



2010 GUIDELINES FOR COST-EFFECTIVE ENERGY MANAGEMENT IMPROVEMENT PROJECTS

Iowa Office of Energy Independence
Wallace State Office Building
502 E. 9th Street
Des Moines, Iowa 50319
(515) 725-0431
Fax (515) 725-0438

INTRODUCTION

The Iowa Office of Energy Independence (Office) administers the State of Iowa's Building Energy Management (BEM) Program. The goal of the BEM Program is to reduce energy costs for taxpayer supported facilities. The Program provides access to the financing needed to identify and implement technically feasible, cost-effective Energy Management Improvements (EMIs). The Office has established agreements with private sector legal and financial resources that make the necessary funds available to BEM clients including public and private schools, community colleges, local governments, hospitals, public and private colleges, state facilities, and nonprofit organizations¹. Iowa Code Section 473.20 states:

“The office may facilitate the loan process for political subdivisions of the state, school districts, area education agencies, community colleges, and nonprofit organizations for implementation of energy management improvements identified in an energy analysis. Loans shall be facilitated for all cost-effective energy management improvements. For political subdivisions of the state, school districts, area education agencies, community colleges, and nonprofit organizations to receive loan assistance under the program, the office shall require completion of an energy management plan including an energy analysis. The office shall approve loans facilitated under this section.”

Therefore, the BEM Program is able to facilitate financing for all cost-effective energy projects in public facilities that are identified in a comprehensive facility analysis, completed according to Office guidelines, and approved after a technical review. It is the goal of this guideline document to define how projects are assessed for cost-effectiveness.

Note:

1. While Iowa Code enables nonprofit organizations to work through the BEM Program, the inability of a nonprofit to raise taxes and/or produce revenue, may impact financing and terms available to implement energy management improvements. Although nonprofit organizations are identified in Chapter 473.20, the Code does not require private financial institutions to offer non-profits the same financing terms as taxpayer supported entities.

TECHNICAL FEASIBILITY

The Technical Engineering Analysis (TEA) report is a comprehensive energy study that must be completed and approved by the Office before financing can be authorized. The final product of the TEA is the Energy Management Plan (EMP). The EMP incorporates all EMIs for all of the facilities studied under the TEA contract. The EMP represents the plan of action for the client with the analyst's recommendation whether to implement and then when to implement each EMI. The EMP is then used by the Office to authorize financing allowed by Iowa Code through BEM Programs.

DETERMINATION OF COST-EFFECTIVENESS

Cost-effective is defined as the ability to recoup the actual or projected cost of construction and acquisition of the improvement (including cost of the engineering plans, specifications, etc.) within the useful life of the improvement, or the incremental cost of the lowest life cycle cost design alternative.

The means of determining which projects are cost effective for BEM financing is explained below.

Simple Payback Period

Simple payback period is a measure of the length of time required for cumulative savings for an EMI to recover the initial and other accrued costs. Therefore, the simple payback method is a form of breakeven analysis. Simple payback does not account for financing costs or cash flows after the payback period. The advantage of the simple payback method is its simplicity since it is easily derived and widely understood.

INDIVIDUAL EMI PROJECTS

Individual EMI projects may be approved for financing provided that the simple payback is less than the industry standard for the estimated service life of the equipment. Refer to the current *Technical Engineering Analysis Guidelines* or *Life Cycle Cost Analysis Guidelines* for more information.

Special Cases

The Office may provide assistance for EMI projects that have a simple payback that is greater than the expected service life. These projects can be approved for financing (if deemed appropriate by the Office) but the amount of the financing for individual EMIs is limited by the cost savings and the expected service life of the installation. The amount of financing available is the "*partial*" financing amount. The amount of the partial financing is determined by the product of the annual energy savings and the anticipated useful life of the improvement. (However, in practice the "*partial*" financing amount is limited to the term of the project package which is a maximum of 12 years. See below for more details.) The remainder of the project must be financed through other funding sources.

AGGREGATE EMI PACKAGE

Aggregating EMIs involves combining savings and installed costs (including design, etc.) of all EMIs into one project. The aggregate simple payback is the total installation cost of all EMIs recommended by the analyst divided by the total annual savings. The benefit of aggregating EMI projects is that short payback projects can be combined with longer payback (but still cost-effective) projects that may not otherwise be implemented. This is a benefit of the comprehensive energy analysis requirement. The aggregate simple payback is limited to the term of the financing. Currently, the maximum financing term is 12 years.

Exception

Although the maximum loan term is 12 years, this does not preclude clients from seeking other financing options to fulfill their duty under Chapter 473.13A to identify and implement all energy management improvements.

FINANCE PACKAGE

The final product of BEM programs is the authorization of approved EMI projects for financing. This authorization will be on a project by project basis or on an aggregated project basis. This method will benefit projects with longer paybacks that might not otherwise be implemented to be combined with short payback projects.

INCREMENTAL FINANCING (NEW CONSTRUCTION)

Iowa Code Chapter 473.20 includes the requirement that a school district, community college, area education agency, city, or county “shall design and construct the most energy cost-effective facilities feasible and may use financing facilitated by the office to cover the **incremental** costs above minimum building code energy efficiency standards of purchasing energy-efficient devices and materials unless other lower cost financing is available.” (473.20.5) (emphasis added)

The incremental cost must be demonstrated by showing that operational savings are sufficient to justify the additional (incremental) investment cost. The savings-to-investment ratio (SIR) of the incremental investment cost must be greater than 1.0. Refer to the Office’s *Life Cycle Cost Analysis Guidelines* at <http://www.energy.iowa.gov> and the *Life-Cycle Costing Manual for the Federal Energy Management Program*, National Institute for Standards and Technology (NIST) Handbook 135, 1995 Edition. This manual can be ordered from:

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
(800) 553-6847 or
(703) 487-4650

This manual (~10 MB) can also be downloaded on the internet at:

<http://www.bfrl.nist.gov/oea/publications/handbooks/135.pdf>

Between April and July of each year NIST publishes an annual supplement to Handbook 135 titled “Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis”. This supplement includes discount factors to be used in life cycle cost analysis and SIR calculations. The analysis must use current Federal Energy Management Program (FEMP) rates discount rates. (Office of Management and Budget (OMB) rates are not to be used). Analysts without internet access or analysts unclear on the appropriate rates to use may call Lee Vannoy at (515) 725-0435. The current supplement to Handbook 135 and the current Building Life Cycle Cost computer software (updated annually) can be downloaded from:

http://www1.eere.energy.gov/femp/information/download_blcc.html#annual_supplement

The manual and the annual supplement is in Adobe Portable Document Format (PDF) so the Adobe® Acrobat® Reader® software must be used. Acrobat Reader can be downloaded from the internet at:

<http://www.adobe.com/products/acrobat/readermain.html>

This material was prepared with the support of the U.S. Department of Energy (DOE). However, any opinions, findings, conclusions or recommendations expressed herein are those of the authors and do not necessarily reflect the views of the DOE.