase of the outcomes of building production in terms of energy efficiency and housing effectiveness, have a role, essentially, in the quality of the definition of the project.

These instruments support the planner in two key moments of planning: principally in the preliminary phase before planning proper, and later at the moment when the project moves on to the phase of technical and technological definition in detail.

In the preplanning phases, a moment in which the planner faces the cognitive part of the project, in which he/she rereads the client’s indications in an explicit and implicit way regarding the project to be carried out, rather than confronting the project at the outset with a building plan of a functional and quantitative character, the planner has at his/her disposal an important quantity of supplementary information that allows him/her to complete the picture of the disciplinary problems of the building or building complex he/she is planning, being able to look further at some of the implications of a performance, technical-constructive and plant character, as well as of a distributive character, right from the first phases of the preliminary project.

In this phase, the alignment of guidelines or codes of practice for the building programme contained in the preliminary planning documents or in the technical disciplines allow the planner an immediate integrated approach to the planning, when he/she do not have access to all the necessary technical competences required for the requested specialist planning. We also have to underline how the accumulation of exemplary experiences that have been made available through these instruments and the cataloguing of typical solutions from a constructive or functional point of view can also allow a more reliable estimate to be made of the economic costs of the interventions being planned.

In the phase of defining in detail the preliminary analysis, support instruments for planning allow us to predict or foresee with greater certainty the behaviour of defined technical elements and the response of the planned use of space. This also permits the introduction into projects of elements of technical and functional innovation providing greater security in respect of the final outcome of the works, thus dealing with the traditional distrust of workers in the sector towards the use of innovative elements that aren’t well-consolidated in the use and technical culture of the operators or the administrations in charge of the technical control and carrying out of the project.

Some local administrations, in particular those involved in phases of particular and intense urban building development, have started to place alongside their traditional control instruments for directing building activity and planning, codes of practice and guidelines in support of planning interventions.

Rome City Council intends to direct the planning process for interventions included in the new Zone Plans, in other words, the provision of guidelines to improve the quality of the definition of projects to improve their level of quality at the building stage, including as it does a more finely tuned and complex control tool to the evaluate predicted performance. On this occasion, all of the regulatory indicators in force can also be made operative in an organic way by the Council with single measures and the new regulations of the General Regulatory Plan with regard to environmental sustainability in building interventions, and also go beyond a certain traditional rigidity of these same urban tools that are currently in use.

The “Code of Practice” is intended as a support tool and indicator for the realization and control of sustainability in building interventions, in particular in social housing, and it proposes a highly integrated approach to planning. The code provides the answer to housing requirements in economic, social, functional, environmental and energy terms. Proposals for innovative useful types of additions to the creation of urban
spaces are analyzed in terms of both the comfort of public spaces, and as a functional and social mix in a way that obviates the phenomenon of social and economic segregation that is typical of metropolitan suburbs.

The Code also deals with the evaluation of appropriate and measured technological solutions to the types of buildings to be constructed in a way that ensures they don’t clash with the aim of the local promoters, even if this requires a higher level of technological performance aimed at the environmental sustainability of the interventions.

The analysis of the innovative technological solutions for the realization of residential buildings is examined closely, down to the study of construction materials to be used so as to orientate in an intelligent way the choice of the construction solutions and their successive control in the phases of construction and building management. By the same logic, the most appropriate plant for energy efficiency was analyzed and evaluated in the light of the most recent legal requirements regarding energy saving and management. To support these requirements, the code proposes an integrated model of analysis of the sites where interventions take place that includes all of the environmental aspects and characteristics of the single sites, in order to create a space within projects and planning strategies for the natural and human character of these sites.

This is only one of the most recent examples of that which is establishing itself as a new culture of public city planning, looking in a particular way at the growth of the residential building patrimony that is innovative both for its quality of use and its environmental impact on the territory and its resources.

These examples, however, are also testimony to a need for a profound renewal of the normative system that governs public and private residential building, both at the level of territorial planning of interventions and at the level of the qualitative and quantitative offer of services or the use and management of resources. The established normative system is now considered tired and inadequate for interpreting the needs of contemporary society, as well as not being malleable and flexible enough to be able to welcome the occasions offered by the advances in technological innovations in the sectors of the construction industry, of management and energy services. The national normative framework of reference on the planning and management of interventions on residential buildings struggles to gather the input that comes from localised contexts and other economic sectors; this is why local administrations are moving to provide themselves with local systems of regulation and guidance to be able to manage in a peripheral manner the evolution and innovation of the system and the construction of new buildings.

Even if the normative intervention of local bodies, generally of an obligatory or recommended nature, cannot limit the area of application of a national provision, they do allow the improving of the requests for additional services to be provided, increasing and detailing the specifics and adapting them to the local context. There are very many local initiatives in this direction that have been promoted in the last ten years by different public bodies, often supported by the collaboration of collective groups of representative cooperatives of the final users or the economic operatives in the sector.

Regional, provincial and city governments in Italy, not without a certain difficulty and since the ‘90s, have started to become aware of the need to promote environmental policies aimed at improving the living conditions of citizens and mitigating the effects of building and manufacturing activities on the urban ecosystem, which is often already compromised. The evolution of environmental sensitivity and the spreading of the awareness that a common response that is sustainable socially, economically and technologically, supported by the acceptance of various European and national laws have led to the defining of a number of instruments of a local normative character for the preliminary definition and control of building activity from an energy and environmental point of view.

These normative instruments, that gather together national indications especially in terms of the energy efficiency of buildings and consequently on the energy management in building activities, are overcoming the traditional approach to building activity based on static control, health and spatial parameters. Local regulations (building rules, technical norms, regional guidelines, etc) have as their aim that of directing individual choices towards the collective interest that can be obstructed or damaged by the actions of individuals.
Considering the environmental impact of the building sector on the global environmental balance of human activities, and that 80% of European citizens live in urban areas and spend 90% of their time inside buildings, it appears evident how the insertion of themes relating to the sustainability of building interventions represents a call to the public and private purchasers for a new system of needs that’s more structured and mature and expressed by citizens, whether implicitly or explicitly.

Sustainability puts itself forward as an additional value in the actions of local government, but also as an economic surplus in building up the exchange value of a property. The new needs picture that defines itself in relation to building activities, whether aimed at the construction of residences or buildings for the service industries, expresses a request for quality connected to the transformation of the models of use for buildings.

In particular, this renovation is most easily perceived in housing where the traditional model of use has been profoundly challenged by a large number of factors; new ways of working, the presence of home working, the cohabitating in the same spaces of traditional dwelling activities with those of free time and amusement, the presence of a substantial amount of refined technologies such as IT which, until a few years ago, would have been extraneous to the domestic setting, these have all profoundly changed and rendered more complex the system of guideline requirements for the planning of buildings. Where once the healthiness of the environment had to be and could only be guaranteed by the positioning of a building and the control of air movement, today it also has to be evaluated in terms of the density and distribution of the plant networks within the structure.

Even if this type of control action of the impact of building on the environment is assuredly an absolutely positive factor, the lack of coordination at national level may cause a number of difficulties in terms of harmonising the measures promoted and the control of their effects, leading to a certain amount of confusion among operators in the sector.

**Local governance and Levels of action**

The levels of action of the policies relating to sustainability in building are primarily three: regional, provincial and communal; these three levels of action echo the levels of the articulation of government of the territory and building activity. The regions provide indications about behaving in the general interest and specific techniques relating to sectors, those that are particularly pertinent to them (social housing, health, education, etc.), the provinces have a very important role in the policies of specific sectors, in particular in housing, educations (schools) and on the management of resources and energy consumption (provincial energy plans), while the communes provide indications of a technical building nature relating to the construction and management of the entire building stock, irrespective of their intended use, while the communes also exercise a controlling role during the phases of construction and approval. The actions proposed by the various bodies are therefore in keeping with their various fields and levels of intervention in the management of building activity. In particular, in the management of public and private residential housing, the regions are in charge of the management and technical and economic planning for social housing and also manage the resources relating to the support of social leases, as well as coordinating the activities of the Territorial (or Local) Agencies for Residential Building (ATER or ALER); the provinces have direct relationships with the Agencies for Residential Building; the communes in turn directly run their own building patrimony and administer in their territory the economic resources destined to the support of social leases, and, in close contact with the Agencies for Residential Building, manage the assignation of public residences to the end users. On the basis of recent national laws, they manage throughout their territory all the initiatives aimed at overcoming the “housing emergency”, and are therefore responsible for the final “local action plans” (2007-2011).

The normative actions and guidelines launched by the various administrations and different scales of action all represent activities aimed at the promotion of a culture and widespread practice of sustainable building; the sustainable approach, in fact, requires a concrete and profound change in the practices and behaviour of all the operators in the building process, in urban planning, in new public and private buildings and in operations of building renovation. In this process of innovation of planning and building behaviour, the public administrations and, in particular, the local bodies entrusted with the role of directing and controlling the process of transforming the territory have to make themselves promoters and models of correct behaviour in the theme of sustainability. Local administrations are entrusted with the task of identifying best practices to be carried out by the operators in the building sector in their construction initiatives. This type of action requires a great planning effort of the part of local administrations, who are called upon to try out new ways
of prefiguring the behaviour of the players in the process, and having to substantially remove themselves from traditional building norms that were generally obligatory and generalist, usually free of any contents to do with use, that are also useful in verifying the efficiency and efficacy of the proposed planning solutions or the technical solutions applied by the builders.

The regions have a strategic role in the cultural renovation of the construction sector. The work of the regions on elaborating the guidelines on the control and governance of building activity contains in fact all the characters of the complex strategic approach that allows, in the successive levels of action, the formulation of a policy of integrated approach in a sustainable key to the transformation of the human environment.

It’s important to underline that in the near totality of cases the introduction of a system of norms for promoting indications or regulations on the sustainability of building interventions has not overturned the traditional structure of regulation in the sector. In many cases, the introduction of criteria of sustainability or best practices aimed at the creation of sustainable buildings runs alongside the traditional indications and regulations, defining a new quality profile that is more complex and efficacious in terms of environmental impact, the wellbeing of users and the reduction of energy consumption.

Paradigmatic of this type of behaviour is the document of the Emilia Romagna Region that defines the criteria for the drafting of building rules for use by the communes in its territory. In this case, building activity is regulated on the basis of the buildings agreeing to two sets of requirements, one that is obligatory and compulsory, the other voluntary, the Suggested Requirements, whose contents were then updated and transformed into Voluntary Requirements, relating to the wellbeing and correct use of building works. This packet of requirements aims to improve the quality of life of the users in respect of the receptive capacity of the ecosystem, of the possibility of renewal of natural resources and of the balance between manmade and natural systems. The indications relating to the interactions between building and environment to reduce non-renewable energy consumption to reduce CO2 emissions in the atmosphere are of great relevance.

This articulation of the directing actions of the region prefigures a hierarchical articulation of the indications that are given about building activity; the binding requirements give indications about security, stability and the health of buildings and the ways to respond to the general indications on energy saving, acoustic isolation and the use of spaces. The voluntary requirements define an area of extra value in the performance of buildings; they define the dispositions on dangerous emissions, surface dampness, artificial lighting, temperature and air movement. The voluntary recommended requirements define an “additional” quality in the building project that the administration renders attractive from the economic point of view for the promoter by means of discounts on the costs of urbanisation.

The path taken by Emilia Romagna was followed by other administrations who articulated their guidelines, always distinguishing between regulations of a binding character and indications of a rewarding character, always identifying environmental quality and the sustainability of the interventions among the rewarded behaviours, but coming together to consolidate the perception of “added value” for environmental sustainability in building interventions.

Recent norms on the energy efficiency of buildings, the putting into effect of EU Directive 2002/91, and their consequent fallout on the management of building activities probably also come together to create a knowledge of the added economic value of a building’s better energy performance; this induced effect might function as a lever to trigger good behaviour at the level of installed complexes as well and not just buildings, involving not only the evaluation of energy consumption, but also evaluating user comfort, the production of harmful substances and rubbish and on the rationalisation of the use of water resources.

This is the case in the Commune of Rome that, in 2006, emitted a provision that integrated its building regulations with a packet of indications aimed directly at the promotion of the creation of interventions for environmental improvement and for the use of alternative energies with particular regard to solar energy, the optimal use of materials, components and systems to attain adequate levels of thermal isolation and thermal inertia in the building envelope, as well as ensuring the profound permeability of the ground soil in urban areas. The path chosen by the Commune of Rome wasn’t that of voluntary adherence to these indications but
the forced imposition of specific regulations, turning therefore to indications of a quantitative character rather than relating to performance.

This provision follows the indications already contained in the new General Regulatory Plan with which were inserted among the permissible categories of interventions those of Bio-Energy Improvement (Miglioramento bio-energetico - MBE), that is, the totality of interventions aimed at improving the bioclimatic performance of the building components. These interventions include climate regulation and acoustic protection or recovery of buildings in line with the principles of bio-architecture, the maintenance of the deep permeability of the ground soil, the use of natural or renewable energy sources, the recovery of flow-back or rain water for irrigation purposes, soil fertilisation or toilets, the use of durable and maintainable construction materials, and the use of greenery with the aim of microclimatic regulation and protection from acoustic and atmospheric pollution. The commune linked this provision to an awards system of incentives to encourage private promoters to take on these interventions, foreseeing a prize of extra cubic capacity to compensate any eventual investment costs to provide for their installation.

Another type of methodological approach, corresponding moreover to an intermediate level of action of territorial governance, is that that has been launched in a number of provinces. The case of the Province of Lecco is representative of this approach. The province elaborated a packet of “Guidelines for the promotion of sustainable development in the instruments of governance of the territory and in building regulations”, which, starting from local energy programming, describe the use of instruments and strategies aimed at the promotion of sustainability in territorial, urban and building planning. They are an integral part of the guidelines for the best practices aimed at illustrating for public local administrations how to behave to promote sustainability in their territory, describing in particular the accompanying measures that many administrations have already put in place; in this case too different types of incentives have been considered. Local building regulations for construction in this case are indicated as being binding or voluntary and are described in terms of their performance to render their application by the administrations easier.

This is a very flexible document and it is aimed at administrations, and as such it is put together in a very efficient and streamlined way; the levels of action identified are only seven and their implementation is delegated to the communes who will follow the indications. The levels of action regard site analysis, the use of ground soil and the quality of the external environment, the quality of the internal environment, materials and technologies, the rational use of climatic and energy resources, and management quality.

Another interesting experience is that of the Itaca Protocol for the energy and environmental quality of a building. This document is the fruit of the action undertaken by the national work group made up of representatives of all the regions and also attended by APAT (Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici – Agency for the Protection of the Environment and Technical Services), set up in January 2002 in the home of ITACA (Associazione nazionale per l’innovazione e la trasparenza degli appalti e per la compatibilità ambientale – National Association for Innovation and Transparency in Tendering and for Environmental Compatibility). The fruit of the work group’s activity is a shared work protocol that permits the attribution of eco-sustainability points to buildings, but, above all, with the adoption of the protocol, a shared method of evaluating sustainability in building interventions was established.

The protocol is expressed in a series of guidelines gathered together in seventy evaluation forms that correspond to the same number of requests for environmental compatibility. The forms are completed by informative elements, namely the legal and technical references and the weight of the requirement. The matrix of reference is the GBTool. The criteria for evaluation of the level of eco-compatibility of the construction under consideration in the system were structured and codified in areas of evaluation, which, in turn, foresee a series of performance subrequirements. The system of awarding points is also adapted from GBTool, with the possibility, for each administration, of adjusting the weight of each individual requirement to adopt it to local realities.

Already a number of administrations are referring to this document, including Tuscany Region which has placed alongside this methodology adapted for the drafting of “Guidelines for sustainable building in Tuscany” a “Basic list of materials for sustainable building”, a document that represents a support instrument for planners and administrations for the knowledgeable choice of technical solutions for the construction of buildings.
The case of the city of Turin probably represents an evolution of this operating culture. The city of Turin, apart from having recently rewritten its building regulations (2004-2006), had to confront, for the Winter Olympics of 2006, a phase of great investment in planning and control both of civic buildings as well as of huge facilities and infrastructure. This preliminary planning commitment has produced among other things a series of instruments that were useful in planning and controlling the construction of these works: among these instruments we remember in particular *Valutazione Ambientale Strategica (VAS) del piano degli interventi per i Giochi Olimpici Invernali Torino 2006* (Strategic Environmental Evaluation of the Plan for Intervention for the Winter Olympic Games, Turin 2006), which, other than providing general indications for the phases of activating the Olympic Programme formulated regulations for the elaboration of the projects of the Olympic works, and the “Guidelines for sustainability in the planning, in the building and in the running of the Olympic and Multimedia Villages”.

These documents represent specific strategic planning instruments of intervention and are not documents of general interest for the city, but given the dimensions of the interventions and the level of fallout from the works in the area of the commune, they came to constitute a major precedent in building practice in the city. Many of the indications elaborated in these documents were then taken up by the communes’ successive building regulations, in particular as regards the indications relating to energy.

The “Guidelines for sustainability in the planning, in the building and in the running of the Olympic and Multimedia Villages”, drafted by Environment Park in collaboration with experts from the Polytechnic of Turin, are put forward as an operative instrument, aiming both at subjects involved in the running of the Olympic Programme and planners of the works foreseen for the Olympic Villages. The organisation of the guidelines is finalised with the aim of facilitating their application and therefore helping towards the attainment of defined objectives. In fact, apart from the requirements of environmental quality, the most appropriate technologies, the normative references, the indicators and the instruments to verify the satisfaction of each phase of the project, construction and use were also indicated. For the first time in a single document, all the fundamental requirements that characterise the energy-environmental quality of a building were synthesised and quantified. This document derives from the political-strategic will of the promoting committee to place the promotion of sustainable development, also by means of this document, as one of the fundamental objectives of the Olympic Movement, as stated clearly within Agenda 21 of the IOC. The “Guidelines for sustainability in the planning, in the building and in the running of the Olympic and Multimedia Villages” were developed bearing these principles in mind, aiming, therefore, at obtaining with the construction works foreseen in the Olympic Programme concrete results for a more sustainable built environment.

This brief description of the panorama, even if it bears witness to a slow evolution of the culture of governance in building activities, also testifies to the distance the Italian reality still has to travel to provide a uniform acceptable level of behaviour of local bodies towards the territory they manage in terms of sustainability. For the experiments in course to ensure that sustainable building becomes a widespread and constant practice, it is necessary, on the part of local bodies, to promote a profound revision of the methodologies they have used up to today as a constant procedure in the provision of general urban and effective instruments.

The ex-post evaluation of these instruments in their application over time also allows us to evaluate if and how these new methods of aiming building activity have effectively influenced the quality of the built environment and the life of citizens. It’s evident how the impact of the new building regulations, provided by local bodies, when these were influenced by the intermediate information instruments pertaining to the protagonists of the process, were more efficacious and immediately productive. The case of the city of Turin is emblematic for the way in which the Guidelines for interventions for carrying out the Olympic Programme then went on to have an influence of the way of running ordinary building processes as well. The introduction of guidelines or codes of practice allows the speedier and more immediate rendering of the assimilation of planning and building behaviour than would have been achieved under legally obligatory regulations. The guidelines contained in a code of practice do not impose turning to a set way of behaviour or a given technical solution, but they help the planner and then the operator to choose in a more informed manner the best solution for the type of scenario they find themselves working in.
When then, as in the case of the Turin guidelines or the Itaca protocol, the choice of a given behaviour or of a particular construction procedure is also linked to a considered evaluation of efficacy in terms of efficiency, use or reduction of impact, this type of instrument can serve to trigger a process of healthy competition about the efficacy of single projects. In other terms and contexts, the rewards mechanism of the “Casa Clima” (Klima House) certification is based on recognising the merit of those who render it most evident: the building that is made well and most rewarded will also be worth more in market terms, not just in economic terms relating to its life cycle.

**Process, Production and quality of life.**

**Environmental qualification of the product, qualification of the process and quality of life for users**

These instruments for directing and controlling planning activity in the specific case of public residential building allow the insertion into a sector of low, not to say very low, technological complexity, almost always run on a minimal budget, processes and product innovations that otherwise the operators in the sector would tend to refuse, considering them incompatible with their established practices, their economies of scale and their company profits.

The risk of impermeability to technological innovation in the residential sector is also often due to the separation that exists between those who construct the buildings and those who manage them. In fact, those whose only role is to carry out interventions have no interest in investing in the efficacy of an object from which they will receive no economic benefit. Those who only build and limit themselves to marketing new dwellings have no interest in investing in solutions that might be more expensive but that render that building much more efficient; this distorted behaviour can be found just as much in energy management as in the management of land suitable for building.

The first really innovative interventions from the point of view of the application of innovative and efficacious provisions in terms of resources, space and energy management, are coming to light thanks to the investments of cooperative groups, of which there are many in Italy, and the agencies for public residential building.

In these contexts where the economic promoter, builder, manager and end user are involved together from the outset of the process, the living efficacy and energy efficiency of the interventions are absolutely central to the development of the projects.

These subjects often turn to internal codes of practice or “agreed codes”, defined between end users and constructors that contain minimum undertakings to guarantee the satisfaction of specifics of use identified by the managers and end users as qualified into the entire life cycle of the building. Obviously, the more decisions are shared and agreed, the greater will be the overall efficacy of the intervention, both for those carrying it out and for those who will have to live with it. These types of best practice are the same ones that allow opposition to the growing phenomenon of energy poverty, which in the social housing sector is unfortunately ever more widespread, exposing the weakest members of society and the institutions who assist them to an ever-greater economic precariousness triggered by the merely modest efficiency of the building system (structure/plant) where they live.

It is important therefore to place alongside every new means of directing, planning or legislating building activity, instruments for evaluating and directing planning in such a way as to render immediately available for planners and builders an additional supply of competences and instruments to confront in a knowledgeable manner the planning of dwellings that are really suitable for those who will then go to live in them and/or manage them.

This type of instrument can in fact have an impact on the technical culture that is found in the sector: providing “unusual” competences and innovative technical solutions will also have an impact on the technical formation of single operators. Correct use and the implementation of codes of practice for the activity of planning and construction can lead to the demolition of the traditional distrust among workers in the sector, enriching their range of professional experiences and instruments.
Accompanying these indications with accurate economic evaluations of the various building procedures in terms of parametric costs related to the total cost of the works, placing them in relation to the performances of single procedures, will also allow the builder or the planner to choose the solution they prefer without compromising the overall performance of the building to be constructed, since they are always able to control with established and traditional instruments the overall cost of the interventions.

The code of practice or the guidelines, if used in such a way as to become also a means of capitalising on competences and technical know-how, will tend to become a real instrument of the technical brief at the disposition of the clients and end users.

In the case of habitual clients, such as Agencies for Residential Housing or the local bodies in charge of managing great housing patrimonies, or again in the case of housing cooperatives, who bring together the thousands of small and medium cooperatives of users/inhabitants or constructors, who characterise the social and productive make-up of the Italian reality, the development and implementation of a codified technical brief allows the modelling of a number of planning and constructive behaviours, thus allowing the optimisation of the single intervention in function of the specific environmental and dimensional characteristics to be confronted each time and in each case. This, other than guaranteeing an average raising of the quality of the different constructions and the quality of life of the users, permits the optimisation of the technical costs for single projects and the reduction of extra costs due to any eventual planning or construction errors, normalising a number of processes of elaboration and above all of control of projects and their outcomes.

The construction and development in time of a codified technical brief allows the consolidation of the competences of the client who has imposed and promoted them, leading to a profound redevelopment of the entire life cycle of the building system. The technical knowledge of clients, planners and constructors can therefore grow in a physiological manner around the settling in of the practices that are analysed and evaluated in the codified technical brief. It’s as evident as it is banal that the patrimony of technical competences should be updated continually or periodically, drawing in any eventual feedback from the projects that have been carried out by various subjects, otherwise the risk would be that of ending up proposing an infinite series “catalogue solutions” proposed over and over in a sterile manner throughout Italy. If well managed, these instruments can be extremely useful for a redevelopment, that will also be economically sustainable, of the small commissioning organisations present in our country.

As things stand, the dissemination of this type of experience in a very compartmentalised sector both at the level of demand as well as supply, is undoubtedly strategic to reach all the subjects involved in the sector of residential building, much more so than legal provisions that are often perceived as oppressive and incomprehensible by those they affect. It is not possible to intervene on the environmental quality of the residential market if we don’t think first of having an impact on the technical culture of the operators in the sector, modifying some of the systems of operational relations that are not compatible with the new needs of the sector and the users.

On the one hand we have some growing number of highly innovative achievements pilot level, often the result of design teams are supported by composite manufacturers particularly interested in testing and/or research centers interested in operational field test their theoretical options that work as a reference and example for other actors and a production problem that painstakingly pursues new directions and requirements of regulatory, marrying technical solutions, materials and components, now widespread in the market, more reliable and efficient. However, a good part of the design professionals, received no training on these issues and is forming on the ground, very gradually, the use of these technical solutions and new ways of design development. This led to years of coexistence with traditional models typologically and morphologically or functional system solutions aimed at satisfying one or more requirements of energy or environmental character.

The case of the diffusion of solar thermal or photovoltaics is absolutely exemplary. The full integration of these systems was the culmination of a location where it has gone from a simple overlap-enhancing elements on buildings and traditional technical elements morphologically, according to the modeling of the building to
maximize energy production, yet at the architectural quality and use. The culmination of this growth path is the compromise between quality and efficiency of the morphology of the architectural object, compromise now beginning to be in the form mature enough.

The need to communicate in a very explicit and to share the end user led innovation that characterized his clothes or building, has resulted in exposing the most innovative technical elements almost grotesque, however exasperating forms, colors and visibility, if one side has created almost a folklore sustainable, the other has created an imaginary new common references that are rooted in non-specialist public basic elements of the technical vocabulary and formal sustainability.

The roots of certain construction practices and responsible use of the building, but also the obligation to comply with certain performance standards is proving the most effective way to accompany the growth and development of an idea of the city in which the 'sustainable construction is not only the value added of some occasional special occasions, but is common practice. The observation of more advanced production contexts can highlight this new culture of design and socially conscious energy is actually creating a language code and constructive self-developed from established forms and settlement patterns, including questioning and references development dynamics.

At the level of urban plan was passed by the development of model districts, isolated and protected from the rest of normal tissue to mend experiments and metabolism of tissues also strongly degraded to return resources to the city and citizenship in terms of quality of space of life and rationalized use of resources. In terms of building, the consolidation of a new language is even more striking, more aware of the use and management of innovative technology solutions, as this is less marked at morphological level. The use of natural light, cooling systems or natural ventilation systems capture solar energy systems tend to lose focus in the formal implementation of this new generation of buildings because they are physiologically integrated system Some building / facility, there is no need to show the enslavement of the building to its environmental performance or energy, the building is primarily the place of life quality or the quality of life and no longer an efficient liveable car.

All of this in view of the production of housing is even more striking, the ancestral home is a concept with dynamic evolution very slow and very cumbersome from security that the image of tradition, a formal language and the tendency towards a formal and constructive language represents the conclusion of a very painstaking process, even the simple constructive innovation in the past has been forced to pay to the tradition, concealing his appearance in forms more reassuring and very normal, so that even the introduction of a new material can be an injury or an element of mistrust by the end user.

A paradigmatic example of this evolutionary dynamic is the experience of the ClimateHouse (Klimahaus) and buildings were completed in Portet territories which have acceded to its protocol design and implementation, the roots of this culture of project implementation and management of buildings has led to a gradual departure from the traditional formal models and construction that characterized the early achievements. Initially we found ourselves in front of types and forms of traditional alpine architecture, weighed down by thick dell'iperisolamento, made awkward by the overlapping of the elements of traditional solar panels on the roofs of stone or wood, in recent years, further improving the final performance buildings and materials, there is a final liberation from the traditional forms that is leading to the establishment of a new scenario of alpine absolutely contemporary, but perfectly integrated with the natural, cultural and productive when it is rooted and from which inspired. The evolution of this new language is also due to technological leap made by designers and implementers that finally are not limited to superimpose new performance structures and traditional techniques, but are experimenting with new construction techniques, or are interpreting traditional building technologies and systems such as wood, so completely new construction coming to full maturity, performance and form. The case is unusual because ClimateHouse rooted in a territorial context clearly bounded both geographically and environmentally culture with a mature technique, nourished by a desire for experimentation and investment in innovation that affected the entire production sector, where manufacturers of materials components and designers collaborate in the establishment of product quality building increasingly comprehensive and complex.

Similarly, in contexts characterized less environmentally and architecturally, this trend is taking place, always at a thrust impressed by the government and by an increasingly articulated, especially in the residential sector. After several years of stalemate in the general production of social housing and the
typological and technological experiments on living, in all European countries was a resurgence in the business of construction and design experimentation on the theme of social housing.

Since the publication in 2006 by the European Commission's Communication of the Thematic Strategy on the Urban Environment "to the recent Communication of the European Ministers of the House in November 2008, the promotion of a new housing policy and in particular a new culture of a sustainable social housing and is considered central and strategic for the complete realization of a truly integrated policy of economic and social cohesion continental focus on quality of life of European citizens and the quality of urban environment, connecting the need to write a real response and quality to a large part of citizenship in terms of profound economic and social precariousness, reducing the weight of this construction industry on the environmental and economic impact of individual countries.

Thanks to this cultural revolution, producer organizations, cooperative or collective subjects are group together to propose a new settlement model, manufactured housing and sustainable socially, economically and energetically, based on sharing and optimization of its technical knowledge and its delivery capacity, enriched by the innovative stimuli from the most advanced production and testing. This trend is leading to a profound renewal of the culture technique also too small and medium enterprise (SME) that characterizes the widespread quality of our cities have an impact on the exchange value of the property, proposing environmental efficiency and sustainability of achievements, as including economic value added.

By contrast, the maturation of the design culture of the operators can metabolize so accomplished innovative stimuli coming from the production, balancing quality of life and sustainable management of energy resources, to fully and effectivley "re buildings as power plants and convert the meshes of world power in networks of smart utilities to deploy that power opens the doors to the third industrial revolution in the twenty-first century, should have an economic multiplier effect equal to those of the first and second industrial revolution of the nineteenth and twentieth century (...) with the objective of enabling millions of people to produce clean and renewable energy through their own businesses, public institutions and homes, and to share the surplus with other intelligent network via public services, thus contributing to initiate the third industrial revolution and a new post-carbon dioxide was dedicated to the democratization of energy and sustainable economic development. “

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