

Energy Efficiency / Management Bibliography

These are the standard references I use. Some of them may be out of print, but are usually available at Amazon.com. This is not exhaustive, as there are certainly other good references around.

CRUCIAL – the best references, used constantly, good value

E Source Technology Atlas Series, (Vol. 1 Lighting, Vol. 2 Cooling, Vol. 3 Heating, Vol. 4 Drivepower, Vol. 5 Appliances), E Source, Inc., Boulder, Colorado, USA.

The best source of information on energy saving technologies. Expensive, but worth it. (Note, I was a writer and reviewer, so may be biased.)

Turner, Wayne C., Energy Management Handbook: Fifth Edition, Lilburn, Georgia, The Fairmont Press, Inc., 2005.

An excellent coverage of most important energy management issues. Some chapters are better than others.

Wulfinghoff, Donald R., Energy Efficiency Manual, Maryland, USA, Energy Institute Press, 1999.

The best overview of energy saving technologies for existing HVAC systems, including chillers and boilers. Weaker on lighting, motors, etc.

New Zealand Standards:
AS/NZS 3598:2014 “Energy Audits”

What is required to perform an energy audit and comply with the Standard.

NZS 4214:2006 “Methods of determining the total thermal resistance of parts of buildings”.

Necessary for justifiable heat loss calculations (or could use ASHRAE/CIBSE handbooks).

NZS 6703:1984 “Code of Practice for interior lighting design”.

Now superseded by AS/NZS1680. Note the lux levels in NZS 6703 are not comparable with those in AS/NZS 1680.x.

AS/NZS 1680.1:2006 “Interior lighting – general principles and recommendations”.

The updated method of doing lighting calculations – See Chapter 5 “Lighting” for full discussion of this standard.

IMPORTANT –used regularly, but not necessary like the above

Thumann, Albert, P.E., C.E.M. and Younger, William J, C.E.M. Handbook of Energy Audits, 6th Edition, Lilburn, Georgia, The Fairmont Press, 2003.

Finally this book is providing some value. Early editions, like most other Fairmont Press books, are useless collections of random gibberish.

IPMVP: International Performance Measurement and Verification Protocol, Department of Energy, USA, 1997.

The definitive source on measuring the performance of energy efficiency improvements. Prescriptive in general, but does not provide specifics. (Also available online).

Eastop, T.D., & Croft, D.R., Energy Efficiency for Engineers and Technologists, UK, Longman Scientific & Technical, 1990.

The best energy efficiency textbook. UK based. Great coverage of ‘pinch technology’.

Krarti, Moncef, Energy Audit of Building Systems, An Engineering Approach, USA, CRC Press LLC, 2000.

A detailed coverage of most of the technologies and issues around commercial building energy audits. Unfortunately repaginated after the index was printed, so everything is a page or two off. Also some glaring typos in calculations, so be careful!

Capelhart, Barney L., Turner, Wayne C., Kennedy, William J., Guide to Energy Management, Fourth Edition, Lilburn, Georgia, The Fairmont Press, Inc., 2003.

The “textbook” version of the “Energy Management Handbook” discussed above. Smaller book, less coverage, but the review questions at the end of each chapter are useful to confirm understanding.

Herzog, Peter, Energy Efficient Operation of Commercial Buildings, Redefining the Energy Manager’s Job, Eugene, Oregon, Northwest Energy Education Institute.

An excellent book on operating energy efficient buildings. Really best for proactive energy managers and end-users, but still useful for auditors.

Rawlinsons New Zealand Construction Handbook, New Zealand.

The Quantity Surveyors’ handbook. Invaluable for estimating prices for retrofits.

Baines, J. T., New Zealand Energy Information Handbook (Energy Data, Conversion Factors, Definitions), Taylor Baines Associates, P. O. Box 8620, Christchurch, 1993.

Somewhat dated, but with lots of information on NZ energy supplies.

New Zealand Standards

NZS 4243:1996 “Energy Efficiency – large buildings”.

What is required for large buildings, in terms of lighting power densities, solar heat gain factors, and inputs for simulations.

NZS 4220:1982 “Code of practice for energy conservation in non-residential buildings”.

The results of the last study of NZ commercial building energy use. Not that much has changed.

NZS 4305:1996 “Energy Efficiency – Domestic type hot water systems”.

The current building code revision may propose Acceptable Solutions that modify NZS 4305 requirements.

USEFUL – specialised references, used occasionally

Energy Efficiency A Guide to Current & Emerging Technologies, Volume 1, Buildings and Transportation, and, Volume 2, Industry & Primary Production, Centre for Advanced Engineering (CAE), Christchurch, New Zealand, 1996.

New Zealand specific; but pretty general. Some useful information.

Rajan, C.G., Optimizing Energy Efficiencies in Industry, New York, McGraw-Hill, 2003.

A good reference on savings technologies for heavy industry. Lots of information on performance monitoring.

Payne, William F and McGowan John J, Energy Management for Buildings Handbook, Second Edition (Mechanical Systems for Buildings Series), Lilburn, Georgia, The Fairmont Press, 1988.

A good general book on applications of building (energy) management systems (BMS). Somewhat dated, but the principles still hold.

Hansen, Shirley J, Ph.D., Performance Contracting for Energy and Environmental Systems, Lilburn, Georgia, The Fairmont Press, Inc., 1993.

The first book on energy performance contracting (shared savings, etc.) Shows some of the pitfalls, but not very technical.

Brown, Harry L., Ph.D, Hamel, Bernard B., Ph.D. and Hedman, Bruce A, Ph.D., Energy Analysis of 108 Industrial Processes, Lilburn, Georgia, The Fairmont Press, Inc., 1996.

An overview of the industrial energy intensity benchmarks assembled by Dun and Bradstreet. Many industries covered in detail, step by step through their processes.

Kane, Raymond and Sell, Heinz, Editors, Revolution in Lamps, A Chronicle of 50 Years of Progress, Second Edition, Lilburn, Georgia, The Fairmont Press, Inc., 2001.

The one source that describes how electric lighting technology has developed, and what is still waiting in the lab.

Mitchell, John W, Energy Engineering, Canada, John Wiley & Sons.

The best simple textbook describing most of the relevant calculations used in energy management.

Wendes, Herb, P.E., HVAC Retrofits: Energy Savings Made Easy, Lilburn, Georgia, The Fairmont Press, Inc., 1994.

A compendium of notes from an engineer not used to writing. Contains some good information, but hard to extract from the dross,

Hartman, Thomas B, P.E., Direct Digital Controls for HVAC Systems, USA, McGraw-Hill, Inc., 1993.

The first book on “high performance BMS controls”. Shows examples of code used for better control algorithms, still well ahead of its time.

Awbi, H.B., Ventilation of Buildings, London & New York, E & F N Spon, 1998.

The definitive book on ventilation of commercial buildings.

Simplified Energy Analysis Using the Modified Bin Method, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Knebel, David E (Principal Investigator), 1983.

How HVAC systems work (in equations) how to calculate their performance and how to develop your own simulations.

Improving Compressed Air System Performance, Lawrence Berkeley National Laboratory, Washington, D.C. (Prepared by), U.S. Department of Energy, and Compressed Air Challenge (Prepared for), November 2003.

The only decent book on the energy saving applications of compressed air.

The State University of New Jersey, Rutgers, “Industrial Productivity Training Manual”, 1996.

An amazing book on quantifying non-energy benefits of energy-saving (and other) technologies. Developed for the US Department of Energy "Industrial Assessment Programme" (free industrial energy audits done by university engineering staff and students).

Honeywell, Engineering Manual "Automatic Control for Commercial Buildings, SI Edition, USA, Honeywell, 1997.

The standard reference source on how to control HVAC systems. Also good reference information on sensors, psychrometry, etc.

McQuiston, Faye C., Parker, Jerald D., Spitler, Jeffrey D., Heating, Ventilating, and Air Conditioning: Analysis and Design, 6th Edition, USA, John Wiley & Sons, Inc., 2005.

The classic HVAC textbook. Good background for people not trained in this field.

Vaillencourt, Richard R., Simple Solutions to Energy Calculations, Third Edition, Lilburn, Georgia, The Fairmont Press, Inc., 2001.

How to calculate energy savings from many different energy efficiency technologies.

Hansen, Shirley J., PhD, Brown, James W., PE Investment Grade Energy Audit: Making Smart Energy Choices, USA, The Fairmont Press, Inc., Marcel Dekker, Inc.

A (mostly non-technical) book on what is involved with top quality energy audits, when it is important to accurately predict energy savings (like for performance contracts).

Cayless, M.A., Marsden, A.M., Lamps and Lighting, Third Edition, UK, Edward Arnold, 1983.

Information on other aspects of electrical lighting beyond simple lumens per watt. Still relevant.

Hansen, Erwin G., Hydronic System Design and Operation, A Guide to Heating and Cooling with Water, USA, McGraw-Hill, 1985.

The one book that actually describes what can be done to save energy and provide better comfort in circulating hot and chilled water systems.

Lovins, Amory B., Small is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size, USA, Rocky Mountain Institute, 2002.

Written mostly for electric utilities and policymakers, this describes over two hundred side benefits of distributed energy resources, beyond just the energy savings. Very dense and detailed.

Gustavson, Robert A., Gustavson, Dale A., The Business of Energy Management: Doing it Right and Making Money At It, USA, Gannam/Kubat Publishing, Inc., 1990.

A great reference on running an energy efficiency business, proposals, planning etc. Geared toward providing BMS systems, but widely applicable.

Fetters, John L., The Handbook of LIGHTING Surveys & Audits, USA, CRC Press LLC, 1998.

A detailed look at what is involved with lighting audits.

Kreider, Jan F., Handbook of Heating Ventilation, and Air Conditioning, USA, CRC Press, LLC, 2001.

HVAC technology presented as a handbook instead of a textbook. Some overlap with other references.

ASHRAE Handbooks (Fundamentals, Systems and Equipment, Applications, Refrigeration), American Society of Heating Refrigerating and Air Conditioning Engineers, Atlanta, GA USA, www.ashrae.org.

These, and the similar CIBSE Guidebooks, are the standard references for HVAC engineering. Full of data tables, but quite difficult to read on their own.