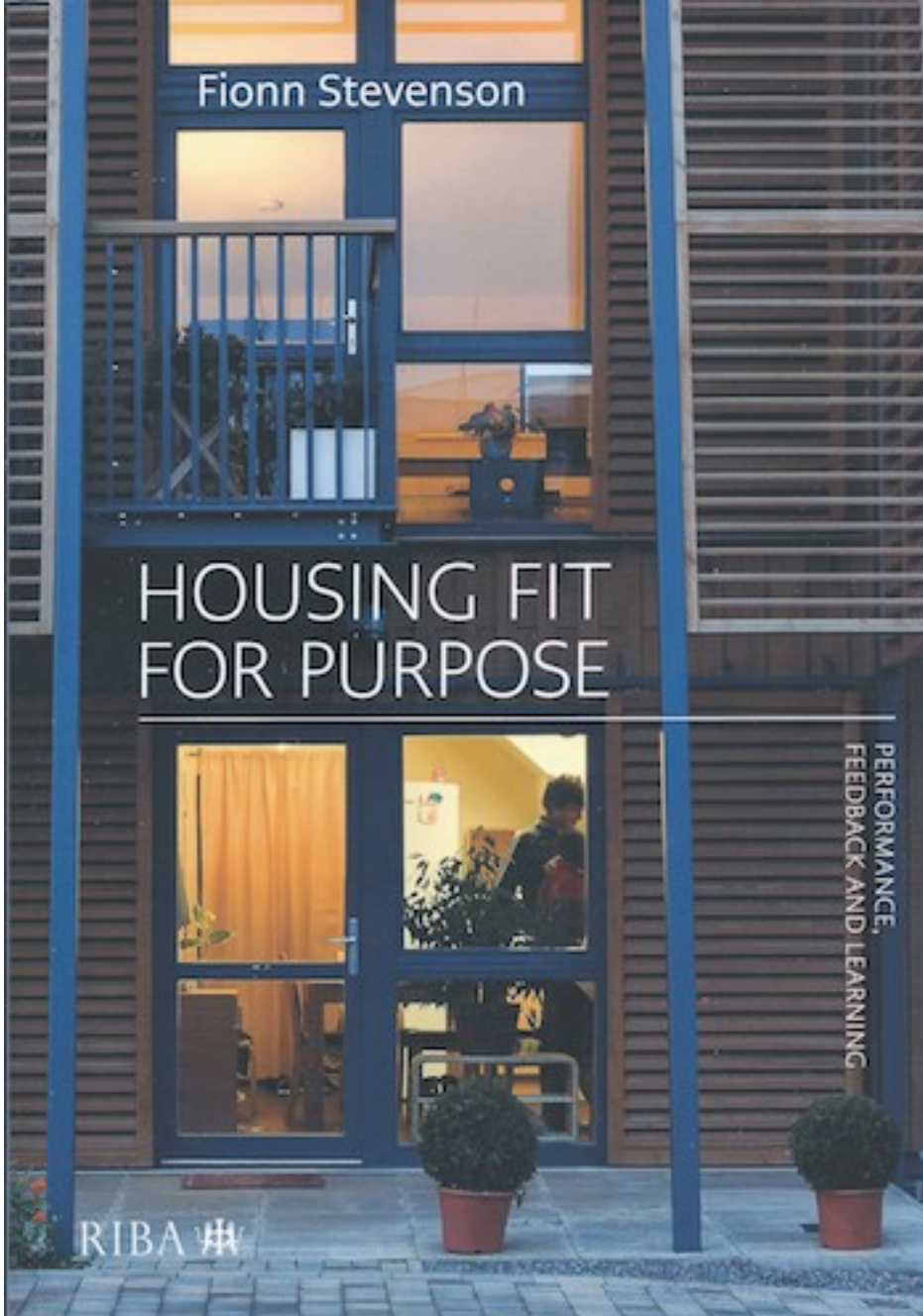


New energy performance book should be mandatory reading for architects and policy-makers

ENERGY EFFICIENCY IN UK HOUSING: Half a century ago, Tom Markus, an architect at Strathclyde University in Scotland, led a seminal investigation into the performance of UK housing.

That research led to the 1972 publication of *Building Performance*, a pivotal book that arguably first identified what is now called a “performance gap” between the way a building was expected to operate and how it operated in reality.

The design professions were largely blind to such performance problems, and the revelations offended many architects and engineers. Markus wrote, with evident reproach, that “no industry that owns capital equipment of a similar cost to buildings could survive unless it had more data on performance”.



Housing Fit for Purpose – Performance, Feedback and Learning by Professor Fionn Stevenson.

Markus' sentiment was undeniably right. History, though, has sadly proved him wrong. Nearly fifty years on, the author of a new book on building performance evaluation *Housing Fit for Purpose – Performance, Feedback and Learning*, reports that only 3 per cent of UK chartered architects routinely conduct performance reviews of their projects. If that figure's right, it's not only pitiful but arguably symptomatic of a deep-seated and chronic lack of professionalism.

The 3 figure is more alarming given the climate emergency. The book's author, Professor Fionn Stevenson, points out that the built environment is responsible for around half of all carbon dioxide emissions. Drastic reductions to those emissions are vital for preventing irrevocable changes to the Earth's climate.

Professor Stevenson's book therefore comes at a pivotal moment: the adoption of performance evaluation by building designers can no longer be regarded as optional. It must become routine for all new and retrofitted housing around the world, irrespective of climate and regardless of local construction practice.

Before reviewing the book we need to nail some terminology. Building Performance Evaluation (BPE) is a broad concept of studying buildings in use and how things work in reality. The resulting feedback is used to improve design and installation practice. This can be done on any building at any time, either to inform a client's requirements or to test the robustness of a proposed design.

Post-Occupancy Evaluation (POE), however, is more specific: it defines an assessment of a particular building soon after occupation, where initial performance is compared with the targets and expectations established during design. Both BPE and POE encompass a broad spectrum of performance factors, typically energy use, carbon dioxide emissions, and measures of occupant satisfaction. The tools and methods of assessment are

largely the same.

Housing Fit for Purpose has been defined by its author as an “intellectual journey” – a fair description of what is a highly comprehensive volume. While it will serve students of architecture particularly well, it may be a little more demanding for practicing architects unfamiliar with BPE or POE. It is well worth the effort.

The book starts by putting BPE into its historical context. It charts the development of housing investigations, from 19th century concerns over the adverse effects of poor heating, sanitation and indoor air quality on the nation’s health to the development of housing standards and professional design guidance that grew out of the major house building programs of the interwar and post-war eras.

This dovetails with a section on Learning from Feedback, which covers the interdisciplinary nature of BPE and the use of investigative techniques in a real-world, action-based context. Topics tackled include the differences between modelled performance and outturn performance (very much a key issue), and the emerging value of longitudinal performance feedback.

Learning from scientific, technical and feedback methods

A training section focuses on the wide range of scientific, technical and social feedback methods available to

practitioners, and the skills and aptitudes required. The section is enriched with case studies.

The examples – UK centric but nonetheless universal in appeal – do not skimp on the dashed hopes of those who have attempted to construct zero or nearly zero carbon homes only to find that construction practice lagged somewhat behind the designer's expertise. Rather than indulge in schadenfreude, the book identifies how performance evaluation can help architects identify the causes of performance shortcomings, and ways they can learn from the feedback.

The book concludes by considering some of the major challenges facing the design professions – notably ethics in research and the use of feedback methods. This is supported by a simple primer for design professionals on how to use BPE and POE tools. A useful route map for practitioners, educators and policy makers is also provided.

Professor Stevenson rightly argues for a graduated approach to building performance evaluation: start with a light-touch approach, she says, and only go deeper where the evidence requires more diagnostic or forensic investigation.

The author also argues for a broad interdisciplinary approach to BPE. BPE is not only a scientific endeavour, she writes, but also deeply rooted in the qualitative arts of anthropology, psychology, ergonomics, and thermal

comfort. While architects are not expected to be experts in all fields says Stevenson, they should develop a working knowledge of the tools and methods of analysis.

Too much reliance on technology can lead to poor outcomes especially if the technology fails or has been poorly installed

The book sounds a warning that may prove prescient. There is growing evidence that unbridled reliance on innovative mechanisation and computerisation in houses may inadvertently be reducing the redundancy required for safe operation, particularly when such technology fails.

For example, the book illustrates problems introduced by the poor installation of mechanical ventilation and heat recovery (MVHR) systems. Professor Stevenson argues that unless BPE is practiced routinely, such problems with advanced technologies may lead to unintended consequences for human health, especially as regulations drive higher levels of airtightness and insulation.

Criticisms of the book are few. Greater emphasis could have been placed on the importance of high quality environmental measuring instruments. Cheap over-the-counter environmental multi-meters for measuring temperature, light and sound are not normally accurate enough for professional use.

Such units are typically loosely calibrated, and some can't be calibrated at all. Architects need to be wary of inaccurate spot readings of light, noise or temperature as they could be highly misleading. More could have been said about the inherent risks of benchmarking.

Performance benchmarks, while ostensibly useful, may lack all-important contextual detail and therefore be little more than vaguely indicative. Some charts listing the strengths and weaknesses of BPE/POE tools and methods may also have been useful for practitioners. Overall, though, these are minor niggles. They do not detract from the book's huge contribution to promoting the adoption of BPE and POE.

Arguably, it should be mandatory reading for all architects and policy-makers.

Fundamentally, Fionn Stevenson's book places practising architects at an existential crossroads: either the profession willingly adopts performance evaluation and feedback, and in so doing takes custody of performance outcomes, or it can continue to pretend that outturn performance is not its problem.

If Professor Stevenson is right, 97 per cent of architects have yet to adopt BPE or POE as a standard routine. That percentage needs to switch rapidly the other way. And when I say rapidly I mean in months, not years. And if an obstinate 3 per cent subsequently go out of business, well, none of us should care in the slightest. They can't claim

they weren't warned.

- *Housing Fit for Purpose – Performance, Feedback and Learning* by Professor Fionn Stevenson is available from [RIBA Publishing](#), ISBN 9781 85946 824 1.

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