



## Proceedings of the Institution of Civil Engineers - Energy

ISSN 1751-4223 | E-ISSN 1751-4231

Volume 160 Issue 2, May 2007, pp. 59-69

[< Prev](#) [Next >](#)

### 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](#)

**Key:** [OA](#) Open access content [S](#) Subscribed content [F](#) Free content [T](#) Trial content

## 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, roofing 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.

## Full Text

## References

## Cited By

## Related content

[Solar photovoltaic energy: generation in the built environment](#)

**Authors:** [AbuBakr Bahaj](#)

**Source:** [Proceedings of the Institution of Civil Engineers - Civil Engineering, Volume 158, Issue 6](#), 1 Nov 2005 (45–51)

[Integrated appraisal of micro-generators: methods and applications](#)

**Authors:** [S. R. Allen](#), [G. P. Hammond](#), [H. A. Harajli](#), [C. I. Jones](#), [M. C. McManus](#), [A. B. Winnett](#)

**Source:** [Proceedings of the Institution of Civil Engineers - Energy, Volume 161, Issue 2](#), 1 May 2008 (73–86)

[Renewable energy systems for sports complexes: a case study](#)

**Authors:** [Eunil Park](#), [Sang Jib Kwon](#)

**Source:** [Proceedings of the Institution of Civil Engineers - Energy, Volume 171, Issue 2](#), 1 May 2018 (49–57)

Visit ICE Bookshop and discover our print books

Manuals, guides and more!

[BROWSE NOW](#)

Are you an ICE member?

To see your access options

[Click here now](#)

## Content tools

- [Add to Favorites](#)
- [Cite this](#)
- [Track Citations](#)
- [Download PDF](#)
- [Permissions](#)
- [Recommend to library](#)
- [Sign up for e-alerts](#)



## Related search

By Keyword

- ☒ [buildings, structures & design](#)
- ☒ [economics & finance](#)
- ☒ [environment](#)

By Author

- ☒ [A. S. Bahaj](#)
- ☒ [P. A. B. James](#)
- ☒ [M. F. Jentsch](#)

[Search](#)

No search history

## Recently Viewed

- > [Photovoltaics: added value of architectural integration](#)
- [A. S. Bahaj, P. A. B. James and M. F. Jentsch](#)

## Resources:

- > [Home](#)
- > [For Librarians](#)
- > [Journals](#)
- > [Books](#)
- > [Help and FAQs](#)
- > [About ICE Publishing](#)

## Subjects:

- > [Buildings and structures](#)
- > [Coastal and offshore engineering](#)
- > [Development, planning and urban engineering](#)
- > [Energy](#)
- > [Geology, geotechnical and ground engineering](#)
- > [Health and safety](#)
- > [Law and contracts](#)
- > [Leadership and management](#)
- > [Professional development](#)
- > [Science](#)
- > [Transportation](#)
- > [Water engineering and wastewater management](#)

© 2024 Emerald Publishing Ltd

Emerald Publishing Limited, registered in England with company number 03080506, and registered office Emerald Publishing, Floor 5, Northspring, 21-23 Wellington Street, Leeds, LS1 4DL  
(VAT Registration No. GB 665 3593 06)

Powered by [Atypon®](#) Literatum

