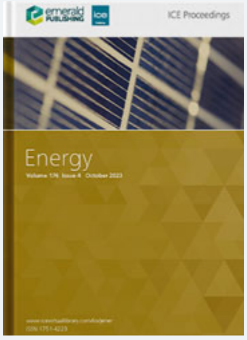

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Proceedings of the Institution of Civil Engineers -
Energy
ISSN 1751-4223 | E-ISSN 1751-4231
Volume 160 Issue 2, May 2007, pp. 59-69

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Photovoltaics: added value of architectural integration

Authors: A. S. Bahaj, PhD, CPhys, MInstP, , , P. A. B. James, PhD, , , and M. F. Jentsch, Dipl.-Ing., ,

Author Affiliations

https://doi.org/10.1680/ener.2007.160.2.59
Published Online: May 25, 2015

Keywords: buildings, structures & design ; economics & finance ; environment

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Abstract

The majority of people live and work in urban environments. If the common targets of substantially reducing greenhouse gas emissions within the next few decades are going to be met, it is in the urban environment where change must happen. Building integrated photovoltaics (BIPV) are commonly seen as one appropriate measure to reduce urban carbon emissions through power generation and as an aid to promote behaviour change of occupiers to contribute to the goal of more sustainable cities. Solar photovoltaics (PV) are often applied as an 'add-on' solution to existing building structures in an aesthetically less than pleasing manner, representing a technological and environmental statement but not always a testament to good design. A more sensitive integration of PV into buildings (glazing, cladding, roo.ng or shading systems) can offer additional benefits by offsetting the costs of expensive materials (e.g. high-value cladding) or by providing additional functions such as solar shading. There is no doubt that the uptake of solar technology by architects and designers can be facilitated by well-designed solutions in which PV arrays form a unity with a building and add to its identity. The study presented here assesses basic forms of architectural integration of PV arrays into buildings and discusses the implications with regard to embodied energy, economics (excluding capital subsidies) and the impacts on a building's carbon footprint.

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