Chapter 11
The Ecological Culture of the Project: A Critical Vision

Andrea Giachetta and Maria Canepa

Abstract The last decades witnessed an unexpected spread of the concept of sustainability. This phenomenon has also involved the urban and architectural design field for its obvious and known environmental impact. This cultural process, undoubtedly positive, is leaving a trace in our time more than others. It is leading to a growing awareness of the environmental problem, to an ever-wider diffusion of new design approaches and new technologies and to a significant reduction in energy consumption and polluting emissions. However, this same cultural process has exponentially accelerated over the last decades, partly because of emergency circumstances, causing an extreme simplification of its content and a subsequent rise in false beliefs. An example is the belief that the direction towards environmental culture is going is unambiguous and commonly shared. The following essay is a reflection on this false belief and its possible consequences.

Keywords Sustainability · Ecological design · Cultural ecology · Environment

11.1 Introduction

This essay provides an unusual reflection on the current ecological culture in architectural projects. Until only a few decades ago, ecological culture was a niche, under development reality, albeit based on incontrovertible principles and solid foundations. It was prerogative of a small number of isolated researchers who worked bravely, often with makeshift means.

Today, the situation has almost reversed. The culture of sustainability, even in the urban and architectural design, represents a wide and largely funded field that employs many people at all levels and with the most diverse roles. The project's ecological culture is the pride of whom contributed to its incredibly fast growth. However, this process, so quickly developed, shows today at a closer look some small cracks.

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This essay aims to be a food for thought about what is happening by providing the reader with test on opening questions about sustainability in a general and applied to urban and architectural design. The reader is invited to analyse issues and wonder what position he would take with respect to them. In the end, those who have the patience to analyse the different cases proposed will understand the goal of this unusual exercise.

11.2 Case Study N. 1: Environmental Assessment Tools

Environmental assessment tools of buildings are voluntary control procedures managed by various different bodies. They allow the assessment of buildings' sustainability through the definition of parameters related to energy and environmental aspects. In particular, they evaluate site sustainability, water management, energy management and consumption, environmental indoor quality, material quality, waste management and service management (Magliocco and Canepa 2015).

The main goal of environmental assessment tools is to validate design and construction processes aimed to crate high-quality buildings with the lowest consumption of resources possible. This comes with additional costs that, however, can be justified by the greater value acquired by the certified buildings on the real estate market. Another reason underpinning these extra expenses might be the superior energy and environmental performance, and subsequent less maintenance and management costs, of certified buildings.

Nevertheless, environmental certifications do not go against the realization of new buildings, despite the current need of reducing land use. In Italy the offer of the real estate market, especially in the residential sector, definitely exceeds the demand. Sustainability should take this into account by promoting the recovery of existing buildings rather than the creation of new ones.

In view of these facts, two considerations can be made:

(A) Environmental assessment tools certify construction industry's quality. Certified building are more valuable compared the uncertified ones, since they are more sustainable and cost-effective. Of particular interest is the unregulated usage of material resources and its repercussions on construction and product choices, and technological solutions. A related issue that must be taken into account in an architectural project is indoor pollution caused by building materials.

(B) The application of the environmental assessment tools is not necessarily synonymous of greater sustainability; it is necessary to make a broader reasoning. In most European cities there is, in fact, no real need to build new buildings, but rather attribute greater energy performance to the old ones. But this is not always easy. Greater efforts must be made to manage cities as a whole rather than individual buildings. Energy savings can only be valid in areas where the minimum levels of energy performance are very low. Only

this condition would determine a significant difference in terms of resource consumption during the operating phase between a certified and an uncertified building. In Europe, the legislation that defines the minimum levels of energy consumption is increasingly restrictive. Energy certification consists mainly in the evaluation of the energy performances; this trend however has to change in the near future. Materials sustainability in terms indoor environmental quality must be favoured, since for example the same energy performance required by directives (thermal transmittance values) can be achieved with different materials that, however, can be more or less energy-demanding in the production phase.

11.3 Case Study N. 2: The Research Centre

A few years ago, to one of the authors of this essay, still not fully engaged in university, was offered a very special professional assignment. It involved the design of a research centre on renewable energy in an abandoned former quarry of a tourist town on the Ligurian coast. The client, who was also the owner of the site, was an entrepreneur from Milan who worked and still works in the field of renewables with great passion and with a close-knit group of technicians, dealing in particular with large wind turbines and solar thermodynamic energy. His idea was to build the centre behind a small town whose main resource is seaside tourism, in a panoramic site of great charm, fairly well connected, even if it lacks the services and opportunities present in a metropolitan area. This idea was founded on the belief that the beauty of the place would have contributed to attracting resources and scholars also from abroad and that the relative isolation would have allowed the formation of a very united community by creating a working atmosphere suitable for cutting-edge research in the sector.

The intervention involved the construction of buildings (with laboratories, classrooms, exhibition spaces, conference centre, canteen), accommodation for researchers and open spaces equipped as test fields. A wind turbine, the core business of the sponsoring company, would have represented both a symbolic identification signal and an important means to guarantee economic resources to run the centre. In the entrepreneur's intentions, the area should have become a veritable open-air museum of renewables with near zero energy buildings. The designers involved (architects, plant engineers, structural engineers, geologists, naturalists, etc.) were all very passionate about this initiative that seemed to offer to a region like Liguria a big opportunity, with innovative, poetic and somewhat utopian features, that recalled an entrepreneurial spirit of the past. The idea was obviously presented to the municipality that strongly supported the initiative.

However, when the project (please refer to Longiardi et al. 2010; Giachetta 2011 for further information) was presented to the Region committee, albeit with the consensus of the president, it was hampered by the landscape and environmental protection offices. The technicians, while fully appreciating the initiative, expressed

concerns. The project area was indeed an abandoned former quarry, but over the year it had undergone a process of re-naturalization (also thanks to the work of Genoese university departments) and has been repopulated by some protected species (chiropters and animal species listed in Annex II of Directive 92/43/CEE, in particular Rana dalmatina, Pelodytes punctatus, Bufo Viridis, Hyla Meridionalis, as well as species listed in Annex I of the Birds Directive 79/409/CEE).

The site was included in a Provincial Protected Area and a Site of Community Importance. The intervention, even if designed with the involvement of herpetologists, chiropterologists and ornithologists, could have put these species at risk. Despite the good intentions of the promoter, the size and nature of the research centre would in fact have led to a construction site with a significant environmental impact. All the regional technicians objected to the construction of the wind turbine, although it was considered indispensable by the client. Birdlife would have been put at risk by the wind turbine. Furthermore, while acknowledging the particularity of the case, the regional technicians did not want to grant a derogation for the construction of the wind turbine in an area so close to the sea, naturalistically delicate and protected because this would have created, according to them, a dangerous precedent. Finally, the regional technicians were not inclined to grant the possibility of creating volumes also for housing purposes (although clearly linked to the permanence of researchers) in an area already widely disfigured by the massive and uncontrolled construction of holiday houses that took place over the past decades.

Due to these obstacles the process of approving the project became complicated and the entrepreneur desisted from continuing the project.

Both regional technicians and the entrepreneur tried to promote sustainable territorial development in different but absolutely legitimate fashions. In regards to what briefly described here, readers are asked the following question: which of the following two opinions do you agree with?

(A) The entrepreneur had a good idea. However, his project would endanger the environment. It is true that the area where he intends to operate is an abandoned former quarry but, has it has become an area of recognized naturalistic importance. Allowing this project to start would create a dangerous precedent. If the entrepreneur really wants to operate in Liguria, he could do it in former industrial areas that really need to be redeveloped (there are many!).

(B) The entrepreneur had a good idea that could attract economic resources and employ researchers in the field of renewables in Liguria, a region that has suffered the economic crisis more than others; we must support him and understand his intention to operate in a beautiful place, or rather to requalify it. The choice of the centre location is important to attract people and funding, also from abroad. Why deny him this chance? (Figs. 11.1 and 11.2).

Fig. 11.1 Design render of the centre

Fig. 11.2 Presentation of the project to the former President of Regione Liguria

11.4 Case Study N. 3: The "Big" Wind Turbines Farms

We have already mentioned the problem of wind turbines that is a sensitive topic, especially in Italy. Energy production from renewable sources is what most would consider the best solution for environmental sustainability; at the same time, they support actions to protect fauna and flora and guide or, if necessary, limite the

anthropization processes of the territory. Today, however, it happens more and more often that these actions, although virtuous, are not compatible with each other (Giachetta 2010, pp. 17–25). Some regional regulations have issued criteria and guidelines for the installation of wind turbines, limiting the construction of wind farms in a more or less severe fashion related to birdlife, or more generally, naturalistic and landscaping values.

These norms have often been contested by municipal and provincial administrations, professional associations and groups of citizens, since they are considered too penalizing for wind turbines or, on the contrary, not enough to safeguard the local ecosystem and the landscape. Hence, debates between opposing factions such as industry experts and well-known environmental associations have started.

Liguria has always pursued an ambiguous wind turbines policy. Environmental Energy Plan envisages installing and administrating new turbines (both by politicians and non) and theoretically promoting this form of sustainable energy production. Nonetheless, it contains significant restrictions on building new large-scale wind farms. Just by looking at the cartography of the "Areas unsuitable for the construction of wind farms" on the regional cartographic portal (https://geoportale.regione.liguria.it—last web access December 2019), one can appreciate the difficulties to overcome to build wind farms in Liguria. It is clear that this resistance is not only the result of what is called NIMBY syndrome (Not In My Back Yard), but it can be traced back to a desire to preserve one of the Italy's orographically more complex and naturalistically rich landscapes, with a coastal strip characterized by avifauna's corridors and one of the most wooded hinterlands.

This summary provides you with sufficient elements to reason about this open issue. Do you agree with the current policy that allows the installation of wind turbines, but rigorously limits it in so far as it has landscape/environmental impacts (on birdlife in particular), or would you support a greater "opening" towards wind energy despite the risk of landscape/environment impacts?

(A) I agree with the current policy.
(B) I support a a greater "opening" towards wind turbines (Fig. 11.3).

11.5 Case Study N. 4: The Bioclimatic Guidelines

A few years ago, one of the authors of this essay was in charge of drafting the Article 11 bis "Guidelines for bioclimatic architecture and green building" of the Plan Implementation Rules Territorial Coordination for the Metropolitan area of Savona. The aim of these guidelines, also due to the nature and specific skills of the administration, was to stimulate the Municipalities of the Metropolitan area to include rules in their Urban Plans and encourage a change in the attitude of contractors and designers, by pushing them to work with solutions respectful of the environment and its resources.

Article 11 bis suggested the adoption of solutions such as: the reduction of urbanization costs for new buildings or the increase in the admissible constructible volumes

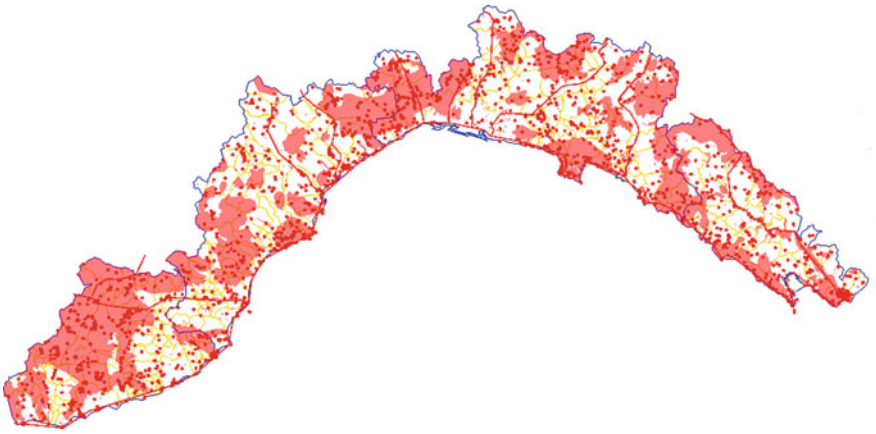

Fig. 11.3 From Regione Liguria. In red the unsuitable areas for the construction of wind farms (https://srvcarto.regione.liguria.it/geoviewer2/pages/apps/geoportale/index.html?id=1235 (December 2019)

as reward measures to be implemented as the application of sustainable intervention strategies. Eventually the article was approved and some Municipalities took it into account in the following years for the preparation of their urban plans. To make the article effective, after listening to the opinions of the competent commissions, the approval of the Metropolitan area Council was required. On the day of the vote, some resistance was expected from political groups that normally are not very interested in environmental issues, but there was no opposition on their part. Some unexpected criticisms, not such as to jeopardize the vote, were instead made, on that and other occasions, by representatives of environmental associations that considered the rules based on incentives too "soft".

In their opinion, for an environmental policy to be effective, it was necessary to impose and not only suggest new and more virtuous behaviors; moreover, the application incentive rules could be dangerous, if not subject to careful and constant checks. For example, granting volumetric incentives to those who use bioclimatic technologies such as solar greenhouse can lead some unscrupulous entrepreneurs to define as passive solar system volumes that are not at all and exploit economic or volumetric incentives (causing a double damage to the community).

To conclude, the adoption of reward or mandatory measures is a fundamental issue that biased the success and failure of many environmental policies, also at national and European level. It is a too complex subject to be treated in this essay thoroughly, but the example reported opens up to another question for readers. Which of the two statements do you feel closest?

(A) Regarding the building sector, better environmental policies (energy saving, reduction of polluting emissions, etc.) are those that focus on specific rules and regulations that oblige operators, in the case of new buildings or redevelopment interventions of a certain entity, to adopt minimum measures to protect the

environment and its resources and the most advanced systems and technologies; the incentive policy (especially in Italy) could economically support those who do not even deserve it!

(B) Regarding the building sector, better environmental policies are those that guarantee environmental safety but, at the same time, aim to promote economic incentives, tax reduction and increase in building permits. There is no point in having rules that citizens and operators involved would break as considered inadequate (Fig. 11.4).

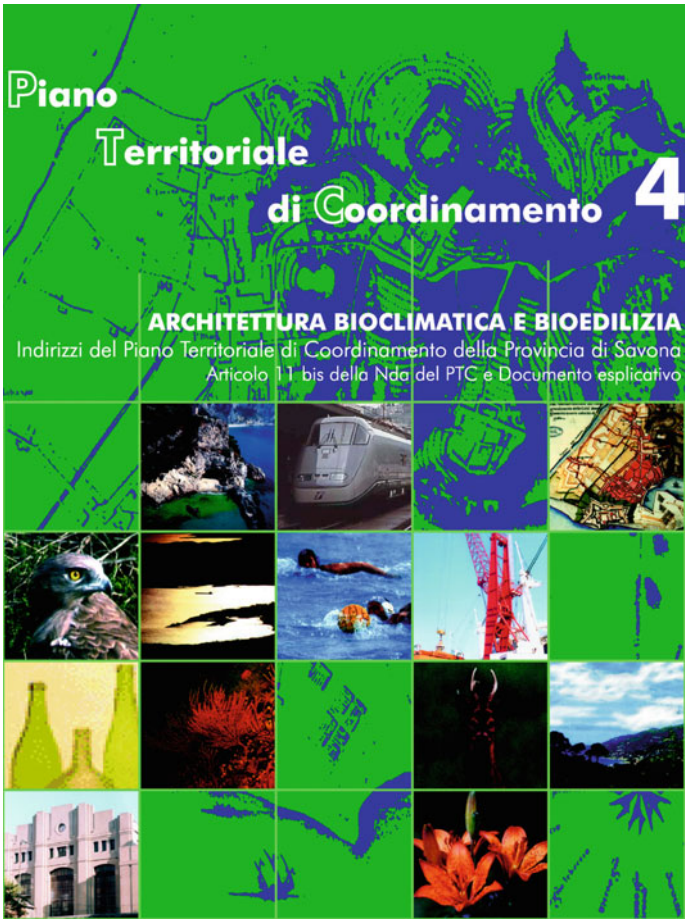

Fig. 11.4 Bioclimatic guidelines cover

11.6 Case Study N. 5: The Historical Centre

Considering the norms on the adoption of sustainable building technologies, especially in Italy, there is at least one other point of discussion that involves two opposing sides. On one hand, one argues that the application of technologies for sustainability must be carried out at any cost, if we really want to achieve a result in a reasonable time; on the other hand, there are those who argue, legitimately, that the protection of the built environment of historical value must also be recognized among sustainable practices, even when it ends up constituting a constraint on the application of elements, innovative building components and systems in the energy and environmental field. For instance, the installation of photovoltaic panels might be a sustainable practice that however could have a significant impact on historical centres.

Until now this issue has been addressed with rather naive attempts of regulatory mediation (Giachetta, 2013, pp. 76–77) or by developing systems for renewable energy that can be camouflaged, almost always significantly more expensive and not exactly performative. Thus, photovoltaic and thermal solar panels have been developed in the form of slate-like or coloured elements, like brick, or in the form of roof tiles in order to be used even in historic centres.

Do attempts like PV tiles shown in the Fig. 11.5 make sense? Can they somehow represent a possible solution for interventions in historic urban fabrics?

(A) Yes, in some cases they can be just mediation!
(B) No, it is necessary—if necessary—to learn how to manage the historical preexistences in a more courageous fashion!

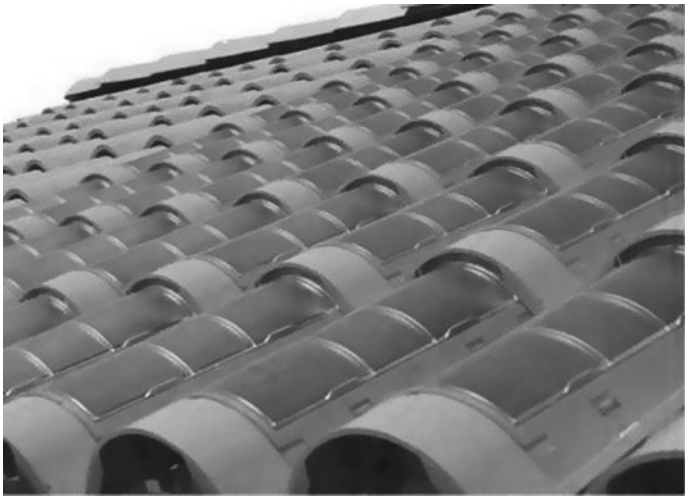

Fig. 11.5 PV tiles

11.7 Case Study N. 6: The Biofuels Debate

Biofuels are sustainable fuels of natural origin that can replace fossil fuels. Bioethanol and biodiesel are two examples of biofuels obtained from sugar can and vegetable oils, respectively.

Some poor or developing countries, such as Brazil, have largely invested on the production of these renewable fuels to boost their economy and become more independent from richer countries. On the downside, this massive production is affecting their agriculture and environment because it requires large portions of agricultural land, sometimes obtained with uncontrolled deforestation, and allows the use of modified organisms and pesticides that would otherwise not be used for nutritional purposes.

We are aware of the fact that this problem would need more in-depth analyses, however we ask you the following question: do you agree with the large use of biofuels even in countries that lack of strict regulations?

(A) Yes, absolutely, the large use of biofuels can significantly reduce the use of polluting and non-renewable fossil sources and can severely limit dependence on oil-producing countries. This is especially important for poor or developing countries that have no other resources apart from their territory. The advantages that might arise exceed the environmental and health hazards. In any case, we do not have the right to limit their energy production from renewable sources.
(B) I have some concerns. The massive use of this type of fuels can affect biodiversity by promoting monocultures and less rigid controls on the use of GMOs and pesticides.

I think that biofuels production should be much better regulated internationally with stricter controls and limitation policies. Sugar cane, for example, is one of the most extreme monocultures and in some countries, such as Mauritius and Barbados, it occupies more than half of the cultivated land causing food and environmental problems. The spread of palm oil crops in Southeast Asia and West Africa has resulted in uncontrolled deforestation and environmental disasters.

11.8 Conclusions

At this point, you will be disappointed if you think that it is possible to define your 'environmental' profile based on the answer provided. This essay wanted to show that there is no single thought on environmental sustainability and a considered reflection is necessary to overcome a homologating and simplified culture.

One should bear in mind that the answers provided by the readers do not result from more or less correct attitudes towards the environment, but simply from different and equally legitimate visions.

In the future, the environmental-friendly management of our life style might be less biased by the backward cultures. Larger economical resources will be allocated

to support a more environmentally conscious vision of the world and fossil fuel lobbies will gradually lose power.

It is very likely that the most important challenge for the near future will consist not so much in convincing the last irreducible anti-environmentalists (who hopefully will no longer occupy positions of power as unfortunately still happens today), but in finding common ways of working for a shared environmental vision.

Almost no one seems to be aware of the complexity behind the fulfilment of a sustainable future. Often, in fact, we take for granted concepts such as 'sustainable design' as if they were recognized and accepted by the majority of public administrators, citizens, teachers, entrepreneurs, professionals and only a small portion were against them.

Upon closer examination, however, when trying to face real issues, unexpected problems often emerge and not even the experts—sometimes especially them—seem to really know what they are dealing with.

Are we so sure to know what it really means to have a more correct attitude towards the environment in term of training, economy, design activities that we carry out, plan to work, relax, travel, live in our buildings, our cities, the territory we occupy, our planet?

As highlighted by the previous questions, more and more often we should ask ourselves what sustainability really is: it means to equip buildings with technical instruments for the production of renewable sources or to protect the integrity of historic buildings and the landscape from human interference? To what extent we can exploit the territory to obtain renewable energy? Should we improve the existing buildings or build new ones? Should we improve the production of objects that we consider essential or try to produce less (Latouche 2004, 2007)? Do we aim at environmental sustainability or sustainable development?

And, furthermore, are bottom-up or top-down policies more needed for sustainability? Who will be the real protagonists of the sustainable future: all citizens or multinationals (Sukhdev 2012)? What ecological approaches will be sustainable in the so-called developing countries? And will these same adjectives make sense in a fairer and more sustainable world? Is it possible to think of organic food for everyone or is it just a green alternative for wealthy people? How will we deal with waste: convert it into energy, recycle it, stop producing it? Is naturalistic tourism sustainable? Will we have to increase or limit the influx of people into sensitive areas? Does it make sense to lash out – even in a hysterical fashion - against some types of products that may be harmful for the environment, such as palm oil, and replace them with lower yields and perhaps even more destructive? The fact is that the opinions of the environmentalists are many and equally reasonable (or almost). Moreover, there exist different recognizable cultural attitudes: sustainability, conservationism, degrowth, deep ecology, strong, weak anthropocentrism, ecocentrism, biocentrism, just to name some of them. But what does it mean today to have, for example, an eco-centric or biocentric position regarding the management and planning of our production, tourism, housing and life activities?

It might be not possible to answer, but raising the question seems indispensable to understand how important it is. A critical approach must be adopted in order to guarantee the existence of a sustainable project in a future.

These criteria should be also included in the trainings of future generations. We are still at the dawn of only a six-year-old environmental culture, but the time to change our behaviors might have come. We should settle for easy solutions. For a truly sustainable approach to the project to be possible, we can no longer rely only on experts, on the intuition of genius which will save us; the complexity this approach require an increasing and closer confrontation with the natural, historical, cultural and social environment and, above all, with the different opinions and skills needed.

The management of ecological complexity might require a joint effort, with greater skills, greater operational humility, more open-mindedness, more listening skills and a slightly less boundless self-love.

References

Giachetta A (2013) La gabbia del progetto ecologico. Carocci, Roma

Giachetta A. (2011), "Project for a renewable energy research centre", in Techne, Journal of Technology for Architecture and Environment, vol.1, Firenze University Press, Firenze (pp.144–147).

Giachetta A (2010) Il progetto ecologico oggi: visioni contrapposte. Alinea, Firenze

Latouche S (2007) Petit traité de la décroissance sereine. Mille et une Nuits, Paris

Latouche S (2004) Survivre au développement. Mille et une Nuits, Paris

Longiardi B, Casadei B, Grassi A, Camana S (2010) Ortofabbrica. 1° Contest di creatività sostenibile, Guaraldi, Rimini, p 85

Magliocco A, Canepa M (2015) Tools for sustainability not for the market: a critical analysis of environmental assessment tools. In: Khan A, Allacker K (eds) Architecture and sustainability: critical perspectives for integrated design. ACCO, Leuven, pp177–180.

Sukhdev P (2012) Corporation 2020: transforming business for tomorrow's world. Island Press, Washington