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Debate 24: Paisaje y energías alternativas

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Towards a landscape-approach to local energy planning*

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In the next years, renewable energy will have a key role in addressing the challenges related to climate change mitigation. In general, the envisioned energy transition entails a massive deployment of Renewable Energy Sources (RES) causing immediate transformations of the landscape. Such transformations will change the physical landscape and the experience of the people who live, work or recreate in it. Energy transition and landscape are often considered in contrast: progress of the former comes with losses in the latter, eventually encountering local opposition. To balance the energy targets with the drivers of landscape transformations, local energy plans could be a tool to facilitate negotiations between stakeholders and shape the values and functions of landscape. Such processes can be undertaken by environmental planners and designers, to negotiate trade-offs and manage transformations, defining, for example, location, spatial extent, appearance of the energy plants (such as wind turbines or photovoltaic panels). This entails that energy landscapes might not be optimized according to economic or technical parameters, but also by physical landscape and social considerations.

The massive deployment of RES expected in the following years requires a wider and more comprehensive consideration of landscape. In this context, the phrase energy landscape or renewable energy landscape indicates the physical environment involved in the energy chain, and it comprises “technical and natural sources of energy within a landscape”. Landscape transformations due to renewables can cause unfamiliar, immediate and dramatic changes, impacting on the physical patterns as well as on the way the user interprets and experiences the environment. This bifold effect is reflected in the definition of landscape given by the European Landscape Convention as “any part of the territory such as it is perceived by its inhabitants, being its character defined by the action of natural and/or human factors and their interrelationship”. Thus, energy landscapes can have an impact on the quality of life, both in cities and in rural areas and both in well-preserved or degraded contexts. In general, the deployment of solar power plants has received less attention on the relationship between energy and landscape than other RES, such as wind. However, the implementation of solar farms has drastically increased in the Mediterranean countries over the last decades, posing questions on how to consider and manage the discussions on land-use competitions and ecological impacts.

The concept of landscape in the energy discourse is wider than its current use and requires to be included more in the processes of energy transition. The research project PEARLS (<https://pearlsproject.org/>), focusing on planning and engaging people in the energy transition, investigates these issues with a focus on the Mediterranean countries. In this framework, two important gaps are addressed: lack of consideration of landscape in the definition of energy targets and lack of inclusion of social considerations in the planning tools. Through case studies at the local level in Andalusia, we aim to advance processes, currently missing, for better involvement of stakeholders and for the inclusion of landscape reflections in the local planning tools. As a matter of fact, the adoption of local energy planning tools is rare and, if present, mainly informed by topographical climatological and legislative data. With this in mind, we aim to propose methodological frameworks that can be integrated in the local planning tools to better shape and control the landscape transformations driven by energy transition. Specifically, we suggest two strategies that could support such a transition: an approach for the inclusion of social concerns in the local plans, expressed by inhabitants and stakeholders, and the connection of spatial planning considerations with innovative design solutions.

Currently, energy targets are often set without taking into account stakeholder considerations, since the methodological frameworks in use do not include qualitative information. Recently, some studies suggest approaches to integrate stakeholder values and preferences in the planning process, for example through interviews or co-visioning processes, including the opinion of inhabitants, experts and decision-makers. The main aim is to consider landscape perception and knowledge of the people to ensure that the energy targets and plans are accepted by the community. Rather than just considering the visual impact of potential solar power plants through visibility analysis, a wider comprehension of lands-

cape considerations is possible through the operationalization of public perception, by translating surveys, performed through different methodologies, into spatial planning and design considerations.

Moreover, at present, energy planning tools define suitable or unsuitable locations for photovoltaic applications. However, recently, some studies focusing on the impacts of solar power plants propose landscape-based approaches as an alternative to the conventional way to plan solar landscapes and mitigate the impacts of ground mounted PV arrays on land use, linking energy targets with the landscape fragilities and peculiarities. With this in mind, planning tools could integrate design approaches to site suitability considerations. Such design approaches could include strategies allowing dual use of land, orienting design parameters to improve the relationship with the existing landscape, and improving the architectural elements and patterns of the PV arrays. In this view, the land use efficiency of the system might be reduced in favor of more landscape-inclusive and accepted solar systems. Hence, the process to design and plan photovoltaic landscapes entails three different scales: planning (site selection; scale), landscape design (pattern), and architectural design (design of the system).

These two strategies suggest that a better inclusion of the concept 'landscape' is also a priority in the energy transition, if we want accepted and integrated solutions. Such a comprehensive view can shift the idea of landscape as a problem causing opposition to an opportunity to shape and design the upcoming energy transition.

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