

Energy management in cultural heritage sites, coastal landscapes and protected areas: opportunities and guidelines for sustainable local development



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ABSTRACT

1. Cultural heritage and landscape as a "strategic economic and social resource"
2. Context analysis for historical centres and protected landscapes
3. Sustainable building renovation: barriers and drivers to energy efficient refurbishment of historical buildings and settlements. Empirical evidence from Italian case-studies in a historical context
4. European Landscape Convention, participatory planning and creative policies: role and education of Conservation departments and economical and professional stakeholders in order to integrate landscape protection and energy efficiency interventions for historical buildings and settlements.
5. Role and education of Conservation departments and economical and professional stakeholders in order to integrate landscape protection and energy efficiency interventions for historical buildings and settlements.

KEYWORDS

Historical centres and protected landscapes
Sustainable building renovation: barriers and drivers
Italian case-studies in historical context
European Landscape Convention
Role and education of Conservation departments
Professional and economical Stakeholders

CULTURAL HERITAGE AND LANDSCAPE AS A "STRATEGIC ECONOMIC AND SOCIAL RESOURCE"

In order for the landscape quality to be considered as a general interest by the civil society and the public administration, it is fundamental to recognize its collective strategic resource character.

As landscape is a set of elements that characterize the environment hosting a community, it is a collective resource and contributes to determine the functional and perceptive quality of living and work spaces.

The landscape is a collective resource as it ensures a possible exchange and a collective communication with the other communities.

Thus, landscape is a determinant image element offered by a community to the outside and it reports the civility degree and the reception capacity.

The landscape is a resource to be enhanced for the development of trade: it is the tourist attraction main element; it increases the material (salubrity) and immaterial (evocative capacity) value of the agriculture products; it promotes the artisanal and manufacturing productions and the intellectual achievements of a community.

A strategic resource

The landscape is a fundamental resource to pursue the general interest of the community.

As the environment represents an invariable element over time and an element of history, that determines people's character, customs and tradition, landscape is a fundamental element for the community in order to recognize their own identity. At the same time, the landscape's characters, that are the result of man's work, report it.

As it is the key element to recognize their own identity, the landscape is an inalienable resource to face, as a community, the competition and the exchanges with the other communities, that increasingly characterize the current historic period of globalization.

To use the requested tools and to ensure the permanency over time of those tools, a community must worry about promoting the local-development opportunities, a development as shared and extended as possible, and this development must base on a creative and durative usage of the territory resources they belong to, in order to ensure their availability and renewability for the present and future generations.

Landscape as language of an area

How does a community recognize itself in a landscape and that landscape tell the others the existence of the community?

How does a territory communicate its identity?

Of the many landscape exceptions, the one that best answers to those questions considers the landscape as a "territory language".

As a language, the landscape consists of the set of signs and elements detected, regardless of their origin and of their random factor.

Therefore, elements and signs of the landscape are its natural components, the permanency signs of the transformations made by men in history, the contemporary transformations, the customs and the signs not permanent when they are detected (a blossom, a ripe cornfield or a field just ploughed, the presence of abandoned wastes, the decorum or the degree status of a building).

As a language, the landscape can have different communication levels depending on the tools used to interpret and link the signs. Certainly, a geologist can appreciate in a

different way a mountain landscape or an agronomer can appreciate or not an agricultural landscape considered important or degraded. At the same time, it is possible to appreciate a landscape as it reminds us something or, instead, it shows us something we have never seen, producing a feeling of astonishment. However, there is always an open communication of the landscape, common to everybody, and that allows to detect the signs that characterize a territory.

The concept of landscape as territory language is the basis of the landscape universal value, even if it is subjectively experienced, and it is an important analysis and project element to define policies, plans, interventions for quality protection and promotion that are detectable and so communicate values to the users of the territory.

Landscape as the result of man's interaction with the environment

The landscape, the set of components that structures it and signs we detect, is conditioned by some large environmental invariants: first the geology and the climate (both not immutable if seen in an evolutive perspective for a long period) and the big biotic and abiotic phenomena connected to it. They determine the characters of many landscape components and they involve various disciplines with which the natural world is studied (botany, zoology, hydrology, hydrogeology, etc).

Man, as part of the natural world, and as a different level component that interacts with it, has developed greater symbiosis capacities and, successively, territory transformation capacities. Socially, man has realized during history a set of achievements and developed multiple management techniques that characterize the territory and the land usage.

These transformations and how the land is used are generally based on the resource and characteristic usage of the environment.

The landscape we detect is so a product of the natural characteristics and of man's interaction with the environment.

Landscape as a public good

If at the beginning of his history man has survived on spontaneous products offered by the natural environment, he knew how to better from the natural world over time, developing transformation capacities and territory management to succeed determining the construction of a distinct life environment.

Transformation and management capacities have been developed during history and enlarged and, after the industrial revolution, have been the object of a gradual acceleration. Technology development has also determined the ability to concentrate high transformation capacities into few persons, even if they belong to faraway communities.

Those circumstances have determined the increase of the risks in using excessively and not equitably natural resources.

Looking at those risks, if you consider the environment and the territory as a collective strategic resource, a community must worry to get benefits without erode the initial capital and to promote an equitable delivery of the advantages and the disadvantages coming from this usage.

As a resource of the community to hand down to future generations, the environment can be defined as a social fixed capital.

This definition seems to be partially contradicted by the possibility of an exclusive usage determined by the deprivation rights that a person or a group of persons can exercise

towards the community. The concept itself of private ownership refers etymologically and historically to the exclusion from the collective usages.

Which is the element that continues to represent the territory, even when it is of private ownership, as a factor of common value and of a community possible identification? How can I use a good of private ownership, when I am not the owner?

The landscape perception is the main form of usage that allows to offer the community benefits (when detected as a value) and possibility of recognition.

Therefore, the landscape is a clear example of an economic public good, a good that can be used without paying and from which it is not possible to be excluded, even when the private ownership of the land exists.

CONTEXT ANALYSIS FOR HISTORICAL CENTRES AND PROTECTED LANDSCAPES

Historical centres

The context analysis for historical centres can be performed in reference to two different but complementary aspects: the settlement system, the landscape.

With reference to the settlement system, historical centres take on a particular meaning which is mainly functional and identity-related, with reference to their specific role and urban rank inside the net of cities on the belonging territory. From this point of view, the position of the historical centres on the territory assumes a strategic relevance, with reference to the soil morphology and the infrastructures.

The historical centre often is the chief town of the municipality or it occupies a large part of it, being actually the representative place of the identity and the historical memory of the local communities. Some of the main historical centres are in wide and crowded urban areas; others are in systems of continuous settlement; others are in urban settlements with limited extension and medium-low density and in these cases they represent the only centre of attraction; others, finally, are in contexts with low density or even isolated, in rural areas.

To a first approximation, we can recognize different situations in which opposite phenomena take place. In the historical centres of the main urban areas, there is a significant organization of the activities, a demographic transformation, processes of social substitution; in this context we witness decay and congestion phenomena at the same time. In all the historical centres on the fringe of the main urban areas, we witness a kind of transformation which is mainly residential and which implies the transfer of the main services outside the historical area. In the medium-sized urban centres, among main historical centres, we see a slow abandonment of the residential use of the historical areas, along with a loss of commercial activities and a poor economic liveliness. The small centres in the rural areas are often abandoned, that is they show signs of restoration to a useable condition inside the tourism-environment-culture mechanism.

For all of these different situations, taking into account the rank of historical centres in the different settlement realities and the possible rank they could assume in a future prospect of development, these are the intervention policies we can suppose:

- the increase in value of the cultural and historical heritage, as well as the overall redefinition of the role of the historical centre, in relation to the productive fabric of the surrounding territory. This can be made according to a more direct link between the historical centres and the productive districts, even the rural ones, while supporting the

qualification of the historical centres as “executive centres of the local development”, as places of the managerial activities and as symbol of the economic activities that characterize the territory, as well as privileged markets for the spreading of the local productions;

- the promotion of taking up residence and keeping and re-establishing basic services and commercial activities;
- the enhancement of the internal and external connections, by strengthening the links among the centres, based on sustainable mobility systems;
- the creation of access nodes, linked to the public transport system, and of all the related services, first of all through the recover and reuse of the existing infrastructures, as well as the requalification of decayed and disused places.

With reference to the landscape, the historical centres can be interpreted according to the different scales they are related to. To a first approximation, the perception of the historical centres can be traced back to three main scales:

- the scale of the recognition of the identity of an entire geographic region; in this case the perception of the territory is not unique and direct, but it is the result of different images that are stored and that create a kind of mental synthesis. This allows you to catch the nature’s distinctive features (as regards morphology, vegetation, etc.) and the human’s distinctive features (as regards history, culture, society, economics, etc.) of the region; in this case, the historical centres participate to the characterization of the region;
- the scale of the perception of a wide area; in this case the interpretation is direct and general, and gives you an overview of the territory for wide morphological, naturalistic and anthropic structures. These landscapes allow you to have a unique interpretation based on a scale which also give you the opportunity to understand and participate to the transformation of the entire landscape in a conscious way. In this case, the historical centres can be the distinctive feature of the area;
- the close scale or that of living; in this case the perception is direct and allows you to catch the signs of the territory and the related relationships in detail (the grain, the rhythms, the thicknesses, the materials etc of each sign). This is the scale for which the attention and the possibility of a “direct” participation to the transformation is more immediate and involving for the citizens. In this case the historical centres are the high value component of the settlement.

Always with reference to the landscape, the historical centres can be interpreted according to the typology of the sites of settlement, as regards the morphology of the soil, i.e., as mentioned above, the location compared with the settlement system. From this point of view:

- the historical centres of the main urban areas need a strict control of the use of the existing heritage, a kind of control that takes into consideration their central role on the territory, as well as the relationship between the centre and the surrounding contexts. All this has to be achieved through the requalification of the access and approaching itineraries to the centre itself, in the case of a poor quality of the urban landscape and extra-urban territories near the city, and characterised by improper uses;



Figure. 1 Historical centres of the main urban areas: Foligno (PG)

- the plain historical centres coincide mostly with those centres integrated in continuous settlement systems, characterised by infrastructure-driven settlement development processes. Those systems need targeted strategies aimed at the landscape and environmental regeneration of the transition processes among the historical buildings, the contemporary buildings and the infrastructures. In this sense, it would be useful to intervene in these areas: the landscape and environmental reconfiguration of the settlement and the reduction of the noise pollution levels caused by the proximity to transport infrastructures or fixed noisy sources. The requalification of the entry points to the centres or to the green areas, the outsourcing and conversion of those uses considered to be unsuited, in order to achieve the target of highlighting the importance of the historical buildings. The preservation of all the agricultural activities near the urban centres and their further landscape qualification; the preservation of the existing historical gardens inside the urban centres;



Figure. 2 Historical centres located in plain areas: Bevagna (PG)

- the historical centres inside the urban settlements of limited extension and medium-low density, particularly those located in hill territories and characterised by the historical distinctive features of the agricultural organization, need the restoration of the identity relationships existing between them and the proximity landscapes. For this reason it is of vital importance to reevaluate the extra-urban territories close to the historical centres and characterised by improper uses and disused or underexploited buildings; to reevaluate the decayed and damaged parts with the aim to recover the prior values, particularly those buildings that serve as landscape settings for the view from the valleys; to keep alive the existing agricultural activities near the urban centres and their further landscape qualification; to reevaluate the entry points to the historical centres, with specific solutions for a sustainable mobility; to remove all the elements disturbing the environment and the landscape or that are in contradiction with the protected sites and the concurrent increase in value of the views of the historical centre;



Figure. 3 Historical centres located in hill territories: Spello (PG)

- the historical centres located in low density contexts or even isolated in rural areas, are old rural villages located in the internal upper hill and mountain areas which are being abandoned. It is important to support: the preservation of all the actions in defence of the human heritage for all those landscapes full of natural surroundings; the preservation of minor villages and of all the other buildings of historical importance (fortresses, castles, religious buildings); the improvement of the access conditions and the public services, particularly for the elderly people, taking into account the target of the protection of villages and the related architectural, historical and cultural importance; the landscape and environmental requalification of undeveloped areas pertaining to the existing buildings and the open spaces around the built area, with the aim to remove the decay caused by the presence of inconsistent manufacturing and an improper use of woody and agricultural areas; the recover of the traditional ordinary housing, with residential and service purposes; the requalification of free areas aimed at functional interventions and strengthening of consistent services and activities (artistic and traditional handicraft, tourist accommodation activities and for spare time, as well as local agricultural markets).



Figure. 4 Historical centres located in low density contexts: Pissignano (PG)

The above-mentioned strategies, actions and interventions for the historical centres need common policies for the protection and the improvement of the centres, involving first of all the institutions and the bodies at different levels, responsible for the territory management (from housing to town planning, from environment to landscape, etc.). Particularly, it is necessary to activate some policies for the organizational planning on the one hand and for the innovative urban planning on the other hand, characterised by the use of compensatory and awarding mechanisms of all those virtuous behaviours oriented towards the sustainable regeneration of the historical centres (see the recent legislation of Umbria about the historical centres).

Protected landscapes

It is a common opinion that the landscape, as a set of signs that represent the language of the territory, returns and describes the stratified relationship over the centuries between human and nature, community and life space, public space and private space. So the landscape structure of the territory is always the result of the innumerable actions taken over time and space, individually and collectively, of the use and transformation of the territory, achieved by the individual or the institution, to meet the need of space for carrying out the different human activities.

The experience carried out in Italy over the last seventy years in the field of landscape, and that made it possible to identify the “landscape goods”, i.e. the “protected environments” which are not subject to many of those human actions listed before, was, is and will be based on protection prescription, since they refer to parts of territory whose landscape structure is considered completed and almost definitive and consequently it is declared by the law or the decree as a territory of great public

interest. If the landscape category is not limited by the law to the category of “landscape goods” but it refers to the entire territory, i.e. not only to the existing resources that we have to protect but also to suggested actions of requalification or transformation, it seems unrealistic to pretend to regulate the landscape only through protection constraints, moreover if these are only related to parts of territory. So it is necessary to set the protection in more organised policies, considering the landscape as a source of local development, able to enter the nets of globalization in an autonomous and authoritative way.

In this prospect, through a slow institutional process as based on new cultural trends, the protection mechanisms are slowly changing in Italy, in the direction of a wider and common awareness of the relationship existing between landscape and ecology on the one hand, and of defining the development policies as sustainable from an environmental and landscape point of view on the other hand. It is a change that, along with the creation of new regional landscape plans, as provided by the recent law, involves the institutions at each level (Ministry for cultural goods and activities, the authorized regional superintendency, regions, provinces and municipalities) with the aim to make the protection of the protected landscapes (“landscape goods”) more motivated, possibly more widespread and, in any case, generally accepted. The urban planning too has to pay more attention to the results of the transformations in the landscape; the planning of the public spending has to be more targeted to improve the territorial heritage (from the single monuments to the historical centres, from the hydrographical net to the woods). The above-mentioned activity is promoting the research of new management procedures of the territory, in compliance with the decision making and the content and methods of the intervention projects, based on the different scales (from the housing, to the urban and territorial scales).



Figure. 5 Protected landscapes – landscape heritage: Porchiano (in Amelia - TR)

Landscape planning: levels and techniques

Though landscape planning tools gave different results, some times satisfactory, sometimes impalpable, and sometimes counterproductive, it is not possible to absolutely declare that a technique or a planning level is better than another.

Other than an available and “well-done” plan, many other factors are important: the efficacy of the administrations who put into effect the plan and the project, the consonance between plan or project contents and civil society's orientations, the economic, social or demographic joint, the actions to accompany the plan (information, training, incentives, assistance), the freelancer and technician qualification level, the local public opinion support.

Although there are many conditions to determine the success or failure of a plan, it is possible to declare that a “well-done” plan must be characterized by:

- Shared and defined general objectives (strategic dimension)
- Verifiable and clear technical definition of the important elements and the rules and performances to ensure while transforming the territory (technical dimension)
- Studies availability and informative basis (cultural and scientific dimension)

A well-done plan must also ensure:

- An application reasonable flexibility without compromising the expected general and specific objectives (adaptive dimension)
- The possibility to monitor over the time the own efficacy level using periodical and formalized tests, based on the qualitative and quantitative judgement elements that assume the monitoring indicator role (evaluating dimension)
- Content properties compared with the capability to relate and integrate in a subsidiary manner to the other institutional subjects (institutional dimension)

In particular, a landscape plan must search:

- An integration with plans, programs and financings that affect the territory transformations to realize the objectives (interdepartmental dimension).

The local landscape project

As demonstrated in the artistic and architectural field, even the artworks preservation requires an active intervention, where taste and culture are fundamental. In other words, protection and restoration are a project and the possibility, neither in theoretical nor in practical words, to stop the flow of time and the change of work material to be preserved does not exist. Even the deleting of a painting or bas-relief's surface ageing signs (patina) or its preservation have been the object of big controversies over history, to demonstrate that an objective restoration does not exist, but that restoration is a project, where the restorer acts on a set of given elements, trying to emphasize (according to the culture of the time) the intrinsic characteristics.

If this is true for a painting or for a sculpture that can be placed on closed environments, limiting the external agent action, it is largely true for landscape. If we refer to territory, it is clear that the components that determine its quality are complex and dynamic. The territory qualitative characteristics are always a result of changes successively happened over time, a geological or historic time, of changes attributable to natural processes or to man's work.

Usually, landscape is also determined by biological components (unless we think to lunar landscapes) and these are the object of continuous changes subject to seasonal cyclic changes. So, landscape changes continuously. If we want to preserve a given territory structure, we must actively intervene.

For example, if we value the landscape of bloom clearing and wood alternation and we want to preserve this alternation as a “landscape painting”, we must actively intervene. On the contrary, the wood will tend to close on the clearing deleting that important element (wood/bloom clearing alternation) we recognized. In this case, to preserve that landscape, we should organize and ensure the continuity to a management form (for example, pasturage on clearing) to allow to maintain the grass and to avoid wood from reforming.

Finally, we can end by saying that we realize a project not only when we change an environment and we plan a new landscape, or when we intervene on restoring a landscape by restoring the lost qualities (for example, when we rebuild a row of trees or we demolish a structure that disfigures an overview landscape picture), but also when we want to maintain, preserve an existing landscape.

So, new landscape protection, restoring, creation must be considered as different project forms for territory.

The planning and the realization of a territorial structure, a landscape is not the same thing as the planning or the realization of a painting or a sculpture and it requires a careful and preliminary feasibility test.

Usually, the economic engagement is different. It is also important to ensure that the project is compatible with the complex administrative rules of town planning.

The project must also be selectively consistent with the social and territorial context. To understand the environmental characteristics and know the historic stratifications, it is first necessary to deeply study the territory. It is also necessary to study the relation between these characteristics and the local community trying to understand in which elements it recognizes the elements of its own identity. It is fundamental to consider that landscape can spontaneously change, and that the usage needs or the needs of a community's spiritual and material needs can change. The given structure must ensure a certain degree of flexibility. However, you must consider that, after realizing a certain territorial structure, it is fundamental to ensure also an adequate territory management; a management that is sustainable under the economic, technical, social and environmental profile and that it ensures the non-renewable resources preservation for future generations.

SUSTAINABLE BUILDING RENOVATION: BARRIERS AND DRIVERS TO ENERGY EFFICIENT REFURBISHMENT OF HISTORICAL BUILDINGS AND SETTLEMENTS. EMPIRICAL EVIDENCE FROM ITALIAN CASE-STUDIES IN A HISTORICAL CONTEXT

During the two-year period 2009-2010, the architect Cafiero, president of Telos s.r.l., as partner of a wide International project (RenovEnergy Project Energy efficiency redevelopment in private residential buildings) coordinated a survey on the real estate market and on a set of case studies about the global energy renovation in many Italian cities.

The outcome is a set of useful information, from the territorial and revaluation market analysis to the identification of barriers and drivers to energy efficient refurbishment of historical buildings and settlements.

Considering the highly historical connotation of the Italian housing heritage and the attention for the landscape as an acknowledged strategic resource, the following aspects were considered in choosing the case studies:

- the territorial location of the buildings subjected to the energy requalification, with particular attention to the landscape, environmental, climatic but also institutional and social characteristics of the local context;
- the historical features of the buildings subjected to the energy requalification

The territorial context and the Italian housing heritage

In Italy, in 2001, 12.812.528 buildings and building complexes were registered, including residential, commercial, industrial or other-purpose buildings, regardless if they were exploited or not.

The analysis outlined that the exploited residential buildings are 11.226.595, i.e. about 87% of the total amount of buildings and building complexes on the national territory, and about 93% of the exploited buildings.

As regards to the building period, according to the Istat data updated in 2001, 31% (about 3.500.000 buildings) of the Italian housing heritage was built before 1945, while 15% was built between 1945 and 1961. The most fruitful period, i.e.35% of the amount, is between 1962 and 1981, the period when the low cost of energy did not imply the use of particular building precautions to limit the energy consumption and the environmental concerns were not so interesting.

The first law for the consumption reduction is dated 1976 (L. 373/76), after the first International oil crisis. Considering that during the first years after this law came into force the building industry did not respect the established parameters, because of the slow adoption of this prescriptive and cultural innovation and the lack of control, today we estimate that 82% of the Italian housing heritage has no energy regulation.

Table 1. Number of residential buildings according to the building period – Italy

Building period	Residential buildings
Before 1945	3.534.074
From 1946 to 1961	1.659.829
From 1962 to 1981	3.951.163
From 1982 to 1991	1.290.502
After 1991	791.027
Total	11.226.595

source: ISTAT – 2001 census

The analysis carried out on the materials that were used for the residential buildings shows a prevalence of bearing masonry compared with the reinforced concrete and above all with the new building materials at National level. The bearing masonry represents 61% of all the current residential buildings (2001).

Then, if we compare this datum with the important datum related to the building period, we deduce that in Italy there is a prevalence of old buildings in bearing masonry, even if the trend now shows a growing use of reinforced concrete to bearing masonry disadvantage.

From 1980's, about 50% of buildings in Italy was built in reinforced concrete, 30% in bearing masonry and about 20% with other materials. The current problems, in terms of energy saving, cannot take into account the fact that in Italy in 2001 there were 6,9 million buildings in masonry, 47% of them built before 1945.

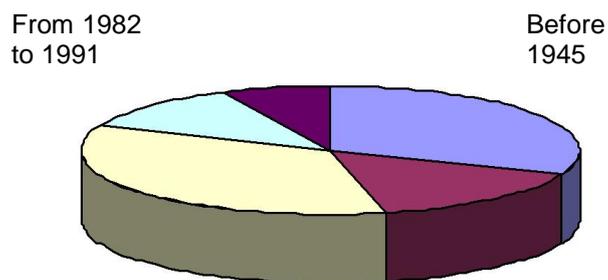


Table 2. Number of residential buildings according to the kind of material used for the bearing wall - Italy

Kind of material	Residential buildings
Bearing masonry	6.903.982
Reinforced concrete	2.768.205
Other	1.554.408
Total	11.226.595

source: ISTAT – 2001 census

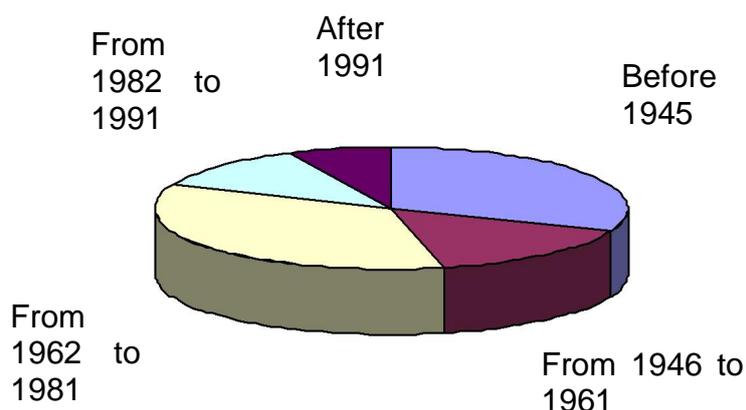
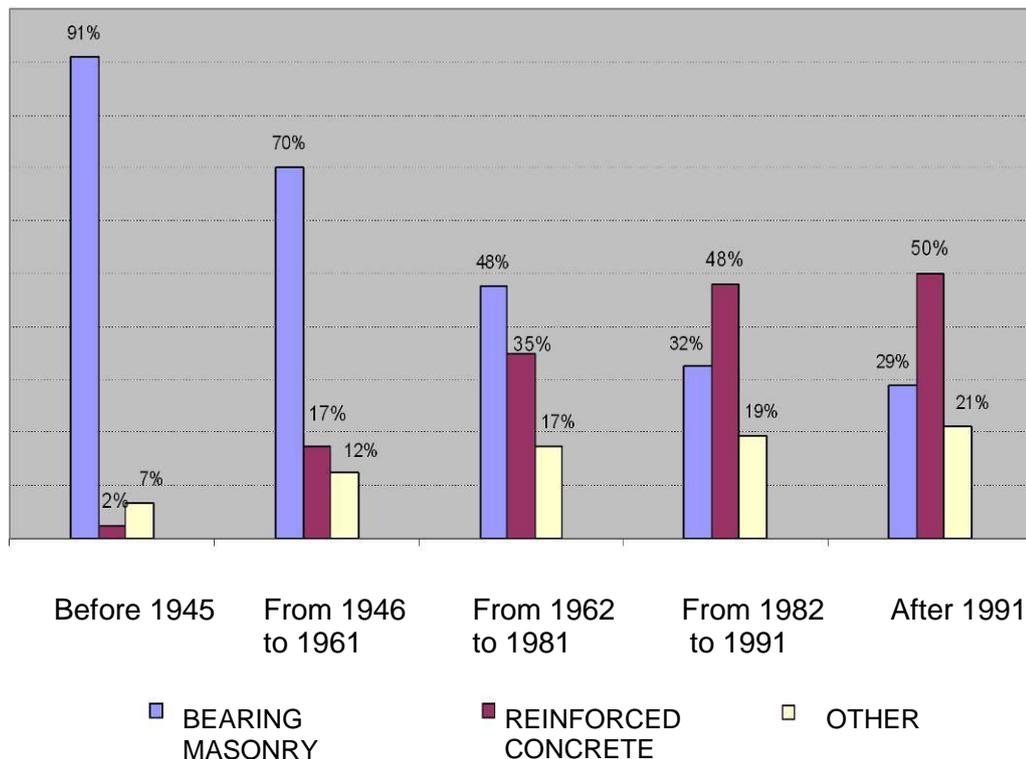


Table 3. Number of residential buildings according to the building period and the kind of material used – Italy

Building period	Kind of material			Total
	Bearing masonry	Reinforced concrete	Other	
Before 1945	3.210.407	83.413	240.254	3.534.074
From 1946 to 1961	1.166.107	288.784	204.938	1.659.829
From 1962 to 1981	1.879.906	1.380.865	690.392	3.951.163
From 1982 to 1991	418.914	620.698	250.890	1.290.502
After 1991	228.648	394.445	167.934	791.027
Total	6.903.982	2.768.205	1.554.408	11.226.595

source: ISTAT - 2001 census



The other important element to take into consideration in order to have a complete overview of the Italian housing heritage, is given by the ISTAT data related to the preservation status of the residential buildings. Always compared with the building period, these data show that the status of 22% of the housing heritage is mediocre – very bad and that 53% of buildings in this status were built before 1945, while 19% were built between 1946 and 1961. It is also important to highlight that 23% was built during the next twenty years, between 1962 and 1981. So about 1.3 million buildings built before 1945 and about 1.1 million built between 1945 and 1980's are in a mediocre – very bad preservation status.

Of about 2.5 million residential buildings in mediocre – very bad status, 79%, which is about 2 million buildings, was built in bearing masonry.

Table 4. Number of residential buildings according to the building period and the preservation status - Italy

Building Period	Preservation status				Total
	Very good	Good	Mediocre	Very bad	
Before 1945	501.352	1.688.868	1.157.392	186.462	3.534.074
From 1946 to 1961	262.252	919.050	440.821	37.706	1.659.829
From 1962 to 1981	1.002.829	2.354.900	565.750	27.684	3.951.163
From 1982 to 1991	542.007	653.865	90.195	4.435	1.290.502
After 1991	566.397	199.656	23.320	1.654	791.027
Total	2.874.837	5.816.339	2.277.478	257.941	11.226.595
Total	26%	52%	20%	2%	

source: ISTAT – 2001 census

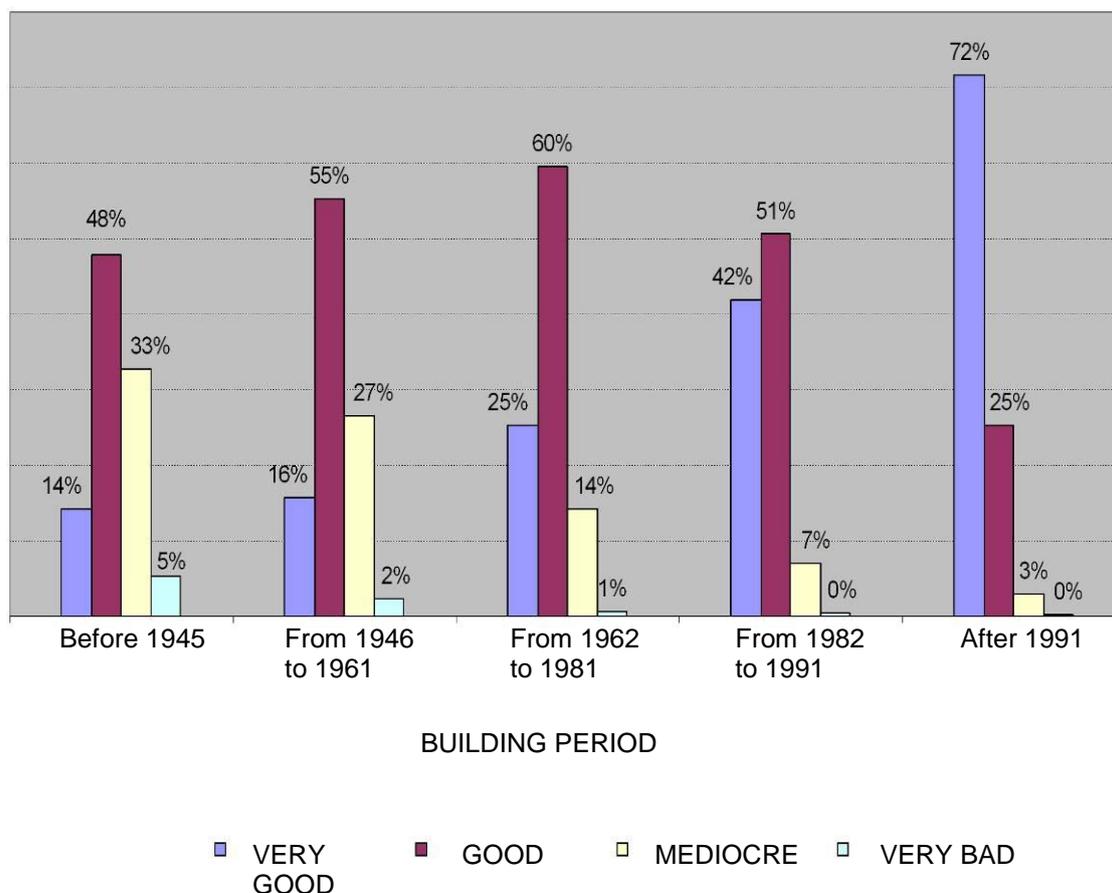
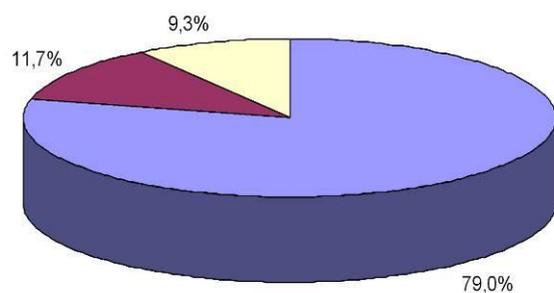


Table 5. Number of residential buildings according to the building period, the mediocre – very bad preservation status and the kind of material - Italy riment

Building period	Mediocre-very bad preservation status				Total
	Bearing masonry	Reinforced concrete	Other	Total	
Before 1945	1.244.320	24.499	75.035	1.343.854	53%
From 1946 to 1961	370.207	59.664	48.656	478.527	18,9%
From 1962 to 1981	340.693	163.453	89.288	593.434	23,4%
From 1982 to 1991	38.416	38.170	18.044	94.630	3,7%
After 1991	9.660	10.065	5.249	24.974	1%
Total	2.003.296	295.851	236.272	2.535.419	100%
Total	79%	11,7%	9,3%	100%	

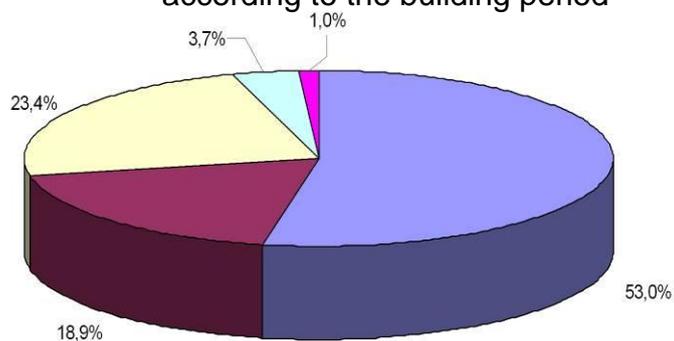
source: ISTAT – 2001 census

The number of residential buildings in mediocre – very bad preservation status according to the kind of material



■ BEARING MASONRY ■ REINFORCED CONCRETE ■ OTHER

The number of residential buildings in mediocre – very bad preservation status according to the building period



■ BEFORE 1945 ■ FROM 1946 TO 1961 ■ FROM 1962 TO 1981
■ FROM 1982 TO 1991 ■ AFTER 1991

Suggestions from the case studies

Among the different case studies that were examined during the RenovEnergie project, some examples of historical buildings requalification are particularly interesting.



Figure. 6 Benatti Palace (Modena)

First, the purpose of the case Benatti Palace of Modena was the improvement of the “building envelope” quality, both from the thermal inertia and the insulation point of view, to minimize the heat loss as much as possible in the pre-existing building.

Since it is a historical building, the insulation of the external brickwork was achieved from the inside using cork panels, covered with bricks and then a final layer of plaster, made of cacciopesto, 20 centimetres thick. The walls overlooking the internal courtyards were covered with an external insulating plaster made of cacciopesto and lime.

Afterwards, there was an intervention on the natural ventilation and lightening systems through the removal of all building additions in the internal courtyards and the painting of the walls with very bright and reflecting colours. On the top of the building were used some dormers, to improve the habitability of the attics in terms of lightening and ventilation. In general, there was the promotion of a “natural cross ventilation.”

As regards the plant engineering, since this is a residential building with different premises producing steam, an active ventilation system was introduced besides the natural ventilation, with a heat recycling system, equipped with air vents and hygrometric control in kitchens and bathrooms, as well as the automatic air renewal through intake vents in the leaving- and bedrooms.

The heating system, conceived to get a high thermohygrometric comfort, though reducing consumption was designed to work also during summer as cooling system,

thanks to the integration of a heat pump and of dehumidifiers to avoid the risk of surface condensing phenomena. The wiring and lightening system were designed according to eco-friendly and energy saving principles and to offer a high visual comfort. The waterworks and the sanitary systems are equipped with devices to reduce the drinking water consumption, among them a hot water recirculation system, jet-disturber systems in the taps and fittings and separate supply systems in the drain boxes of the bathrooms.

Furthermore, a buried tank was created for meteoric water gathering with a specific filter that, tanks to a suitable dual net, will allow the supply of drain boxes in the bathrooms.

Summary of the intervention:

- Global requalification; Casa Clima certification, energy efficiency class B.
- Requalification achieved also through the adoption of green housing criteria.
- Action needed after the roof check. Company in charge very interested in green housing and energy saving topics. Interested in increasing the value of the building.
- Interviewed persons: company in charge, designer, buyer of one of the apartment.



Figure. 7 San Giovanni Court (San Giovanni in Persiceto – Bologna)

Second, the case study of San Giovanni Court (San Giovanni in Persiceto in Bologna). Besides the recover and consolidation of the bearing structures in bricks and the wooden floor, the main choices of the project concerned the adoption of green housing and bioclimatic criteria, to minimize the energy consumption and improve the internal comfort.

The intervention was made on the internal distribution of the premises and on the external openings to improve the lightness, preferably locating the living areas toward the south, southwest and southeast of the building, in order to use the free energy of the sun (particularly during the winter). In summer, this openings will be shady thanks to trees and external wooden structures.

It was established the recover and a considerable insulation of the external walls, with natural insulating materials on the internal walls (wooden fibre and cork) and an

insulating plaster made of natural lime on the external side of the building, in order to minimize the heat loss in winter and to allow a phase delay (12/16 hours) of the summer thermal waves.

The flat roofs and the storey heights were recovered through wooden structures similar to the traditional housing typologies and were insulated to improve the housing envelope, always using natural insulators (wooden fibre, hemp).

The covering of the two buildings is made of bricks and there is a ventilation room to avoid the heating in summer, with air intakes located by the gutters and hip roofs. The gutters and the downpipes are made of copper.

The external and internal door and window frames are made of wood, with glass structures able to limit the heat loss, with a total heat transmission rate of 1,3 W/ m²·K.

The insulating and finishing material (included floorings, paintings, wood treatments, glues etc.) are natural and in any case without any potentially harmful substance.

As regards the heating system and the hot water production in the bathrooms during the winter, in the residential part of the building is expected the presence of a central generator with geothermal energy, with the possibility of accounting each real estate unit.

During the other seasons, the hot water will be supplied by a renewable source of energy, in particular the sun, thanks to a set of solar panels facing south.

It is expected the installation of radiant heating and cooling systems at low temperatures on the walls or on the ceilings.

The wiring must have suitable systems to reduce and shield the induced electromagnetic field, among them shielded boxes and cables and circuit-breakers for the bedrooms, in order to ensure the best comfort.

There are also some devices to reduce the drinking water consumption, among them pressure regulators, bathroom drain boxes with separate supply systems, jet-disturber systems in the taps and fittings, etc.

To further minimize the drinking water consumption, the building was equipped with a suitable dual net for the meteoric water gathering, according to the UNI 9182 norm, with visual signalling of the pipes and a plate with the inscription «non-drinking water» for the distribution of this gathered water inside and outside the building.

Summary of the intervention:

- Global requalification; Casa Clima certification, energy efficiency class A.
- Rural court where 9 houses of 120 m² were built.
- Private housing initiative coming from the agreement on topics like green housing between the company and the designer. Entrepreneurial choice based on the promotion of the housing heritage, through a global requalification in terms of green housing.
- Interviewed persons: company in charge, designer.



Figure. 8 Orangérie - Bolzano

Third, the case study of the Orangérie in Bolzano:

The building chosen for the energetic requalification was the wing of the palace of the owners' family dated 1700, which was used as the winter garden (Orangérie). So there was a change of the purpose of use. The entire building is made up of 4 apartments and is under protection of the Belle Arti (Monuments and Fine Arts Office).

This action was taken so that the building could become the residence of the owner, famous environmentalist and founder of the Öko-Institut of Bolzano, and of his partner. After he died, in 2009, just one year after the works were finished, the building was rented to a couple of German academicians. So the interview was submitted to the heir of the building, i.e. the brother of the owner who started this action.

The starting idea was that of an energetic requalification to obtain the Casa Klima Oro certification. But the constraints of the Belle Arti did not allow the achievement of this standard, but it was possible to achieve the equally prestigious standard Casa Klima A+, particularly in relation to the limits given by the monumental feature of the building.

The requalification action concerned the building envelope: the floor decking, completely dug-out (60 centimetres of materials were removed), the external and internal walls (where not protected) and the glass walls. Since it was not allowed to install the photovoltaic power system and the solar panels, the energy balance was achieved through a pellet stove, an under floor heating system, a geothermal exchanger and a controlled ventilation system.

Summary of the intervention:

- Global requalification; Casa Klima certification, energy efficiency class A+.
- Renovation and change of purpose of use of a building from Orangérie to the owner's residence.
- Environmental requalification of the building and related increase in value, not only in terms of money. Decisions promoted by the high environmental culture of the owner

and by the cooperation between owner and designer, chosen for his wide experience in the energy requalification field.

- Interviewed persons: designer, owner (heir).

EUROPEAN LANDSCAPE CONVENTION, PARTICIPATORY PLANNING AND CREATIVE POLICIES: ROLE AND EDUCATION OF CONSERVATION DEPARTMENTS AND ECONOMICAL AND PROFESSIONAL STAKEHOLDERS IN ORDER TO INTEGRATE LANDSCAPE PROTECTION AND ENERGY EFFICIENCY INTERVENTIONS FOR HISTORICAL BUILDINGS AND SETTLEMENTS.

Landscape and institutions

The landscape institutional protection, as a single environmental and cultural good with characters of rareness and excellence, usually originates from a public action performed at the maximum levels of the State organization.

This action, historically, has mostly concerned the cultural dimension and has considered the landscape as an important perceptive picture to be maintained. At the same time, this setting comes from the attribution of a universal and absolute value (the beauty of the landscape) and a partial vision, as the landscape is considered only as a perceptive picture and not as a people and community's life scene.

This traditional setting contains more than a weakness element:

1. It does not consider the agents and the social, economic and technical conditions that determined the landscape picture's production.
2. While a protection (constraint) measure is applied, it removes (effectively or considered as it) a territory portion from the free availability of the local community;
3. It considers only a portion of the landscape, such as the important places and not the entire territory, as a populations' life scene.

While the democratic institutions are becoming more consolidated and stratified, each state organization becomes more articulated and more complex both horizontally, related to the organization in sectors (ministries, national institutions, etc), both vertically, from the national level to the regional and local one.

Due to a missing suitable institutional cooperation and a sectors of intervention's integration, with this higher complexity it is difficult to realize both the protection of a single landscape picture both the pursuit of a high-qualitative level of the diffuse landscape, that make up the community's place of life.

For an effective landscape policy, both for the important areas and the entire territory, it is necessary to define the expertises to consider the integration necessities between the different sectorial policies (from territorial planning to agriculture, environment, tourism, infrastructures) and the required cooperation and the coordination between the different levels of the government.

The expertise definition and the integration mode of the policies and the cooperation between the institutions must be modulated on the specific institutional and administrative condition of each national reality.

Shared landscape

The participatory element for the protection, the promotion and the management of the landscape is a key factor in exceeding the policies on landscape based on the

“command and control” mechanism: appending a constraint, determining the instructions to respect, controlling its applications and repressing possible abuses.

Even though, theoretically, this conception of command and control originated in periods when the relation between the institutions and the civil society was certainly based on an authoritative spirit and on an extreme repressive attitude of the government structure, has almost been unanimously exceeded, this effective exceeding could be a goal not reached and not easy to reach. Actually, only the first significant experimentations of the goal have been recently performed.

The topic of the participation has become central for the observations on the landscape policies and is one of the fundamental engagements of the European Convention on landscape. The Convention provides for “public participation procedures on the part of local and regional authorities and other subjects involved in the definition and realization of landscape policies”.

This process, which is itself a founding moment, must be followed by actions that strengthen the landscape importance's consciousness; from an educational action to increase the participation, the knowledge and the sensitivity towards the environment.

To realize an effective participatory process, it is necessary to address both to the local communities, as a set of citizens, and the institutional and non-institutional representative bodies for the interests, needs and points of view of civil society's specific categories with a higher relation, as active or inactive users, to the landscape topic (stakeholder).

Creative and integrated policies

The exceeding of the command and control mechanism requires the experimentation of new involvement modes of the economic and social actors that determine the landscape transformation and management. They are necessary creative policies for the protection and the promotion of landscape quality. These policies are creative not because they are concrete assumptions-free, but as they constitute a project that produces new values and meanings, factors and activities based on economic, technical, cultural, legal principles that can be real, existing or possible and are able to produce positive effects for landscape. In some cases, those policies have already been experimented (think about the agritourism that merges agricultural landscape management activity with the tourism activities), in other cases they have been theorized, but must be evaluated. The continuous evolution of the economics, the technology, the material and immaterial goods expressed by the civil society requires and values the capability to creatively pursue the public interest, involving the civil society and the businesses.

ROLE AND EDUCATION OF CONSERVATION DEPARTMENTS AND ECONOMICAL AND PROFESSIONAL STAKEHOLDERS IN ORDER TO INTEGRATE LANDSCAPE PROTECTION AND ENERGY EFFICIENCY INTERVENTIONS FOR HISTORICAL BUILDINGS AND SETTLEMENTS.

Considering the landscape and historical heritage as a strategic resource, is an important achievement for a society. The protection of landscapes and cultural heritage, while respecting the regional and national diversities, is one of the key elements of the European territorial culture (European Spatial Development Perspective (ESDP))

Informal council in Potsdam 10/11 march 1999). The regional diversity is considered as a treasure at the European level.

But this achievement has to be open to the social and economic needs and to the new cultural patterns of environmental sustainability.

So the landscape and fine arts guardians have to be aware of the new needs both at cultural and technical level, with the aim to preserve the essential elements of the cultural identity and of the landscape, historical and artistic value and to be consistent with the new needs of the society.

To that end, it is essential to promote a cultural, technical and prescriptive *milieu*, to allow the search for solutions that can satisfy the different criteria corresponding to different purposes of public interest: preservation of the historical and cultural heritage, energy saving, environmental qualification of the touristic economy, the increase in value of the real estate sector.

The analysis coordinated by the architect Cafiero within the project RenovEnergie, showed some aspects of the relationship with Monuments and Fine Arts Office, and this help understanding the problem.

In the case of Orangérie, the main difficulties concerned the achievement of the authorizations from the Belle Arti (Monuments and Fine Arts Office). Anyway, compared to those of the Tuscan cases, these difficulties were lower, even if the Tuscan buildings were not classified as monumental and historical heritage. In the Upper Adige case, we can affirm that the administrative interlocutors were more willing to cooperate and to find solutions to the stated problems.

In this specific case, the interviewed architect highlights some other important aspects during the negotiation with the superintendency: the fact that there was a central seat in Bolzano, being it a region with special statute and, finally, the « firmness » of the client: «the superintendency, faced with plans expecting the implementation of the exterior insulation finishing system, is a priori reluctant. But showing them the documentation concerning a prior modification of the building in 1925 and stating that the plan's purpose was to recover the old façade, we managed to obtain the necessary authorizations”.

Another difficulty, because of the protection of the façade and the “ambitious” request of the owner, was to integrate the internal and the external insulation, in a never insulated building, avoiding thermal bridges and keeping the building healthy, without any condensate. This was a completely innovative challenge on the Italian territory and the post-operam monitoring is showing that the executive and planning solutions taken were correct.

RenovEnergie Project: “Summary of interviews conducted in Italy” (October 2010)

The outlined case for Bolzano and the general remarks about the different regional contexts taken into consideration, allow us to understand some of the key aspects of the creation of a well-disposed environment for the energy requalification of the historical buildings, that can be summarized in these guide lines:

1. Creating a cultural, social and economic context sensible to the energy-environment pattern
2. Arranging some technical regulations oriented towards the environmental sustainability
3. Creating training paths for the real estate market, businesses, architects and engineers
4. Creating training paths for the technical staff of the Belle Arti (Monuments and Fine Arts Office) and for the other involved public administrations

5. Arranging a support system for starting up the energy renovation
6. Arranging handbooks and data banks of best practices to facilitate the exchange and spreading of the best European experiences.

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