Green Construction

An introduction to a changing industry

Alison Dykstra

Also by the Author

Construction Project Management: A Complete Introduction LEED Certification: An Introduction to Certifying a Green Building

Copyright © 2016 Alison Dykstra

This book may not be reproduced, in whole or in part, including illustrations, photos, in any form (beyond that of copying permitted by Section 107 & 108 of the U.S. Copyright Law and excerpt by reviewers for public press), without written permission from the publishers.

Library of Congress Control Number: 2015960690

Printed in the United States of America 10987654321

ISBN: 978-0-9827034-2-7

Cover design and cover photograph by Andrea Young Arts, Berkeley CA Interior design by Lauren Woodrow Design, Chicago IL

Kirshner Publishing Company Production Offices: PO Box 14132 Santa Rosa, CA 95404 Editorial Offices: San Francisco, CA www.kirshnerbooks.com www.kirshnerpublishing.com

Bibliography

- American Society of Interior Designers and U.S. Green Building Council. *REGREEN Residential Guidelines*, 2nd Edition. Washington, DC: 2008.
- Arup and WBCSD. *Material Choice for Green Buildings*. London, UK: Arup and World Business Council for Sustainable Development (WBCSD), 2012.
- Jeffrey Beard. A Study of Comparative Sustainability Construction Costs/ Green Rating System Cost Comparison Study: LEED and Green Globes. Philadelphia, PA: Drexel University, 2014.
- Jared O. Blum. "Impact of Advancements in Model Energy Codes." *Construction Specifier*, January 2014.
- Build It Green. *New Home Construction: Green Building Guidelines*. Oakland, CA: 2007.
- Lane Burt and Duane Desiderio. *A New Retrofit Industry*. USGBC and the Real Estate Roundtable, June 13, 2011.
- Peter Calthorpe. *Urbanism in the Age of Climate Change*. Washington, DC: Island Press, 2011.
- Rachel Carson. Silent Spring. Boston: Houghton Mifflin, 1962.
- Jim Cassio & Alice Rush. *Green Careers: Choosing Work for a Sustainable Future.*Gabriola Island, BC, Canada: New Society Publishers, 2009.
- CBRE Group. *National Green Building Adoption Index 2014.* Los Angeles, CA: CBRE, 2014
- Daniel D. Chiras. *The Solar House: Passive Heating and Cooling*. White River Junction, VT: Chelsea Green, 2002.

- Construction Specifications Institute. *The CSI Sustainable Design and Construction Practice Guide*. Hoboken NJ: John Wiley, 2013.
- Paul Crabtree. *Principles of Green Infrastructure*. CNU Rainwater-in-Context-Initiative, Congress for the New Urbanism. *www.cnu.org*.
- Jesse Dean, Otto VanGeet, Scott Simkus, and Mark Eastment. *Design and Evaluation of a Net Zero Energy Low-Income Residential Housing in Lafayette, Colorado.* Golden, CO: National Renewable Energy Laboratory, 2012.
- Alison Dykstra. *Construction Project Management: An Introduction*. San Francisco, CA: Kirshner Books, 2011.
- Alison Dykstra. *LEED Certification: An Introduction to Certifying a Green Building*. San Francisco, CA: Kirshner Books, 2013.
- Energy Information Administration, U.S. Department of Energy. *Annual Energy Outlook 2014*, Dec. 2013 preview. Washington, DC.
- Gene Farmer. *Contractor's Guide to LEED-Certified Construction*. Clifton Park, NY: Delmar, 2012.
- Kathryn Ferbholz, Jim Bowyer, Sarah Stai, Steve Bratkovich, and Jeff Howe.

 Differences between the Forest Stewardship Council (FSC) and Sustainable
 Forestry Initiative (SFI) Certification Standards for Forest Management.

 Minneapolis, MN: Dovetail Partners, 2011.
- Monika Freyman. "Hydraulic Fracturing and Water Stress: Water Demand by the Numbers." *Ceres,* February 2014.
- Thomas L. Friedman. *Hot, Flat and Crowded: Why We Need a Green Revolution and How It Can Renew America*. New York: Picador, 2009.
- Lynn Froeschle. "Environmental Assessment and Specification of Green Building Materials." *Construction Specifier,* October 1999.
- Geothermal Energy Association. 2014 Annual U.S. and Global Geothermal Power Production Report. Washington, DC.
- Peter Gevorkian. *Alternative Energy Systems in Building Design*. New York: McGraw-Hill, 2010.
- David Gissen, Editor. *Big and Green: Toward Sustainable Architecture in the 21st Century.* New York: Princeton Architectural Press/National Building Museum, 2002.

- Thomas E. Glavinich. *Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation and Risk Protection.*Hoboken, NJ: John Wiley, 2008.
- Mike Guertin. *Green Applications for Residential Construction*. Clifton Park, NY: Delmar, 2011.
- James Hamilton. *Careers in Solar Power.* Washington, DC: U.S. Bureau of Labor Statistics, 2011.
- Stuart Hand. "LEED vs. Green Globes: How to Choose." *Daily Journal of Commerce*, February 27, 2014.
- EC Harris. *Global Built Asset Wealth Index Report 2013*. London, UK: EC Harris Built Asset Consultancy.
- Holly Henderson. *Becoming a Green Building Professional*. Hoboken NJ: John Wiley, 2012.
- ILO Skills and Employability Department, European Union. *Skills and Occupational Needs in Green Building*. Geneva, Switzerland: 2011.
- David Johnston and Scott Gibson. *Green from the Ground Up: A Builder's Guide.* Newtown, CT: Taunton Press, 2008.
- David Johnston and Scott Gibson, *Green from the Ground Up: Sustainable, Healthy, and Energy-Efficient Home Construction.* Newton CT: Taunton Press, 2008.
- David Johnston and Scott Gibson. *Toward a Zero Energy Home: A Complete Guide to Energy Self-Sufficiency at Home.* Newtown, CT: Taunton Press, 2010.
- Van Jones. The Green Collar Economy. New York: HarperCollins, 2008.
- Greg Kats. *Greening Our Built World: Costs, Benefits and Strategies*. Washington, DC: Island Press, 2010.
- Joseph F. Kennedy, Michael G. Smith, and Catherine Wanek. *The Art of Natural Building: Design, Construction, Resources*, 2nd Edition. Gabriola Island, BC, Canada: New Society Publishers, 2015.
- Charles J. Kibert. *Sustainable Construction: Green Building and Design*. Hoboken, NJ: John Wiley, 2005.
- Catharine Killian. *Deep Green Renovation: Broad Scale Strategies for Achieving Deep Energy Savings in Existing Buildings.* 2011 AIAS/AIA COTE Research Fellowship.

- Jong-Jin Kim and Brenda Rigdon. *Qualities, Use, and Examples of Sustainable Building Materials*. University of Michigan, National Pollution Prevention Center for Higher Education, December 1998.
- Sharon Kooman Harmon and Katherine E. Kennon. *The Codes Guidebook for Interiors*, 5th Edition. Hoboken, NJ: John Wiley, 2011.
- Abe Kruger and Carl Seville. *Green Building: Principles and Practices in Residential Construction*. Clifton Park, NY: Delmar, 2013.
- Sam Kubba. *Handbook of Green Building Design and Construction: LEED, BREEAM, and GREEN Globes.* Waltham, MA: Butterworth-Heinemann,
 2012.
- Norbert Lechner. *Heating, Cooling, Lighting: Sustainable Methods for Architects,* 4th Edition. Hoboken NJ: John Wiley, 2015.
- Barry B. Lepatner. *Broken Buildings, Busted Budgets: How to Fix America's Trillion-Dollar Construction Industry*. Chicago: University of Chicago Press, 2007.
- Amory Lovins, Paul Hawken, and L. Hunter Lovins. *Natural Capitalism*. New York: Little Brown, 1999.
- Amory Lovins and Rocky Mountain Institute. *Reinventing Fire: Bold Business Solutions for the New Energy Era*. White River Junction, VT: Chelsea Green, 2011.
- Donald Martin, Stevan Vinci, and Dan Prows. Green Globes for New

 Construction: Building Better Science for Better Results, May 2013.

 Retrieved from: http://www.thegbi.org/content/misc/White_Paper_for_an_

 Overview_of_Green_Globes_New_Construction.pdf
- William McDonough and Michael Braungart. *Cradle to Cradle: Remaking the Way We Make Things.* New York: North Point Press, 2002.
- McGraw-Hill Construction. *SmartMarket Report: Construction Industry Workforce Shortages—Role of Certification, Training and Green Jobs in Filling the Gap.* Bedford, MA: McGraw-Hill Construction, 2012.
- Ian L. McHarg. *Design with Nature*, 25th Anniversary Edition. Hoboken NJ: John Wiley, 1992.
- William McKibben. *The End of Nature*. New York: Random House, 2006.

- R. S. Means. *Green Building: Project Planning and Cost Estimating,* 3rd Edition. Hoboken NJ: John Wiley, 2011.
- Molly Miller. *Integral: Revolutionary Engineering*. Portland, OR: Ecotone, 2013.
- Peter Morris and Lisa Fay Matthiessen. *The Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption.* San Diego, CA: Davis Langdon (now known as AECOM), 2007.
- Natural Resources Defense Council. *Energy Down the Drain: The Hidden Costs of California's Water Supply.* Oakland, CA: NRDC Pacific Institute, 2004.
- New Buildings Institute. *Core Performance Guide: A Prescriptive Program to Achieve Significant, Predictable Energy Savings in New Commercial Buildings.* Vancouver, WA: NBI, 2007.
- New Buildings Institute. *NEEA Study: Examples of Deep Energy Savings in Existing Buildings*. Vancouver, WA: NBI, 2011.
- David W. Orr. *Design on the Edge: The Making of a High-Performance Building.* Cambridge, MA: MIT Press, 2008.
- Ron Pernick and Clint Wilder. *The Clean Tech Revolution*. New York: HarperCollins, 2008.
- Peterson's. *Green Careers in Building and Landscaping*. Lawrenceville, NJ: Peterson's, 2011.
- Peterson's. Green Careers in Energy. Lawrenceville, NJ: Peterson's, 2010.
- Peterson's. Green Jobs for a New Economy. Lawrenceville, NJ: Peterson's, 2009.
- Stephanie S. Pincetl. *Transforming California: A Political History of Land Use and Development*. Baltimore, MD: Johns Hopkins University Press, 1999.
- Linda Reeder. *Guide to Green Building Rating Systems*. Hoboken NJ: John Wiley, 2010.
- Hegazy Rezk and Abou Hashema M. El-Sayed. Sizing of a stand alone concentrated photovoltaic system in Egyptian site. *International Journal of Electrical Power and Energy Systems*, Vol. 45, Issue 1, February 2013.
- David Riley, Kim Pexton, and Jennifer Drilling. *Defining the Role of the Contractor on Green Building Projects*. State College, PA: Pennsylvania State University, 2003.

- William Souder. *On a Farther Shore: The Life and Legacy of Rachel Carson*. New York: Crown, 2012.
- Ross Spiegel and Dru Meadows. *Green Building Materials: A Guide to Product Selection and Specification*. Hoboken, NJ: John Wiley, 2012.
- J. William Thompson and Kim Sorvig. *Sustainable Landscape Construction:*A Guide to Green Building Outdoors, 2nd Edition. Washington, DC: Island Press, 2008.
- Union of Concerned Scientists. *Production Tax Credit for Renewable Energy*. January 4, 2013. *xucsusa.org*
- U.S. Department of Energy/Building Technologies Program, Energy Efficiency and Renewable Energy. *Buildings Energy Data Book 2011*. Washington, DC: 2012 (Metadata updated August 28, 2015).
- U.S. Energy Information Administration. *Annual Energy Outlook 2010 With Projections to 2035*. Washington, DC: Office of Integrated Analysis and Forecasting, U.S. Department of Energy, 2010.
- U.S. Energy Information Administration. *Annual Energy Outlook 2013 Early Release Overview* (with projections through 2040). Washington,
 DC: Office of Integrated Analysis and Forecasting, U.S. Department of
 Energy, 2013.
- U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds. *Case Studies Analyzing the Economic Benefits of Low Impact Development and Green Infrastructure Programs.* Washington, DC: 2013.
- U.S. Green Building Council. *Green Jobs Study*. McLean, VA: Booz Allen Hamilton, 2012.
- U.S. Green Building Council. *LEED Core Concepts Guide*, 3rd Edition. Washington, DC: USGBC, 2014.
- Sim Van der Ryn. *Design for an Empathetic World; Reconnecting People, Nature, and Self.* Washington, DC: Island Press, 2013.
- Sim Van der Ryn and Stuart Cowan. *Ecological Design*, 10th Anniversary Edition. Washington, DC: Island Press, 2007.
- Rob Watson. *Green Building: Market and Impact Report 2011.* Oakland, CA: GreenBiz Group, 2011.

- Sarah L. White. *U.S. Skill Formation: Towards a Greener Future*. Greenforce Initiative: Advancing Greener Careers and Campuses. Merrifield, VA: National Wildlife Foundation, October 20, 2011.
- World Commission on Environment and Development. *Our Common Future*. Oxford, England: Oxford University Press, 1987.
- World Green Building Council. Annual Report 2012/2013. www.worldgbc.org
- World Green Building Council. The Case for Green Building: A Review of the Costs and Benefits for Developers, Investors and Occupants. WBG, 2013. www.worldgbc.org
- Jerry Yudelson. *Green Building A to Z.* Gabriola Island, BC, Canada: New Society Publishers, 2007.
- Jerry Yudelson. *The Green Building Revolution*. Washington, DC: Island Press, 2008.
- Jerry Yudelson. *Green Building Through Integrated Design*. New York: McGraw-Hill, Greensource Books, 2009.
- Jerry Yudelson. *Green Building Trends: Europe.* Washington, DC: Island Press, 2009.