Aisthesis

Solar Landscapes. Aesthetics in the Energy Transition

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Abstract. This essay explores the aesthetics of solar landscapes in the framework of a broader investigation about the concept of landscape and its semantic richness. The article consists of four paragraphs. In the first, the terms territory and landscape are introduced to properly distinguish between disputes over land use and landscape perception. The second paragraph reflects on energy landscapes as particular cases of cultural landscapes that are typical of modernity and are generally not associated with positive aesthetic values. After a brief examination of the aesthetic issues related to energy landscapes in general, the third paragraph deals specifically with solar landscapes and offers a philosophical commentary on part of today's literature, which is mainly drawn from the fields of energy economics and landscape planning. Finally, in the fourth paragraph, I will show that energy and solar landscapes also deserve attention from an aesthetic point of view: Although they are unavoidable from a territorial point of view, they still need to be socially and aesthetically accepted to be fully realised as full-fledged landscapes.

Keywords. Energy landscape, modified environment, patch, solar landscape, territory.

1. *European solar energy targets and related controversies*

The European Union (EU) has set ambitious targets in its energy policies concerning solar plants as part of its wider efforts to transition towards clean and renewable energy sources[1]. These goals are outlined primarily in the European Commission's strategic documents, such as the European Green Deal[2] and the Clean Energy for All Europeans package[3]. The EU has set a binding target to achieve at least 32% of its energy consumption from renewable sources by 2030. This includes solar energy, among others. The EU's solar energy capacity increased significantly from 164.19 GW in 2021 to 259.99 GW by 2023, with employment in the sector growing from 466,000 workers in 2021 to 648,100 by the end of 2022, representing a 39% increase. The European Commission adopted in May 2022 an EU solar energy strategy, which identifies remaining barriers and challenges in the solar energy sector and outlines initiatives to overcome them and accelerate the deployment of solar technologies. It aims to deliver over 320 GW of solar photovoltaic by 2025 and almost 600 GW by 2030.

In order to reach the targets on schedule, not only rooftops and abandoned factories have been identified as locations for the installation of photovoltaic panels, but also farm fields and green spaces. According to Chatzipanagi:

> Although considerable capacity can be installed on roofs, in urban areas, on brownfield sites and on infrastructure, approximately 50% (SolarPower Europe, 2022a) are expected to be ground mounted systems using land in agricultural areas. Indeed, agricultural land is already extensively used for energy: bioenergy crops occupy approximately 10 Mha at present, accounting for around 2.4 % of the total EU land area (Strapasson et al., 2020), whereas existing utility-scale ground mounted PV systems (approximately 92 GW) use 0.1 Mha. (Chatzipanagi et al. [2023])

The use of photovoltaics is nonetheless controversial in at least two respects: first, large-scale solar energy facilities installed at the level of the ground come into conflict with other land uses, like agriculture and livestock; second, ground photovoltaics heavily affect the perception of the landscape and, hence, the very sense of place (Relph [1976]) of the involved site. Land use conflicts can be seen as part of a territorial controversy, that is, a controversy that concerns the ways in which a portion of space is materially shaped by the productive forces active in the area; conflicts about place-perception constitute a landscape controversy, concerning the transformation of a portion of space's appearance and character induced by the installation of solar facilities and the ways in which people per-

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1   https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en.
2   https://www.consilium.europa.eu/en/policies/green-deal/.
3   https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en.

ceives and appreciates it. The two controversies are clearly interlinked, yet they maintain a certain distinction: in fact, one refers to space understood in terms of territory, the other to space understood as landscape.

Territory and landscape are polysemic and multidisciplinary concepts: how we define them is not obvious and depends on the adopted scientific framework and theoretical perspective. In philosophical aesthetics, for instance, the conceptual tension between territory and landscape is not addressed[4]. This may be due to the birth of the territory concept in the political, administrative and military ambits (Elden [2013]), which are traditionally far from the interest and the inquiries of aestheticians. The conceptual distinction between territory and landscape has been addressed in the framework of human geography. In both aesthetics and human geography, landscape has been and can be defined in multiple ways, according to different cultural sensitivities and theoretical frames, but its link with the sphere of aesthetic appreciation and experiential/existential perception, however addressed, is generally accepted, as it is implied in the «intuitive sense of the term landscape» (Turner, Gardner [2015]: 1). In human geography, the recognition of the inherent aesthetic character of the landscape concept immediately highlights the need to use different concepts to emphasize more objective, economic, or socio-political structures and meanings of spatiality. According to the influential geographer Claude Raffestin, territory is the product of «the projection of labour – energy and information – by a community into a given space» (Raffestin [2012]: 126). In this framework, territory is a spatial configuration whose elements and functions depends on quantifiable processes such as economic flows, labour organization, used technologies. A territory is a material and social entity and its specific layout depends on the part played by that territory throughout the supply chain. When a socio-economic structure is superseded by a new one, the signs of the old territorialization remain on the same portion of space as marks of a past that will very soon be idealized by local communities: this territorial desire of the past, inevitably bound up with nostalgia, is what Raffestin calls

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4   In aesthetics, the concept of landscape is often coupled and paralleled with the notion of environment. The field of environmental aesthetics has among its defining questions the distinction between environment and landscape. Allen Carlson (2000, 2009) has framed it in an oppositional sense: landscape has to do with art and cultural gaze, whereas environment is nature, characterized by its own balances and dynamics: to aesthetically appraise nature as landscape means to mistake nature, wrongly confusing it with nature. However, the conception of landscape assumed by Carlson is based on prior separation between nature and culture, which is strongly discussed. Already in 1997 Arnold Berleant proposed a different conceptualization of environment, landscape, and their entanglements, by claiming that environment is «the more general term, embracing the many factors, including the human ones, that combine to form the conditions of life», while landscape is «an individual environment, its peculiar features embodying in a distinctive way the factors that constitute any environment and emphasizing the human presence as the perceptual activator of that environment» (Berleant [1997]: 12).

landscape (Raffestin [2005]). Landscape emerges as a sort of «convivial utopia» (Quaini [2006]), in which the real conflicts and struggles connected to the former territoriality have been removed; but such removal is only achieved through imagination, as an aesthetic compensation of the lost territory[5].

Nowadays, in many geographical approaches, differences between landscape and territory have faded, partly under the impulse of the landscape definition provided by the European Convention signed in Florence in 2000. According to the Convention, landscape is: «an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors»[6]. In this definition, the aesthetic question survives in the reference to the perception of people and to the character of landscape. Perception is always connected to imagination, imaginaries, nostalgias and desires, but it returns us to the actual presence of its object: all territories (and not only the disappeared ones) are always already landscapes, in that they take on meaning for people via perception. In this perspective, the interplay between territory and landscape is deeply rephrased: they become two coexisting aspects of the very same spatial entity, like two sides of the same coin.

At the price of some risk of confusion, the definition proposed by the European Convention attempts to restore the unitary character of the spatial phenomenon, which has been too often considered in a fragmented manner because of the multiple disciplines in which it is framed. Nevertheless, it is useful to maintain a minimal difference between the territorial and the aesthetic side, if only because, at the operational and practical level, arguments based on taste judgement and aesthetic appraisal are improperly employed to evaluate the rationality, sustainability, and equity of the land use. The interference of taste judgements in land use assessments is perfectly normal precisely because of the always also aesthetic character of any territory. Nonetheless, this interference risks to mistake what is at stake in the land use controversy. For example, we may prefer a picturesque, yellow oilseed rape field or a gently manicured lawn to a solar power plant regardless of whether they are actually more ecologically sustainable or socio-politically equitable than SPP: we intuitively associate agriculture and gardening to something more natural than energy extraction or production and this is quite relevant in a taste paradigm like ours, particularly sensitive to the aesthetic value of nature (Parsons [2008]).

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5   The analogy between the conception of landscape as aesthetic compensation for the loss of the territory, discussed by geography, and the conception of landscape as aesthetic compensation of the loss of cosmic nature, famously provided by Joachim Ritter in 1963, cannot be neglected.
6   Council of Europe Landscape Convention * 1 as amended by the 2016 Protocol Florence, 20.X.2000, 2, site consulted June 25, 2024.

Realizing that green lawns and crop fields are not necessarily more sustainable than an agrivoltaic plant, especially considering the irrationalities and inequities of today's global agricultural production and distribution system, may be disturbing, but it helps to recognize the conflict between agricultural use and energy use of a land for what it is: a clash between two different ways of configuring that portion of space depending on the role it is given in the economic system. Incidentally, this does not detract from the controversy about landscape aesthetics: the fact that a certain economic activity leads to an appearance, an aesthetic quality of the landscape that is perceived as ugly, disturbing or problematic by percipients is relevant because the processes of self-knowledge and mutual recognition also depend on how communities perceive the places where their existence takes place. In short, even if from a conceptual point of view a certain convergence of the notions of territory and landscape is acceptable, as opposed to a too rigid and outdated separation of object and subject and nature and culture, there is nevertheless a specificity of the aesthetic sphere that must be recognised in order for it to be seriously taken into account in landscape planning, whose aim should be precisely to mitigate the spatial impact of a given regime and make it socially acceptable.

After this philosophical clarification about the legitimacy and the limits of the distinction between territory and landscape and the controversy they respectively give rise, in what follows I will deal, first, with the aesthetics of energy landscapes in general and, second, with solar landscapes in particular.

2. *Energy Landscape: a modern problem*

It is possible to classify landscapes not only according to representational parameters such as artistic style or media, but also according to the morphological characteristics of the considered area. Morphology, in this context, does not only refer to the natural forms characterizing a certain landscape (mountains, rivers, native vegetation), but also to the shapes that result from the set of human activities insisting on that area. This inclusion of human-induced modifications of landscapes in the scope of morphological inquiry has already been claimed about one century ago, when Carl Sauer published the essay *The Morphology of Landscape* (1925) in which the expression «cultural landscape» (Sauer [1996]: 342) appeared for the first time[7].

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7   In Sauer's approach, every portion of land is a landscape as long as it is perceived, and every landscape can be labelled as cultural insofar as it shows the presence of some kind of human activity. Even though the nature/culture dualism that clearly characterizes Sauer's approach has been repeatedly deconstructed in philosophy and the human sciences (Duncan 1980, Descola 2005), we continue to distinguish between natural and cultural landscapes in everyday discourses as well as in many legal sources, such as, for instance, the UNESCO documents.

From the perspective of environmental aesthetics, cultural landscapes can be better grasped as «modified environments» (Brady et al. [2018]: 7): natural environments that bear the marks of human activity. Brady, Brook, and Prior argue that the notion of modified environment is preferable to cultural landscape, claiming that:

> While we see this category as a useful means to properly foreground the work of human labour, propagation, and territorialisation, in shaping the land (including its aesthetic qualities), as well as cultural readings of landscape, it does so in a manner that risks downplaying the role of non-human nature. (Brady et al [2018]: 9)

It is undeniable that in many traditional approaches to landscape the role of non-human agency, i.e. the landscape formation, shaping and transformation brought into play by non-human forces, processes, and «actants» (Latour [1996]: 8), has been overlooked. However, the definition of landscape provided by the European Convention includes non-human factors and processes into the scope of the concept. Such an inclusion is paralleled, in recent theoretical developments, by a growing emphasis on the material and performative dimension of landscape, testifying of the efforts to retrieve the substantive nature of landscape. According to the geographer Kenneth Olwig, for instance:

> Landscape, I will argue, need not be understood as being either territory or scenery; it can also be conceived as a nexus of community, justice, nature, and environmental equity, a contested territory that is as pertinent today as it was when the term entered the modern English language at the end of the sixteenth century (Olwig [1996]: 630-31).

The recent development of the concept of landscape on a theoretical and normative level downplays its representational and aesthetic character and brings it closer to the more objective concepts of territory and environment. The significance of this conceptual rapprochement is not the dissolution of the aesthetic sphere into the spatial and ecological sphere, but rather the overcoming of those dualisms that have interrupted the fundamental continuity of the spatial phenomenon: every modified environment is also a cultural landscape, insofar as the complex of transformations that a particular environment undergoes is essentially dependent on a cultural set of actions, techniques, and goals. At the same time, the notion of landscape preserves a connection with the sphere of aesthetic appreciation that is more explicit than the notions of environment and territory: Even if the strictly visual and representational character of landscape has been downplayed, the term landscape is retrieved in territorial planning and environmental policies to the extent that it raises issues concerning how people perceive and appraise a certain territory or environment.

After these conceptual clarifications, we can introduce «energy landscapes» (Pasqualetti, Stremke [2018], Jørgensen [2018], Yuqing [2021]) as a subcategory

of cultural landscapes, or modified environments, whose aesthetic character is deeply affected by the presence of energy infrastructures and the associated signs and effects. The term "landscape" is used in contemporary energy studies to refer to the experience that it is possible to have of an environment characterized by a land use related to energy: An experience that is not only visual, but includes visibility as part of a more complex, multisensory experience rooted in the affectivity of the perceiver and the cultural history of taste. Examples of energy landscapes are: «scars left from mining, patchworks of drilling pads, cleared routes for pipelines and canals, harbours for large tankers, oil refineries» (Pasqualetti, Stremke [2018]: 95). All examples are drawn from a kind of territorialization that is clearly interlinked with the industrial age.

One can certainly claim the «universality of the energy concept» (Geerts et al. [2014]: 109), where energy is defined as the capacity to do work and create material change[8]: this definition clearly comes from modern physics, yet material processes based on energy transfer and transformation have always existed. The very fact that it is modern physics that takes hold of the concept of energy, giving it a general and quantifiable meaning, is nevertheless a sign of an important change in the way energy is produced, stored, used, and transformed during the modern era. It has been noted that: «changes in energy practices became increasingly visible and influential in industrial societies» (Geerts et al. [2014]: 110). The specific interrelations between the passive, materialistic, desacralized understanding of nature implied by modern science, the capitalist mode of production characteristic of the industrial revolution, and the rapid development of ways to use natural resources for the production of goods and commodities are the foundations of what we recognize as energy landscapes.

So, energy landscapes are a modern problem in two respects: first, capitalism produces specialized territories that fulfil a specific function within the economic system, and energy landscapes embody and reflect one of these functions; second, landscape aesthetics in general emerges as a reaction to the loss – or better, the reinvention – of the sense of nature experienced by Europeans and North Americans during the industrial age (Ritter [1963]). In other terms: modern industrialization has laid the basis for both the shaping of energy landscapes and the aesthetic sensibility towards landscape, seen as a compensation for the birth of what we now call industrial or energy landscapes. The paradox, here, is that today, at least if we follow the European Convention definition, we use the term landscape to refer also to portions of land that are transformed according to the dictates of the economic system (following Raffestin, territories), regardless of

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8 The semantic complexities of the energy concept from Aristotle to Einstein has been remarked (Coehlo [2009]); we assume here the common notion of energy adopted by modern physics: «a quantitative, abstract concept of the ability to do work that mutually interconnects a broad range of physical phenomena» (Geerts [2015]: 109).

their aesthetic value, which is often felt as negative in the case of energy landscape. Such a use of the term landscape would have been impossible for most of the modern age, when it was mainly used to identify the aesthetic, even pictorial, value and quality of a portion of the land, however that value is assessed. In my view, the semantic paradox of landscape can be resolved by identifying a conceptual tension between two levels of meaning in the concept of landscape itself: I will go into this in some detail in the conclusions.

The modern character of energy landscape lies also in the dramatic, fast changes that have modified environments during the industrial age. In that respect, energy landscapes can be easily opposed to agricultural landscapes. Agricultural and energy landscapes share the fact that their aesthetics «sits alongside or is integrated within practical, productive activities which are not ordinarily or mainly aimed at an aesthetic effect» (Brady et al. [2018]: 51). However, agricultural landscapes are often associated with more traditional «modes of inhabiting the land» (Brady et al. [2018]: 50): the aesthetic appreciation of agricultural landscapes is often interwoven with a positive axiological and ethical attitude towards the rural way of life. Traditional agricultural landscapes are considered as «tangible witnesses of ancestral values anyone can perceive and experience directly in the landscape. Symbolic and cognitive values pass through aesthetically felt scenery» (Antrop [2005]: 32). Such a depiction of the agricultural landscape is perhaps a little idealized and does not take into account the enormous changes that have taken place in the practice of agriculture in recent centuries, so that it seems very difficult to find a patch of traditional agricultural landscape anywhere that corresponds to the ideal. It is undisputed that energy landscapes feel anything but traditional and have little to do with dwelling: their modern character lies precisely in their break with traditional landscapes as we are used to imagining and representing them. Energy landscapes indicate a less direct relationship between humans and nature than agricultural landscapes, for they usually require heavier use of technology and machines. It is however clear that, today, a too sharp opposition between agricultural and energy landscapes is illusory and deceitful at the level of land-use controversy: intensive farming, the standardization of crop production to meet the demands of the global food supply chain, the use of all kinds of artificial products (which are sometimes harmful to health), advances in satellite technology and GiS in precision agriculture are just some of the factors that make today's agricultural landscapes as technologically informed (and potentially damaging) as energy landscapes. This is why the aesthetic dispute about landscapes must be practically distinguished from the land-use controversy: the very fact that energy landscapes are often judged as ugly, machinic, depressed does not necessarily entail that they are more harmful or irrational or unsustainable than agricultural landscapes.

Energy development produces «marks, structures, excavations, creations, and supplements» (Pasqualetti, Stremke [2018]: 96) that also depend on the kind of energy we are dealing with. In this sense, it is appropriate to speak of energy landscapes in the plural, because there are as many types of energy landscapes as there are types of energy. Pasqualetti and Stremke argue that the societal hardships of energy landscapes are connected to the different temporal consequences of a certain land-use: are the environmental consequences of a certain kind of exploitation «temporary or timeless» (Pasqualetti, Stremke [2018]: 96)? In answering this question, a distinction must first be made between different types of energy landscapes: On the one hand, we are dealing with traditional energy landscapes based on non-renewable sources such as carbon and fossil fuels; on the other hand, we are dealing with energy landscapes based on renewable and (at least partly) circular resources such as solar power plants, wind turbines and so on and so forth. Despite the scientifically confirmed association of traditional energy landscapes with timeless consequences for the environment (the very term «non-renewable resources» implies this), they are perhaps less aesthetically problematic for today's beholders. Suffice it to think to the aestheticization of mines implied in contemporary practices of mining heritage and tourism:

> the process of de-industrialisation and the subsequent transformation of mining areas is proceeding very rapidly, with mines closing at short notice. They are, however, a very important element in the development of society and should not be completely erased from memory. Indeed, vanishing remains could be treated as part of our heritage that help preserve its values and meaning. Cultural tourism is one way of ensuring that it is preserved and passed on to a wider audience and to future generations (Jelen [2018]: 94).

In this case, the aesthetic potential of mining landscapes only manifests itself after the territorial processes that shaped them have run their course and the vivid memories of the struggles associated with mining have been dissolved and reshaped into tales of an exotic past. Such a nostalgic aestheticization of mining landscapes is not related to the careful consideration for the timeless environmental consequences of mining. A renewable energy landscape can be problematic from an aesthetic point of view because of its uncommon visual impact, because of the unnatural shape of the employed infrastructures, and above all because of its evident link to the non-aesthetic sphere of production and consumption – a link that has been severed in the case of decommissioned energy landscapes that are now considered as a heritage of historical value[9]. This does not mean that we have to wait for the dismissal of solar power plants or wind turbines to have solar

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9   «Large scale PV arrays in particular, makes new energy-oriented land uses and landscape transformations visible because the energy generators are close to the places where people live» (Scognamiglio [2016]: 630).

or wind landscapes. Once the aesthetic controversy is recognised in its relative autonomy, it can be addressed through a series of arrangements and solutions aimed at reducing the sense of alienation and contempt that can arise in the face of an anonymous, desolate landscape dominated by thousands of photovoltaic panels.

3. *From solar power plants to solar landscapes*

In the second part of the article, I focus on a specific, yet highly relevant case of renewable energy landscape: the solar or photovoltaic landscape, i.e. landscape characterized by the presence of solar energy infrastructures. The landscape effects of energy new demands are often considered by the institutional and economic actors as «collateral damage» (Pasqualetti, Stremke [2018]: 95) of decisions necessary to achieve the renewable energy production and distribution targets mentioned in paragraph 1. However, the literature is mostly aware of the problems of public acceptance of the landscape transformation brought about by the implementation of photovoltaics. Making the required room for large photovoltaic facilities «means significantly altering existing natural or cultural landscapes, a matter which has been met with resistance by local residents». (Car et al. [2024]: 1). The «opposition of local stakeholders» (Sirnik et al. [2024]: 1) to the SPP alteration of existing landscapes represents «a challenge to the expansion of the renewable energy sector» (Car et al. [2024]: 1). Since this opposition is often motivated by the fact that solar power plants affect «how landscape is perceived by inhabitants and other users» (Oudes, Stremke [2021]), it is important to address the aesthetic issues that can hinder public acceptance of solar landscapes.

Among the research dealing with the experience of solar landscapes, the study sponsored by Oudes and Stremke stands out for its clarity in identifying the aesthetic question for empirical purposes. They propose an analysis of 22 front-runner cases of solar power plants landscape throughout Europe. Three macro parameters are taken into account: 1) the host landscape features; 2) the solar infrastructure design features; 3) the solar landscape final features. We will briefly discuss them below, also taking into consideration other contributions coming from specialized literature.

1. Taking into account the prior morphological features of the landscape where the new solar park will insist is already a sign of the adoption of what has been called «acting-with attitude» in landscape planning research:

> In this case, human action is not exerted from the outside on matter understood as lifeless, but blends into the movements, the contours and the morphologies of a matter endowed with its own vital animation, with which human action interacts in responsive and dynamic ways. That sequence of interactions deals more with transformation than produc-

tion. Whereas in the demiurgic paradigm of the technical action, which corresponds to the implementation of a plan previously elaborated, the technical action understood as transformation is rather defined through adjustments and corrections, which allow us to tailor our action to an evolving situation. (Besse [2017]: 61; my translation)

According to Oudes and Stremke, it is important to assess the host landscape type by checking whether its morphology is open or enclosed, whether it includes slopes or bodies of water, and by listing the existing landscape elements and the size of the eventual parcellation. It is also useful to associate the existing elements to the previous land use: agriculture, husbandry, uncultivated meadows, brownfields. The evaluation of the morphology, aesthetics and the land-use of the host landscape is fundamental in order to make appropriate design-oriented decisions about the solar infrastructures themselves.

2. Oudes and Stremke identify three nested levels of design-oriented choices to be made for photovoltaic infrastructures: «the system as a whole, the patch as distinct group of arrays, and the array as specific object» (Oudes, Stremke [2021]). The system level corresponds to the solar park in its entirety; its final configuration will determine the new landscape layout. At this level, it is important to assess the number, size, and spatial arrangements of the patches. It has been noted that public acceptance of solar landscapes diminishes as the size of the solar system increases (Späth [2018], Lucchi et al. [2023]). This clashes with the preference of economic actors for large-scale solar parks, which are justified by the need to create economies of scale. Very influential is also the level of the patch, which is also very interesting for landscape theory more broadly. The term patch comes from landscape ecology, where it is defined as follows: «a surface area that differs from its surroundings in nature or appearance» (Turner, Gardner [2015]: 3). Landscape is a composition of patches: we go from the system as a whole to the patches that compose it by analytic reduction. This kind of analytic reduction is perceptually driven and phenomenologically based: we just recognize the patches by virtue of their peculiar way to appear. Of course, the patches only attain their full experiential meaning when they are considered in their context: Isolated from each other, the patches are mere abstractions. Yet, the inner diversity of a landscape depends on the variety of the patches that compose it: this is what renders them quite important also from the aesthetic point of view. Sirnik et al. note that «the shape of the patch occupied by the photovoltaic unit affects the landscape experience» (Sirnik et al. [2023]). The density and the ground coverage of the arrays have an impact on how the patches on which the solar power plants insist appear as a last resort. The third level depends on the design of the solar power plants arrays themselves: their orientation, the number and type of rows, the tilt of the modules, their length, width, length. It is of course important to analyse the colour of the modules and the materials used to build the supporting structure.

As one can see, only the third level of analysis of the solar infrastructure concerns it as a design object, and not even fully, since the landscape planner is invited to design the single arrays by taking in ongoing consideration the other levels of analysis and the existing features of the host landscape. In this analysis, the patch already results from a peculiar combination of nature and culture, so to speak: on one side the plot of the host landscape, on the other side the module selected for planting. Of course, the plot of the host landscape is not necessarily natural, as it may bear traces of previous land use and exploitation. From the perspective of landscape planning, assessing whether or not a spatial spot is fully natural or cultural in principle is not so important. It is more relevant to assess whether the new graft on the considered plot results in a harmonious patch. About this topic, Sirnik et al. (Sirnik et al. [2024]) have distinguished four kinds of patch configurations: responsive, irresponsive, split, and island. Different design solutions are possible in order to realize a harmonious patch, but the responsive one has the advantage of being site-specific: «it mimics the shape of the plot» (Oudes, Stremke [2021]), creating a temporal continuity between the inherited shape of the land and its new layout. Thanks to similar design-oriented choices, an aesthetic continuity is achieved with a view to reducing the percipient's bewilderment and resistance against dramatic landscape changes.

3. The solar landscape features taken into account in the analysis carried out by Oudes and Stremke include both aesthetic and non-aesthetic factors, in coherence with the definition of landscape provided by the European Convention. The first features included in the landscape assessment are the ecological ones: «features that support ecological functions, such as patches of wild flowers and hedgerows» (Oudes, Stremke [2021]). The second considered landscape features concern the presence of recreational and educational spaces close to the facilities of the solar park. The third and fourth features concern agriculture and water management. In all cases, the aesthetic quality of the solar landscape also depends on the types of land-uses and socio-spatial practices that can be carried out. These parameters suggest the adoption of a more-than-representational conception of landscape, which emphasizes the multisensory nature of environment, the perceptual richness enabled by environmental immersion, and the incorporation of visual landscape experience into a variety of embodied socio-spatial practices. I prefer to adopt here the term "more-than-representational" in lieu of the more exigent version "non-representational" (which is preferred by some human geographers such as Nigel Thrift, Candice Boyd, Christian Edwardes) because visibility remains an important trait of the landscape experience.

According to Sirnik et al., the factors that shape a landscape experience are: accessibility, visibility, patch configuration and agricultural land use beneath PV arrays. Accessibility concerns the sphere of spatial practices, whereas visibility

concerns the representational character of landscape. There is no point in opposing them: landscape is made to be seen and crossed, contemplated, transformed, and cared. As a matter of fact, negative appraisals of solar power plants are often centred on the visual impact it produces on a beholder who has in mind other models of landscape beauty. From such a visual, immediate negative aesthetics we often draw undue consequences concerning eco-ontological aspects (for instance: the solar power plant destroys biodiversity) or societal implications (for instance: local farmers are struggling against the project of the solar park) that need to be verified case by case. It is therefore of pivotal importance to adopt design choices with a view to promoting a positive visual impact on possible beholders. A number of cases analysed by Oudes and Stremke address visibility issues by reducing the overall visibility of the solar park, with some exceptions represented by specific vantage points from which visibility is enhanced. The aim is to «reframe visibility from a mainly negative impact into a potential positive impact» (Oudes, Stremke [2021]).

The compatibility and complementarity of energy and agricultural land use has been pursued for a long time (Goetzberger, Zastrow [1982]), but only in recent years have relevant successes been achieved in the field of agrivoltaics (Rule [2014], Toledo, Scognamiglio [2021], Sirnik et al. [2023], Sirnik et al. [2024]). The combination of different land uses under or near the energy modules is also important for aesthetics: it emphasises perceptual variety and diversity, and promotes a practical understanding of landscape as an operational context in which people do something and, through their doing, develop a general sense of their own self in relation to their living landscape.

4. *Conclusion. From solar power parks to solar landscapes*

Public acceptance issues of energy landscapes can be linked to the land-use (territorial) controversy, the aesthetic (landscape) controversy or, most of the time, a mix of the two. In the preceding sections, I have attempted to distinguish the two controversies from a logical and conceptual standpoint, by linking the territorial controversy to the socio-economic processes that give structure and function to a geographic area, and the aesthetic controversy to judgments of taste that are embedded in the everyday landscape experience of a percipient. From a phenomenological point of view, both controversies are important. Addressing the landscape controversy in its relative autonomy means overcoming a conception of the judgement of taste as the expression of a distanced and contemplative relationship between a perceiving subject and a perceived object (Berleant [1991]). Of course, taste judgements also reflect historical and cultural developments that may depend on multiple external factors, such as, for instance, the

influence of successful place-images in the global market image or the fascination for the picturesque, the wild, the exotic. Nonetheless, taste judgements about places and landscapes also arise from our locally based aesthetic habits, that «extend the self and one own's personality» by scaffolding our «ecological niche aesthetically» (Bertinetto [2021]: 10). In other words: our aesthetic judgements testify to the quality of the relationship between the percipients and the living environment.

Such a constitutive relation between the percipients and their living environment makes of landscape something more than a representational construct: the landscape is not only the scenery we contemplate from a distance, but also the «horizon that determines our perceptions and preferences» (Haapala [1999]: 260). The stability of our home landscapes elicits a sense of familiarity and safeness, which are fundamental aesthetic and affective stances in everyday life: «the everyday attitude is coloured with routines, familiarity, continuity, normalcy, habits» (Naukkarinen [2013]). A dramatic change of our home landscapes affects our sense of place and hence our sense of self, putting us into a state of uncanny bewilderment and disorientation. Much of the negative aesthetics related to solar landscapes can be explained by considering the imbalance that a too rapid transformation of the landscape creates in the relationship between the inhabiting community and its environment. This imbalance should not be understood as the result of either the improper application of abstract and contemplative judgments of taste on the part of a subject or her prejudicial aversion for the new: it is rather the result of the challenge that a new territoriality poses to the sense of belonging and continuity that phenomenologically binds the inhabiting community and the living landscape.

Within this onto-phenomenological framework, the landscape desire or nostalgia discussed by Claude Raffestin is not reducible to a childish imagination or a pleasant but pointless retrotopia (Baumann [2017]), as provisionally suggested in the first paragraph. That desire of landscape often arises from the disruption of our home landscape – the landscape in which we grew up, which has accompanied us until now, that we have taken for granted for too long and that now is challenged by new territorializations. In this sense, the aesthetic controversy is always already more than aesthetic, in that it thematizes our very existence as «being-in-an-aesthetic-world» (Haapala [1999]: 257). This does not only apply to energy landscapes or solar landscapes, although they reflect it particularly well today. By bringing this dynamic into focus, we finally meet again the paradox of landscape to which we alluded in paragraph 2: On the one hand, every spatial reality is a landscape insofar as it is perceived; On the other hand, the landscape is an area which I can experience in an aesthetically positive way, not because it is consistent with external parameters of judgement, like criteria drawn from visual arts, but because of the possibility of feeling at home in it.

We can conclude by arguing that solar power plants are always already landscapes in the first sense, but they must become landscapes in the second sense – and this will only happen if they are perceived as part of the domestic landscape by a community of perceivers. If landscapes in the full sense are only those areas that we can positively appreciate in our aesthetic experience, as opposed to areas whose design strictly depends on the functions they serve within economic system, it would be pointless to call landscape a modified environment whose outlook depends on activities concerning energy extraction, production, and distribution. Even without sharing the dualistic view that underlies an overly rigid separation between landscapes, i.e. environments or areas available for positive aesthetic appreciation, and territories, the design of which is the result of economic practices with no inherent aesthetic value, it seems important to retain at least one aspect of this view: that a solar power plant is not synonymous with a solar landscape, if by landscape we mean a place where we recognize ourselves and that we can call home. But a solar power plant can become part of a domestic landscape if right design choices mitigate its impact, allow continuities between the host landscape and the new landscape experiences, integrate a variety of social and ecological functions, and remain partially visible and accessible so that they are gradually incorporated into the framework of our aesthetic habits.

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