What End Users Should Know About Energy Performance Contracts **And** How to Minimize Their Risks

Martin A. Mozzo Jr., P.E., CEM, CLEP
M and A Associates, Inc.

There have been many books written and papers presented regarding risks in performance contracts, especially for Energy Performance Contracts. This article will present some of the experiences and thoughts that this author has had in minimizing risks in Energy Performance Contracts. The slant of the article will be on how the End User can minimize his risks, and will be presented from experiences as an End User and as an ESCO. Risks discussed fall into the following categories: (1) engineering, (2) implementation, (3) financial, (4) verification, and (5) selection of an ESCO.

Performance Contracting for energy projects, as performed by third parties, has been around for quite a while. This article will discuss engineering risks, implementation risks, financial risks, verification risks, and the risks involved in selecting an ESCO. The issues and points discussed here are the result of several years experience of the author in this field as an end user, an ESCO employee, and an independent energy consultant.

RISKS IN PERFORMANCE CONTRACTING

This article will restrict itself to some risks which impact the end user. It will provide a framework which the end user can use in negotiating his contract for such projects.

First and foremost in negotiating the contract, the end user should recognize that he is an equal partner in the contract and he should use this opportunity to minimize his risks at this time. Too often, the end user does not fully recognize all of the issues involved in the project, and when he finally learns them, it is too late. The end user should use this opportunity to develop a true partnership relationship. Failure to do so, will result in conflict and possible project failure.

Second, all parties in the contract negotiation stage will be attempting to reduce their risks to zero. While there is nothing wrong with this position, especially if you are the one to negotiate a zero risk contract, it's practicality is somewhat questionable. In the true partnership, all parties to the contract share equally the risks involved in a project. In this manner, the "true partnership relationship" will be enhanced. Additionally, it has been my experience that if an end user demands and gets a zero risk (to him) contract, he will have left a lot of rewards on the table, and he is not truly representing his company.

The risks discussed here are (1) engineering, (2) implementation, (3) financial, (4) verification, and (5) ESCO selection. This is certainly not meant to be an all inclusive list of risks, but rather, a few of the more important ones. Also, of risks should not be considered all inclusive as well. The end user is cautioned to thoroughly evaluate the Performance Contract and project associated with it to insure that he has taken into account all of the contingencies he believes are important and to minimize the risks involved through a partner-sharing relationship.

Engineering Risks

The first step in entering into an energy performance contract is to perform an engineering or technical review of the project. The party making the proposal to the end user, identified in this article as the ESCO, should have performed an energy audit, or site review, to identify potential Energy Conservation Measures (ECMs). Before any

contract is reviewed or signed, this audit should be thoroughly reviewed by the end user. The end user should have his own team of experts who are knowledgeable and unbiased analyze the audit, the ECMs involved, and the costs and savings to implement the ECMs.

The audit should be reviewed for its thoroughness. Is it an Investment Grade Audit (IGA) or one of a lesser quality? Usually the ESCO will not perform an IGA unless financial commitment has been made. The end user might want to consider committing a limited amount of funding in order to get an IGA performed. The more thorough the audit that is performed, the less risk to all parties involved. Expenditure of money to perform an Investment Grade Audit may be money well spent in reducing his risks and conflicts at later stages in the project.

The end user should evaluate the proposed list of ECMs. Do they make sense? For example, a lighting ECM might be proposed which requires the conversion of lighting source to be changed to one which has poor color-rendering characteristics. This however, may not be acceptable to the operational or production staff. Another ECM may be Variable Frequency Drives (VFDs) on an HVAC system which is not suitable to such an application, such as a dual deck system.

The end user should also recognize that the ECMs will likely have an interactive component. It is important that he recognize this and insure that any interaction is considered and accounted. Insure that savings are not double counted or that implementation of one ECM precludes the implementation of other ECMs.

The end user evaluation should also include a review of the materials to be used in the project. Reliability of the equipment to be installed is very important to the project, especially if savings are required to finance the project. Allowing the ESCO to have sole authority to choose equipment suppliers should not be acceptable. The end user should insure that he has the final, reasonable authority on this subject.

The end user should also be knowledgeable of other operational issues that are required by the implementation of the proposed ECMs. Such issues could encompass hours of operation required or mode of operation necessary to meet the energy savings. For example, if the ECM is a lighting retrofit in a university or school setting, assuming 4,000 hours of operation per year is unrealistic, that works out to almost 12 hours/day 7 days/week. Additionally, changes in modes of operation may not make sense as well.

As previously pointed out, the end user should have his own team of technical experts evaluate the ECMs. This team of experts can be composed of internal personnel, consultants, or a combination. The important thing to consider here though is that the team be unbiased in their thinking. The end user's team, however, should be prepared to work cooperatively with the other partners in the project.

Implementation Risks

As part of the contract negotiations, the end user should also be aware that there will be certain risks during project implementation. Probably first and foremost, is the timing of the project to be installed. Typically, all contractors like to work during the day, Monday through Friday. There is nothing wrong with this, in fact, there are usually a lot of good reasons to do so. However, the installation work may interrupt normal operations. There are cost factors which involve the time of installation. Understanding these issues, and addressing them in the Performance Contract, will go a long way to minimizing the risk to the end user.

Another key issue is operational in nature. Specifically, questions should be asked as to when and how the ECM will be installed and the potential impact on operations. Suppose the ECM is a fuel switch that requires a change in heating systems. If this ECM is to be installed during the heating system, then consideration must be given for "backup" heating. Additionally, adequate fuel supplies for the "new" fuel source could be an issue as well. It should not be assumed that all issues will automatically occur correctly. They should be addressed in the contract as a means to minimize end user risk.

Another consideration is response to emergencies during construction by the ESCO. No one plans, expects, or wants an emergency, but the odds are that they will occur. What is important is to identify how an ESCO will respond to a potential problem. While not every contingency can be foreseen, it is important that the contract have provisions in it to minimize impact to any party.

Financial Risks

The third area of concern is financial risks. The Energy Performance Contract has financial provisions in it regarding costs, contract length, savings, payments, terms, etc. The objective for all parties in contract negotiation is to insure that all fully understand the terms and

conditions of the contract, and recover their costs at minimal risks.

The performance contract will have the following components: (1) the costs of the project, (2) how these costs will be paid, (3) energy savings from the project, and (4) a termination clause.

The costs of the projects include all subcontractor materials and labor, engineering, sales, M&V, and an overhead and profit component. The true risk to the end user here is to understand how each component is developed and to insure that the costs are developed fairly, i.e., he is not paying a high cost for the project.

There are numerous ways to finance a project and there are several excellent books and papers written on this subject. Some methods are fixed periodic payments, full sum at completion of construction, or shared savings. Each way has its pros and cons, and will not be discussed in this article. Suffice it to say that the end user should evaluate the proposed financial structure to insure that it minimizes his risks, and meets the financial guidelines of his company.

Determination of energy savings is an important subject in that, if there are no savings, why do the project? Energy savings should be subject to measurement and verification protocols (M&V). For purposes of this section, it is assumed that the M&V Protocol and Equipment is acceptable to the end user. Assume at this time that the energy savings that are presented are acceptable to the end user. Some contracts require that the end user share a percentage of these savings with the ESCO. Shared savings may be to pay off the costs of the installed project, or may be used to pay for "further engineering services" related to the project, or both.

From an end user risk standpoint, there is an issue regarding what happens if projected savings are not realized, especially if the savings are used in some fashion to pay off the installation costs. To this end, the end user should insure that he fully understands his risks involved with this and minimizes them. For example, the contract should hold the ESCO fully accountable for projected ECM savings as long as the ECM is operated according to defined standards in the contract. Likewise, the end user has some responsibility to insure that the ECM operates as he has agreed to in the contract. For example, if the ECM is a lighting retrofit, the ESCO should be accountable for the kW reduction of the retrofitted system as he designed it, and the end user insures that the hours of operation will be met. Either party should be culpable if their end of the project is not met.

The end user, however, should not accept unusual operational considerations of equipment under the new system. He should insure that his contract only requires him to operate the equipment as he normally would have, prior to the installation of the ECM.

To minimize the risk to the end user, clauses with potential penalties can be included, if under-performance of the ECM occurs not because of end user operational issues, but because of engineering design. This is especially important if the repayment of the project capital costs is dependent on energy savings. One way to insure this is to require that the ESCO provides a "guarantee" for the performance savings of the project. Typically, this means that the project will produce some mutually agreeable minimal savings during the course of the contract.

If the minimal savings is not achieved for a reason which the ESCO is responsible, the ESCO must then pay a penalty to the end user. This type of clause is helpful especially in situations where minimum savings is needed to cover debt service for the project. There obviously is a cost to this, and the end user should be aware that his project costs will increase as a result of the guarantee. The "insurance" and the resulting peace of mind however, may be worth the cost.

Another key issue is increased savings due to over-performance of the ECM or an increase in energy prices. This becomes important in contracts which hold the ESCO responsible for under-performance. The ESCO will probably require, and I believe deservedly so, the rewards of over performance or increased energy prices. The fairest way is to share in this bonanza on a percentage basis. It then becomes a "win-win" situation for both the end user and the ESCO.

One issue frequently overlooked is maintenance and warranty issues. It is extremely important from an end user view to insure that he fully understands his maintenance responsibilities over the life of the contract as well as warranty issues involved with the installed equipment. No one expects that the equipment installed as part of the Performance Contract will always be fully functional over the life of the contract. The end user should be well aware of his responsibilities in both maintenance and warranty issues. This will minimize the end user's financial risk due to under-performance of energy savings.

The last important financial risk to the end user is termination. Performance contracts are written with a termination clause in order to protect the ESCO and the financial lender from harm if the project

ceases to exist during the life of the contract. The end user should recognize that this is important to a project, and it is unreasonable to request that termination clauses be excluded from the contracts.

While I have seen exclusion of such clauses on very rare occasions, they have been for end users who are typically quite secure. The cost to the end user is quite high, that is, project costs are usually fully recovered in the first year or two of the project, and any revenue gained by the ESCO after that is pure profit. The end user should consider termination clauses when negotiating his contract, recognize their integral part of the process, and develop his risk potential before signing of the contract.

Verification Risks

One important portion of Performance Contracting is the Measurement & Verification (M&V) Protocol to be used in the project, and the equipment to be used to perform the M&V function. Too often, this function is performed as an afterthought, the last task done in the completion of the project, and usually with whatever funds remain to the project. Such a cavalier approach usually will not minimize risk in Performance Contracts. The end user can enhance minimization of his risks by understanding the M&V protocol and insuring it is satisfactory to his needs and is properly installed and documented.

All Energy Performance Contracts need a baseline energy usage determination. For each ECM this is the calculation of energy usage that would have been consumed prior to the retrofit. Typically, models have to be developed for the "preimplementation" condition on weather or production sensitive ECMs.

It has been my experience that the baseline models should be developed early in the project. The reason for this early development is that the models need to be reviewed to insure that they accurately reflect conditions prior to the retrofit, and are adjusted accordingly. Too often, this step is done late in the project, sometimes when "verification" of the baseline cannot be determined since existing conditions no longer exist. The end user, in order to minimize his risks, should be active in developing and approving the baseline.

The next step in the M&V Protocol is to decide how energy consumption after an ECM retrofit will be determined and how energy savings will be calculated from this data. If the project can support the cost, utility grade metering should be employed to measure the "post-

implementation" energy consumption data. If costs cannot be supported by the project and engineering calculations are required, then once again the end user should be very involved and have approval authority for these calculations.

It has been my experience that not only are the M&V considerations done as an afterthought, but too often the end user has no input into the process. As a result, the end user has greatly increased his risks for under-performance of the project and the inherent financial liabilities for this inaction.

A side issue regarding M&V protocol and equipment is the maintenance requirement of the M&V equipment. Like the equipment installed as part of the project, M&V equipment is also subject to maintenance requirements. The end user should be aware of whose responsibility it is for such maintenance.

It also has been my experience that while such equipment may be 95% functional, faulty sensors can give erroneous results. Someone should be examining this equipment on a full-time basis and be responsible for correcting any deficiencies. The contract that the end user will sign may or may not specifically address this issue, but failure of any M&V component which results in under-performance may provide a risk to the end user.

ESCO Qualification

The last risk for the end user is the selection of an ESCO to perform the project. There have been numerous articles written regarding this subject. The end user, to minimize his risks, should thoroughly evaluate the ESCO that he would like to use. He should remember that he wants a true partner arrangement in this situation.

The ESCO as a company should be evaluated for qualifications. I have seen articles written which suggest that a national, or maybe even an international company, with decades of experience in the performance contracting business, should only be considered. If that is the case, then there are only a few companies who meet those requirements, and I personally would challenge their unilateral capability. Most, if not all of these companies, are vendors of equipment who have one purpose, to sell their equipment, whether the peg fits into the hole or not.

There are several smaller ESCOs who have not been around a long time, who may also be local, who are excellent companies to do

business with. These companies should be given a fair chance for evaluation.

Some of the items that the end user should consider about such companies is their financial strength, technical qualifications, success in the business, and depth within the company.

Obviously, as the ESCO is interested in the end user's financial strength, the end user should likewise be interested in his ESCO's financial strength. Do they pay their bills on time? Are their contractors paid within reasonable time periods? Has a D&B been run on them, and is it satisfactory?

What are the technical qualifications of the ESCO involved? Have they proposed a complex mechanical project, but have never done anything but lighting retrofits? What are the qualifications of the personnel who meet with end users? Are they technically qualified to discuss all aspects of the project? Are they financially qualified to discuss the project? Do they appear to have a team supporting them?

What is the ESCO's success in business performing projects similar to that being proposed? Are there references available? How have their relations with contractors and vendors been? What are the savings results from previously installed projects?

What is the depth of the ESCO's organization? Is there only one engineer involved or is the office fully staffed? What support can be provided by the ESCO during emergencies?

Finally, an ESCO should not be discarded just because they have never completed a similar project, or if they are fairly new in the field. The evaluation should however, be more thorough. The end user may want to consider the ESCO for an initial smaller project for evaluation purposes prior to selecting them for a more complex project.

CONCLUSIONS

This article presents some of the risks involved in doing Performance Contracting for energy projects, and reviews how an end user can minimize his risks. It is important to note that the end user is one party in the execution of such a contract. It is also important to note that a partnership agreement between all partners will go a long way to minimizing risk and conflict.

The end user should recognize that there are risks in the (1)

engineering, (2) implementation, (3) financial, (4) verification, and (5) ESCO selection phases of an Energy Performance Contracting.

The end user should fully understand all the risks that are involved within each phase, understand how much risk he is willing to accept, and insure that he actively participates in contract negotiations to insure that he has reduced his risk to an acceptable level.

Bibliography

1. Hansen, Shirley J., Ph.D., and Weisman, Jeannie C., *Performance Contracting; Expanding Horizons*; The Fairmont Press. 1998.
2. Hansen, Shirley J., Ph.D., *Performance Contracting for Energy and Environmental Systems*. The Fairmont Press. 1992.
3. Thumann, Albert, PE, CEM and Wainwright, Fred, *Financing Energy Projects Deskbook*. The Fairmont Press. 1997.
4. Tharoor, Mahesh, CEM, CDSM, CLEP. "Minimizing Risks With Performance Contracting Projects—A Customer Checklist." A paper presented at the *Business Energy Solutions Expo '99,* December 1999, Orlando, FL.

ABOUT THE AUTHOR

Martin A. Mozzo Jr. is president of M & A Associates, Inc. M & A Associates provides energy engineering and consulting services to retail, commercial and industrial end users as well as energy service companies. Prior to starting M & A Associates Inc., Mr. Mozzo worked for Energy Performance Services, Inc. and KENETECH Energy Management, Inc., both nationally prominent energy service companies. Prior to that, Mr. Mozzo worked for 17 years at American Standard Inc. in a number of positions including corporate director of energy management.

Mr. Mozzo has been very active in the Association of Energy Engineers. He is currently past president of AEE, having served as president during 1999. He currently serves as chairman of two of AEE's certification boards, the Certified Lighting Efficiency Professional (CLEP) and the Certified GeoExchange Designer Boards. He is a senior charter member of AEE, was Region I vice president (national) for two years, was executive vice president, and was a board of director member for the New Jersey chapter for several years. Mr. Mozzo was elected into the AEE Energy Managers Hall of Fame in 1995.

Mr. Mozzo holds a BS in mechanical engineering from Rutgers University, an MS in logistics management from the Air Force Institute of Technology, Dayton, Ohio, and is a registered PE in the states of New Jersey, New York, Pennsylvania, and Ohio. He has received certification as a CEM and CLEP from AEE.

Mr. Mozzo can be contacted at 609-584-9244 or by e-mail: mmozzo@aol.com.