



Rural resilience and vulnerability:
The rural as locus of solidarity and conflict
in times of crisis

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Solar energy, innovation and community resilience: the case of Amareleja (Portugal)

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Abstract - The solar photovoltaic power plant of Amareleja in southern Portugal was built in 2008. At the time it was the largest in Europe. This large-scale technological infrastructure triggered an unusual buzz on an otherwise quiet rural municipality of Moura. It inspired triumphant political speeches, national and international news coverage, and many visits by foreign dignitaries. And yet, it was the target of some criticism regarding its costs and the limited impact on the local economy and on jobs creation. Moreover, apart from a dramatic transformation of the rural landscape, this solar power plant also brought multiple scientific and technological innovations (supported by a social fund). This paper offers a preliminary analysis of the public acceptability of this form of energy production and discusses the extent to which these scientific and technological innovations have impacted on the local identity, development and community resilience in times of crisis. The empirical material draws on a combination of methods: documentary analysis, quantitative analysis of secondary databases, interviews with local stakeholders and ethnographic observation.

SOLAR ENERGY AND RURAL DEVELOPMENT

Renewable energies are generally seen as a key resource for energy transition: a clean and sustainable replacement for fossil fuels, a crucial tool in the mitigation of climate change and in achieving national self-sufficiency in terms of energy. Unlike other energy production technologies (such as nuclear or coal power plants, but also biofuels and dams), solar and wind power are generally perceived as "clean," "green" or "environmentally friendly" (Pasqualetti, 2001; Nadai & Van der Horst, 2010). Despite this apparent consensus, scholarship in this field (cf. Wolsink, 2007; van der Horst & Toke, 2010) has identified a paradox that has severely hindered the development of RE in some European countries: a general social support for RE contrasts with localised resistance to the siting of energy production facilities (often blamed on NIMBY reactions). This is especially the case of windfarms, whose turbines are often seen as technological blemishes on natural landscapes. The social literature seems to be more abundant regarding windfarms impacts in rural areas rather than big solar plants projects. However some interesting insights come from case studies in Spain (Velasco, 2010), the US (Pasqualetti and Haag, 2011), Germany (Kunze and Busch, 2011) and even China, the latter on the solar city Daegu (Kim et al., 2006). Some of

the problems researched in this literature are the aesthetic/visual impacts of the solar power plants on the landscape, the wide territorial spaces they tend to occupy which could otherwise be used for food production, the socio-economic impacts they have on rural development and the spin-off of innovative technological sectors, especially when they are sited in backward regions. It is thus important to assess whether this form of energy enables independence (autarky) and resilience in rural communities. Given the current economic crisis that is affecting many European countries (notably Portugal) and rising energy prices it is apposite to look at how these infrastructures of solar energy are being received and appropriated by rural local communities where they are sited. Do local rural communities get economic, symbolic, social or cultural return from the investment made or not? Do they feel more resilient than other regions in the country that have no infrastructures such these? Answers to these questions have not been fully resolved and more work is needed in this field. In this paper we aim at offering a preliminary analysis of the processes of public acceptability of solar power in a small rural area of Portugal and contribute to answering some of these questions.

CASE-STUDY IN AMARELEJA

The empirical material is based on a case study in a small rural area of southern Portugal: Amareleja, in the municipality of Moura. Economic deprivation, an elderly population and low levels of literacy affect this village with 2500 inhabitants. In 2008, a solar photovoltaic power plant was built in the outskirts of Amareleja. At the time it was touted as the biggest solar plant in Europe, but was quickly surpassed (today is below the top 25). It occupies 250 acres and has 2,520 solar trackers, capable of producing 45.8 MW / year. This plant is paradigmatic of the intersection between science and technology, rural development, connection to the business sector and society in general

The empirical analysis draws on a combination of methods: documentary analysis, quantitative analysis of secondary databases, interviews with local stakeholders and ethnographic observation. Documentary analysis included content analysis of documents (publications, reports, press releases). Exploratory interviews were conducted with local authorities, the business sector and the mentor of the scientific project.

RESULTS: PUBLIC ACCEPTABILITY OF SOLAR ENERGY IN PORTUGAL AND IN AMARELEJA

In the past decade, Portugal has made an extensive investment in RE generation. The ambitious target of 45 per cent of electricity from RE sources by 2010

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was met and the percentage of RE in total consumption is already 25 per cent (the goal for 2020 is 31 per cent). The main source of electricity through RE is hydropower (43 per cent), followed closely by wind energy (42 per cent); solar power is responsible for just 2 per cent of electricity (DGEG, 2012). One of the biggest contributors for this percentage is the solar power plant in Amareleja.

Though the original project for the solar power plant was devised by a Portuguese company, in collaboration with the City Council of Moura, it had to be sold to a Spanish company, Acciona. Although 350 jobs were created during the construction stage, in the long term only 15 employees are required to operate the power plant. The project included the construction of a factory for the production of solar panels, in what would be a strong incentive for economic development of the region and even the country. However, the factory actually built only assemblies panels, whose components are imported from China, and is currently not operating at full capacity. The project also involved the creation of a technological park (supported by a social fund paid by Acciona) aimed at attracting small high-tech companies working on sustainable energies. However, the only companies currently in the park are the solar panel factory and a municipal tech company that is also responsible for managing the park (Lógica EM). Consequently, in terms of economic development and job creation, the impact of this solar plant was limited, as explained below:

"Of the 15 jobs created by the plant 12-13 were occupied by inhabitants of Amareleja but it is too few for a project with this level of investment. There are also some of our countrymen employed in the photovoltaic panels factory, but who are at home due to the lack of factory activity" (interview with the President of the Amareleja Parish, June, 2013).

Job creation benefits fell behind expectations, however Amareleja and Moura became associated with solar tourism promotion ("some regions sell cheese, others chorizos, we here sell the sun" claims the same interviewee). There is a solar land route tourists can take around the power plant. And yet, in conversation with a representative of a local tourism office of Moura, we found out that the excitement and tourists' curiosity were higher at the beginning when the plant was built, but nowadays there isn't much interest in visiting the plant.

Despite the lack of job creation and tourism attention to the value added product around the sun, this solar power plant brought multiple scientific and technological innovations (supported by the social fund). Examples are a program of domestic micro-generation (hence the visibility of so many photovoltaic collectors and panels on roof tops), the leadership of a European network of municipalities involved in renewable energy, a municipal tech company that owns a laboratory for the certification of photovoltaic modules and is involved in several international research projects and partnerships with companies, universities and research institutes. One such project is SKA – Square Kilometer Array – an infrastructure of radio astronomy to be built in the southern hemisphere powered entirely by renewable energy, which will be tested in the region of Moura.

DISCUSSION AND CONCLUSION

Despite such promising high-tech developments, the region and its rural population seems to have failed to capture the economic value of this plant and of its

spin-off activities. From the exploratory interviews, a few reasons are pointed out: 1st the economic environment of the country that has affected the functioning of the assemblage factory and technological park, both operating under their full potential; and 2nd the lack of consensus regarding the funding activities and priorities of the fund, managed by Moura City Council. However, it should be pointed that the plant was responsible for creating some qualified employment positions in municipality where the main economic activities are related to the transformation of agricultural products, through the creation of a solar micro-generation program and a public tech company involved in international research projects.

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