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Evaluating the landscape impact of renewable energy plants

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Different types of renewable energy have been on an ongoing competition with each other. There has been a lot of research comparing the most common types of renewable energy plants in relation with their efficiency, cost and environmental impact. However, few papers so far have attempted to analyse their impact on landscape and there has never been in depth research on which type of renewable energy causes the least impact on the natural, cultural and aesthetic characteristics of a landscape. This seems to be a significant omission given the vast areas of land already covered with renewable energy plants and the worldwide plans for many more renewable energy projects in the future.
Meanwhile, the low aesthetic quality of renewable energy plants has already been an obstacle to their further development, with several relevant examples from countries such as Spain and the Netherlands. There have even been cases where aesthetic degradation is the primary or even the single argument of the opposition to proposed plants. In any case, the aesthetic design and the integration of renewable energy plants into the landscape should really be important design parameters if we plan those projects to truly be sustainable and to be considered complete works of engineering.
To initiate dialogue over those aspects of renewable energy, we provide a first comparison on hydro, solar and wind energy. To materialize this comparison, we use data from existing dams, photovoltaic and wind farms. Initially, the average area per MW covered by each type of energy plant is calculated and then evaluated qualitatively from a landscape-impact perspective. Although the area affected is comparable in these three cases, the analysis of the data suggests that dams offer a considerable amount of advantages compared to the other two types of plants. This conclusion arises from the fact that dams, whose basic impact to the landscape is the creation of an artificial lake, contribute much less to the industrialization of landscapes, as the area they require for their constructional and electromechanical works (main body, power station, spillway etc.) is several times smaller than in the other two cases discussed. Moreover, even this small area captured by the dam and is appurtenant structures has potential for architectural and cultural adaptability, which neither wind nor photovoltaic farms have.