Fuel Cells for Buildings

J.F. Elter

This document appeared in

Detlef Stolten, Thomas Grube (Eds.):
18th World Hydrogen Energy Conference 2010 - WHEC 2010
Parallel Sessions Book 6: Stationary Applications / Transportation Applications
Proceedings of the WHEC, May 16.-21. 2010, Essen
Schriften des Forschungszentrums Jülich / Energy & Environment, Vol. 78-6
Institute of Energy Research - Fuel Cells (IEF-3)
Forschungszentrum Jülich GmbH, Zentralbibliothek, Verlag, 2010
ISBN: 978-3-89336-656-9

Fuel Cells for Buildings

John F. Elter

Abstract

Buildings account for about one third of the primary global energy demand, and as such, a major source of energy related greenhouse gas emissions. In this chapter, fuel cells are considered as an alternative and more efficient source of electricity and heat for building applications. Starting with a discussion of the importance of the customer's perspective, a brief overview of the different types of fuel cells applicable to buildings is given. These include those based upon polymer and solid oxide electrolytes. Newer alternatives including alkaline polymer and solid acid systems are mentioned. A in-depth discussion of the recent advancements made in low temperature and high temperature PEM electrodes and membranes is provided as a context from which fuel cell systems for buildings is discussed. A brief discussion of some aspects of fuel reforming and system control is provided, with relevant references, along with some examples of nearly commercial fuel cell systems.