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Conceiving the (everyday) landscape of energy as a transcalar infrastructural device

The progressive construction of a working hypothesis

Penser le paysage de l'énergie en tant que dispositif infrastructurel transcalaire
Ou de la construction d'une hypothèse de travail

Introduction. Conceiving the (everyday) landscape of energy

This paper aims to explore the material and immaterial consequences engendered by a new way of considering the role of energy flows in the process of constructing and transforming contemporary *everyday landscapes* . This purpose requires a *step-by-step* clarification of the scientific point of view we intend to use to tackle a set of epistemological issues, as for example the meaning of such terms as «energy», «transcalar», and, most importantly, the metaphor of the «infrastructural device», used to describe the landscape of energy itself.

Responding to the question «which sort of *energy* are we referring to?» is probably the hardest task which we attempt here. Nonetheless, the cloud of vagueness that surrounds the meaning of this word, in both contemporary scientific and mass media speech is, in our opinion, a dangerous and contradictory way to approach any helpful reflection on, for example, low carbon strategies in contemporary urban and territorial planning and design. Moreover, the ambiguity of this term seems to reflect the «nebulous sustainable» (Zardini, 2010), in the sense that its current usage is at high risk for ideological manipulation, recalling the use of easily-appropriated terms such as «sustainability» or «sustainable design».

Following the philosopher Ivan Illich[1] and the architect Jean Robert's shared reflection, the architect Rania Ghosn (2010), teaching at the University of Michigan, recently noted in her introductory text *Landscapes of Energy* [2], that, «"energy" belongs to a class of words that share the characteristics of being strong in connotation and weak in denotation.» We share this point of view and our scientific reflections are therefore oriented towards contributing to the «deconstruction of energy as an abstract category», by proposing, as in the case of this paper, a way of thinking about the contemporary landscapes of energy that focuses on the spatialization processes situated, and in most cases hidden, *behind* or *underneath* the actual forms and features in which the chain of extracting, producing, distributing, and consuming electric power redesigns the context in which we live.

This scientific attempt is in particular based on two sets of convictions. First, we believe that the different phases of this «decrypting» operation, with regards to the role of the embedded energies that supply the life cycle of the territories on which the activities of our daily life are based may redefine the scopes and scales of design practices, and in general the agency of the design at the territorial scale. This first aspect supports a critical point of view in terms of what is currently explored and carried out in the name of a «sustainable» approach to spatial design disciplines. In general, this criticism takes into account the long-lasting influence of the rich heritage of scientific research, which has been developed since the Seventies, concerning the «overshooting» of the limits for human society's growth which could be *sustained* over time (Meadows, 2004), and, more specifically, the recent critical revision of the notion of «sustainability» within design practice (Jarzombek, 2006).

In this first step of our considerations, we mainly refer to the landscape of energy as the «ground of the action» or the «operation field» for designers. In other words, as the context in which the speculative reflection and consequent trajectory of transformation carried out through the work of architects, landscape architects, urban designers and planners can be spatialized.

At the same time, our scientific goals follow the perspective that the idea of emphasizing

the way in which the *everyday* landscapes of energy are produced may represent an important factor in the contemporary speculation concerning inhabitants' perception of their living context, a question raised by the well-known definition of the *European Landscape Convention* (2000). Therefore, in the second step of our analysis we adopt an epistemological point of view referring to a *paysage* of energy: we furthermore take into account issues of perception and social representation. In particular, here we follow the hypothesis that in order to consider these issues more critically, the social perception of *everyday* landscapes of energy should be founded on an increased level of awareness for inhabitants of their own ways of producing and incrementing the spatial energy flows embedded in their physical *milieu* , according to each activity they carry out in their daily lives.

With a view to providing a set of scientific tools specially designed to respond to both of our dual goals, we intend to construct a comprehensive analytical framework, using a relevant metaphor to *describe* , from the designer's point of view, and to *conceive* , from the various perspectives of social actors, landscapes of energy.

Conceiving the (everyday) landscape of energy as an infrastructural device

As announced in the title of this article, the metaphor of an «infrastructural device» is adopted here to pave the way to a fundamental operation of *decrypting* energy flows, through a perspective of both reading and interacting with the everyday landscapes that support and encompass their material and immaterial components.

It is in this sense that we employ the term «infra-structure,» with the specific technical and mechanical meaning evoked with the idea of an «infrastructural device», first by its etymological definition and secondly, by virtue of its physical and conceptual meanings.

Infrastructure is here a physical and virtual medium that serves as the foundation for the construction of our epistemological approach to landscapes of energy: *infrastructure* as an *object* of design practice and, at the same time, a *concept* able to structure our reflections on the spatialization of energy flows and the physical and virtual influences they have on contemporary urban and territorial transformational processes.

Taking a literal definition of infrastructure as a starting point, in this case from the Italian *Lexicon of Architecture and Urban Study* , edited by Paolo Portoghesi (1969), we consider infrastructure as an intervention carried out by human beings on their territory, with the aim of «supporting economic and political structures», and therefore «necessary for human relational existence»[3].

Moving beyond this etymological definition, we are influenced by the theoretical and practical approach first defined by the North-American *Landscape Urbanism* , subsequently adopted by its most recent iteration, *Ecological Urbanism* (Mostafavi, Doherty, 2010). In order to clarify the legacy of this important epistemological influence on our study, we deem fundamental to report here the disparate ways in which tenants of Landscape Urbanism refer to the term «infrastructure,» in various analytical contexts. In fact, within this design-oriented theoretical framework outlined by landscape architect James Corner (2003), *infrastructure* is a fundamental concept, constituting one of the five

general themes outlined in the text *Landscape Urbanism* , which preceded the well-known

Reader manifesto (Waldheim, 2006) by some years. In this work the emergence of a detailed declination of the notion of infrastructure within Landscape Urbanism theory and practice is clearly exposed, in the context of a wider reflection on the processes and dynamic structures that lead to the complex development of a city, or more specifically, the «dynamic, open-ended matrix» forming the urban territory.

In addition to the conventional definitions of infrastructure in landscape design terms, a «preparatory substrate that conditions ground for consequent uses». and in urban planning, the material and immaterial systems that «support and instigate the development of the city», Corner proposes an alternative approach to interpretation and establishment of infrastructural systems. They may be considered as a *catalyst* that the landscape or urban designer orchestrates to implant new potential in the urban *field* , the *horizontal surface* that «organizes, collects, distributes and condenses» all the forces operating upon it. When operating in this dynamic framework, «infrastructural catalysts perform, produce and exfoliate effects» in the urban horizontal matrices. This is why Landscape Urbanism designers give a prominent role to infrastructures: they draw particular attention to the effects engendered by new forms and materials in the urban landscape, rather than just considering the stylistic modes of expression inherent to the lexicon of geometry.

In virtue of these characteristics and in the operative framework of the Landscape Urbanism *surface strategy* , infrastructure may be viewed as a working model for the whole urban landscape, where the horizontal matrices, which make up the urban living ecology, themselves function as *infrastructure* , because they establish new conditions for the future development of the city.

Although originally positioning its research focus within the urban design disciplines, across which «landscape has become a lens through which the contemporary city is represented and a medium through which it is constructed» (Waldheim, 2006), the Landscape Urbanism theoretical speculation can also represent a reference for our reflections on the potential for using the metaphor of *infrastructural devices* to describe landscapes of energy, even when they move beyond the realm of cities. The idea of viewing

infrastructural catalysts in the light of the different effects they engender within their physical context, rather than in virtue of the geometric forms they assume - as elsewhere pointed out by another Landscape Urbanism proponent, architect Stan Allen [4] (1999) - represents an important foundation for our research that introduces a notable degree of intermediation between the symbolic and physical ways of considering landscapes of energy in terms of infrastructural devices. As pointed out in our introduction, the epistemological approach proposed here is precisely focused on the consequences produced by this way of thinking for the landscape of energy, for both designers and inhabitants.

From a concrete non-figurative point of view, the image of the infrastructure device applied to the interpretation of the landscape of energy as a *whole* , composed of different types of visible and less visible components [5], provides a stream for the scientific development of reflections mainly aimed at spatializing the existing connections between the various parts

of the energy system, and between each part and the whole.
In this case, the notion of energy is therefore understood - and the physical deployment of its flows re-calibrated - through the lens of the catalyst effects engendered by its systems of production, distribution and consumption at the territorial scale. It is in this specific sense that we take into account the scientific hypothesis of «thinking energy spatially», which is the basic line of reflection for Ghosn and the other scientists whose work is collected in the second issue of the Harvard GSD journal *New Geographies* . Through the physical and conceptual medium of *infrastructure* , a new way of repositioning the «spatial agency of energy» within design practice may be conceived, referring, for example, to a «geographic grounding» over energy transition debates, «to foresee and possibly avoid the potential perpetuation of uneven geographies of power in the sunbelts, fields, and wind corridors of the world» (Ghosn, 2010).
The idea of thinking landscapes of energy through their ability to define and progressively implement an integrated network of infrastructures leads to a reciprocal point of view, such as designers and planners' adoption of a «landscape approach» (Lassus, 1998), in considering the spatial dimension of energy and the physical consequences of the deployment of energy flows within a context where human beings live. The interest in making reference to a *landscape approach* to be adopted in the construction of the energy infrastructural system within urban and territorial contexts, will be introduced in the final part of our work, where, in analyzing different scales of action and perception, we'll focus on the potential consequences of considering landscapes of energy as a scientific and political arena for discussion.

The complementary symbolic declination of the meaning of «infrastructural device» involves, on the other hand, the idea of constructing a conceptual structure *infra* (lat. between) the discontinuous fragments of the «dominant meta-narrative» of twenty-first century, i.e. *sustainability* (Selman, 2010), particularly within the context of territorial development. This goal directly responds to the need to contextualize reflections regarding the search for an effective sustainable approach to landscape design, and particularly to its developing processes, into a wider framework, synergistically taking into account the different issues which arise through attempts to provide an energy efficiency strategy for contemporary societies and, thus, landscapes. This perspective may for example be intended to overcome the dichotomous logic of renewable/non-renewable, which seems to serve as the main characteristic in today's debates about research for new forms of energy production and new energy sources to ensure adequate supplies for the future. The main idea here is to take into account energy sustainability concerns, by inter-connecting the different environmental, economic and socio-cultural aspects involved in the context of a more complete spatial and chronological scenario[6], at both an analytical and design strategy level. Projecting the work on landscapes of energy to this scientific horizon basically represents an alternative way to think and design the *energetic shift* of contemporary landscapes, as well as a active proposal to face the important change in the energy paradigm that has dominated both scientific-technological disciplines and humanities since the Seventies.
In particular, this goal takes as a starting point that the strategy of «disseminating» green

energy power stations within human beings' context of life, in order to produce so-called «sustainable» energy landscapes, can no longer be considered as sufficient in terms of dealing with the current complex development of energy crises. In more general sociological terms, material technology, independent from social change, can no longer be seen as a solution to the energy crisis and for problems connected to energy shortages (Lacy, 1982).

Even if it has increasingly been adopted in Western national contexts, the «zoning» strategy for the distribution of green energy power plants, producing off-limit enclaves under a system of strict surveillance - «a work of destruction or the reflection of a guilty conscience», rather than places which experience «a new achievement in the evolution of civilisation» (Schöbel, Dittrich, 2010) - has been demonstrated ever more clearly to lack the capacity to construct an effective sustainable scenario for energy transition.

Deeper reflection is indeed needed, and specifically on the way in which energy infrastructures «deploy space, capital, and technology to construct their geographies of power and inscribe their technological order as a mode of organization of social, economic, and political relations» (Ghosn, 2010) and, furthermore, on the different geographic and socio-political scales involved within this process.

Conceiving the (everyday) landscape of energy as a transcalar infrastructural device

The need to distinguish between different levels of complexity for the problematic issues outlined here derives from the hypothesis of basing our scientific reflections on the fundamental role that the heterogeneous components of the energy supply and demand chains play in shaping the everyday landscape of living, specifically in consideration of both the material (physical changes in landscape structures) and immaterial (landscape perception) implications of the close bilateral relationship between landscape and energy drivers.

In the light of this consideration, in the final part of our text we will briefly outline some lines of reflection concerning the different *types* of scales on which designers may focus their attentions when they are working on projects which articulate a «geographic future» (Ghosn, 2010) for landscapes of energy. Complementarily, a reflection on scales, developed in coherence with the specific purpose of our research, also takes into account the way in which it is possible to integrate the role that inhabitants' social perception of their everyday landscape plays.

As we focus on a *transcalar* dimension of infrastructure devices, rather than a *multiscalar* one, which in our hypothesis represents a metaphoric way to think about landscapes of energy, we mainly intend to orient our considerations toward the possibility of analyzing the reciprocal *interactions* between the different kinds of scales here in question, instead of simply considering their cohabitation or superposition[7].

Moreover, the idea of considering *transcalarity* as another fundamental dimension of landscapes of energy is grounded in our hypothesis in the important political connotations of this notion, which takes into account the «concomitant insistence upon the same territorial area» for systems of different scales (regulatory or normative systems, as in the

case of political *transcalarity*), which overlap and compete, rather than describing a hierarchical articulation of powers or spheres of influence[8] (Garibaldo, 2007).
Thinking these infrastructural devices that embody energy landscapes in a transcalar way highlights the fact that these networked systems should be conceived and created in a renewed political dimension, where the interactions between different kinds of actors are able to design an isotropic political geography rather than a polarized geography of powers.
This assertion refers to recent scientific speculation on the necessity of an «energetic governance» (Zélem, 2007), intended as a transversal political approach able to, first, face and counteract the complexity of the vertical and hierarchical *power game* involving energy issues and, second, to provide an effective alternative to the complex and often murky system of regulatory procedures that feed this game[9]. An example can be seen in the case of the public policy implementation process (Prieur, Durousseau, 2006), in particular with regards to the installation of renewable energy power plants. This kind of approach to public participation may open up the possibility of viewing management of energy projects as a local *laboratory* for experimenting with a new integrated approach to *sustainability* .

Nevertheless, questions arise when we establish the need for energetic governance of contemporary energy issues, at the intersection of economic and environmental concerns, such as the assumption of the axiom of *scarcity* (Illich, 1974, 2010; Robert, 1995, 2010) and the necessity of a carbon *neutrality* viewpoint (Selman, 2010). These questions concern the fact that geographical and political scales finally can be seen as overlapping and tightly intertwined within the landscapes of energy, as the first actually spatialize the physical «imprints» of the second. We may even state that the act of mapping the geographic distribution of the various nodes of the hypertrophic or hypotrophic energy system that permeate our living spaces represents a way to reveal the irregular - dense or rarefied - political plot that governs the energy market, as well as its external and internal regulation logics[10], and, consequently, the supply/demand balance.
A comparable approach to this synchronic and synoptic interpretation of spatial and political scales of landscapes of energy is, for example, the one recently outlined by the geographer Gavin Bridge (2010), which he proposed to describe the extractive geography of oil wells, considered to be «strategic sites for challenging the social relations of capitalism».
Our reflections on the concept of transcalarity may be rhetorically comparable, in light of the observation that «the punctuated, discontinuous geographies of extraction do not coincide well with notions of national territory or development». This scientific research, which takes into account the inappropriateness of conventional political maps of global oil production in their representing national oil supply systems as an uniform «fitted carpet» reveals, in fact, the important gap existing between *uniformity* in political representations and *discontinuity* in extractive geography. In this perspective, oil patches become a kind of «miniature corporate state», independent from the national space from which the global «enclave economies» produced within oil stations are isolated[11] . Complementarily, the episodic emergence of « rhizomatic structures», which distribute fossil fuels within the dystopian territory of globalised economies of investment and trade in the energy sector,

reminds us of the difficulty for energy resource geography to overcome the hurdle of «natural production» and to move in the direction of a balanced «social production»[12].
In conclusion, the analysis of the relevant discrepancy existing between geographic distribution and political dependency of the oil economy apparatus highlights notable fragmentation of spaces and scales involved in its transboundary and transnational territorial dimension and combines with the more general considerations proposed by our study about the possibility of reading landscapes of energy in virtue of their connotations of transcalarity.
Ultimately, what we states in our hypothesis is the fact that this last way of conceiving landscapes of energy may lead to a renewed interpretation of their transacalar dimension, taking into account the original meaning of the Latin prefix *trans-* and suggesting the idea of reading *across* the political and geographical scales involved in the construction of landscapes of energy, and critically searching for important spaces of contradiction.

Conclusions. Problematic scales for discussion on the landscape arena

As a conclusion of the hypothesis of work we propose here, specifically in reference to our final considerations about the overlapping socio-political and geographic scales involved in the *social* production of landscapes of energy (viewed as infrastructural devices prone to tangibly and intangibly interconnect social needs, as well as political interests), we intend to highlight a particular approach emerging within the contemporary debate on energy and landscapes. Firstly outlined in the discussion which developed during the session *Climate change and the new energy paradigm* of the «8th Council of Europe Meeting of the Workshops on the Implementation of the European Landscape Convention - *Landscape and driving forces* » (Malmö, 8-9 October 2009), it acknowledges a transversal line of analysis that emerged across the different scientific contributions presented at this international meeting.
The diverse interventions of the various participants emphasized the need, for researchers, professionals, and social actors, to establish a better understanding of the way in which the 20th century carbon energy landscapes were formed, in accordance with the different patterns and methods which were developed in the past to manage both energy production and consumption. In this scientific framework, the emergence of a *landscape-sensitive* approach to energy issues seemed to play a prominent role: «as many of the ideas around energy are abstract and difficult to grasp, the idea of landscape may be able to solidify the debate, to ground it, to help make the energy debate more concrete» (Fairclough, Sarlöv Herlin, 2010).
This suggestion brings to mind the controversial yet fascinating idea of a conceptual *reciprocity* of landscape ad energy. If, on one hand, landscape may represent a new critical observatory from which to approach a more balanced consideration of the past and present use of energy in different societies (van der Horst, 2010), then, on the other hand, energy may be considered as an important «driver» for landscape, in regards to three main aspects, «energy production», «energy consumption» and «embodied energy» (Selman, 2010), and entailing «explicit» and «implicit» streams which permeate everyday living [13]. This distinction may subsequently lead to wider acknowledgment of the ways in which the

historical «dialectical relation» between contemporary societies and energy is spatially reflected into the landscape (Ghosn, 2010).

Nevertheless, the hypothesis discussed here involves consideration of the everyday landscape, not just as a *medium* trough which the notion of energy «materializes», thus not just as the object of scientific observation, but also as the *place* for the debate. In particular, landscape itself may be conceived as a «forum» or a «stage» (Van der Horst, 2010) for the construction of discussion between multiple actors about the role of energy flows in structuring the physical milieu of societies, and, more specifically, about the way to consider the relationship between energy production and consumption and the context in which the societies themselves live.
A deep analysis of these relationships, if observed through the lens of both geographical and political scales involved, may ultimately represent a relevant and shared topic of discussion within the *landscape arena* (Nadai, van der Horst, 2010), in particular between those social actors who can create the possibility for a significant shift from an - indeterminate and undistinguishable - landscape of energy to *their* everyday landscape of energies.

Notes

1. «The word *energy* functions as a collage of meanings whose persuasiveness is based on the myth that what it expresses is natural», Illich, 2010. Previously unpublished, this text is the opening talk to a seminar on «The Basic Option Within Any Further Low-Energy Society», held at El Colegio de México, July 1983. Copyright: Valentina Borremans.
2. Volume 2 of *New Geographies*, journal of Design, Agency, Territory, founded and edited by Gareth Doherty, Rania Ghosn, El Hadi Jazairy, Antonio Petrov, Stephen Ramos and Neyran Turan at the Harvard University Graduate School of Design and distributed by Harvard University Press. Some of the articles presented in «Landscapes of energy» issue represent fundamental references for our research.
3. «A term used in politics to indicate the projects which humans carry out on the land to support their economic/political structures. Therefore, in a more abstract sense, each architectural or urban project constitutes a piece of infrastructure. More strictly speaking, and in particular in terms of urban planning, the term is used to indicate projects necessary for life in relation to said political structures, that is the entirety of the lines and nodes which constitute the reticular system of connections, exchanges, the distribution of water and various types of energy, to the movement and disposal of waste. Hence, multiple networks can be distinguished, each characterized by its pathways, points of origin and points of transformation, nodes for exchanging with other parts of the same network, or between different networks.» (Portoghesi, 1969).
4. In his 1999 text *Infrastructural Urbanism*, Allen distinguishes between two kinds of effects produced by infrastructures and apt to influence the field conditions: the *capillary effects of scales* , generated by a great number of small elements that compose the infrastructural network, and the *effect of synergy*, that originate where there is convergence and interchange between different systems in the network.
5. Where the fact of being *visible, less visible or invisible* for each one of these components never responds to a casual dynamic, but rather to a political intention. For deeper analysis of these subjects, see (Barry, 2009). He here draws attention to the notion of «distribution of the sensible», about the «very configuration of the visible and the relation of the visible to what can be said about it.» (Rancière, 2003).
6. See the energy timeline «Power Perestroika» proposed by landscape architect Pierre Bélanger (2009) in order to chart «the convergence of historical events, technological innovations, energy consumption, resource conservation, and population count from the fifteenth to the twenty first century."
7. «Systems, and in particular, energy-based systems, do not scale geometrically, nor do the have distinct boundaries. Indeed, even if one system is isolated from the others, multiple scales and boundaries come into play.» See Addington (2010).
8. The author refers here directly to the notion of transcalarity proposed within the works of Cox (1998) and Sassen (2003).
9. For a critical approach to the notion of «electric territorial governance», and the risk of marginalisation and *political indetermination* to which they can lead, see Pautard (2007).
10. According to Ghosn (2010), the spatial consequences of these logics generally correspond to an internalization of benefits, «accrued» within urban centers and a complementary externalization of costs, «slided» to the periphery, «out of sight».

11. Bridge refers here to the works of Labban (2008).
12. Quoting the work of E. Altvater (1993), in this passage of his text, Bridge takes account of the «asymptomatically reduction to zero» and the «annihilation of space by time» inducted by the system of distribution of fossil energies in their journey from the underground world of «natural production» to a «surface world of mobility and change», where neither differentiation between space and time, nor possibility to make space distinguishable occur.
13. These might include transportation networks, electric power and heating facilities in the first case, and energy footprints of products and production and consumption habits in the second case (Selman, 2010).

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