Contents

Acknowledgments · VII

Abbreviations and Acronyms · IX

Chapter 1 **Introduction · 1**

Contents · 2

How to Use this Guide · 3

Chapter 2 **Integrated Process for Achieving Energy Savings · 5**

Design Phase (Including Planning and Pre-Design) · 6

Construction · 11

Acceptance · 11

Occupancy · 11

Operation · 11

Energy Goals and Strategies · 12

Chapter 3 **Recommendations by Climate · 17**

Zone 1 · 20

Zone 2 · 22

Zone 3 · 24

Zone 4 · 26

Zone 5 · 28

Zone 6 · 30

Zone 7 · 32

Zone 8 · 34

Chapter 4 **Technology Examples and Case Studies · 37**

Climate Zone 2—Happy Feet Plus · 38
Climate Zone 3—Interface Showroom · 40
Climate Zone 3—PETCO Energy Showcase Store · 42
Climate Zone 3—Real Goods Solar Living Center · 44
Climate Zone 4—Nusta Spa · 46
Climate Zone 5—Zion National Park Visitor Center and Bookstore · 48
Climate Zone 7—BigHorn Home Improvement Center · 50

Chapter 5 **How to Implement Recommendations · 53**

Quality Assurance · 53
Envelope · 58
Opaque Envelope Components · 58
Fenestration: Vertical Glazing and Skylights (Envelope) · 66
Lighting · 70
Daylighting · 70
Electric Lighting Design · 73
HVAC · 81
Service Water Heating · 90
Bonus Savings · 91
Plug Loads · 91
Exterior Lighting · 93

Appendix A **Envelope Thermal Performance Factors · 95**

Appendix B **Additional Resources · 97**