

Solar Thermal on Patrimony Heritage Buildings

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Description:	<p>Patrimony heritage buildings can be assessed as exemptions regarding the adoption of STOs. Although one can easily understand the importance of maintaining the historical patrimony, this exemption, often miss appropriated by investors and real estate promoters in non considered buildings, incentives heritage buildings to not comply with the actual requirements for energy efficiency and comfort in residential buildings. This is clearly an inducement to the desertification and abandon of these areas, a common situation in several European countries. To overcome this tendency it is important to adapt residential building heritage to modern standards, including the possibility to integrate solar technologies.</p>
Link/Download:	www.solarordinances.eu

Introduction

Patrimony heritage buildings are usually assessed as exemptions regarding the compliance with energy performance regulations and adoption of renewable energy technologies. The exemption character often restrains the requalification of the built patrimony, preventing the implementation of some of the best practices regarding buildings energy performance. Such a fact easily promotes the desertification and abandon of these areas, a common situation in several European countries. To overcome this tendency, and allow these areas to become lively, it is important to adapt residential building heritage to modern standards, while respecting and enhancing its architectural value. The adoption of energy efficiency measures and integration of renewable energy technologies in buildings is one of the areas that have presented an extremely positive evolution over the years. Regarding solar technologies, these renewable energy technologies present the unique capacity to be merged with the urban environment, being able to be fully integrated within the building skin, taking advantage of the proprieties these equipments present as construction materials. Solar thermal collectors integration solutions are one of the most promising concepts and one can easily find in the market solutions for roof integration, for example imitating a skylight. New products, concepts and applications are still to research and this force must be actively

driven by demand, clearly stating which the architectural criteria are and developing innovative solutions that integrate both technology and built patrimony.

Assessing solar potential

Evaluating the potential to adopt and efficiently install solar technologies is a problematic that has been under evaluation for some time. From the most preliminary assessments to the most complex tools, a large number of projects have already dealt with this issue, mostly focused on local assessment tools that consider solar radiation, useful area, shadowing and architectonic constraints, etc.

When assessing built patrimony, more specifically historical patrimony, the conventional preliminary assessments lack the consideration of specific architectural constraints and integration criteria that can operationalize the adoption of solar collectors. For this reason the evaluation of the solar potential in historical areas through simplified assessment tools is difficult and imprecise. In Lisbon's Baixa Pombalina historical area the work was developed according to the following stages:

- Evaluation of the technical solar potential, according to roof areas and orientation;
- Assessment of the available potential according to architectonic patrimony criteria, specific of the area under analysis;
- Assessing the technology potential according to the technological constraints for implementation and minimal areas;
- Economic assessment of the solar potential according to technological potential.

The evaluation of the technical solar potential is developed having as basis aerial photomaps, analysed using geographic information systems, which allow easily visualizing data, identifying patterns and summarizing it in the form of maps.

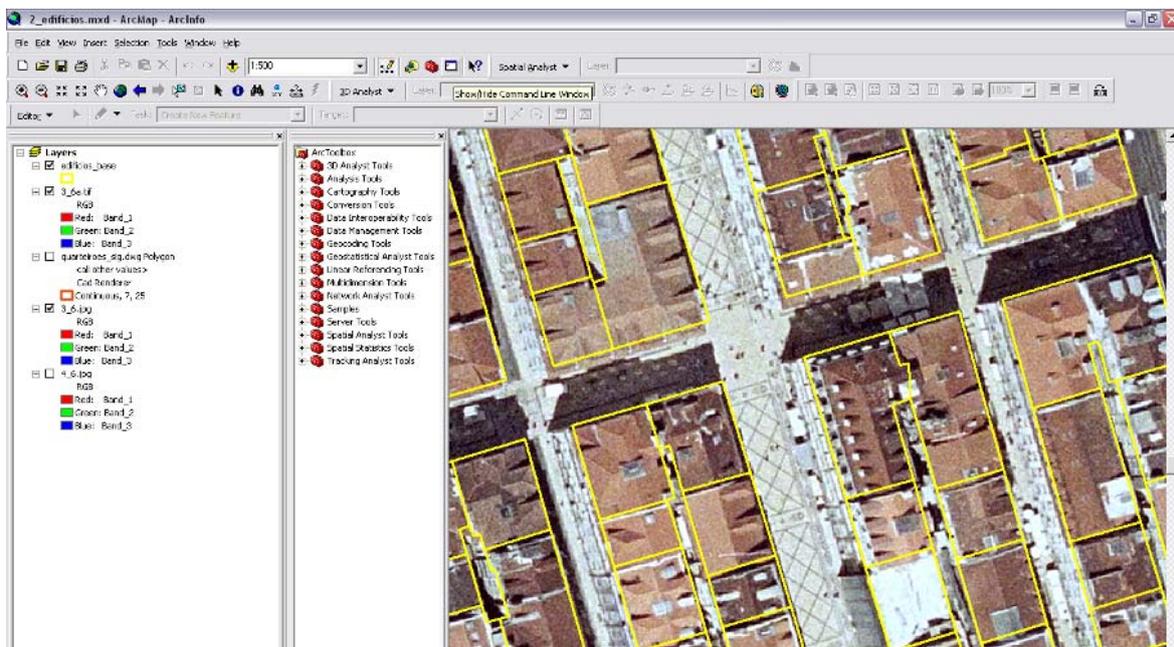


Figure 1 – Schematics of the GIS tool used for assessing areas and orientation.

Once the available areas and orientation have been identified, the categorization of each of the areas takes place, building a pattern.

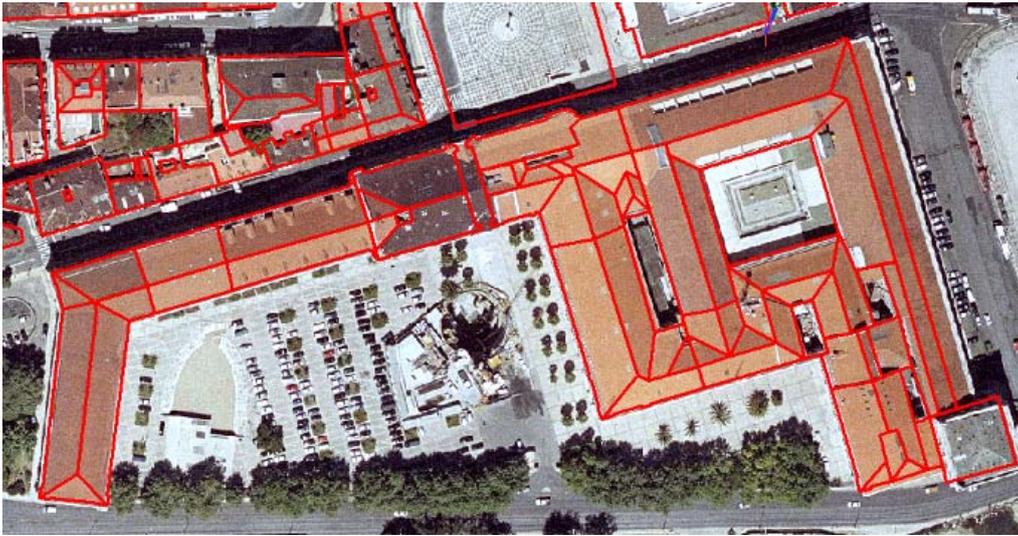


Figure 2 – Definition of the areas available in the roof covers according to each orientation.



Figure 3 – Classification of the areas according to the orientations

The assessment and economic evaluation according to the architectural criteria and technological potential is developed in straight cooperation with the entities responsible for

the management of the patrimony. It requires an exhaustive and thorough market analysis of the possible integration solutions and a cross reference of the most adequate ones.

The final deliverable, the Solar Integration Assessment Map is presented in combination with a Good Practices Manual for Solar Systems integrated in classified areas.



Figure - Example of a solar thermal system integrated in a historical area roof.

Stakeholders and Public relations, the key success for addressing Historical Patrimony

When addressing historical areas the key point are the stakeholders, in this case the National Entity for Architectural and Archaeological Patrimony Management and the Municipality's Department of Architectural Patrimony. Their participation is crucial for the study's success and viability from the technical and technological point of view. These entities are responsible for the management of these areas and validate all the construction interventions that take place. In this process they were responsible for identifying which were the buildings and covers that, for their exceptional status or unique conservation value, shouldn't be considered.

After this, the market consultancy process aimed at identifying specific technical solutions for building integration. An open workshop with several companies is the most transparent way of presenting solutions and defining the ones that most adequately fit the needs of the area to preserve.

It is also through the involvement of these stakeholders that the new requalification plans will take into consideration the integration of ST systems. That is also the case of the Baixa Pombalina area, where the Solar Integration Potential Map is part of the framework that dictates the interventions that can occur in the area.

Finally communication and dissemination are crucial for the successful adoption of these technologies. This communication must start in the first place by the Municipality itself, whose technicians are responsible for appreciating and validating the intervention projects. In this sense their knowledge of the frameworks and solutions available is essential to allow them to perceive interventions' opportunities.

The dissemination to other professionals and to the wide public should also be the focus of a dissemination campaign, so the market can also be pulled by users and respond to their need and requirements

Conclusion

Conventional solar assessment tools do not adequately fit the needs of architectural criteria that have to be taken into account when evaluating the solar potential of historical patrimony buildings.

The detailed potential of these areas and identification of integration solutions has to involve, from the very beginning, the entities responsible for the management and conservation of the areas.

Demand and offer do not always meet and for this it is essential to draw new solutions, concepts, applications and products that can meet the architectural criteria.

Imprint

Edited by:	Joana Fernandes (Lisboa E-Nova)
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See www.solarordinances.eu for more information on solar thermal ordinances and the ProSTO project.

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