

CONCEPT STAGE QUESTIONNAIRE

EPC TOOLKIT FOR HIGHER EDUCATION | APRIL 2009



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The following is an adapted excerpt from a report by the National Association of Energy Service Companies (NAESCO), which outlines recommended questions that should be “considered in any facility energy efficiency evaluation” before a building owner decides to undertake a comprehensive energy efficiency retrofit alone or with ESCO.¹

1. Has a lighting retrofit been done already or is standard interior and exterior lighting in place?

Lighting retrofits offer the shortest payback period and an opportunity to subsidize other equipment replacements as part of a comprehensive retrofit. If a lighting retrofit has been done already, the economics of any remaining work will require careful evaluation.

2. What is the age of the Heating, Ventilation, and Air Conditioning (HVAC) equipment? What is the energy efficiency rating of the HVAC equipment? Is the equipment damaged? Does the refrigerant contain Chlorofluorocarbons (CFCs)?

Older equipment with outdated energy efficiency ratings indicate a need to further investigate savings opportunities through an energy efficiency retrofit.

3. Is the existing insulation rating low? Are the building envelope conditions in need of upgrade?

Older insulation and building envelope conditions offer savings opportunities.

4. Has an energy management system (EMS) been installed or are all thermostats metered separately? What are the thermostat limits?

If an EMS system is in place, it should be incorporated into future energy efficiency work. If one is not in place, it should be considered as part of an energy efficiency retrofit.

5. Is there a deferred maintenance problem? Is the cost of maintenance significant relative to the facility’s budget? How often is equipment replaced? Who performs the maintenance? Is it being performed in accordance with manufacturers’ specifications?

Excessive maintenance costs offer opportunities for energy cost savings.

¹ Jessica Lefevre, “The Energy Efficiency Project Manual – The Customer’s Handbook to Energy Efficiency Retrofits: Upgrading Equipment While Reducing Energy Consumption and Facility Operations and Maintenance Costs,” The National Association of Energy Services Companies and the United States Department of Energy, 1997, pp. 9-10.

In the same document, NAESCO offers the following questionnaire to assist building owners who are considering whether or not to take on a comprehensive energy efficiency retrofit using only in-house resources.² Colleges and universities may want to consult it before making their decision to go with or without an ESCO for their retrofit work.

1. Does the facility's maintenance staff include engineers with training and expertise in energy systems?

Yes___ No___

Evaluate your facility's maintenance staff for level of relevant training and education, job training, experience, and current responsibilities and capabilities. Based on an evaluation of these criteria, is the staff primarily janitorial or does it include engineers with sufficient energy systems expertise?

Are the facility's engineers qualified to audit the facility for energy use and potential energy savings?

Yes___ No___

An audit should be done of the facility's energy use and potential for energy savings. If the energy audit is to be used as the basis for financing the project, it must meet the standards of a comprehensive or investment grade energy audit (IGA) (i.e. an energy audit that provides the level of detail and accuracy required by the financial community when reviewing a proposed project for financing purposes).

2. Are the facility's energy engineers qualified to design a comprehensive energy efficiency retrofit for the facility?

Yes___ No___

Designing a comprehensive energy efficiency retrofit for a facility requires an understanding of the facility's energy systems and a thorough knowledge of available energy efficiency technologies. The level of knowledge that is needed will vary depending upon the facility's energy use. In a facility where energy is used mostly for lighting, the retrofit design may be fairly straightforward. However, even in a facility with relatively simple energy systems, all opportunities for energy savings might not be readily apparent to someone who is not familiar with the advantages of a comprehensive and interactive energy efficiency retrofit design.

² Ibid, 21-23.

- 3. Does the facility's staff have the time to design and install a comprehensive energy efficiency retrofit?**

Yes___ No___

Undertaking the design and installation of a comprehensive energy efficiency retrofit in-house will consume a substantial amount of engineering and maintenance staff time. This is true even if a non-ESCO contractor is used for the installation. These time requirements should not be overlooked in evaluating staff capabilities.

- 4. Do the facility's energy engineers have sufficient knowledge of measurement and monitoring technologies and protocols to warrant that energy savings generated by the project will persist over time?**

Yes___ No___

The energy efficiency retrofit should pay for itself based on energy savings that can be measured and verified using current technologies and energy industry recognized protocols. If the new energy efficient equipment and energy efficiency measures are properly maintained, the energy savings produced by the project should persist indefinitely. However, if the facility's energy engineers lack knowledge of measurement, monitoring, and maintaining equipment, the potential costs associated with degrading equipment will likely be significantly larger than the added cost of an EPC.

- 5. What types of hazardous materials might be encountered when existing equipment is removed? Are facility personnel prepared to provide for removal and disposal and/or abatement?**

Most fluorescent light fixtures installed prior to the 1980s are equipped with magnetic polychlorinated biphenyls (PCB) containing ballasts. The installation of high-efficiency lamps equipped with electronic ballasts generally will require the removal and disposal of existing PCB-containing ballasts. In addition, the U.S. Environmental Protection Agency currently classifies fluorescent tubes as hazardous materials based on their mercury content. The removal, transport, and disposal of these items are regulated under the federal Resource Conservation and Recovery Act (RCRA) and state environmental statutes. Facility personnel must be knowledgeable about applicable federal and state laws and regulations and facility owners must ensure that in-house personnel or third-party providers, whoever is engaged in the retrofit, dispose of hazardous materials properly and lawfully.

6. Is the facility owner in a position to pay for or finance, the energy efficiency capital investment? Also, in its accounting practices, is the owner able to forward savings from retrofits with short paybacks to help pay down the cost of more retrofits with longer paybacks?

Yes___ No___

Does the facility owner have the capital available to finance the retrofit internally? If not, are there external financing options available? A financial analysis including comparative costs should be undertaken.

7. Is the facility owner/manager in a position to assume the risk that the project will produce the projected savings on a verifiable basis to ensure that the capital investment is recovered out of saved energy costs?

Yes___ No___

If the energy efficiency retrofit is undertaken using in-house resources and is expected to be paid for out of realized energy savings, the facility manager must be willing to assume the risk that the project will produce verifiable savings that will persist and be sufficient to cover the cost of the capital investment. In a comprehensive, performance-based retrofit undertaken by an energy services company, the ESCO guarantees project performance and is paid only from verified energy savings.

If the answer to any of the above questions is no, it may be advisable to consider going outside the institution for assistance. ESCOs offer a wide range of services and expertise in the design, installation, maintenance, guarantee of project performance, and financing of comprehensive energy efficiency projects. This expertise and full-service approach can be utilized to ensure the most comprehensive and cost-effective retrofit possible.

However, if the facility's maintenance staff includes professional engineers who are familiar with state-of-the-art high efficiency equipment and related measures and technologies, and if financing is available for the project, it might be cost-effective to use in-house resources to accomplish the retrofit.