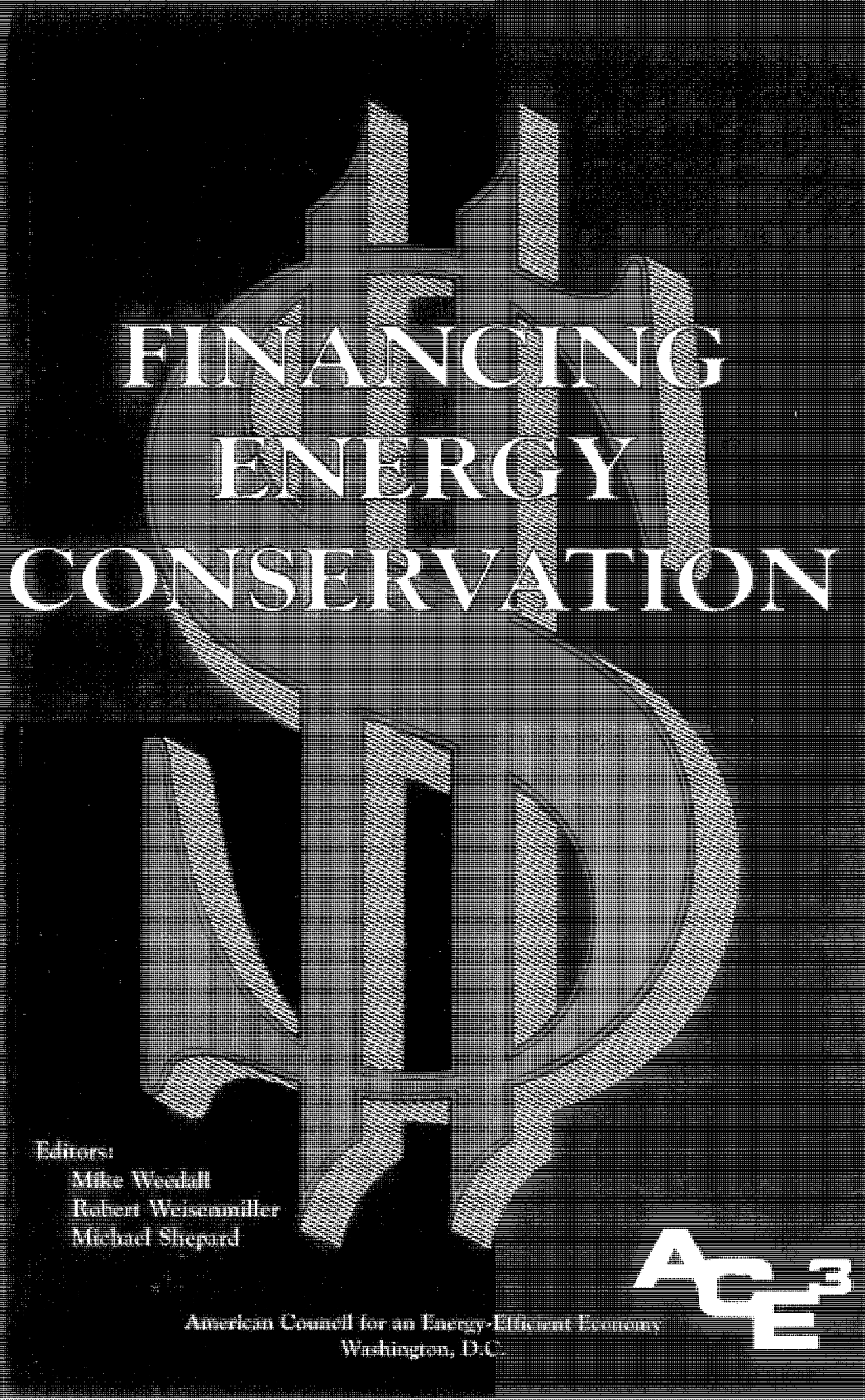
FINANCING ENERGY CONSERVATION



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American Council for an Energy-Efficient Economy
Washington, D.C.

Financing Energy Conservation

American Council for an Energy-Efficient Economy Series on Energy Conservation and Energy Policy

Series Editor, Carl Blumstein

Financing Energy Conservation
Energy Efficiency in Buildings: Progress and Promise

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1986

Library of Congress Cataloguing in Publication Data

Bibiliography: p.
Includes index.
1. Buildings—United States—Energy conservation—Finance.
I. Weedall, Mike, 1949- . II. Weisenmiller, Robert, 1948-
III. Shepard, Michael, 1955-
TJ163.5.B84F517 1986 333.79 86-3589
ISBN 0-918249-0-31

First published in 1986.

American Council for an Energy-Efficient Economy
1001 Connecticut Ave., N.W., Washington, D.C. 20036

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

Financing Energy Conservation, 1986

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Preface

This book had its origins in the 1984 Summer Study on Energy Efficiency in Buildings, sponsored by the American Council for an Energy-Efficient Economy (ACEEE). During the Summer Study, held in Santa Cruz, California, many of this volume's authors participated in panel discussions to share their experiences in developing innovative financing strategies for energy-efficiency programs. The financing panels focused on the practical lessons learned in developing effective programs and on the issues that would affect performance contracting and other forms of conservation financing in the coming years.

Because of the positive response to the financing sessions at Santa Cruz, ACEEE decided to publish this book, using the Summer Study papers as a nucleus. Selected papers from the original proceedings were revised, and additional materials were solicited to provide a comprehensive treatment of experience to date in this rapidly evolving field.

The editors would like to acknowledge the direction and inspiration of Carl Blumstein, who served as Chairman of the 1984 Summer Study. Our appreciation is also extended to Peter duPont for his good cheer and perseverence as production editor, and to Cheryl Wodley, who graciously developed an index and provided support and encouragement throughout. Jeanne Clinton provided excellent guidance to the editors early in the process by bringing into focus many of the issues facing the performance contracting industry. Thanks also to Steve Hickock and Sue Hickey of the Bonneville Power Administration for providing a supportive environment for Mike Weedall's efforts and to Reva Bennet, who cheerfully helped with manuscript preparation.

Mike Weedall
Robert Weisenmiller
Michael Shepard

Summer Study Sponsors and Contributors

The American Council for an Energy-Efficient Economy thanks the following organizations for financially supporting the 1984 Summer Study that gave rise to this book. The list is extensive, and so is our appreciation.

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Financing Energy Conservation.

Section I: The Tool Kit — An Introduction to Financing Options for Energy Projects

Michael Shepard and Robert Weisenmiller

INTRODUCTION

In the wake of the Arab oil disruptions of the 1970s, energy conservation—or energy efficiency as this book terms it—was pronounced the "moral equivalent of war" by President Jimmy Carter. Driven both by government energy policies and energy price increases, Americans have attempted to reduce the amount of energy required to heat, cool and illuminate their homes and businesses. These building owners faced a bewildering array of approaches to energy-efficiency and had to select among price quotes and performance promises from many firms. Most of the building owners who invested in energy-efficiency measures paid for them with cash or borrowed money and assumed the risk that the improvements would in fact reduce energy demand and lead ultimately to financial savings. Oil prices stabilized in the early 1980s, reducing the expected savings for these investors and banishing energy issues from the headlines—into the company of other infrastructure problems. Local governments, school districts, hospitals, universities, businesses, and homeowners—all with limited budgets—looked out upon a sea of challenges. Yes, their energy bills were too high, but there also were roads needing repair, teachers demanding raises, equipment that had to be modernized to compete with foreign factories, and countless other matters at least as pressing as their utility bills. Because energy was no longer the overriding concern it had been in the 1970s, many building owners

were reluctant to risk their scarce capital on efficiency measures that came with no guarantee of performance.

In the early 1980s a new type of business appeared, offering to take much of the uncertainty, work and risk out of energy-efficiency investments. Known as energy services companies (ESCOs), these firms provide a one-stop-shopping approach to energy conservation. They audit energy use in buildings to identify the optimal mix of measures for energy efficiency, then install and maintain these measures, often paying for the whole project at no up-front cost to the building owner. In exchange, they get a share of the savings that the project produces. The building owner is guaranteed to pay no more for energy than would have been the case without the efficiency measures. This type of business arrangement—in which payment for goods or services rendered is contingent on their successful operation—is called performance contracting.

Most of this chapter, indeed most of this book, is about performance contracting. As interesting and innovative as this technique is, however, there are instances when other financing approaches are more appropriate. Consequently, this chapter briefly reviews the principal methods of financing energy projects and offers some guidelines for choosing and applying the best method for a given situation.

Many other publications cover financing theory in great detail, and some of these are cited in the bibliography that follows this chapter. The goal here is not to duplicate existing literature in the field, but to provide an introduction sufficient to assure that the reader can clearly understand the unique case studies that comprise most of this book. Rather than generalizing about how performance contracting is supposed to work, the case studies reveal the practical lessons their authors learned while implementing energy-financing programs in the real world. They demonstrate that the difference between theory and reality in energy project financing is often substantial. In preparing this chapter, the authors drew heavily on three earlier works: *Business Guide to Energy Performance Contracting*, by Mitch Rosenberg, *Guidelines for the Public Sector: Implementing a Third-Party Financed Energy Services Transaction*, by Dale Breed and Marlene Michaelson, and *Financing Alternatives for Energy Management Programs*, by Larry Fenster. (More complete citations for these three articles can be found in the bibliography that follows this chapter.)

FINANCING CONCEPTS

There are many ways to finance investments. One can pay cash, borrow money through either debt or bonds, lease equipment, or pursue some form of performance contracting. Each of these options has costs and benefits. And any one may be the optimal choice in a given situation, depending on the skills and financial position of the individual or institution seeking the efficiency improvements as well as the size, cost, riskiness, and performance of the measures being considered.

One yardstick for evaluating energy-efficiency investments is their cost-effectiveness. There are a number of ways to compare the projected savings to the costs of the investment. One measure is the *simple payback*—how long it takes to recover the initial costs from the savings or revenues. For example, a $1,000 investment that saves $500 a year is said to have a 2-year simple payback. Another measure is the *rate of return* on the investment. A $1,000 investment that saves $500 a year is said to have a 50 percent rate of return on the investment. Another measure is the *benefit-cost ratio.* If the $1,000 investment saves $500 a year for three years, then its benefit-cost ratio is 1.5 to 1.

Most investments, however, do not provide the same benefits each year. Rather, they produce a stream of varying levels of benefits. Moreover, a dollar next year or in ten years is less valuable than a dollar today. Future dollars should be *discounted* to put them on a comparable basis with today's dollars. Different investors may have different discount rates. A *net present value* calculation collapses the entire stream of benefits into a lump sum figure, which can be compared with the costs. If the net present value of the benefits is greater than the costs, then the investment is economically attractive. The *internal rate of return* is the discount rate that equates the net present value of the benefits to the costs. The internal rates of return of a number of projects can be compared and the most attractive investments selected.

These evaluations can be modified to incorporate both the risks of various investments and their tax consequences. How certain are the future savings? Is there only a 50 percent probability of actually saving $500 per year? If so, the expected return would be $250 per year. In general, investors expect higher potential returns for riskier investments. Rather than investing in energy-efficiency measures, the homeowner could have invested in a savings account, bonds, stocks, or real estate. These investment options can be ranked according to their expected returns and the

associated risks. Part of the returns could include tax savings such as depreciation, investment tax credits or special energy tax credits. There is not space here to explain the details of these evaluation procedures, but the reader should know that they exist and are useful tools for comparing investment options. For comprehensive treatment of financial analysis, see the financing materials section of the bibliography following this chapter.

Cash Purchase

Cash purchase is the simplest and most familiar method for financing energy-efficient improvements. A homeowner, for example, may hire a contractor to install attic insulation, or a school may draw from its operating budget to have its boiler upgraded and to have more efficient lights installed in its halls. All of the costs and benefits accrue directly to the building owner, whose cash pays for the project.

Before committing funds to an energy-efficiency project, however, one should consider several issues. Are the funds available and can they be tied up over the length of time that the project will be paying for itself in energy savings? Will the internal rate of return on the investment be greater than the savings and/or revenues that could be obtained by investing the money in other facility improvements or alternative investment options? How significant are the risks that the savings may be less than expected? Do the potential benefits justify the risks?

In general, relatively inexpensive, simple efficiency measures that are likely to pay for themselves within a year or so should be purchased with cash. Larger, more complex energy projects are often funded in different ways.

Borrowing Money

Major projects are rarely financed with cash. In most cases, at least a portion of their costs are borrowed. For example, the bulk of the purchase price of a house is generally borrowed and then repaid throughout its expected useful life. The loan allows the purchaser to match her payments with the use of the product through monthly payments over 20 or 30 years. There are essentially two ways to borrow money: receive a loan or issue bonds. Each of these mechanisms will be examined in turn.

Loans. Building owners often take out a loan to finance large projects. One generally needs a certain amount of equity to leverage a

loan (also known as debt). For example, down payments (or equity) of 10 to 20 percent are generally required for car loans or home mortgages. Lenders often require up to 40 percent downpayments on loans for energy projects. The relative portions of borrowed funds and cash are called the debt/equity ratio. A higher ratio of debt to equity (e.g. 80 to 20 rather than 60/40) indicates a higher degree of leverage.

Along with the degree of leverage, other important parameters include the term of the debt, the interest rate and the transaction costs. For example, a 10-year loan might be arranged with a 14 percent interest rate and an additional 0.2 percent rate as the closing (or financing) cost. Generally, a higher-risk loan will have less leverage, a higher interest rate and a shorter term of debt.

Lenders generally require some form of security or guarantee for repayment of the loan. If repayments are backed up by personal or business assets (i.e. recourse financing), then the lending institution will simply assess the credit-worthiness of the individual or the corporation for its repayment and then tie the financing costs to the individual's credit rating or the corporation's Moody's or Standard and Poor's rating. Recourse financing is the traditional approach. In traditional financing, the borrower bears all the risks of a project, but receives all of the benefits.

Alternatively, a project can be supported through "project financing," an off-balance sheet, non-recourse financing technique in which a lending institution looks at the cash flow generated by the project and the collateral value of the project for repayment of its investment. The loan is not with the host corporation, but with a thinly capitalized, special-purpose corporation, whose primary assets are the particular energy-efficiency project and its associated contracts. These contracts define both the obligations and liabilities—the risks—of each participant in the project and their associated rewards. In project financing, the lender must assess the financial strength of the project and evaluate all the risks which could undermine it. Investors generally require higher returns for non-recourse financing relative to traditional financing. (For more details on the type of risk assessment that a financing institution performs in evaluating specific projects, see George Schaefer's chapter.)

There are advantages to borrowing money to finance energy investments. The annual costs of the loan are typically covered through savings generated by the investment. The building owner not only gets tax breaks like depreciation and tax credits on eligible

equipment, but the interest costs and much of the transaction costs of the loan are tax deductible.

Debt-financing is not without its costs. The building owner must pay interest and transaction costs for the loan. These debt obligations must be paid before any benefits from the project reach the building owner. Recourse-financed debt must be counted as a liability on the borrower's balance sheet, a factor which may reduce her credit rating and thus increase her costs for future debt. As with cash purchases, the borrower assumes all the risk that the project will perform as expected and must pay the contractors and the bank whether or not the hoped-for energy savings occur. With project financing, some of the risks and rewards must be shared with the other participants in the project. Depending upon the specifics of the arrangement, the transaction may not even be completely off the participants' balance sheet.

Bonds. Municipalities, states, utilities, and corporations can raise money for specific projects in a unique way, by issuing bonds. A bond is a pledge to repay the investor both a particular interest rate over a specified period and to repay the debt at the end of the period. Instead of borrowing this money from a bank, the party issues thousands of bonds to thousands of investors. Bonds allow essentially 100 percent debt financing. Because bond issues are complex and costly transactions to arrange, they are applied only to large projects, generally costing more than $1 million. The interest payments on bonds issued by public agencies are not taxed. Consequently, the interest rates for tax-free bonds are significantly lower than those paid on regular bonds. Federal and state tax codes determine which projects are eligible for tax-free bond financing.

There are two types of bonds, analogous to the two types of loans. General obligation bonds are backed by the full faith and credit of the issuing entity. These bonds play a role similar to traditional, recourse financing. The key question for evaluating a general obligation bond issue is the credit-worthiness of the entity or the amount of outstanding bonds. Another variable is the assets of the entity. Various agencies will rate the credit-worthiness of these entities, and this rating will determine the financing costs for future bond issues. Local governments and states have a variety of legal requirements (such as voter approval of a ballot measure) before general obligation bonds can be issued. General obligation bonds are typically issued for projects such as school construction and park land acquisition. In some localities, general obligation bonds are not a viable option for project financing.

Revenue bonds are backed only by the anticipated revenues of the project being financed. Because of the higher risks, revenue bonds are more costly than general obligation bonds. Revenue bonds are very similar to project financed, non-recourse, off-balance-sheet debt in that investors need to evaluate the financial strength of the project, rather than the credit-worthiness of the entity. Convention centers, airports and other similar income-generating public enterprises can be financed with revenue bonds. Revenue bonds can often be issued by local entities without explicit approval by the voters, since they involve little risk for the local ratepayers. However, the projects must be relatively large (to support the transaction costs) and entail very little risk to be suited to revenue bond financing.

Some states will issue revenue bonds that are free of state taxes for projects owned by private companies, if these projects serve a "public purpose". In California, for example, revenue bonds can be used to finance construction of housing, light rail systems, pollution control equipment and alternative energy projects.

Because of the small size of the investment and the uncertainty associated with the energy savings, energy-efficiency measures have not been financed very often with revenue bonds. However, some innovative programs have demonstrated the viability of this option. The Bonneville Power Administration and the Eugene Water and Electric Board have cooperated to issue revenue bonds for energy-efficiency measures. Similarly, the Department of General Service of the State of California is preparing a revenue bond program for energy-efficiency measures in which third-party developers guarantee the savings.

Performance Contracting

There are instances when either borrowing money and/or paying with cash is the ideal financing tool. However, there are also many situations in which these options are not attractive. If one lacks funds, then cash financing is not viable, and loans are hard to obtain. If one's credit is weak, it is difficult to borrow money. If the project is too small, too risky, or overshadowed by more pressing needs, it will be hard to finance with bonds. In each of these approaches the facility owner ultimately pays for the efficiency improvements and assumes most of the risk that they will generate energy savings.

Fortunately, there is another class of financing mechanisms that allocates risks differently and relies very little upon the financial

strength of the building owner. These financing tools fall under the general heading of performance contracting and represent an extension of the project financing approach. With performance contracting a company essentially puts the project financing package together or absorbs all the risks for energy-efficiency investments at a host site. Performance contracting is particularly appropriate for situations in which the building owner lacks the necessary expertise or time, and either does not have or does not want to risk the up-front cost of a project.

There are many potential performance contracting arrangements. Some simply finance the purchase and installation of energy-efficiency equipment such as temperature controls or chillers. Under more complex service arrangements, the contractor assumes all responsibility for the client's energy systems, from installing and maintaining equipment through paying the monthly utility bills. There are two general categories of performance contracts: those involving primarily the sale or rental of equipment and those in which services (often including equipment) are provided. Each of these classes of performance contracts will be discussed in turn.

Equipment Contracts. Equipment contracts generally involve some form of equipment leasing. In a leasing arrangement, one essentially borrows equipment instead of money. For example, instead of purchasing an automobile with a loan, one can lease an automobile. No downpayment is required, and the monthly lease payments are generally less than the monthly loan payments would be if one were purchasing the car. The lessee can deduct the entire lease payment from her taxes and can negotiate with the lessor on who will claim any investment tax credits associated with the car. If the lessee wants to own the car at the end of the lease, she must purchase it at its current fair market value.

Equipment leasing is a widespread practice for businesses. For example, photocopy equipment and computers are frequently leased rather than purchased. Leasing transfers the risks of equipment obsolesence or performance problems from the user to the supplier. In addition, the lessor may be able to achieve economies of scale in purchasing the equipment or in arranging financing. Leasing is also becoming a common financing mechanism for municipalities and other public entities. With a lease to a public entity, the lessor may have access to tax benefits which the public agency would not have received in any case. In addition, the lease payments from the public entity may not be taxable as income for the lessor. These factors can result in lower costs to the municipality through a leasing arrangement.

When energy-efficiency equipment is leased to a building owner, the vendor typically sets the lease payments below the level of expected savings from the reduced energy payments. For example, the vendor may charge a lease fee of $500 per month for equipment that he asserts will reduce a building's energy bill by $1,000 per month. The vendor installs, maintains and owns the equipment. If the equipment does not perform as outlined in the lease agreement, then the customer has the option to terminate the agreement. The vendor would then have to remove the equipment at his own expense.

The laws and regulations governing equipment leasing are complex and constantly changing. Under current Internal Revenue Service rules, only removable equipment that is not a structural part of the building may be leased. A transaction that meets this and a variety of other conditions of the tax code is called a true lease, but there are other types of leases that meet certain conditions of the tax code. The details of leasing law are too complex to be completely explained here. A more comprehensive discussion of these issues can be found in several of the references in the bibliography. (For example, see *Business Guide to Energy Performance Contracting* and the references therein.)

Equipment contracts are attractive to customers because they minimize risks and save time. One need not worry about problems with leased equipment. If the equipment does not perform properly, the vendor is responsible for remedying the problem. Similarly, a customer does not have to spend a lot of time learning about and selecting among all the technologies that could meet her needs. Instead she could lease one and see how it works, switching later at little or no cost to another technology that may better meet her needs.

Service Contracts. Although equipment contracts offer many advantages, they too have limited applicability. They can work well in instances where there is clear need for a specific piece of energy saving equipment. In larger projects, however, a more complex combination of services, equipment and control strategies are called for. In such cases, equipment contracts may be inadequate, and service-based contracts should be considered. In service-based transactions the building owner contracts with one or more firms to manage all or part of the energy systems of the facility.

Two principal features distinguish service-based performance contracts from equipment leases. The former are generally more

comprehensive, and the customer is guaranteed to pay no more than she would if the efficiency measures were not taken.

There are two varieties of service-based performance contracts: shared savings and energy services. Identical services and equipment can be provided under both kinds of contracts. The only difference between the two concerns the manner in which payments are determined. In each, a vendor or third-party investor finances and installs energy-efficiency improvements on the customer's premises. The customer pays nothing for the installation, which remains the property of the contractor. The contractor assumes all the risk, draws all the tax benefits, and may sell the system to the customer at the end of the contract for its fair market value. Each month, the actual energy consumption of the building is compared to what the energy use would have been without the efficiency improvements. This calculation is based on methods carefully analyzed and agreed to by all parties to the contract. The difference between these two figures represents the measured energy savings (assuming that the installation actually saves energy).

In shared savings contracts, the dollar value of the measured savings is divided by some contractually agreed upon formula between the customer and the energy services firm. In other words, each takes a certain percentage of the energy savings pie. If there are no savings, the customer simply pays her energy bill and owes the vendor nothing. In an energy services contract the customer pays a flat amount each month to the ESCO for all the energy needs covered in the contract. If the actual energy costs are less than that amount, the vendor keeps the difference. If the actual bill is greater than the flat fee, the vendor must pay the difference.

Some simple examples should help here, beginning with a shared savings contract. An energy services company installs a number of conservation measures on the customer's facility for free, in exchange for an 80 percent share of the savings these measures will generate. In the first month of operation, the building uses $1,000 less energy than it would have without the conservation improvements. This savings is "shared" 80/20 between the energy services company and the customer. In other words, the customer saves $1,000 on her utility bill and pays the ESCO $800. The customer thus comes out $200 ahead and the ESCO receives $800 to help pay off its investment. The ESCO owns the equipment for the duration of the contract—typically around five years—and receives any applicable tax benefits. After the contract expires, the ESCO may sell the equipment to the customer for its fair market value.

In an energy services contract an ESCO conducts an audit of a facility and identifies opportunities for efficiency improvements. The firm offers to install efficiency measures at no charge and to pay the facility's energy bills for, say, five years. In exchange, the customer agrees to pay the ESCO each month a sum equal to 80 percent of what the utility bill would have been in the absence of the conservation measures. The customer is thus guaranteed to save money. The ESCO can make a profit if its measures reduce the facility's energy bill by more than 20 percent. Assume for example that the typical monthly energy bill without the improvements is projected to be $1,000. The building owner agrees to pay the contractor 80 percent of the $1,000, or $800 each month for her energy. Thus the building owner is saving $200 per month compared to what she would otherwise be paying. Assume that the contractor can reduce the building's actual energy bills to $600. The contractor will then earn $200 per month. If the contractor cannot reduce the building's actual energy bills to below $800 he will not make a profit. Whatever happens, the building owner simply pays the contractor $800 per month.

PUTTING TOGETHER A PROJECT

At first glance, shared savings and energy services arrangements appear to be ideal means for building owners to reduce fuel bills at no cost and with minimal risk. The customer must relinquish an often sizeable portion of the savings generated by the improvements, but at least she saves something or at least breaks even, having spent no money up-front and having assumed no risk. In addition, this process frees the building owner to invest her time and money elsewhere. Furthermore, after five years (or however long the contract lasts) she may be able to purchase the system, and from that point on, keep all of the savings.

For the process to run smoothly, however, the customer must carefully select a reputable firm to work with. Developing a fair contract and implementing the program can take far longer than one might expect, particularly in institutional settings where decisions must be approved by several tiers of administrators. The assertion that energy performance contracting costs the customer nothing is a myth. Because these transactions are inherently complex and must be tailored to the conditions of specific facilities, they take lots of time and skill to implement. Furthermore, because performance contracting is a relatively new concept,

advocates of this approach often have to convince key decision makers that the process can work. The case studies in this book demonstrate that implementing a performance contract is a lengthy, challenging process.

The process of selecting a firm, developing a contract and seeing the project through to completion is discussed below. The first step is to make sure that there is enough potential for energy savings to attract an ESCO to the project. The time and effort required in these projects is significant enough that few energy services firms will even consider jobs whose potential annual savings are under $50,000, and many require at least $100,000/year to get involved. Assuming that a 20 percent reduction in energy bills can be achieved, this implies that eligible users have annual energy bills greater than $250,000 per year. A low-cost, preliminary audit of the facility should reveal roughly how much energy can be saved. This audit gives all parties an initial idea of the possibilities. The customer should consider financing with cash any simple, inexpensive, quick pay-back efficiency measures revealed by the audit. If, after skimming this "cream" off the system, significant potential savings remain, it may be worth pursuing a performance contract. Sometimes, the building owner may have to leave some of these low-cost measures in order to attract an ESCO to the project.

One should compare the costs, benefits and risks of all other financing options to the prospect of getting from 10 to 50 percent of the savings under a relatively risk-free performance contract. If the performance contract still appears attractive, one should consider whether staff is available to go through the extensive process of selecting firms, negotiating contracts and overseeing project implementation. This requires legal, accounting and engineering skills. Finally, one should make sure that any key officials who will have to approve the project support the idea and are ready to work to make the project succeed. Without such administrative blessing, a sound project can easily falter because officials at many stages of the process can bring the project to a grinding halt.

If a preliminary analysis indicates that there are large savings to be gained, adequate staff to do the work and cooperative administrators supporting the project, it is time to select an energy services firm. There are four ways to do this: direct negotiation, request for bids, request for qualifications, and request for proposals.

In *direct negotiation,* one simply contacts one or more ESCOs and starts discussing the terms of an agreement. This process can work simply and well if the customer already knows reliable firm(s)

and if the project is straightforward enough that the efficiency measures required are obvious. In more complex situations, one of the other selection methods may be more appropriate.

A customer can develop or contract for technical specifications on an energy-efficiency project and then *request bids* on the job from ESCOs. As with direct negotiation, this process is more appropriate for simple projects. Unlike standard contracts, most performance contracts are not well suited to bidding. For example, one firm might claim that a specific piece of equipment will save $10,000 per month in energy costs and propose to keep half of those savings. Another firm may assert that its installation will save $15,000 per month and that it wants 60 percent of the savings. Since the bidding process does not include detailed engineering analysis, the customer may have difficulty judging which firm's projections are more accurate. In theory, the customer will save more under the second offer ($6,000 vs. $5,000) even though the ESCO takes a larger share of the savings. The second project is much riskier, however, and without verification of the projections, it is impossible to know which claims to believe.

One should not make a decision simply on the financial terms of the offers. The reputability of the firms, their past experience, their service record, and the complexity and risks of the technology should all be considered.

One way to identify the firms interested in a certain project is to issue a *request for qualifications* (RFQ). Firms respond by submitting statements describing their expertise and experience in the field. A customer may select a firm to negotiate with strictly on the basis of their stated qualifications. More frequently, this process is used to narrow the field to a handful of candidates who are then asked to submit detailed engineering and financial proposals on the project. The solicitation of these detailed proposals is known as a *request for proposals* (RFP).

The RFP process is the most costly and time consuming method for selecting firms. Nonetheless, it is a good approach in cases where the size and complexity of the project warrant detailed analysis. Often, proposals will include energy conservation and management features which the customer had not even considered.

There are certain steps a customer can take to insure that the proposals she receives are sound and responsive to her needs. The first is to prepare a basic description of the facility, its energy use patterns and equipment. The RFP should also include a summary

of the services sought, deadlines, contact persons, and should explain how the proposals will be evaluated. Specific measures typically requested include a detailed energy audit; clearly enumerated energy savings calculation procedures; installation, construction management, maintenance and monitoring; project financing and management; and a schedule for completion of each stage of the project. For more details on the tradeoffs among the approaches for selecting firms see the bibliography, particularly the Breed and Michaelson paper.

The customer should make clear at the outset which provisions she will require in a contract, and should ask the firms to respond to these concerns in their proposals. Factors to be considered here include liability in the event of equipment failure and accidents, benefit sharing arrangements in the event of sudden, sharp rises in energy prices, and terms for customer buy-out of the equipment during or after the contract period.

The procedures used to calculate energy savings are at the heart of performance contracting. They determine how large a pie there is to be shared. Firms should be asked to clearly explain the methods, data and assumptions used in their calculations. Examples from past jobs should be requested.

The customer should ask for and carefully check references from firms, including past clients. The firm should clearly demonstrate that it has the capacity to finance and implement the project on schedule, that the contract complies with all applicable legal and tax issues, and that the firm is stable and will be in business throughout the duration of the contract.

Once a firm is selected, the customer should sign a preliminary agreement to proceed with the project. The firm should then perform a detailed energy audit, recommend certain improvements, estimate the costs and savings that will result, and propose detailed financial terms and other contract provisions. If there are significant differences between the preliminary agreement and the findings from the detailed engineering work, some renegotiation of contract terms may be appropriate. Before signing the final contract, the customer should conduct an engineering, legal, and financial review to insure that the firm's proposals are sound and that they meet the customer's needs.

Contract review is very important. The task is too involved to be covered in detail here, but the reader is encouraged to consult the references at the end of the chapter for more in-depth guidance on contract evaluation. Two of the publications cited, *How to be*

an Intelligent Consumer of Energy Conservation and *Innovative Financing for Energy-Efficiency Improvements: Phase II,* should be particularly valuable.

The contract should be signed only after it survives thorough review and the customer is sure that it addresses all relevant issues. The customer's responsibilities do not end, however, with the signing of the contract. The path from contractual agreement to project completion is long, and requires patience and perseverance from all parties. The process should become easier as performance contracting becomes more common. Although each contract does have to be fine-tuned to the specific conditions of the project, most transactions do have common elements. Model contracts have been published and are cited in the bibliography. These can provide a starting point for negotiation.

The customer should assign staff to monitor the project and see that it proceeds along the schedule agreed to in the contract. The contract should allow for the customer to withdraw from the agreement without penalty if the contractor fails to make timely progress. Once the installation is compete, the customer should monitor the firm's maintenance and operation of the equipment and should double-check the first several invoices issued by the firm to ensure that it is adhering to the energy savings calculation methods stipulated in the contract. If all seems well at this stage, the customer can step back from the day to day concerns of the project and assume an oversight role, checking periodically to see that operation and maintenance are going smoothly and that the ESCO is fulfilling its obligations. With luck, the customer will have to do little more than monitor the situation for the duration of the project, but she should always be prepared to assume a more active role if problems arise.

This chapter has sketched out the options for financing energy conservation projects and the steps to take in developing and implementing a performance-based contract. As the following case studies show, unanticipated situations often arise. Those seeking efficiency improvements should keep this in mind as they proceed, and should minimize their risks by reading relevant material, talking with others who have implemented similar projects and seeking the advice of qualified experts where appropriate.

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cial, and legal services to the energy industry. Previously, Dr. Weisenmiller has held positions of executive vice-president of the Independent Power Corporation and assistant executive director for policy and program evaluation at the California Energy Commission (CEC). He was responsible for establishing the CEC's programs in cogeneration, small hydro, and enhanced inter-regional power pooling, and for providing financial incentives for alternative energy technologies. He also was involved in developing California's legislation in the areas of solar energy, cogeneration, and the establishment of alternative energy finance mechanisms. Weisenmiller has a Ph.D. in chemistry and an M.S. in energy and resources from the University of California at Berkeley.

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Financing Energy Conservation.

Section I Bibliography

Entries are arranged in five categories: "how to" guides, procurement materials, contract guides, financing materials, and energy services firms.

GUIDES TO PERFORMANCE CONTRACTING

• *Building Energy Management: A Purchasing Guide for Local Governments.* Stephen B. Gordon and Lloyd B. Chaisson, Jr. (eds.) National Institute of Governmental Purchasing, September 1982, 22 pp. Provides local government framework for the purchase, lease, or lease-purchase of energy management systems and services, including shared savings arrangements. Addresses planning, assessment, procurement processes, and project reporting requirements. Also cites sources of further assistance.
Available From: National Institute of Governmental Purchasing, Inc., 115 Hillwood Ave., Falls Church, VA 22046, $15.

• *Business Guide to Energy Performance Contracting.* Prepared by Mitchell Rosenberg of the Technical Development Corporation, under subcontract to Grenadier Realty Corporation for the New York State Energy Research and Development Authority (NYSERDA), May 1984, 54 pp. Directed to owners of residential, commercial, and institutional buildings. Defines and compares various types of energy performance contracts including installment purchase, lease, shared savings, and energy services. Based on experience gained in a NYSERDA demonstration program, the guide provides step-by-step procedures for soliciting and evaluating proposals and for negotiating and implementing an energy performance contract.

Available From: New York State Energy Research and Development Authority, Two Rockefeller Plaza, Albany, NY 12223, report #84-11, $3.

• *Creative Financing for Energy Conservation and Cogeneration.* F. William Payne (ed.) Fairmont Press, Inc., 1984, 270 pp. Addresses third party financing, shared savings, leasing options, tax credits, and legal considerations. Also provides economic analyses and guidelines for selecting appropriate financing mechanisms for energy conservation and cogeneration projects in industrial, commercial, and public buildings. Appendices include list of energy services companies and sample energy services agreement.
Available From: AEE Energy Books-Department 95, Association of Energy Engineers, 4025 Pleasantdale Rd., Suite 340, Atlanta, GA 30340, $36.

• *Financing Alternatives for Energy Management Programs.* Larry Fenster. In Volume L of the *Proceedings of the ACEEE 1984 Summer Study on Energy Efficiency in Buildings.* Defines financing approaches including internal funds, installment sale, leasing, guaranteed savings, and provides case-studies of cash flow analyses of various options. This book is adopted from Volume L but does not include the Fenster chapter.
Available from: Proceedings of the summer study can be obtained from the American Council for an Energy-Efficient Economy, P.O. Box 9985, Berkeley, CA 94709, $100.

• *Financing Campus Energy Conservation Projects: State Policy Initiatives for Financing Energy Efficiency in Public Buildings.* Energy Task Force, 1984, 4 pp. One in a series of eight energy financing papers. Contains policy and program suggestions for developing and financing energy-efficiency projects in public sector buildings. Addresses regulatory and procedural barriers and summarizes available financing options.
Available From: Energy Task Force, Association of Physical Plant Administrators of Universities and Colleges, 1446 Duke St., Alexandria, VA 22314-3492, $4.50 (non-members)/$2.00 (members), set of 8 papers: $27 (non-members)/$15 (members).

• *Financing Campus Energy Conservation Projects: Third-Party Financing of Cogeneration and Central Plant Projects.* Energy Task Force, 1984, 12 pp. One in a series of eight energy financing papers. Presents guidelines for developing third-party financing arrangements in central plant projects. Discusses management concerns in project planning, structuring financing transactions,

procurement procedures, contract elements and negotiation, and case studies. Also addresses utility relationship.
Available From: Energy Task Force, Association of Physical Plant Administrators of Universities and Colleges, 1446 Duke St., Alexandria, VA 22314-3492; $4.50 (non-members)/$2.00 (members).

• *Guide to Financing Hospital Energy Conservation Projects.* M.J. Morrow, et. al. Blue Cross and Blue Shield Association, 1984, 205 pp. Provides information on how to use external financing for hospital energy conservation projects. Discusses debt financing, leases, shared savings agreements, and energy services contracts, as well as federal, state, and local voluntary incentive programs. Describes benefits, limitations, and key issues associated with each approach, strategies for negotiating a financing agreement, and methodologies for evaluating and selecting a financing option.
Available From: Health Services Foundation, Energy Project Publications, 676 N. St. Clair, 12 Floor, Chicago, IL 60611, $40 prepaid.

• *Guidelines from the Public Sector: Implementing a Third-Party Financed Energy Services Transaction.* Dale Breed and Marlene Michaelson. In Volume L of the *Proceedings of the ACEEE 1984 Summer Study on Energy Efficiency in Buildings.* Describes factors a public entity should consider in deciding whether to pursue third-party financing for energy-efficiency projects. The procurement process, selection criteria, solicitation documents, proposal evaluation, and contract negotiation and monitoring are all discussed. This book is adapted from Volume L but does not include the Breed and Michaelson chapter.
Available from: Proceedings of the summer study can be obtained from the American Council for an Energy-Efficient Economy, P.O. Box 9985, Berkeley, CA 94709, $100.

• *A Manual for Financing Cogeneration in North Carolina.* Prepared for the North Carolina Alternative Energy Corporation by Ultrasystems, Inc., January 1982. Provides the public official with a treatment of how to develop a cogeneration project. Step-by-step development allows for an interesting contrast to the elements which are inherent in an energy-efficiency project.
Available From: North Carolina Alternative Energy Corporation, P.O. Box 12699, Research Triangle Park, North Carolina 27709, (919) 549-9046.

• *Third-Party Financing: A Primer for the Baffled Energy Professional.* Claude W. Brenner, 1983, 128 pp. An introduction to performance contracting. Various financing options are discussed.

Available From: Commonwealth Energy Group, 200 Swanton Street, Suite T-12, Winchester, Massachusetts 01890, (617) 729-2676.

PROCUREMENT MATERIALS

• *Alternative Energy Financing: A Guidebook for Public and Private Buildings in Utah.* Utah Energy Office, December 1984, 100 pp. Guidebook assesses energy service, shared-savings, lease and lease-purchase financing arrangements. Provides key points for developing procurement documents. The appendices include references, a sample request for proposals and a sample contract used for third party financing services at Utah State University.
Available From: Mike Glenn, State of Utah Natural Resources, Utah Energy Office, 355 W. North Temple, 3 Triad Center, Suite 450, Salt Lake City, UT 84180-1204, (801) 538-5428, free of charge.

• *City of Newark, New Jersey - Impact Management Systems, Inc: Shared Savings Proposal, Energy Engineering Reports, Model Contract/Schedules.* Impact Management Systems, Inc., August 1983, 125 pp. Proposal for 10-year shared savings project in six municipal buildings. Includes energy engineering reports, proposal, and model service agreement. Schedules include proposed energy conservation measures, procedure for calculating energy savings, energy savings shares, default fees, property/equipment inventory, baseline energy consumption, projected energy savings, 0 & M responsibilities, buyout values, service and comfort standards, equipment operation/maintenance information, and insurance certificates.
Available From: Impact Management Systems, Inc., 401 Gordon Dr., Lionville, PA 19353.

• *City of New York, Department of Housing Preservation and Development: Shared Savings Request for Proposals and Contract with Benec Industries, Inc.* Office of Energy Conservation, 1983, 51 pp. Includes request for proposals and resulting energy services agreement for 7-year municipal shared savings contract.
Available From: Tommy Davis, Office of Energy Conservation, 100 Gold St., Room 8040, New York, NY 10038, free of charge.

• *Delaware Department of Health and Social Services Request for Proposal: Energy Services.* Delaware Department of Health and Social Services, September 1982, 13 pp. Solicitation for 10-year energy services shared savings contract at Delaware State Hospital. Includes selection criteria and proposal requirements.

Available From: Delaware Department of Health and Social Services, 1901 N. DuPont Hwy., New Castle, DE 19720, free of charge.

• *ECCO Selection Criteria and Contract Guidelines.* Environmental Policy Institute, 1983, 5 pp. Invites proposals for multi-family shared savings demonstration project conducted by the Environmental Policy Institute/D.C. Department of Housing and Community Development. Includes proposal requirements and evaluation and selection criteria for both small and large energy conservation companies (ECCOs).
Available From: Environmental Policy Institute, 218 D St., SE, Washington, DC 20003, free of charge.

• *Energy Management System: Augusta College, Augusta, Georgia.* Georgia Department of Administrative Services, Purchasing and Supplies Division, April 9, 1984, 80 pp. Request for proposals to install a computerized energy management system in 13 buildings at Augusta College. Shared savings contract will match funds provided through DOE's Institutional Conservation Program. Specifies contract terms and conditions including savings calculation, required payback, and contractor liabilities. Also contains system specifications, standard agency agreement, federal contract information, and building utility costs.
Available From: Georgia Department of Administrative Services, Purchasing and Surplus Property Division, Room 1308-West Tower, 200 Piedmont Ave., SE, Atlanta, GA 30335, free of charge.

• *Energy Services Proposal for John E. Runnells Hospital, Union County, NJ.* Natkin Energy Management, 1983, 99 pp. Proposal for 7-year shared savings contract includes feasibility study, energy use analysis, identification of potential retrofits, projected savings, and share percentages. Energy services agreement addresses equipment and property ownership, responsibilities, liabilities, default, and insurance.
Available From: Natkin Energy Management, P.O. Box 1598, 2775 S. Vallejo St., Englewood, CO 80150.

• *Guide for the Public Sector: Implementing A Third-Party Financed Energy Services Transaction.* Dale Breed and Marlene Michaelson. Lane and Edson, August 1984, 12 pp. Presented at the First Annual Conference of the National Association of Energy Service Companies (NAESCO). Provides federal, state, and local governments with guidelines on evaluating the use of third party financing, developing procurement documents, evaluating proposals, and negotiating energy services agreements.

Available From: Lane and Edson, 2300 M St., NW, Washington, DC 20037, free of charge.

• *"How to Evaluate Shared Energy Savings Performance Contracts."* George M. Grieder, in *Energy Economics Policy and Management,* Winter 1983/1984, pp. 64-75. Traces developments in shared savings contracting in Europe and the United States. Also presents several issues to consider in evaluating or comparing shared savings contracts.
Available From: Hospital Efficiency Corporation, Russia Wharf East, 286 Congress St., Boston, MA 02210, free of charge.

• *Parsippany-Troy Hills Township Schools, New Jersey: Viron Corporation Shared Savings Proposal.* Viron Corporation, 1983, 94 pp. Includes 5-year energy cost savings projection, description of energy analysis methods, insurance information, and other required procurement data. Proposal describes Viron Corporation shared savings contract at Adrian College, Michigan, and provides guaranteed savings lease plan and agreement for the Adrian College contract.
Available From: Viron Corporation, 1828 Swift, Suite 300, North Kansas City, MO 64116.

• *Parsippany-Troy Hills Township Schools, New Jersey: Draft Specification for Shared Savings Energy Management Bid.* Parsippany-Troy Hills Township Schools, Office of the Superintendent of Schools, June 1983, 58 pp. Draft bid specification for 5-year shared savings contract in a designated high school. Includes bid requirements, selection criteria, methodology for computing energy cost savings, and model agreement.
Available From: Parsippany-Troy Hills Township Schools, Office of the Superintendent of Schools, P.O. Box 52, Parsippany, NJ 07054, free of charge.

• *Request for Proposals from Energy Services Companies for the Purpose of Entering into Contracts for Shared Savings Agreements for Office of Energy Management.* Metro-Dade County Office of Energy Management, June 1984, 77 pp. RFP for shared savings contracts in several Metro-Dade county-owned buildings. Scope of work to result in guaranteed energy savings, entails energy audits, acquisition and installation of equipment, and training of on-site personnel. RFP addresses savings calculations, buy-out, contractor requirements, and evaluation criteria. Supplementary material concerns contractor selection process.
Available From: Mr. Paul K. Glasser, Deputy Director, Metro-

Dade County Office of Energy Management, 44 West Flagler St., Suite 2302, Miami, FL 33130, (305) 579-5275, free of charge.

• *Request for Proposal: Energy Services.* Department of Administrative Services, School District of Philadelphia, April 30, 1984, 10 pp. Shared savings solicitation for comprehensive energy services in ten Philadelphia high schools. Includes bid requirements, contractor/client responsibilities, and selection criteria.
Available From: George Edwards, Energy Office, School District of Philadelphia, John F. Kennedy Center, 734 Schuylkill Ave., Philadelphia, PA 19146, free of charge.

• *Request for Proposal: Energy Service/Shared Savings.* Delaware Technical and Community College, 1982/1983, 10 pp. RFP for shared savings contract indicates proposal requirements and evaluation criteria. Related schedules (21 pp.) address energy conservation measures, savings calculations, savings shares, baseline measurement, and contractor/client responsibilities. Also available is 14-page energy management agreement resulting from contract award to Impact Management Systems, Inc.
Available From: Barbara S. Ridgely, Assistant to the Campus Director, Delaware Technical and Community College, Southern Campus, P.O. Box 610, Georgetown, DE 19947, free of charge.

• *Shared Savings Financing of Energy Conservation Measures: Selection Process for Energy Service Companies.* New Jersey Department of Energy, January 2, 1984, 3 pp. Provides criteria for evaluating shared savings proposals and energy services companies. Identifies important steps in the pre- and post-award phases of the contract. Also addresses state regulation (N.J.A.C. 14A:12-1) on shared savings contracting.
Available From: Shared Savings Task Force, New Jersey Department of Energy, 101 Commerce St., Newark, NJ 07102, (201) 648-4499, free of charge.

CONTRACT GUIDES

• *Consumer Energy Purchase Agreement Between Bio-Energy Services Corporation and Morristown Memorial Hospital, Bridgewater, New Jersey.* Bio-Energy Services Corporation, August 1983, 10 pp. Shared savings agreement for 7-year contract involving solar, waste utilization, and cogeneration systems in hospital facility. Includes calculation of energy fees, contractor/client responsibilities, liabilities, and defaults.

Available From: Bio-Energy Services Corporation, 221 Canal St., Ellenville, NY 12428.

• *Contract Between Colorado Department of Institutions and EMC Engineers, Inc.* Colorado Department of Institutions, September 27, 1984, 25 pp. Shared savings agreement specifies contractor/client responsibilities, equipment and energy reduction methods, baseline data, savings calculation, savings shares, and buyout schedule. Although state limits contract terms to 1 year, the agreement allows renewal for 6 years, contingent on the state's annual appropriation of utility funds to the Department of Institutions.
Available From: Robert L. Sutherland, Facilities Manager, Colorado Department of Institutions, 3550 W. Oxford Ave., Denver, CO 80236, (303) 761-0220/ext. 267, free of charge.

• *Financing Campus Energy Conservation Projects: Shared Savings Financing for College and University Energy Efficiency Investments.* Energy Task Force, 1984, 6 pp. One in a series of eight energy financing papers. Describes shared savings concept for use in colleges and universities and outlines procedures for evaluating its appropriateness and negotiating successful contract. Procurement issues addressed include calculating savings and contractor/client shares, operations and maintenance requirements, purchase options, contract buyout, contract contingencies, contractor selection, and special considerations for public sector shared savings contracts.
Available From: Energy Task Force, Association of Physical Plant Administrators of Universities and Colleges, 1446 Duke St., Alexandria, VA 22314-3492, $4.50 (non-members), $2.00 (members).

• *Guaranteed Energy Savings Agreement Between Admiral Associates and TRI-M Corporation for the Commerce Building, One Broadway, Camden, New Jersey.* New Jersey Department of the Treasury, Capital Services Bureau, April 1984, 4 pp. Ten year guaranteed savings agreement for the installation of an energy management system and chiller in a state-leased facility where utilities are paid by state funds. Agreement specifies required minimum cost avoidance, savings calculation procedures, equipment guarantees, and instructions to operating personnel.
Available From: Shared Savings Task Force, New Jersey Department of Energy, 101 Commerce St., Newark, NJ 07102, (201) 648-4499, free of charge.

• *How to be an Intelligent Consumer of Energy Conservation Services.* George M. Greider, Hospital Efficiency Corporation, 1983, 7

pp. Paper presented at 1983 Mid-Atlantic Energy Conference. Presents common problems in shared savings contracting from both client and contractor perspectives. Also provides consumer tips and model contract guidelines addressing payment schedules, saving calculations, tax claims, performance requirements, and project management.
Available From: Hospital Efficiency Corporation, Russia Wharf East, 286 Congress St., Boston, MA 02210, free of charge.

• *Innovative Financing for Energy-Efficiency Improvements. Phase II Report: Model Documents and Financial Projections.* Martin Klepper. Lane and Edson, December 1982, 523 pp. Second in a three-report series prepared under contract to the U.S. Department of Energy. Describes key terms and issues associated with shared savings transactions, leasing arrangements, and utility-sponsored energy services companies. Contains an economic model for evaluating feasibility of various options, financial analyses, model energy service and equipment lease agreements—including guidelines for modification—and discussion of legal and financial issues pertaining to innovative financing in industrial, commercial, and multifamily buildings.
Available From: Bonneville Power Administration, Planning and Evaluation Division, P.O. Box 3621-KE, Portland, OR 97208, free of charge.

• *Lease-Purchase and Service Agreement for York County Hospital and Home.* Impact Management Systems, Inc., March 21, 1984, 48 pp. Lease-purchase agreement between York County, Pennsylvania and Impact Management Systems (IMS), Inc. Ten year contract involves the installation and maintenance of energy conservation equipment and construction of a new laundry facility at a county hospital and home. Includes energy audit, conservation plan and savings calculation procedures. Also addresses property ownership, default liabilities and O&M responsibilities.
Available From: Impact Management Systems, Inc., 401 Gordon Dr., Lionville, PA 19353, free of charge.

• *Sample Energy Services Agreement.* Time Energy Systems, Inc., 1984, 6 pp. Sample shared savings contract addresses allocation of savings contractor/client responsibilities, and liabilities.
Available From: Time Energy Systems, Inc., 2900 Wilcrest Dr., Houston, TX 77042, free of charge.

FINANCING MATERIALS

• *"Energy Investments: Comparing Financial Alternatives in Tough Times."* David Brown and Robert Rauch, in *Energy Management,* November/December 1982, 6 pp. Reviews financing options for industrial and commercial energy investments. Methodology involves computer model for evaluating present value of energy savings achieved by user financing, combined equity and debt financing, and shared savings. Also addresses tax laws affecting energy investments.
Available From: Time Energy Systems, Inc., 12944 Travilah Rd., Potomac, MD 20854.

• *ENVEST Microcomputer Software.* Developed by Governor's Energy Council, Commonwealth of Pennsylvania and Alliance to Save Energy, March 1985. ENVEST is a flexible tool for analyzing opportunities for energy conservation, fuel conversion and cogeneration. The program calculates year-by-year cash flows, payback, internal rates of return and scenario analysis for loans, leases and shared savings agreements. This program can run on IBM personal computer and many "IBM-PC-compatible" computers.
Available From: Alliance to Save Energy, Suite 507, 1925 K Street, NW, Washington, D.C. 20006, $75.00.

• *Financial Analysis of Energy Conservation Strategies in Public Facilities.* Impact Management Systems, Inc., October 1984, 16 pp. Paper presented at the First Annual Conference of the National Association of Energy Service Companies (NAESCO). Provides economic analysis of shared savings versus internal financing of energy retrofits in public buildings. Includes cost/benefit analysis and comparison of net present value for specific conservation measures with differing return on investment ratios, contract duration, and savings shares.
Available From: Impact Management Systems, Inc., 401 Gordon Dr., Lionville, PA 19353, free of charge.

• *Financial Aspects of ESCO Transactions: Key Assumptions and Methodology.* Marlene L. Michaelson, Lane and Edson, October 1984, 6 pp. Paper presented at the First Annual Conference of the National Association of Energy Service Companies (NAESCO). Describes model for comparing different financing arrangements. Variable energy savings, energy escalation rates, and discount rates are used.
Available From: Jane Carpenter, National Association of Energy Service Companies, 2300 M St., Washington, D.C. 20037, free of charge.

• *Financing Campus Energy Conservation Projects: Financial Planning for Energy Efficiency Investments.* Energy Task Force, 1984, 10 pp. One in a series of eight energy financing papers. Presents guidelines for determining positive cash-flow financing options and cost-effectiveness of energy projects.
Available From: Energy Task Force, Association of Physical Plant Administrators of Universities and Colleges, 1446 Duke St., Alexandria, VA 22314-3492, $4.50 (non-members)/$2.50 (members).

ENERGY SERVICE FIRMS

• *Energy Service Companies Listing.* National Association of Energy Service Companies. Listing of NAESCO members who wish to be publicly listed. Not all NAESCO members are listed. Provides addresses, areas of expertise and financing offered.
Available From: National Association of Energy Service Companies, 2300 M Street, NW, Washington, D.C. 20037, (202) 955-9600, free of charge.

• *Firms Offering Innovative Financing for Energy Conservation Projects.* Wisconsin Division of State Energy, 1984, 4 pp. Listing of 54 firms around the country engaged in innovative financing of energy conservation projects. Indicates addresses, types of finance plans offered, and areas of energy technology experience.
Available From: Wisconsin Division of State Energy, Department of Administration, 101 Webster St., P.O. Box 7868, Madison, WI 53707, (608) 266-8234, $20.

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Section II: The Practitioners Speak

Section I provided an introduction to the theory and mechanisms of performance contracting. Armed with an understanding of these concepts, the reader could simply acquire resource materials cited in the bibliography to Section I and start to develop performance contracts. There is a missing element, however, which can greatly ease the novice's transition into the practical world of "real-life" financing. That missing element is the experience of the brave souls who were the pioneers of this approach. What practical, day-to-day lessons did they learn that can be helpful to those now considering this financing option?

Section II offers such lessons from those who have actually developed performance contracting programs to deliver energy efficiency. The authors in this section share their enthusiasm, satisfaction, and anguish. They explain why certain decisions were made, what the trade-offs were, and how these decisions affected the final program structure.

The reader should keep in mind that each of the programs discussed in this section was developed with unique goals or objectives in mind. For example, the development of a program by the State of Pennsylvania to use shared-savings to deliver energy efficiency to state buildings is quite distinct from the Bonneville Power Administration developing an umbrella program to acquire electrical resources through performance contracting. Each program is driven and shaped by unique circumstances, objectives, and available resources. By considering the objectives and motives of the specific programs the reader can better understand each author's perspective.

Despite the variety of programs, common themes do appear throughout this section. First, clearly defined objectives are vital

for a successful performance contracting program. The purpose of the program should be well-understood from the outset to ensure that those activities are pursued that will best attain the stated objectives. For instance, a public sector organization would use very different approaches to implement performance contracts for its facilities than it would to provide technical assistance for localities wishing to get involved in performance contracting.

A second theme running through this section is that assistance from experts can spell the difference between success and failure. There is no reason to make the same mistakes that the pioneers did. Beginners should take advantage of the experience and resources of experts and incorporate that technical expertise into the program design.

A third theme is that performance contracting is inherently complex and takes a long time to implement. Many factors contribute to this complexity. The transactions need to be tailored to individual facilities; standardized, cookie-cutter transactions are not possible. Since the financial agreement will span several years and probably involve significant sums of capital, the contracts must cover a wide-range of contingencies. Many skills are required to develop this type of transaction. Even if all these talents are available with in-house staff, the staff must be educated on the unique way in which such skills are applied in performance contracting. It is common for a key in-house staff person to leave a project at mid-course, causing the schedule to slip as a replacement comes up to speed. If the necessary resources are not available in-house, they must be obtained from outside sources. Evaluating procurement vehicles, drafting appropriate documents, and negotiating final agreements are very time-consuming.

Even if all the elements discussed above are in place and the project manager is prepared to be tenacious, there must be a key decision-maker supporting the project who can move events when things get bogged down. This figure must ensure that proper visibility is focused on the project when necessary. Without such high level support, many projects die on the vine, victims of bureaucratic inertia.

The first chapter of this section focuses on one of the leading programs to use performance contracting in state facilities. Robert Shinn and Anthony Rametta of the Pennsylvania Governor's Energy Council describe the history and current status of that state's program. Their case study covers the specific processes and elements needed to develop such a program. In particular, the

authors discuss the various pitfalls in selecting sites and identifying the appropriate technologies and contractors for each project. They also discuss how past experience will lead them to modify the program in the future, and how lessons they have learned can apply to conditions elsewhere.

Mary Brennan of New York City's Community Preservation Corporation next describes that city's program to improve the energy efficiency of repossessed multifamily buildings abandoned by their landlords. Performance contracting was the only financing option open to the city for improving these buildings because of budget constraints and the extensive amount of energy work required.

New York faced some very unusual problems in developing this program, since properties that the city repossesses tend to be old and dilapidated. Would energy services companies be willing to work with this sector of the market? How could contingencies be planned should vandalism result in damage to installed equipment? How would city officials respond to the typically long term of performance contracts? How could baselines of energy use be developed given the spotty data on historical energy use? Brennan touches on all of these issues as well as on the challenge of establishing an innovative program in a government bureaucracy. As the footnote to her article reveals, even the best laid plans can go awry.

A third successful state program is described by David Wolcott of the New York State Energy Research and Development Authority. The state has recently completed an initial demonstration of performance contracting in a state mental hospital. The success of that project has given rise to a larger, second round of demonstration projects in New York State facilities.

Wolcott provides a comprehensive account of the step-by-step process New York followed in this initial demonstration. Public officials contemplating similar programs should find valuable guidance in this chapter. Readers should focus on the give and take in contract negotiations between the state and the energy services company. Note particularly that the end results were not always what the parties had anticipated. The "lessons learned" section provides an excellent outline of points to consider in program design.

Legal issues are mentioned frequently in this section, and the next chapter deals explicitly with this issue. Philip Yates, an attorney and energy consultant in Portland, Oregon, discusses the major

legal obstacles local governments face in performance contracting for energy savings.

Yates' chapter is not a comprehensive discussion of all legal issues related to performance contracting but rather offers an overview of the major concerns for local governments. The author also discusses how localities that have tried performance contracting have dealt with these issues.

Turning back to state-level activity, the next chapter discusses how New Jersey has been a leader in assisting localities to use performance contracting to enhance energy efficiency. New Jersey officials realized early on that successful local performance contracting programs would depend upon technical assistance provided by the state. Gilbert Freeman and Michael Shepard describe the Shared Savings Task Force operated by the New Jersey Department of Energy. They trace the evaluation of the program as well as the day-to-day elements that make the program effective. The New Jersey program has emphasized flexibility and the minimization of bureaucratic complexity. This state program is a strong model for meeting the long-term need for technical assistance to public entities entering performance contracting arrangements.

In the following chapter, Philip Yates introduces a new actor in the performance contracting field: the energy agent. The energy agent is an individual who offers legal, technical and financial skills to a locality on a contingency fee basis. Public entities can work with these experts to develop a program most appropriate to their circumstances and needs. Yates provides a step-by-step guide to developing a working relationship with an energy agent. This model of private entrepreneurial involvement in the field is likely to grow.

No matter how carefully a performance contracting program is planned, factors outside the participants' control can have major effects on the program's outcome. Michael Garland of the California Department of General Services discusses the challenges such external factors have posed to that state's efforts in performance contract financing of efficiency improvements in state buildings. The uncertainty caused by changing tax laws and ways of coping with that uncertainty are discussed in some detail. Trends in the regulation of performance contracting are highlighted, as are the effects of energy supply and prices.

California is also at the center of the next chapter, in which Jan Hamrin describes the history of Municipal Solar Utilities (MSUs). MSUs were first developed as a means to finance and enhance the

delivery of solar systems in California. Today MSUs are not as widely used or implemented as some once expected them to be. Several municipalities have canceled programs which once had much promise. The lessons learned in the MSU experience may be instructive in the field of performance contracting.

Utility involvement in performance contracting is discussed in the next two chapters. George Reeves and Marilyn Brown describe General Public Utilities' (GPU) residential performance contracting program. GPU is a holding company for three utilities in New Jersey and Pennsylvania. Faced with a need for additional power and the high cost associated with that option, GPU has turned to acquiring energy through conservation programs. One of their most innovative approaches has been to adapt performance contracting to the needs of the residential sector in an effort known as the Residential Energy Conservation Action Program (RECAP). After describing the program's history, operation and present status, the authors discuss the lessons learned thus far. This program is special in that it adopts performance contracting to the single-family residential sector. The authors discuss the challenges this poses and conclude by focusing on the issues which must be resolved if the RECAP model is to be accepted on a wider basis.

Also from a utility perspective, Skip Schick and Leslie McMillan describe the Bonneville Power Administration's (BPA), Purchase of Energy Savings (PES) program. The PES program was designed as a way for BPA to acquire kilowatt-hours through energy-efficiency programs in the commercial sector. This chapter highlights the steps taken to develop an effective program structure. The authors go on to discuss the specific lessons learned with the initial test of PES and how they were incorporated into the second round of the program. Public and utility officials will find many of the points discussed in this chapter relevant to their own efforts in developing and designing a performance contracting program.

The final chapter in Section II looks north of the border to a Canadian energy efficiency program. Tom Brett, General Manager of Cannercon Conservation Limited, describes the origins and operation of that Crown Corporation. Cannercon was established in 1980 as part of a federal initiative to catalyze public and private sector activity in energy conservation. Besides describing the program's background and structure, Brett discusses the marketing approach that has made Cannercon a successful organization. Through a series of partnerships in the various provinces, a national network has been developed under Cannercon which meets the needs of end-users in many diverse circumstances.

Section II should provide the reader with a good sense of the practical aspects of developing and implementing performance contracting programs. The lessons learned and recounted by the authors can help smooth the way for those who follow. For those who want to learn more, an annotated bibliography of publications on performance contracting as well as the addresses of two information clearing-houses are provided at the end of the section.

Financing Energy Conservation.

A Penny Saved is a Half Penny Earned: Pennsylvania's Experience With Performance Contracting

Robert A. Shinn and Anthony J. Rametta

If Ben Franklin were managing Pennsylvania's performance contracting program for energy investments he probably would recoin "a penny saved is a penny earned" to something like "a penny saved in reduced energy costs shall be calculated by subtracting the energy consumption for each type of energy consumed after completion of the contracted work, as provided in schedule A, from the actual energy consumption recorded during the equivalent base line month, multiplied by a sliding scale factor of .2 in the first full year of savings increasing by .1 per year for each of four years thereafter."

Ben Franklin admired all things innovative; he might even have approved of "creative financing" of energy investments. But he might well ask why state and local governments need to "share" their energy savings potential with high-powered lawyers, ambitious financiers, and clever engineers.

The answer is simple: it takes money to save money, and Pennsylvania has too many competing priorities to fully invest in all the energy savings potential that is waiting to be extracted from its public buildings.

That potential is large. In fiscal year (FY) 1982/83, our state spent over $100 million for fuel and electricity in state-operated buildings. Conservation, fuel conversion, and cogeneration opportunities could easily reduce annual energy expenditure by $20—30 million. The present value of this savings stream over time is large; and we incur heavy opportunity costs by continuously

deferring the investment to some future day when the money can be appropriated. As a result, we are willing to share our savings potential with third parties.

This chapter is about the practical experience gained by the State of Pennsylvania in developing and implementing a performance contracting program for energy projects. It reviews the process, criteria, and results of ranking state facilities as potential candidates. It identifies the key features of our contractor selection process. And it describes what we would do differently today if we were just establishing a performance contracting program.

ORIGIN OF THE PROGRAM

Building energy management responsibility in Pennsylvania is diffuse. Each agency and department prepares its own energy and utility budgets, its own capital budget requests, and establishes its own budget priorities according to the governor's guidelines. Operation and maintenance procedures for boilers and energy equipment are governed by each agency, but each institution (hospital, university, etc.) is autonomous in the supervision and evaluation of its operational staff. A few large state agencies, such as Welfare and Education, maintain central support staff to provide training and advice to each institution.

Our Department of General Services is responsible for all engineering and construction work in excess of $25,000 and is obliged by state law to competitively bid most construction projects. Construction projects that exceed $500,000 may be included in the commonwealth's capital budget. Consulting engineering services, are obtained separately by each institution or from Penn State's Institutional Engineering Advisory Service. Penn State also collects energy and utility information from 67 state institutions and generates an annual report that can be used to compare relative performance.

In 1981, state agencies were directed to perform an energy audit of all buildings under their control and to submit conservation measures identified in the audits for funding through the budget process known as the program revision request. Few did. An informal investigation revealed that while many conservation funding proposals had been generated at the institutional level, most had died at the program budgeting level of the agencies in Harrisburg, the state capital. Given the choice of continuing to fund

programs and personnel versus an energy conservation investment that would generate some future savings, most program budgeters chose the former. They reasoned, logically enough, that their utility bills would be paid whatever happened and that if they were to make program sacrifices today for energy savings tomorrow, their future utility budgets would probably be cut too. To overcome this obstacle the Governor's Energy Council (GEC) and Budget Office established a special $2 million state-buildings energy conservation appropriation for FY 83/84 limited to measures with paybacks greater than one but less than two years. Last year it failed to pass; but $1 million was approved for FY 84/85.

Enter performance contracting. After hearing a presentation on this innovative approach, the GEC sponsored a series of performance contracting workshops around the state, including one for state officials in Harrisburg. The workshops stimulated action. The Secretaries of Budget and General Services agreed to appoint their personal representatives to an ad hoc, in-house, third-party financing task force chaired by the GEC and to establish a Pennsylvania pilot program by July of 1984. The task force members included two lawyers, two engineers, a capital budget specialist, a program budget analyst, and a program director.

Each of the major agencies with responsibility for building management was subsequently asked to identify sites within their jurisdiction that they would like to have considered for the pilot program. After considerable discussion, the task force concluded that the facilities of three agencies—the Departments of Welfare, Education, and Military Affairs—would be considered as their central staffs exhibited the most willingness to cooperate and enthusiasm about the project. Some agencies were not interested. One, the Department of Corrections, was heavily involved in a prison construction program they believed would take all their available time, with none left over for performance contracting.

The task force then formed a subcommittee to select a contractor to advise in the preparation of a request for proposals and to evaluate and compare responses. No member of the task force had had any direct experience with performance contracting; all agreed we needed help. Our selection committee, half of whom came from private industry, chose a group consisting of a local engineering firm, a national law firm specializing in performance contracting, and a performance contracting firm. The evaluation and scoring criteria used to select these advisers is available from the Governor's Energy Council.

SITE SELECTION CRITERIA

Site selection, perhaps the most important phase of a performance contracting program, was more complicated than we had anticipated. Many buildings and institutions were screened out because they lacked adequate fuel consumption records. Others were removed from our list of candidates because of uncertainty concerning their future use or because substantial renovations of their heating systems were already underway. Still others were eliminated because they were applicants for the federal Institutional Conservation Program conservation grants or were slated for capital budget appropriations that could cover needed energy improvements.

A decision to limit our pilot program to six institutions representing at least three agencies and a variety of energy measures forced us to narrow the field of candidates further. Our first mistake was to attempt to rank and select state facilities for our pilot program before selecting and contracting with our professional performance contracting advisors. Because of their data base and experience we asked the Penn State group to identify, evaluate, and list in order of priority, state-owned institutions as potential candidates for cogeneration, coal conversion, and a variety of energy conservation measures.

This list caused confusion as it did not coincide with the rankings later developed by the engineering advisors. The discrepancy was rooted in the criteria. Penn State generated its "figure of merit" for cogeneration feasibility principally by matching an institution's steam usage with its electrical consumption, i.e. by dividing steam use (in total pounds per year) by electric use (in total kilowatt hours). Where this ratio exceeded 27, Penn State judged it a "very good" cogeneration candidate; where less than 10, as is the case in two of our projects, a rank of "poor" was assigned. Intermediate gradations of "fair" (10—20) and "good" (20—27) were also assigned. Our other consultants were less interested in obtaining the perfect steam/electric ratio and looked for optimum opportunities for packaged cogeneration units in the 50—200 kw range that could displace a portion of an institution's high priced electricity and utilize the steam or heat generated.

Another apparent discrepancy arose in the recommendations on building energy conservation projects. To generate their recommendations, Penn State reviewed all their energy audit and report files and ranked all building energy conservation projects with estimated costs in excess of $50,000. While the possibility for

metering of energy demand was included in their ranking criteria, Penn State gave its highest priority rankings to insulation on steam and condensate pipes, valves, fittings, tunnels, and manholes and replacement of deteriorated underground steam and/or steam-condensate piping systems. Second priority was assigned to heat recovery systems, conversions to gas-fired domestic hot water to permit summer shut-down of central steam plants, and automatic temperature controls. Third, fourth, and fifth priority were assigned to installing computerized energy management systems.

Our engineering consultants, on the other hand, recommended strongly against projects that could not "stand alone" as non-integrated parts of buildings and which would thus have difficulty both with respect to tax advantages (investment tax credit and depreciation for the project) and savings measurement. They also found, from site visits, that most of the institutions listed had already budgeted or were in the process of repairing defective steam distribution systems. The engineering firm recommended, and we requested, proposals for energy management systems on four out of our six projects.

THE HUMAN INTERFACE

Perhaps the most important criteria for site selection was the attitude of the management and staff at the institutions toward the performance contracting concept and the options it might provide them. Screening sites for a pilot program with numbers and formulae is no substitute for half-day visits with vice presidents for administration and institutional maintenance supervisors. Several of those we visited had only vague notions of what we were about, as communications between them and their contacts at the state capitol were limited. In a few cases, the on-site staff lacked confidence in their Harrisburg energy coordinators and required thorough briefings to be convinced that we knew what we were doing, and that performance contracting could help them.

Where it appeared that an institution's operational or management staff had significant reservations about participating in the program, they were dropped. The task force and its consultants felt strongly that the pilot program could be easily sabotaged if it lacked support at any level and was merely imposed at the top. We paid a price by dropping institutions and reordering heavily on this criteria. For example, some of the state's best coal conversion projects may be deferred for want of performance contract

financing, since the operators were in love with their maintenance free, clean, put-your-feet-upon-the-table natural gas systems and refused to even consider conversion to "messy" coal. Such attitudes will have to be changed if states are to realize optimum economies of building operations; but they will have to be attacked by changing the techniques for performance evaluation and incentives that motivate (or fail to motivate) current boiler operators.

Our approach to these human interface problems could be characterized as, "take it or leave it, you have little to lose." Each institution was provided a copy of our performance contracting manual before our visit, which answered most of their initial questions. Most institutions were interested in the mechanics of how the contracts would be let and managed, who would have responsibility for what, and how they could minimize their risk. Most had unfavorable experiences with centrally-managed (from Harrisburg) construction projects and were delighted at the prospect of circumventing the Byzantine, multiple-contractor construction practice that they would otherwise have to face. Many viewed performance contracting as a prospective life preserver that would allow them to shift scarce capital and operating funds to other priorities.

Our most attractive feature was our willingness to hand the institutions a performance contracting project on an almost "turn key" basis. The task force and the energy council were providing for free all consulting and project selection services, ranging from the request for proposals (RFP), contractor selection, engineering review, project evaluation, legal research, and contract drafting. Each institution would ultimately be obligated to honor its contract, and each would be involved intimately in the selection process. Few expressed a willingness to go it alone. This feature, while making our pilot program selling job much easier, may become our largest challenge in the future as we attempt to move beyond the pilot stage. We would be interested to know how speedily other public institutions moved toward performance contracting programs without central support from a state after the "pilot" projects were completed.

PROCESS

In order to solicit proposals for our program, we used a competitively-bid, two-phased request for proposals. Phase I was basically a prequalifying stage. The phase I RFP asked firms to submit a proposal based primarily on their prior experience with

the types of projects we proposed for each site. The firms were not permitted to make an on-site visit. We felt that allowing an unlimited number of companies access to our facilities would prove too disruptive.

The denial of on-site visits caused much consternation at our pre-bid conference. About a third of the attendees expressed a preference for an open access, one-phase process with no prequalifying phase. We assured them that this process would reduce their up-front costs, since they would not have to perform a complete engineering and financial analysis until the field of competition was narrowed to two or three bidders. If the number of bids received was any indicator of the acceptance of our approach, then a significant percentage of firms were content with our method.

A total of twenty firms submitted phase I proposals. As specified in the RFP, those proposals contained the firms' qualifications (with a list of proposals that were similar), a general, overall description of the equipment to be installed, and the source and type of financing. We reviewed and evaluated the proposals, with 50 percent of the score based on qualifications (including direct performance contracting experience), 20 percent on the technical approach, 20 percent on the financial resources, and 10 percent project management. Narrowing down the field to two proposals proved very difficult. There were many well-qualified companies, with solid proposals that offered our facilities coal conversions, energy management systems, lighting conversions, heat recovery, and even cogeneration. A variety of financing techniques were also offered, including shared savings, municipal lease, lease purchase, and energy services agreements.

Because of the many fine proposals, three firms instead of two were selected to go into the next phase. (This later proved to be a wise decision, because some firms chose not to submit a phase II proposal.) The firms were notified of their selection, and each was sent copies of the phase II request for proposals which required the companies to visit the facility, conduct an energy audit, and submit a complete financial and technical proposal. We gave the companies a suggested scope of work that we deemed feasible, but told them explicitly that the type of project offered was up to their technical judgment.

The proposals were prepared in two volumes, a technical proposal and a financial proposal. The technical volumes contained a description of the equipment and services to be provided at the facility, a management and quality assurance plan, a proposed

schedule, and any resources required from the commonwealth to implement the project. The financial volumes contained a description of the financial arrangement, an estimate of cost savings to be achieved and the commonwealth's share of those savings, conditions for termination, insurance and performance guarantees and an estimate of the net present worth of the dollar savings based on a specified discount rate.

To facilitate the review and evaluation of the proposals, the phase II RFP specified certain assumptions. It directed the firms to use a set price for each energy type for each utility service territory. A set rate of inflation for each fuel type was also given. By using a specified set of assumptions each proposal could be evaluated on an equal basis.

After allowing seven weeks for proposal preparation, our evaluation team reviewed and scored each proposal based on 10 percent for the qualifications of the team, 35 percent for the technical performance estimate, 40 percent for the adequacy of the financial resources and the net present value of the cost savings, and 15 percent for management and quality assurance. As mentioned before we found it wise to invite three companies to submit phase II proposals. As it turned out, only two firms submitted proposals for two facilities, and one site received no proposals. Contractors were selected for the first two sites in the spring of 1985; the other site was included with some additional projects in a later RFP.

LESSONS LEARNED

While our program is far from over, and there remain many more lessons to be learned, there are some practical learning experiences we would like to share with those who are about to begin a performance contracting program:

1. Carefully consider what you want to accomplish in your initial request for proposals. To limit the number of firms that would call at each of our pilot program sites, and to ensure thorough engineering work in advance of proposals, we structured our RFP into two phases. The first, was based primarily on the firm's prior experience with measures we proposed for each site. The second step was to select for contract negotiations from those firms who submitted the best proposals.

   There is probably no "one best" method. For example, if institutions have the cash, an alternative approach would be to

buy the front-end engineering and audit work. This would allow them to bid specific detailed projects and have a wider potential selection of performance contracting firms. Others might prefer to work with specific institutions based on prior working experience. It was clear from our bidder's conference that many performance contracting firms are not used to competitive bidding.

2. Secure expert advisory services (engineering, legal, and performance contracting experience) before ranking and selecting sites for a pilot program. State and local governments with limited capital pools would be wise to segregate and fund their potential energy savings investments from the most efficient source, e.g., from operating funds, capital projects, or performance contracting variants.
3. Know with a good degree of certainty what you want the bidder to consider at each site before you bid it, and obtain good estimates of the capital costs and potential savings before you request proposals. To increase the probability of successful projects it is important to know current and projected utility and fuel rates, as well as the attitudes and practices of local utilities when cogeneration projects are being considered.
4. Make sure that the governor, agency heads, and intermediate bureaucracies generally support your program and are briefed at the appropriate junctures. Do not underestimate the size of the potential "turf" that performance contracting projects can affect or the number of obscure agency functionaries who can raise this executive order or that ancient statute to drop you in your tracks. Set goals and milestones to push the group along, but do not be surprised when things take longer than you ever thought possible.
5. Get to the lawyers early and often in the process. Make them write down their concerns about the contracting process and potential conflicts with existing state statutes. Lock them in a room with your expert performance contracting law firm until they agree on the type of contract that will work and the recommended method for allocating legal responsibility.
6. Make sure at least one government employee member of your performance contracting group visits each of the final candidate sites prior to site selection and is prepared to address the substantive concerns that may be raised. Get a personal and verbal report on their findings, especially on the attitudes and body language of the site personnel to the visit. Ignore sites

that have uncertain personnel for the pilot program even if the project itself has superior economics. If possible, interview the facility's chief administrator to secure his personal interest and approval of all project options before publishing your request for proposals.

7. Require that consultants calculate the approximate costs and benefits of each project that they recommend for bid. Reject proposals that are uneconomic on their face.
8. Consult and visit other states that have performance contracting programs. We regarded as invaluable our contacts with California, New Jersey, New York, Delaware, and Maryland—each of whom confronted different problems and approached the opportunity differently.
9. Prepare a list of questions and answers for handout at your bidders' briefing. Our bidders' conference generated questions about the following:
    - any prior audits or calculations performed on energy measures for the specific sites,
    - the reasoning behind including or excluding specific measures at individual sites in the request for proposals,
    - an explanation as to how proposals will be evaluated for shared savings when access to sites is denied (e.g. how to detect unrealistically low bids submitted in hopes of landing the contract),
    - how teamwork proposals will be compared to single-contractor bids,
    - how selections will be made where two bidders competing for one site but offering non-competing measures will be made,
    - how many weeks will be allowed between phase-I selections and final selection (we increased the period from six to seven weeks to accommodate subcontracting),
    - what limitations exist, if any, to the state signing long term contracts with cancellation penalties,
    - what regulations govern the payment of prevailing wages and/or union activity, and
    - what work rules, civil service laws, and/or union contract restrictions if any will apply to the operation and maintenance of installed equipment.
10. If considering a solid fuel conversion project, check the applicable air quality requirements before issuing your request for proposals. Require the bidders to include total emissions of

the plant and review these numbers with the local or state agency responsible for air quality.

THE NEXT STEP

As we analyze the results of our pilot program, and the projects prove successful (energy savings are actually achieved), we hope to establish a procedure for performance contracting that state agencies can follow. Our ultimate goal is to enable our institutions to continue with performance contracting without holding their hand throughout the process.

We are also considering a pilot or demonstration program as a means of assisting local governments and school districts with performance contracting. We will undertake a survey of the existing market penetration of performance contracts in this sector. If a significant number of contracts already exist, then a promotion program may be more desirable than a demonstration.

PARTING THOUGHTS

Even governments never get something for nothing. Performance contracts, shared savings, municipal leases, etc. have all arisen because of a failure in our political and budgetary systems to properly establish the present value of energy-savings investments and to provide access to capital to realize those savings. While they often identify unknown savings potentials or provide and operate advanced efficiency technologies, performance contracting firms remain a viable and important option by doing what public- and private-sector entities should be doing and by doing it quicker than bureaucracies and politics will permit.

Performance contracting may only be an intermediate solution to energy management problems in public facilities management. Typical contracts cover two to five years; most equipment becomes the property of the public entity once the performance contracting firm has milked the tax advantages. While the public entity is arguably better off than it would have been without the performance contracting firm, the public has given away taxable revenues, shared savings, and significant opportunities it could and should have realized for taxpayers on its own. Plus, it takes resources for the public sector to do these projects. Moreover,

performance contracting often fails to address the fundamental problem of facilities management behavior and incentives—in short, the civil servant or union protected boiler operator who could care less how much he saves for his institution or who pays a large price in inefficiency for reliability (the two boilers in the spring in case the laundry needs steam syndrome). And it does not solve the technical interface between the institutional maintenance supervisor and the head of the institution, who has no way of evaluating performance even if he did care.

We view performance contracting as a bridge to what we could call "the energy service era"; a time when heat, steam, work, and light service is provided to public facilities by a host of private competitors driven and motivated by their ability to increase energy productivity and efficiency. This concept, known as "chauffage" in France, is the principle means by which public and private buildings, in fact whole towns, are provided with heat in France, Germany, and other parts of Europe. There are no good reasons it should not be transplanted to the United States. It will probably be our next experiment.

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Financing Energy Conservation.

Performance Contracting in New York City-Owned Multi-Family Buildings

Mary A. Brennan

INTRODUCTION

Rising energy prices affect municipalities in two ways: by the export of dollars to pay for energy produced outside of the local economy and through increased operating costs for services, such as vehicle fuel, street lighting and building management. This chapter discusses performance contracting as an innovative source of capital for energy-efficiency improvements in government-owned buildings by presenting a case study of an energy services contract for a group of New York City-owned apartment buildings. The New York City contract is the first privately funded energy services contract for residential buildings owned by a municipality.

Many of the factors which make shared savings or performance contracting difficult to implement for government entities are equally applicable to residential properties. Since the New York City contract implements energy services in small, scattered-site apartment buildings owned by the city, many of the points covered below will also apply to privately owned multi-family buildings.

BACKGROUND

The world knows that New York City possesses many unique characteristics, including special problems. One of these problems is its ownership and management of occupied apartment buildings abandoned by their private owners and foreclosed for non-payment

of taxes. As of 1984, the city owned approximately 4000 occupied buildings with 45,000 apartments.

In January 1977, the New York City Council enacted legislation which represented a bold experiment in the effort to stem housing abandonment—which plagues many older urban areas—as well as to increase property tax revenues. The "fast foreclosure" law (local law 45 of 1977) reduced from three to one the number of years that a property must be in tax arrears before the city is entitled to foreclose and take title to the property. This procedure is referred to as being "taken in-rem"; hence the term "in-rem housing". It was the intent of this statutory change that the threat of quick and aggressive action by the City would induce recalcitrant owners to pay tax arrears before they became excessive. It was also the intent of the new policy that abandoned property would be brought into City ownership earlier in the abandonment cycle, in (relatively) better condition and before the most severe deterioration set in.

Whatever the ultimate effect of these theoretical good intentions, it was inevitable, and expected, that the initial foreclosures (called "vestings") under the new law would make New York City responsible for a large number of very deteriorated properties. These expectations have been well fulfilled. Between 1978 and 1982, 16,500 buildings were vested, comprising 112,000 apartments.

As would be expected, these properties are disproportionately old. Although New York City has a relatively aged housing inventory (62 percent of the multiple dwelling units were built before 1946), city-owned housing is even older. Currently, 23 percent are "old law tenements," built before 1901, and 58 percent are "new law tenements," built between 1901 and 1929.

By and large, these properties constitute the worst housing in New York. Constructed, on average, 60 to 80 years ago, the building conditions reflect both their age and significant deterioration due to neglect. The relationship between high energy costs and abandonment is recognized, if not quantified. These buildings, as is true for most of the housing in New York, suffer from two sources of energy inefficiencies. Built at a time when the cost of fuel did not require maximum efficiency, time has taken its toll on the heating system and building envelope to further erode the optimal operation of the energy system.

At the time of foreclosure, these buildings reflect the often lengthy period of neglect and deferred maintenance by the prior

owners. Characteristically, a foreclosed building suffers from severe deterioration of its structural and mechanical systems, including loose and leaky single-pane wooden windows; masonry cracks; old, poorly maintained and inefficient heating systems; pervasive steam and hot water leaks; and poor system balancing. It should not be surprising, therefore, that the annual fuel bill for these properties is about $23 million.

New York City's budget for capital improvements barely stretches to cover expenditures to protect the health and safety of building occupants. These necessary improvements sometimes result in lower energy bills, but limited opportunity exists for planned or comprehensive building-wide efficiency modifications.

Accordingly, the city chose to explore the potential for private investment in these properties to finance energy-efficiency modifications. Various alternatives were investigated, including straight leasing and tax-exempt leasing, which is structured as a lease purchase by a municipality. As the assistant commissioner of the Office of Energy Conservation at that time, it was my responsibility to explore and identify the most promising alternatives, and oversee the implementation process, including contract negotiations.

As noted above, traditional sources of financing for municipalities, such as the capital budget and operating revenues, were available but inadequate to cover the total need for improvements. Moreover, it was not clear that the capital budget could legally be used to rehabilitate buildings which were intended for ultimate disposition. While New York has made some forays into the municipal bond market, its bond capacity was (and remains) limited as a result of the 1975 fiscal crisis, and more pressing infrastructure needs eclipsed any bond offerings for the foreseeable future.

Utilization of both tax-exempt leasing and a so-called "true lease" were rejected because of the nature of the buildings and the equipment that would probably be required. It is still questionable whether a new burner, for example, can be depreciated separately from the building which it services. Business energy tax credits, which were available at the time of our analysis, were not applicable to multi-family buildings. In addition, none of the likely efficiency improvements—boiler/burner retrofits, heating controls, separate hot water heaters, pipe insulation, new windows, etc.—would be eligible for investment tax credits. Finally, the total

investment, even considering the extent of the city's housing inventory, would be so small as to make syndication costs excessive, if not prohibitive.

Therefore, it was concluded that energy services, or shared savings performance contracting, presented the only feasible option for private investment in energy improvements to city-owned buildings.

In the spring of 1983, the New York City Department of Housing Preservation and Development (HPD) issued a request for proposals (RFP) to install energy improvements in a group of 30 to 60 in-rem buildings on a shared savings basis.

Only five contractors showed up at the pre-bid conference, although the RFP had been advertised and had been sent to all energy service companies known to operate in the New York area. Three of the contractors had no experience with performance contracting, and only two of the five submitted proposals (one was from a company with no previous experience in this field). Presumably, the reluctance to bid rested both on the characteristics of the properties (severely deteriorated buildings, containing 20-25 multi-family apartments, scattered through three boroughs) and the lack of experience with performance contracting on municipally-owned buildings.

Since only one of the two bidders submitted a complete proposal, the selection process was simple.

The energy services company selected was a New York City-based engineering firm which has specialized in energy audits and in supervising the installation of efficiency improvements. Prior to negotiating with us, they had implemented an energy services contract at a South Bronx housing project owned by the National Center for Housing Partnerships.

During the negotiations with the firm, the city and the contractor attempted to negotiate a basic agreement to cover buildings that would be retrofited under this program. Because characteristics and energy performance history of specific buildings were unknown, negotiations were difficult to conduct. Both the contractor and the city, however, felt that a 40 percent energy savings target in selected facilities was reasonable.

Based on this assumption, the city and the contractor negotiated the following terms:

SUMMARY OF CONTRACT STATUS	
TERM:	7 years
BUILDINGS:	30 to 60, mutual selection
SAVINGS SPLIT:	years 1 to 4, 80 percent to contractor years 5 to 7, 60 percent to contractor
EQUIPMENT:	burners, computerized controls, system balancing
COST:	$1 million
PROJECTED SAVINGS:	40 percent

Actual building selection did not take place until after the contract was executed. Because the basic financing arrangements had already been specified, the effect was to force selection of buildings which could meet this target rather than specifying contract terms appropriate to each facility.

As of March 1985, it appears that the program will be limited to 27 buildings, 3 short of the minimum specified in the beginning. There are several reasons for this shortfall, but the difficulty lies primarily with the type of buildings which comprise the selection pool.

In order to guarantee an economic return, the performance contractor was looking for larger buildings (over 30 units) with wasteful consumption for heat and hot water (over 1000 gallons of heating oil per apartment annually). Only 12 percent of the city-owned buildings meet the size criteria, and even fewer meet the consumption test. Both the energy services company and city officials concurred that non energy-efficiency factors—such as the type of neighborhood, tenant stability, and the characteristics of the building staff—were important, though non-quantifiable factors in eliminating certain properties. The absence of accurate fuel records was also a problem.

Equipment installation is virtually complete in all of the buildings. The major modification is an energy management system linked to apartment sensors, with a telephone tie-in to the contractor's offices. Also included were low-flow showerheads, thermostatic radiator valves, pipe and boiler insulation, window and door "weatherization," burner upgrading and domestic hot

water control valves. Although the equipment is in place, the energy management systems are still being fine-tuned. Billing is expected to begin in March 1985, and the first invoice will reflect winter savings.

The audits submitted by the contractor project savings ranging from 30 percent to 46 percent. Average heating oil consumption should be reduced from 1,119 gallons to 667 gallons per apartment. If the audit projections are achieved, the City's share of the savings will be over $100,000, and the contractor will "pay back" its capital investment in less than 2 years.

MAJOR CONTRACT ISSUES

Every sentence of every paragraph in the contract was discussed and dissected at length, with long and fanciful discussions about what would happen under every conceivable set of bizarre circumstances. It is, of course, unlikely that every eventuality was anticipated, but most of them were. Some of the more interesting issues are discussed below.

Because the contractor had done business with the agency previously, the negotiations were relatively cordial. Often, when a particular provision was objectionable to either party, an understanding of the reason for the objection was sufficient to yield a mutually acceptable solution. (This technique, though it may appear self-evident, is rarely practiced.)

One unusual factor was the involvement of the investor. As in most shared savings arrangements, the investor owns the equipment even though the contract is with the energy services company. In this instance, he was an active participant in the contract negotiations. Although his presence itself did not pose a problem, it is now clear that many of the contract issues related to the limitations imposed by the financing entity, and were not directly tied to the shared savings contract. For example, the investor would receive all savings from the transaction for the first four years. Consequently, there was concern over timeliness of payments leading to the establishment of an escrow account.

It may be surprising that the split of the projected energy savings was not the most important, nor the most controversial negotiating point. Rather, administrative issues, and the methodology for determining the size of the pool to be shared, were far more important.

Multi-Year Contract

This was less of a problem than had been anticipated. There is no legal prohibition in New York City against contracts longer than 12 months, although a seven-year agreement is admittedly unusual. Multi-year contracts require approval by the Board of Estimate (the New York City budget and contract body).

The contract defines as a default failure by the city to appropriate funds to pay its obligation under the agreement. (This is unlikely to occur since the city would have to pay more for fuel for these buildings if the energy services contract had not been implemented.) In the case of a default, the city is required to pay to the contractor the "termination value" of the equipment. This is defined in the contract as the estimated savings owed to the contractor for the remaining term of the contract—a potentially hefty sum. It has not been necessary to include the termination value as a contingency item in the annual budget.

Since the termination value is certain to be substantially larger than the fair market value of the equipment at almost every year of the contract, the right to assess a termination value was a sore point in our negotiations. The original proposal made the city liable to pay the termination value virtually at the option of the service company. In the end, the termination value will be paid only if one of two carefully defined defaults occur: failure to appropriate funds or failure to pay contractor invoices.

Maintenance

The service company, of course, is responsible over the life of the contract for maintaining the equipment which it installs. This obligation extends to repairs required by vandalism, unless the damage is caused by the negligence or willful misconduct of HPD or its employees. The city is required to exercise the same "standard of care" for the contractor's equipment as it applies to the buildings and its own equipment.

For a separate fee, the service company agreed to take over the maintenance and repair of the "pre-existing energy production equipment," using the same fee schedule as for other city vendors. This was a happy instance of mutual benefit: the city has the assurance that there will be accountability for maintenance of a heating system which could potentially have been serviced by two distinct entities; and the service company can be certain that

the entire "energy production system" will be maintained at its optimal efficiency level.

Baseline

Setting the baseline is the single most important issue facing both the contractor and the user in a performance contracting agreement. The baseline—amount of fuel the property would have consumed, as adjusted for weather and changes in use, if the efficiency improvements had not been made—determines the "universe" of savings that is split. Obviously, if the baseline is artificially high, the user will be paying for phantom savings; if it is artificially low, the contractor will not receive a fair return.

Accurate data about historical consumption is critical to establishing a fair baseline. This statement may seem obvious, but few building operators maintain reliable consumption data. (In the case of oil-consumers, the data is based on deliveries, and not consumption. This makes monthly patterns difficult to discern.) New York City is no exception, especially considering the size of its inventory, the multiplicity of fuel vendors (eight or more), potentially long periods of non-operation, and a chronic problem with so-called "short deliveries." ("Short delivery" is a euphemism for theft by a supplier: i.e., the practice of delivering substantially less oil than the amount specified on the invoice.) Accordingly, buildings were selected in part on the basis of the reliability of fuel data (and the data collection system has been upgraded in anticipation of future projects). The baseline for each building is determined by the service company via a multiple-regression analysis using historical consumption (or delivery) data.

Happily, baseline disputes have not been an issue in the implementation of the contract—except in that the lack of reliable data needed to identify a justifiable baseline severely limited the number of buildings suitable for inclusion in the contract. Both the city and the energy services company report that any disagreements over the baseline have been resolved by mutual agreement and without antagonism. (Two of the "selected" buildings were eliminated when baseline adjustments dropped consumption levels below the threshold.)

Approval Delays

The contractor and investor were concerned—probably not without justification—about the potential for long bureaucratic

delays in the approval of audits, building selection and the payment of invoices. On the other hand, the city was not willing to abdicate its right of approval (of a baseline, for example) by agreeing that the mere failure to respond within a certain time was equal to acquiescence by default.

Therefore, each contract section which required a city response also provided for a second notice (by certified mail, return receipt requested) if a reaction was not forthcoming within the specified time. Approval by default then occurred within five days of the second notice.

It should be noted that HPD failure to respond in a timely fashion has not been a problem to date.

Building Condition

The nature of these properties and their ownership posed unusual problems. Nonetheless, the manner in which these issues were dealt with may be instructive. As noted, foreclosed properties are generally located in the city's worst neighborhoods, and vandalism of the installed equipment is of concern to both parties. Neither party was willing to accept responsibility for vandalism losses. As a compromise, if damage not covered by insurance (and not caused by the negligence of either party) occurs, the energy services company has the option to remove the equipment and install it in another building. The city is required to exercise a reasonable standard of care for the property of the energy services company, equal to the standard applied to its own equipment.

A related but thornier issue concerned the potential deterioration of other building systems (such as the windows, or a boiler not replaced or upgraded by the contractor) to the extent that the energy savings were eroded, through no fault of the energy services company. Given the nature of city-owned housing, this is not an unlikely scenario.

To resolve this issue, the contract provides that the baseline can be adjusted, by mutual agreement, if the service company has notified the owner of the need for a capital improvement which the city declines to undertake.

Payments

The city enjoys a favorable price on oil due to its volume purchasing, as much as $.15 per gallon under the generally available

market price. Therefore, HPD retained the obligation to buy fuel, and the contractor agreed to bill the city for savings generated by the building improvements. The contractor was concerned, however, that the city could be late in paying these bills. To protect the contractor against late invoice payment by the city, an advance account has been established, with a payment by the city of $4000, (approximate audit value) for each building accepted into the program. The contractor is authorized to withdraw from the advance account only when an undisputed bill to the city remains unpaid for more than thirty days.

Other Issues

The following points deserve brief mention:

- The contract was subject to termination, without obligation to either party, if the energy services company was unable to obtain financing within ninety days. This did not occur.
- The contractor guaranteed (subject to termination without penalty by the city) at least 25 percent of the projected savings. (The projection for all target buildings was 40 percent, so the effective guarantee of savings equals 10 percent).
- Any disputes which cannot be resolved will be submitted to arbitration.
- The city has an option to purchase the equipment at the end of the contract for its "fair market value." Should the city choose not to purchase the equipment, the contractor would remove the equipment and the city would assume responsibility for the installation of new equipment.
- Any sale of the buildings (which, if it does occur, would be to tenants as a cooperative) is subject to approval by the service company.
- In this transaction, the selection of buildings was limited by the need for a minimum consumption level to ensure that the improvement would have a swift payback. This is a reasonable selection criterion, but some city officials believe the contractor adhered to it too rigidly. An alternative mechanism would require that the average consumption not fall below a certain level, so that more buildings would be included in the program.

INSTITUTIONAL BARRIERS

Implementing the first municipal shared savings contract presented some very special legal, financial and administrative issues, most of which are discussed above. The fact that the subject properties are residential, small and geographically dispersed added further complications. The most serious problems, however, were presented largely by bureaucratic intransigence. Overcoming those barriers required creativity, diplomacy, and persistence to the point of stubbornness. Some examples are noted below.

Pride

On the face of it, performance contracting presents an opportunity to improve buildings and reduce operating costs without capital investment. To those who are responsible for managing the subject properties, however, it can also be interpreted as an indictment of their capabilities. A fear of loss of control (or stature) will occur in any situation where the decision to implement shared savings (or to pursue any other innovative strategy) is made by persons other than those who will be responsible for implementing the strategy.

The only way to overcome this problem is to involve key decision makers in the process leading up to the decision. This was impossible to accomplish in a bureaucracy the size of New York City's. (HPD alone employs over 4000 people.) The contract went forward, despite staff opposition, at the insistence of the commissioner. This demonstrates another principle: the importance of having the support of the agency head or key decision maker.

Greed

Those who weren't trying to stop the project because they feared being embarrassed by the results were trying to stop the project because they wanted to do it themselves.

Having been convinced of the feasibility of large-scale savings, some staff wanted the city to install the improvements itself, even at the expense of delaying the work until (limited) funds became available. Since it is unlikely that city employees can achieve the same degree of savings, resolving this problem was especially difficult. This is where diplomacy and the support of the commissioner were especially valuable.

Envy

Implementing an innovative idea is always done at the risk of incurring the enmity of those who wish they had thought of it. In this case, the city Office of Management and Budget, which had to approve the contract despite the fact that it did not require an expenditure of funds, refused to do so, ostensibly because they were unhappy with data they had received on another conservation project. (If you fail to see the connection here, that is because there isn't one.) They succeeded in delaying project approval by the Board of Estimate and in obtaining the revised information they wanted.

Sloth

Most city lawyers are used to putting square pegs into square openings—or at least to putting the same language into every contract. The HPD general counsel is an exception: without her creativity and assistance, the contract would never have been written.

Corporation counsel, who must sign off on every contract as to form, were not so helpful. Corporation counsel withheld approval because they didn't like it. Period. End of discussion (at least with me). What can be done to satisfy your objections, I innocently asked? Do not do the contract, I was told. Again, this problem was solved only at the highest levels.

LESSONS

The difficult part doesn't stop with signing the contract; in fact, it may be just beginning. Even if building selection is not at issue, the audit report must be reviewed and approved, the baseline established, the ESCo equipment agreed upon and its installation coordinated and completed. Only then do the savings materialize. Regardless of how carefully the contract is negotiated and the contingencies anticipated, problems—or the least-expected turn of event—will occur. Successful implementation requires the supervision of a decision maker familiar with the principles of performance-based financing as well as the specific contract terms.

The institutional barriers—in any institution, private, public, or non-profit—remain, in my opinion, the most intransigent. On the other hand, as performance contracting becomes less unusual, they

also become less intimidating. You should be prepared to learn from the lessons of others, but do not hesitate to alter procedures or requirements to suit your needs.

Finally, performance contracting presents a unique opportunity for a segment of the building inventory, where efficiency improvements are beyond the financial and/or managerial capabilities of the owners. However, when owners can afford to finance energy improvements themselves, they should consider doing so rather than entering into a performance contract.

Footnote:

By the end of 1985, the City of New York had terminated its shared-savings contract with the energy services firm, technically for failure to complete the installation of the energy conservation measures (ECMs) required by the audits (most of the items were installed, but several buildings remain incomplete), and for failure to achieve the minimum savings (i.e., 25 percent of the amount projected by the audits; in this case, 10 percent of baseline consumption).

In fact, the contractor's financial problems made it impossible to fulfill its obligations, and the company has gone bankrupt. From discussions with the principals, it is now clear that Benec was overextended and undercapitalized long before the shared-savings contract with the city was even contemplated. The company's economic instability turned an admittedly difficult task into an impossible one.

This result is certainly disheartening, but it points up the critical importance of contract terms to both parties. The city's contract gave the service company the ability to "opt out" if satisfactory financing was not obtained within a specified time period. (With hindsight, it is clear that Benec should have exercised this option.) Although the contract has been terminated, the city has suffered virtually no harm (except for the administrative costs incurred in negotiating and implementing the contract). The equipment installed to date will remain in the buildings, unless the investor decides to remove it—an unlikely scenario, since the salvage value would be less than the removal costs). However, should the investor decide to remove the ECMs, he is obligated to restore the property to its original condition. Any pre-existing item, such as a burner, which was replaced for efficiency reasons, would have to be returned.

Nonetheless, given this result, it is unlikely that the City of New York will embark on a shared-savings program for its in-rem properties in the foreseeable future.

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Financing Energy Conservation.

New York State's Experience with Energy Performance Contracting: a Case Study

David R. Wolcott

INTRODUCTION

The New York State Energy Research and Development Authority (NYSERDA) conducted a demonstration program in energy performance contracting from 1982 through 1984. This chapter briefly describes the program and then focuses on lessons learned in the demonstration project at the Hutchings Psychiatric Center, which is operated by a state agency. The chapter concludes with some observations that will guide New York State's future activities in energy performance contracting.

NYSERDA'S DEMONSTRATION PROGRAM

The rationale for a demonstration program was derived from three hypotheses put forth by NYSERDA. First, clear benefits could be gained by public sector institutions entering into performance contracts. These transactions appeared attractive as a means of obtaining off-budget financing, shifting risk to the contractor, providing appropriate incentives for equipment performance, and obtaining project management expertise. The second hypothesis was that these contracts constituted very complex transactions. It would take a sophisticated, knowledgeable client to successfully negotiate all the technical, financial, and legal aspects. The third hypothesis was that the performance contracting industry was

initially concentrating on large, premium commercial and industrial properties, with little market development occurring in the public sector. Therefore, if we wanted to learn anything about performance contracting or encourage its use by public agencies in New York, we would have to catalyze the process ourselves.

To test these hypotheses, a demonstration program was initiated in November 1982. The purpose of the program was to gain a deep understanding of the inner workings of performance contracts at sites involving public sector institutions such as state and local governments, non-profit organizations receiving state reimbursements (e.g., hospitals and nursing homes), and publicly-assisted, multi-family housing projects. First, qualified sites and contractors were identified. Deals were then brokered as relevant parties to a transaction were brought together. NYSERDA facilitated contract negotiations by providing clients with background information as well as engineering, financial analysis, and legal services. NYSERDA then documented the negotiation process at each of five demonstration sites by participating in all meetings between the clients and contractors and receiving copies of all correspondence. Lessons learned from the demonstration program were presented at two conferences held in May 1984 in Albany and New York City. The program also resulted in the production of two publications (1).

The varied lessons learned from each of the demonstration sites reflect the statutory and regulatory environment within which each institution operates. There is not space here to discuss the details of each case. Rather, the remainder of this chapter focuses on developments at the Hutchings Psychiatric Center, where a number of valuable insights have been gained through an extensive and complex contract acquisition process. Since the performance contract at Hutchings is the first of its kind to be developed by a state agency in New York, the lessons learned have practical application and set a precedent for many New York State properties, a sector comprised of 6,740 buildings covering 178 million square feet with a current annual energy bill of $320 million.

THE HUTCHINGS PSYCHIATRIC CENTER

The New York State Office of Mental Health (OMH) is one of five state agencies that manage most of the state's property. OMH operates a system of 33 psychiatric hospitals throughout the state covering 38 million square feet with a current annual energy bill of

$50 million. Many OMH facilities were considered for participation in the program. For purposes of a demonstration undertaken in a controlled setting, the "ideal" facility was one that had a complete and verifiable utility bill history for at least the previous three years. The absence of major energy conservation work over that period of time was also important for establishing a clear baseline of the facility's energy consumption. Naturally, the facility's administrators had to be willing to participate in the demonstration program.

The Hutchings Psychiatric Center was one of OMH's facilities that fit the bill. NYSERDA conducted a preliminary energy audit of the facility and analyzed its utility bills. The audit revealed a complex composed of 13 buildings covering 462,000 square feet with a current annual energy bill of $840,000. The buildings are 13 years old, each with their own boiler, single-glazed windows, air conditioning units in each room, master-metered electricity, and a non-functioning energy management system (EMS). The NYSERDA audit identified a number of energy conservation opportunities including: a new EMS, relamping, a summer boiler for domestic hot water, energy-efficient air conditioning units, submetering, and possibly a cogeneration facility with district heating, absorption air conditioning, and on-site electricity production. In May 1983, Hutchings agreed to join NYSERDA's program as a demonstration site.

NYSERDA solicited energy services companies to participate in the demonstration program and evaluated their qualifications. Over thirty-five companies were asked to provide information on at least one completed project, covering the type of equipment installed, the nature of the firm's financial services, how the firm conducted marketing activities and established client eligibility, and the type of decision process the clients used. This inquiry was followed up with telephone interviews and client references. The twenty companies which responded formed the pool from which program participants were drawn. NYSERDA selected energy services companies that had the technical expertise, offered the type of financing, and utilized a contract that appeared to complement the technical and institutional requirements of each demonstration site.

NYSERDA selected a performance contracting firm from New York City for the Hutchings Psychiatric Center project. Representatives of the two organizations were introduced and relevant information was exchanged. The firm received NYSERDA's preliminary audit and utility bill analysis for Hutchings and then

conducted its own walk-through audit. Hutchings received NYSERDA's case study and sample contract terms and conditions from the performance contractor. In July 1983, the firm agreed to join the demonstration program at the Hutchings site.

Negotiations with the Energy Services Company

Many types of bureaucratic review and approval are required in New York State for an institution like Hutchings to undertake any procurement action. Basic technical and administrative issues are addressed at the institution itself. Policy and budgetary issues are then reviewed at the parent agency (Office of Mental Health) in consultation with the division of the budget of the Governor's office. Finally, the state attorney general's office and the state comptroller's office determine if the contract conforms with provisions of the state finance law and other relevant statutes and regulations.

With Hutchings and the Office of Mental Health on board as participants in NYSERDA's demonstration program, their role in the review process was assured. One of the next steps was to discuss performance contracting with the comptroller's staff to identify any issues and constraints that would have to be resolved in order to obtain its approval. A meeting for that purpose was held in September 1983.

The discussion focused on whether performance contracts are subject to the competitive bidding requirements of the state finance law and other statutes. The question turned on the treatment of performance contracts as "lease/purchase" agreements or "professional services" agreements. A lease/purchase agreement is an equipment transaction in which the customer makes periodic lease payments throughout the contract's term, and then purchases the equipment at the end of the contract with the payment of a predetermined amount. A professional services agreement is a service transaction through which the expertise of professionals (e.g., architects and engineers) is obtained.

The comptroller's representatives agreed that a performance contract structured as a lease/purchase agreement would be subject to the laws requiring competitive bidding, while a professional services agreement would not. Furthermore, a professional services agreement could involve the incidental purchase of a capital asset at residual fair market value.

Regardless, the comptroller's staff expressed a preference for making the exercise of a purchase option in a professional services

agreement subject to applicable competitive bidding laws if practical at the time. This would result in a situation of putting five- to ten-year-old installed equipment out for bids at the end of a performance contract. All the parties agreed that this would not be practical. Nonetheless, this determination would meet the terms of the state finance law pending some future opinion on the subject by the comptroller.

The energy services firm had difficulty with this understanding. Its concern centered around the following scenario. Consider a technical installation that is very successful at saving energy. The state decides to acquire the equipment before the end of the contract term so as to capture a greater share of the benefits. The state could do this by not appropriating funds to make the contract payments, thus terminating the contract under the provisions of the standard executory clause for non-appropriations. The state could then solicit competitive bids to retain or replace the equipment.

The performance contractor asserted that it would be at a disadvantage in such a situation because its bid would have to cover not only the unrecovered cost of the equipment, but also all the other costs that had gone into providing a full-service performance contract. Additionally, an experienced competitor would know that some equipment could not be removed from a facility and so would offer a bid for less than full replacement value. To avoid this potential problem, the performance contractor proposed the inclusion of a "termination value" for the contract which would have to be paid by the state, and which would include a substantial valuation for the future stream of revenues foregone by the service company.

NYSERDA had problems with that proposal. It would play havoc with an agency's appropriations each year to include an amount not only for the contractual payments but also for the large contingent termination value. Some alternatives were considered, such as treating the termination value as liquidated damages, or self-insuring against the termination value with the premium paid from a sinking fund that would decrease with time along with the net present value of the state's liability.

The issue was never resolved, because the performance contracting firm withdrew from the program in February 1984, citing a recent change in corporate policy regarding the size and geographic location of facilities that it would work with. This policy precluded its further involvement with the project at Hutchings. While NYSERDA respected the firm's right to make such a

decision, this action provided the first major lesson of the demonstration program. *Lesson learned:* It is a myth that performance contracts involve no up-front costs to the client.

While energy services companies certainly do pay for equipment and services once a project is underway, clients should expect to incur some costs before a contract is signed. It takes time and money to compile technical data, analyze the financial terms of a company's standard offer, and conduct legal analyses to determine if the transaction is possible. Clients nervous about a service company's intentions or commitment to a project should consider requiring the posting of a bid bond. This would be analogous to the contingency fee that energy services companies usually require to conduct a detailed engineering analysis, to protect themselves in case a client decides at the last minute not to proceed with a contract.

Negotiations with a Second Energy Services Company

The demonstration program had to go on, so NYSERDA selected another qualified company for the Hutchings site. NYSERDA introduced the organizations to each other, and they exchanged relevant background information. The firm conducted its own walk-through audit of Hutchings, and, in March 1984, agreed to join the demonstration program. The following discussion focuses on the technical, contractual, and financial issues that arose during contract negotiations, how the issues were resolved, and the lessons that were learned in the process.

TECHNICAL ISSUES

After conducting its preliminary audit, the performance contractor suggested a number of potential energy conservation opportunities including an energy management system, relamping, heat recovery from boilers and compressors, and replacement of a boiler with a waste-to-energy system. On the basis of a detailed engineering analysis, the waste-to-energy system proved technically infeasible. It also turned out that Hutchings would do some of its own relamping under a state program. Finally, the performance contractor figured out that the EMS would be so efficient that heat recovery would no longer prove economically viable. Thus, a large, technically robust program had been reduced to an EMS installation. *Lesson learned:* Do not allow unrealistic expectations to be established from preliminary audit results.

The energy services company established its contingency fee for the detailed engineering analysis at $750 plus 4.25¢ per square foot, totalling roughly $22,000. Neither Hutchings nor the Office of Mental Health wanted to be liable for the fee because this was a demonstration project, so NYSERDA agreed to cover it. Only $11,000, however, was available for such a purpose. After some negotiation, the performance contractor agreed to do the job for that amount. However, when the audit report was completed, Hutchings, OMH and NYSERDA all agreed that it was incomplete. The energy services firm protested that for $11,000 it had conducted just enough analysis to satisfy itself that a good technical opportunity existed. In the end, payment of the contingent fee was not required. *Lesson learned:* Performance contractors are not necessarily energy audit firms. Do not expect the breadth and quality of a technical assistance report that schools and hospitals have grown accustomed to under the federal Institutional Conservation Program.

In order to establish a baseline of energy consumption at Hutchings, the energy service firm required extensive documentation of the facility's electricity, gas, and oil usage over a three year period. This information was presented in NYSERDA's preliminary audit report, which was based on computer printouts of utility bills that the OMH had provided. These data, however, did not account for subsequent changes in hours of operation of certain equipment, nor was it possible to establish monthly oil consumption rates because bulk deliveries occurred on an irregular schedule. As new data became available, the performance contractor had to continually revise the baseline and energy savings estimates for the project. *Lesson learned:* Gathering all the energy consumption data that a performance contractor requires can be a difficult, expensive and time-consuming task, especially for a large facility.

CONTRACTUAL ISSUES

Early in the negotiation process, the Office of Mental Health lawyers requested a sample contract from the energy services company to review the terms and conditions. The firm complied, but its sample contract contained a number of blank spaces and missing attachments regarding such matters as how the baseline would be established and what the financial terms of the transaction would be. The OMH lawyers said they could not review the

contract until the blanks were filled in. The performance contractor said it could not fill in the blanks until the detailed engineering analysis had been completed. OMH said it could not authorize the engineering analysis until the contract was approved. Thus, a frustrating catch-22 situation had developed that could only be resolved by someone (in this case, NYSERDA) incurring the contingent expense for the engineering study. *Lesson learned:* Sometimes the client in a negotiated performance contract must make a little leap of faith in the beginning in order to get the ball rolling. Competitive procurements may offer clients greater control in handling up-front risks.

The New York State comptroller's position regarding competitive bidding was explained to the performance contractor, which, unlike the first firm in the project, had no problem with the situation. *Lesson learned:* Not all performance contractors are created equal in terms of their willingness or ability to negotiate certain terms and conditions.

In presenting the results of the detailed engineering analysis in July 1984, the energy services company required that Hutchings decide within 90 days whether to proceed with the project, or else the contingent fee would be due. Hutchings signed a letter of intent 86 days later, in October 1984. *Lesson learned:* A task fills the time available. Performance contractors and the public entities hiring them are generally justified in requiring reasonable time limits for action.

FINANCIAL ISSUES

Part of NYSERDA's support to each demonstration site included an independent financial analysis of the performance contractor's proposal. A key issue of the analysis was to determine the reasonableness of the rate of return from the contractor's investment in the project. This task required knowing such facts as the debt/equity ratio, cost of capital, and investors' required internal rate of return. NYSERDA asked the energy services firm for this information. It provided the printout of a spread-sheet program that it used to evaluate the deal. This printout provided some, but not all, of the required data. By digging a little (through the company's annual report and their financial filing with the federal Securities Exchange Commission), NYSERDA's financial consultant was eventually able to piece together the entire picture. *Lesson learned:* Public sector clients have a need (and a right) to know

the underlying financial arrangements of a performance contracting transaction.

Another issue of the independent financial analysis was to determine if performance contractors were charging an excessive penalty for a client's early exercise of a buyout option. If a project is very successful (i.e., when energy savings exceed the contractor's projections), the client might want to exercise a buyout option in order to more fully participate in the proceeds of success. In such a case, the buyout price is not excessive if the value the customer realizes in exercising the option is greater than or equal to the value realized if actual savings equal those projected by the contractor, *and* if the customer remains in the contract until it expires. The firm's buyout formula, expressed in the contract, met the test. *Lesson learned:* Clients should be able to buyout the equipment of a performance contract at any time without paying an excessive penalty.

The last issue that was tested in the financial analysis was the extent to which the energy services company expected to take federal and state tax benefits on the transaction with Hutchings. This matter was relevant because of changes prescribed in the 1984 federal tax law affecting the availability of tax benefits for energy conservation projects in tax-exempt institutions. Also, a recent Internal Revenue Service ruling had called into question the treatment of energy management systems as tangible personal property eligible for five year accelerated depreciation. It was important for the Office of Mental Health to know the performance contractor's intentions in order to make judgments about the firm's long-term viability as well as its cashflow position in the deal with Hutchings, should its claims be denied by the Internal Revenue Service. NYSERDA requested a disclosure regarding the firm's tax intentions, which it supplied. *Lesson learned:* Public sector clients should get specific information from performance contractors regarding their expected tax benefits.

CONCLUSION

An agreement regarding the technical terms of the contract was finally reached between the energy services firm and the Hutchings Psychiatric Center in January 1985. This milestone was achieved ten months after the company first saw the site and twenty months after Hutchings joined the demonstration program. That is not the end of it, however. The agreement is still being reviewed for approval by the Office of Mental Health and the state comptroller.

From February through October 1985, OMH's counsel further negotiated terms and conditions with the performance contractor. And for the last two months, OMH's capital operations unit has been conducting technical analyses to verify the firm's baseline procedures. It is very likely, then, that the project will take three years to get underway, if ever.

All parties involved recognize that this is an excessive period for a project which will have a total installed capital cost of only $240,000. There were a number of obvious reasons for the delay, such as the time it took to establish precedents, the requirements of the demonstration program, and the withdrawal of the first performance contracting firm. Clearly, however, mechanisms must be established to expedite the procurement of performance contracts by New York State agencies.

Some states have found that legislation is one way to stimulate the use of performance contracts. Over the course of the demonstration program, NYSERDA examined the legal environment for state procurement activities and found no statutes that explicitly prohibit the use of performance contracts. Nonetheless, proposed legislation was drafted and introduced that clarifies the ability of state agencies to enter into performance contracts and exhorts them to consider such an approach to off-budget energy equipment financing. The bill was passed and signed into law in August 1985 (Chapter 733 of the Laws of 1985).

NYSERDA is now working on another approach which is responsive to the lessons learned from the demonstration program. Looking back to the original hypotheses underlying the program, NYSERDA believes that there *are* clear benefits to be gained by public sector institutions entering into energy performance contracts, that they are *indeed* very complex transactions, and that we are going to *have* to catalyze their use by public agencies in New York. Having demonstrated these facts, our approach now is to develop practical tools for the public sector procurement and engineering personnel in the state. In a research project currently under way, we are working closely with such personnel at municipal, county, and state governmental levels to develop model requests for proposals and contracts, standardized guidelines for the solicitation and evaluation of proposals, and standardized procedures for the negotiation and implementation of contracts. We believe that this material will make it much easier for government to procure energy performance contracts in New York State.

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Financing Energy Conservation.

Legal Issues for Local Governments Interested in Performance Contracting

Philip Yates

INTRODUCTION

Public entities must consider legal issues at the outset of any project. This is particularly true in the area of performance contracting for energy efficiency. Given that these transactions are relatively new, the typical jurisdiction will have no prior experience with the mechanisms. Moreover, public officials will have to consider where performance contracting fits within the existing maze of laws and regulations.

This chapter provides a brief overview of the threshold legal questions a local official must consider when first looking at performance contracting. The following discussion focuses on two central areas of concern. First, what are the legal issues affecting appropriations for performance mechanisms? Second, if the authority exists, what are the major regulatory elements which affect procurement and contracting with performance-based transactions?

In addition to these central questions, local officials must also be careful to examine relevant local statutes and regulations. For example, local ordinances may govern environmental considerations and affirmative action requirements, or mandate programs for economic development through the use of local contractors. Where such statutes or programs exist, performance contracting programs must accommodate them.

This chapter's discussion of legal issues in no way can substitute for the opinion of local counsel. Options and approaches which have been developed and implemented by various local governments are outlined here. However, what is appropriate or attractive in one situation may not fit the needs or objectives of the town next door. The purpose of the following discussion is to introduce the paramount legal and regulatory considerations in the broadest manner possible.

RESTRICTIONS ON PERFORMANCE CONTRACTS

There are several features common to most public sector energy performance contracts. Equipment and services are provided to the public entity, which pays for them in a manner that is in some way dependent upon the energy savings they produce. In almost all instances the contract extends for more than one budget cycle.

There are statutory provisions in many jurisdictions that may limit the ability of a public entity to enter into this kind of transaction. For example, in some jurisdictions there are statutory limitations on the maximum term of certain contracts, on the ability of a local government official to bind the public entity beyond the official's term of office, and on the ability of a public entity to make a profit through an investment of another entity.

Statutory restrictions vary widely in scope and purpose, and must be examined on a case-specific basis. However, most public entities face similar constitutional debt limitations. One strategy which has been employed to overcome restrictions of this nature is to develop short-term contracts. Upon the expiration of that agreement, the contract is renewed. The municipality also retains the right to buy-out the contractor at any time for a fair-market price.

Constitutional Debt Limitations

Constitutional debt limitations usually specify an amount of debt that a legislative authority can incur on its own. This amount is usually set as a fixed dollar amount or as a percentage of the tax base of the jurisdiction. If the legislative authority wants to exceed this debt limitation, it usually must go to the voters for approval.

If the public entity's constitutional debt restrictions are severe, the public entity may be precluded, for all practical purposes, from entering into a multi-year contract that involves a "debt." For

example, in Oregon, a public entity may not incur a debt in excess of $5,000 without a vote of the people. Since voter approval is expensive and never certain, multi-year contracts that involve a "debt" in excess of $5,000 are simply not feasible.

Fortunately, there are a number of mechanisms that can be used in certain circumstances to avoid the restrictions. Many of these mechanisms rely upon structuring the transaction to avoid a "debt" characterization. For example, since contracts of this type are contingent on performance with payments not being fixed, the liability may not be characterized as a debt. However, since the case law on these mechanisms is extremely limited, public officials should explore this issue in detail with their counsel.

Adequate Debt Authorization

Of course, it is not necessary to artfully construct a performance contract to avoid a "debt" characterization if the public entity has excess debt authority. Incurring a "debt" through a multi-year performance contract does not run afoul of the limitation if the total anticipated cost of the contract does not exceed the public entity's debt limitation. Since this is the case for many public entities, a determination of the public entity's debt limitation, its current debt, and the anticipated amount that will be paid under the performance contract should be one of the first inquiries made.

Non-appropriation Clause

Despite restrictive debt limitations, a public entity can enter into a multi-year contract by including a provision in the contract which operates to make it, essentially, a series of one-year renewable contracts. With this provision, commonly called a "non-appropriation clause," the public entity has the ability to terminate the contract by failing to appropriate funds to honor the contract. In that eventuality, the public entity would agree to buy the equipment at a fair-market value or have the contractor remove the equipment. Since it is totally within the discretion of the public entity to make the appropriation, such contracts have been held not to create a debt subject to constitutional debt limitations. Under this approach, as long as the *annual* payments under the contract do not exceed the applicable debt limitation, the contract is not subject to the debt restrictions. Kansas City, Missouri has developed this type of arrangement to implement its program.

A non-appropriation clause is usually acceptable to the contractor (for an extra fee) if the risk of the non-appropriation is small. The risk is typically considered small by the contractor if the equipment purchased is "essential" and the public entity agrees not to substitute another piece of equipment in the event that the non-appropriation clause is exercised. However, if the "essentiality" is too severe (such as a building's only heat source, with contract renewal in the middle of the winter), a court may conclude that the non-appropriation clause is a fiction, and thus the arrangement really is a "debt."

Other Mechanisms

Other mechanisms may exist in a jurisdiction to eliminate the problems created by constitutional debt limitations. For example, under most performance contracts, payments to the contractor are contingent upon performance, i.e., if there are no measurable energy dollar savings, there is no fee. In some states, the fact that the liability is contingent on a subsequent event operates to remove the obligation from the "debt" characterization.

In other jurisdictions it might be possible to use the special fund doctrine (with energy savings creating the special fund) to allow a public entity to enter into a performance contract without a vote of the electorate. The contract in this case would be analogous to a revenue bond issued by the public entity, which creates no obligation on the public entity because the project generates revenues to satisfy the bond obligations.

Finally, a state can pass a constitutional amendment to exempt energy projects from debt limitations. Despite the difficulties inherent in such an undertaking, some states, including Oregon and Washington, have passed such amendments.

PROCUREMENT OF MULTI-YEAR CONTRACTS

The debt limitation issue, though important, is not unique to performance contracts. Most public entities have dealt with debt limitation in the context of leases and installment sale contracts. However, the procurement issues raised by performance contracting pose questions that in many cases have never arisen before.

Equipment/Service Contract Distinctions

Under the procurement statutes of many jurisdictions, a public entity is required to contract for the purchase of equipment through competitive, fixed-price bidding. The standard for awarding the contract is usually the "lowest responsible bidder."

Unfortunately, it is difficult to choose a performance contractor upon a "lowest bid," at least not in the traditional sense. The true value of an energy performance contract is not the market value of a piece of equipment or a set of services but rather the improvement in cash flow that the equipment and services create. A contractor cannot even supply this cash flow improvement figure until it performs the engineering to determine the costs of the required energy equipment and the savings that it will generate.

A "bid" in the traditional sense *could* be submitted based on a contractor's preliminary engineering estimates of cash flow improvement. However, there are two disadvantages to this approach. First, with each bidder providing different savings estimates, the contractor that most grossly overestimates savings will be able to offer the "lowest bid." Second, to require competing bidders to do engineering before submitting a bid will sharply limit the number of contractors that would respond to a solicitation for bids. Engineering, even preliminary engineering, is expensive. Generally, a firm is willing to incur those expenses only after it has received some assurance that it will receive the contract.

A public entity can avoid many of the problems of equipment contracts by treating performance financing as a service contract. Many of the restrictions on equipment contracts do not apply to service contracts, i.e. contracts for consulting, engineering, financing, maintenance, etc. Generally, public entities are permitted to *negotiate* service contracts after determining through a public competition the "best qualified" firm with which to negotiate. Under such an approach the successful bidder would do the engineering *after* being notified that its proposal is the most attractive. Many important parts of the contract (term, savings split, etc.) can be negotiated after the contractor has performed the required engineering.

Unfortunately, the laws in most jurisdictions do not specify the type of procurement that is required for energy performance contracts, which involve both services and equipment. Even if service contract procurement is permissible for an energy performance contract, this approach limits the flexibility of the public entity in structuring the arrangement.

For example, under the service contract procurement approach, the public entity cannot immediately take title to the equipment. To do so would constitute an equipment procurement. Consequently, the public entity is precluded from financing the equipment with its tax-exempt borrowing authority (which requires title to be held by the public entity). Furthermore, the public entity may encounter some difficulty in purchasing the equipment during the term or at the termination of the contract because service contracts do not cover the acquisition of property. If a public body issues an equipment procurement at the termination of the service contract, the energy services company which had title to the equipment would obviously win the bid and would be open to charges of an unfair advantage. The State of New York has examined this question and determined that letting of service contracts is permissible when followed by a subsequent equipment procurement. However, counsel for each public entity must look at this question very closely. A statutory change allowing negotiation of a performance energy contract is an obvious solution to this procurement problem. Several states, including Washington, Massachusetts and New Jersey, have recently enacted such statutes.

Fortunately, legislative change is not an absolute prerequisite to the procurement of performance contracts. Many public entities currently have the flexibility to negotiate energy performance contracts that involve equipment. Even for those that maintain rigid rules for equipment procurements, there are procurement avenues that may be used for performance contracts.

One solution was recently applied by the City of Yakima, Washington, where the city advertised for two contracts. Under this approach, a performance contract is negotiated with a contractor selected through a request for qualifications. The selection is based upon the firm's experience, approach, financial strength and the financial arrangement that can be offered by that firm for the energy equipment thought to be needed. Respondents do not need to perform preliminary engineering in order to be chosen the best qualified firm. The selected services firm provides engineering, financing, construction management, and maintenance.

The equipment installation contract is awarded to a separate contractor. The public entity selects the installing contractor based on its determination of the lowest bid that is *responsive* to the bid specifications published by the public entity. The services firm develops the bid specifications to be published by the public entity, and it advises and assists the public entity in making the

determination of the lowest responsible bidder. The installing contractor performs its work under the direction of the services contractor.

This approach raises some problems due to the fact that many aspects of the second contract (including the identity of the installing contractor, the equipment to be installed, the management of the installation, and the mechanism for paying the installing contractor) are critically important to the services contractor. However, these issues can be dealt with in the negotiations between the public entity and the services company.

CONCLUSION

A number of important factors were not addressed above. These include issues common to both private and public sector energy performance contracts (baseline provisions, insurance, indemnification, etc.) and issues generic to all public sector contracts (affirmative action, etc.). These issues are discussed further in the first chapter.

These other issues arise only if the threshold questions discussed above are adequately answered. Frequently, they can be answered only through creative legal structuring which sometimes creates problems of its own. It is preferable to enact specific legislation to authorize performance contracts and provide a mechanism for their procurement. Until such statutes are passed, innovative legal solutions may be the only means available to minimize the impact of many of the barriers to performance contracting.

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Financing Energy Conservation.

Performance Contracting For Energy Savings In New Jersey

Gilbert R. Freeman and Michael Shepard

INTRODUCTION

Each year over $10 billion leaves New Jersey's economy to pay for energy services. These high energy costs are particularly painful for public facilities which already face difficult budget choices. Financially strapped public and non-profit institutions such as municipalities, schools and hospitals cannot afford to invest in energy efficiency. To resolve this predicament, the New Jersey Department of Energy has established a program to facilitate performance contracting by local governments for energy improvements. This chapter examines New Jersey's approach and discusses the implications of this experience.

The catalyst for performance contracting in New Jersey has been the "Shared Savings Task Force." A small, relatively independent group, the task force is a part of the New Jersey Department of Energy and can draw upon other offices within the department for legal and engineering assistance. The task force has had the support of high level officials in the state. This support and the task force's unique status enabled the program to form quickly and to generate positive results with a minimum of red tape.

The task force's simple flexible program has been oriented towards performance and experimentation rather than paper studies. It began its work by test marketing the concept of performance contracting with cities, school boards and hospitals throughout the state. Most local officials were facing mounting

energy bills but felt that budget constraints limited their ability to implement programs to contain or reduce energy costs. Performance contracting seemed to be a solution to this quandary but it also seemed to promise something for nothing, and thus sounded too good to be true. The state's involvement was an important factor in lending credibility to the concept of performance contracting and encouraging local officials to pursue this innovative financing approach.

LEGAL CONSIDERATIONS

The program faced two critical legal hurdles: New Jersey law prevented municipalities and school boards from entering into multi-year contracts, and competitive bidding was required for major capital improvements. These laws seriously impaired the potential for performance contracting, since such contracts generally last several years and are not well suited to traditional competitive bidding.

A legislative package to address these constraints was developed by the task force and supported through a low-key, bipartisan lobbying effort. This lobbying effort stressed that cities, schools and hospitals could achieve a significant reduction in energy costs with performance contracting. Jobs would be created to provide these energy services, and revenues would accrue to the state treasury from this new industry. The legislation glided through the Democratically controlled legislature without a single dissenting vote and was quickly signed by the Republican governor. Municipal governments and school districts in New Jersey can now sign 10-year contracts and are permitted to use a competitive negotiation process, rather than a formal competitive bidding process, to select among performance contract offers.

DEVELOPING THE MARKET

As soon as this legislation was adopted, the task force expanded its efforts to promote performance contracting to local officials. The task force sent mailings to local officials throughout the state and followed up with staff visits to schools, hospitals and municipalities. These meetings stressed general concepts rather than technical details. The basic message was that performance contracting meant the client assumed no risks and required no up-front capital.

The staff explained the steps in implementing a performance contracting program and offered technical assistance to officials who wanted to pursue performance contracting. If a local official expressed interest in the program, the task force requested that they submit a letter confirming their interest and that they provide descriptions of the facilities to be upgraded, the heating equipment involved, and one or more years of energy bills. The requirement of assembling this information was designed to separate serious customers from the "tire kickers."

At the same time, the task force was developing a list of qualified energy services companies (ESCOs) who specialized in the field of performance contracting for energy-efficiency improvements. The task force sent letters to ESCOs throughout the country to identify those firms interested in working with the task force in New Jersey. Firms expressing interest were screened in a standard process administered by the State Treasury Department. This prequalification screening is a requirement for any firm doing business with the State of New Jersey. It is a simple procedure, and most firms that apply are qualified. The criteria include financial background, length of time in business, experience in the field, insurance, licenses, and disclosure of the names of stockholders and partners.

DEVELOPING THE RULES OF THE GAME

After determining the level of interest in performance contracting among local officials and ESCOs the task force developed regulations to guide its program. These included a methodology for calculating the savings in energy costs associated with various energy-efficiency measures and a procedure for evaluating and ranking proposals from ESCOs. The regulations also required out-of-state firms to use local subcontractors for installation and maintenance. While the legislature had not specifically empowered the task force to adopt these regulations, this authority was implicit within the requirement to establish the program. Most local officials and ESCOs were pleased to operate under explicit "rules of the game".

BROKERING PROJECTS

With the ground rules established, the program reached the stage in which the task force puts client institutions in touch with the

appropriate ESCOs. The task force reviews the letters of interest from local officials then provides the officials with a list of vendors, indicating no more than three firms which, in the task force's judgement are most suited to meet the client's needs. The local officials can solicit proposals from any firm that they wish, but most accept the task force's recommendations and invite the firm(s) suggested by the task force to audit their facilities and to submit a proposed performance contract.

The task force strives to avoid even the appearance of favoritism in its brokering services. So far there has not been a single allegation by the ESCOs of any favoritism on the part of the task force. Both the number and variety of projects allow the task force to suggest the services of a number of different firms.

Most local officials lack the expertise to critically evaluate ESCO proposals. The task force will evaluate these proposals if asked to do so by the client. The task force strives to be objective in evaluating vendor proposals. It applies the prescribed evaluation methodology and points out both the strengths and weaknesses of the proposals. It never recommends a specific proposal over the others. Accordingly, the task force can maintain an objective position with respect to the ESCOs allowing it to gain the confidence and respect of the energy services firms, while providing technical assistance to local government. The final decision on which ESCOs to do business with is left entirely to the local officials.

The selection of the contractor does not signal the end of the task force's role in the project. Often, the task force will participate in negotiations on the contract. For example, one contract did not include any maintenance for an old, ineffective and hazardous boiler. The task force knew that this boiler was "an accident waiting to happen" and pointed out the problem to both the city and contractor. The ESCO agreed to replace the faulty boiler in return for a slightly increased share of the project's savings.

Generally, the task force is willing and able to provide a broad range of assistance to local officials to insure that projects do not simply stall for lack of local capability or resources. In addition, the task force is continually looking for new opportunities for performance contracting. For example, the U.S. Department of Energy (DOE) funds local government energy efficiency projects through its Institutional Conservation Program (ICP). This program only funds about 10% of the proposals that it receives. To apply to ICP, the local government must submit a detailed audit of its facility. The audit must consider a variety of energy-efficiency

measures and must determine the amount of energy that can be saved by the proposed improvements. In the past, the proposals of all unsuccessful applicants for ICP funding simply disappeared into the DOE archives. At the request of the task force, the DOE now notifies the task force of all unaccepted proposals from New Jersey public facilities. The task force then provides the names of these applicants to the various ESCOs, who can then obtain copies of the audits from the DOE. Based upon the information in these audits, the vendor can then submit a performance contracting proposal to the local government.

Many projects are too small to interest energy service firms. To overcome this problem, the task force groups a number of small projects within a ten mile radius and then searches for vendors who are interested in taking on the entire package. In one case, seven facilities that individually ranged from $25,000 to $35,000 in annual energy consumption were successfully packaged into one deal. Each of the local institutions required an individually negotiated contract for its applications. The key element of such a program is to find one local subcontractor to install and maintain the equipment in each of the institutions.

This type of program is difficult to implement. Identifying enough small projects that can be developed at the same time within a small geographical area is challenging. Orchestrating projects with a half dozen municipalities is extremely complex and time consuming. Furthermore, most performance contractors prefer to focus on large individual projects rather than accept the risks and marketing costs of packages of smaller projects. Aside from the one group project described here, the task force has not been able to implement this approach.

LESSONS LEARNED

The task force has been in existence since 1983. In that period it has helped more than thirty local governments install energy-efficiency measures. Over their service life these measures will save New Jersey tax payers an estimated $28 million. Many lessons learned in the development of this program may be of benefit to others designing similar programs.

- Design the program so that it is easy for both ESCOs and local governments to participate. Make the requirements as flexible and unbureaucratic as possible. Minimize rules and

regulations. For instance, there are no reporting requirements in the New Jersey program. Neither the local government nor the ESCOs has to tell the task force anything about specific projects. However, extensive information has been voluntarily provided to the task force.

- Projects take time. Even with the streamlined approach developed by the task force, these projects take at least nine months and often more than a year to be implemented.
- Even the best projects can be delayed or halted by unanticipated factors. For example, one project was mysteriously voted down by a city council which had been expected to provide a rubber stamp approval. The task force determined that the project would receive more favorable consideration if it included a minority-owned sub-contractor. Such a subcontractor was added to the contract and the project was quickly approved.
- Innovative programs need a champion to guide them through the difficult start-up phase. Flexibility in bureaucratic red tape is helpful in getting such programs established.
- It is critical that clients be satisfied with the work performed by the performance contractor, particularly in the early stages of an innovative program. News of bad experiences travels quickly and undermines the credibility of the industry. On the other hand, testimonials of positive experiences by local officials can be very useful in marketing performance contracting. Satisfied local officials should be called upon to relate their experiences in workshops and seminars.
- Local governments need technical assistance from the state to evaluate performance contracting proposals. State governments can lend credibility to the performance contracting industry. Given both the innovative nature of performance contracting, the short history of many of the firms, and the mistrust associated with "something for nothing offers" the importance of the state role cannot be overestimated.
- There are a variety of possible state roles in performance contracting. In New Jersey our task force has selected the course of being an honest, objective broker and facilitator of performance contracting transactions.

We in New Jersey are very pleased with the success of our performance contracting program. We have kept the program simple and direct so that the concept can simply sell itself. We believe that this type of innovative financing approach has a bright future. Such innovation will not only help us conserve energy, but will protect the environment, reduce our dependence upon imported fuels, create jobs, free up internal capital for facility expansion and shift the attention and resources of local governments more towards the people they serve. Performance contracting is the kind of partnership between government and the private sector which serves everyone's interest. With performance contracting, everyone is a winner.

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Financing Energy Conservation.

Energy Agents for Local Governments

Philip Yates

INTRODUCTION

Local governments have unique energy management needs. Limited staff and resources, however, frequently combine to produce unnecessarily large energy costs. In some cases these costs can be reduced through federal, state, or utility energy-conservation grant programs. Even when available, however, these programs take a long time to implement, and energy is wasted in the meantime. Furthermore, they frequently require matching funds, substantial staffing, and other responsibilities that often cannot be met by the local government.

In addition to grant programs, a host of energy-conservation financing arrangements is now available in the marketplace. These performance contracting arrangements come in a variety of forms, including shared savings, guaranteed savings, and micro-utility arrangements. Under a shared savings contract, a contractor provides engineering, financing, installation and maintenance of energy conservation measures in exchange for a share of the energy cost-savings that are generated. Under a guaranteed savings plan, the contractor provides the same services for cash, but provides guarantees that a certain level of savings will be achieved. Under a micro-utility contract, the contractor installs equipment that can easily be metered, such as a new boiler, and charges the building owner for the units of energy (steam) consumed.

Performance contract financing is more complicated than energy-conservation grant programs. It involves legal, procurement, and engineering issues that are not raised by more traditional financing methods. Furthermore, when one of these financing arrangements is combined with a grant program, the issues

become even more complex, because the financing offered by the contractor must not only meet the needs of the institutional building owner, it must also meet the requirements of the grant program.

How can a local government take advantage of grant programs and/or innovative financing arrangements without hiring additional staff or otherwise increasing its budget? One way is to retain an energy agent—an energy conservation consultant who works to improve a local government's energy efficiency on a contingent- or delayed-fee basis. An energy agent should be distinguished from an energy services company that provides complete turnkey services (engineering, financing, installation, maintenance) for capital intensive equipment.

The energy agent acts as the liaison between energy equipment vendors, financial sources, energy services companies, and various department heads within the local government. The functions performed by the energy agent include energy auditing, developing energy management plans, developing requests for proposals, evaluating proposals, arranging financing, helping negotiate energy services contracts, and a number of other energy related functions.

The key distinction between an energy agent and other energy consultants is that the energy agent works on a contingent-fee basis. Under a contingent-fee arrangement, the energy agent is paid only if his efforts reduce energy bills for the local government. If there are no savings, there is no fee. However, an energy agent may also combine the two forms of payment by receiving a set fee for up-front project preparation and additional contingent fee reimbursement once the project is initiated.

This chapter discusses some of the issues that a local government should consider in retaining an energy agent on a contingent-fee basis. The issues include: elements of energy agent contracts, determining project feasibility, selecting an energy agent, what an energy agent does, and measuring energy savings.

ELEMENTS OF ENERGY AGENT CONTRACTS

An energy agent contingent-fee agreement may include the following features:

1. Payment is deferred until the energy agent completes his work. This preserves the owner's positive cash flow in improving a building's energy efficiency.

2. The fee is contingent on the savings that the energy agent's program generates for the building owner, i.e., the cash that is left over after the debt service and the maintenance costs associated with the investment are paid. The energy agent may be paid a specified percentage of the savings or his fee may be tied to the completion of certain tasks, e.g., conducting an energy audit, implementing an operations and maintenance program, drafting a request for proposals, evaluating responses, helping negotiate contracts, etc. While the shared savings fee structure creates a stronger performance incentive for the energy agent (the greater the "bottom line" savings, the greater the fee), it also creates a number of conflicts (see number 5 below). Under either contingent fee contract, the local government pays for the energy agent's fee out of the energy savings generated through the energy agent's efforts—if the contract's specific contingencies are not met, there is no fee.
3. There should be an upper limit on an energy agent's fee. It is reasonable to pay the energy agent a higher fee than one would pay "up-front" to a contractor who assumes no risk that the system will perform as claimed. The cap in shared savings contracts should limit the total amount the energy agent can receive and should also limit the length of time that the agent can continue to send bills. In contracts that finance the energy agent's fee along with the cost of the installed energy conservation measures, the cap need only specify an hourly rate and a maximum amount.
4. The local government should agree to pay the energy agent's fee if—through no fault of the agent—the agent's recommendations are not implemented. This provision protects the energy agent from expending time on a building, making recommendations that would save money (and thus generate a fee) and have the building owner refuse to implement the recommendations. To implement this arrangement, a locality might pay an agent a net hourly fee for program preparation. Then, if a contract is let and an energy management program implemented, the agent can be reimbursed on a contingent-fee basis.
5. The contract should be designed to limit any potential conflict between the energy agent and the local government. Conflicts are most likely with shared savings fees, because the energy agent has an incentive to secure a financing arrangement that continues as long as possible—paying his fees—while most local governments are interested in the shortest possible contract

term. This conflict can be ameliorated by limiting the term of the energy agent's contract.

Another potential conflict can arise if the energy agent recommends quick payback measures. Energy agents might avoid recommending energy-efficiency measures that have long payback periods, since this will reduce their fee in the near term. Local governments can guard themselves by studying energy audits thoroughly and questioning which identified measures are economical for installation from the government's position.

A final potential conflict is in the area of preventative maintenance. Energy services companies may have little interest in insuring the operation of equipment beyond the term of their contract, often 7 years. Energy agents—for a set fee—can help to develop or arrange for a preventative maintenance program.

DETERMINING PROJECT FEASIBILITY

An energy agent is unlikely to work on a contingent-fee basis without some assurance that the local government has the flexibility to be able to finance equipment beyond the current budget cycle. A local government may be faced with a variety of restrictions on its ability to enter into a long-term contract that imposes an obligation (even if it is contingent on energy savings) that will be paid out of a future fiscal year's budget. The ability to enter into long-term contracts is critical to the success of a local government's plan to finance energy conservation measures with no negative cash flow.

Even if the local government has the authority to enter into contingent-fee contracts, an energy agent will not be interested unless there is some assurance that the building(s) in question offer real potential for energy savings. Savings are generally available in large buildings that consume a large amount of energy per square foot, and thus have a high energy usage index (EUI).

It is simple, although frequently time-consuming, to determine the EUI of a building. (1) Determine (a) the total energy consumption of the building (gas in therms, oil in gallons, electricity in kilowatt-hours) for the last 12 months; and (b) the total square footage of the conditioned space in square feet. (2) Then convert the building's consumption to British thermal units (Btu) using (a)

100,000 Btu per therm of gas; (b) approximately 140,000 Btu per gallon of Number 2 fuel oil (but get the exact number from your oil company because it varies substantially for different types of oil); and (c) 3414 Btu per kwh of electricity. (3) Then divide the total number of Btu consumed in a year by the square footage of conditioned space in the building.

The resulting EUI will range between 30,000 Btu/sq.ft./year and 300,000 Btu/sq.ft./year (depending on the building type, building use, climate, and level of energy efficiency). A phone call to a local energy auditing firm or state energy office will enable the local government to determine some general rules of thumb concerning appropriate local EUI levels. Of course, these rules of thumb apply only to "standard" buildings. Any large building baseload usage (a large computer, a kitchen, etc.), unusual hours of operation, or other anomalies will have to be considered in determining whether a particular building's EUI is a true indication of overall efficiency. While it may be a little more difficult to determine the efficiency of a particular building type and usage, the EUI is nonetheless the point of departure for examining energy conservation investment opportunities for all buildings.

SELECTING AN ENERGY AGENT

The local government should select an energy agent in the same way it selects architects or engineers. However, the government should understand that the skills required of an energy agent go beyond technical expertise. The energy agent must be able to deal with energy auditing, governmental grant programs, local procurement statutes and regulations, training and maintenance procedures for the local government's staff, financial analysis of the various energy-conservation investment options in local government buildings, and contract negotiation (potentially) with an energy services company.

Most of the enterprises to be contacted in the search for an energy agent will be energy auditing firms. However, the firm or individual selected for the job should be able to provide the whole host of services described below. Further, because the services to be provided deal intimately with the "process" of government, the energy agent should have a demonstrated ability to get along with people and be able to deal with the recurrent problems faced by an outsider telling insiders how to better do their jobs.

WHAT AN ENERGY AGENT DOES

The functions of an energy agent will vary among different communities, and even from building to building within a particular jurisdiction. However, the following functions can be performed by an energy agent.

If the energy agent is to be paid through shared savings, the first step is to negotiate a baseline energy use for the building(s) against which energy savings can be measured. The baseline agreement should be negotiated with one designated local government official. Indeed, all aspects of the energy agent's services should be run through this official. The higher the official in the local government hierarchy, the more likely are the efforts of the energy agent to succeed.

Once a mutually agreeable methodology to measure energy savings is reached, the energy agent should perform an energy audit of the buildings operated by the local government. The audit should indicate which cost-effective energy conservation opportunities (if any) exist in the local government's buildings.

The audit will not be as detailed as an audit provided by a consultant working under a traditional hourly fee. The energy agent's incentive is to keep his time and costs to a minimum. Therefore, the local official should not expect the kind of report that has been typical of government-funded audits. Rather, the government should be able to rely on the agent's expertise and self-interest (no savings, no fee) to recommend only cost-effective retrofits.

Some of the recommendations will involve low-cost/no-cost measures that should be implemented immediately. By definition, these energy conservation measures have very short paybacks. A delay in their implementation costs a great deal in energy savings relative to the cost of the measure. Accordingly, it may be appropriate to procure these measures and install them quickly through the auspices of the energy agent's contract rather than through the local government's normal, time-consuming procurement channels. Local governments may wish to install these measures themselves or give the energy agent a flat fee for installing them, rather than providing the agent with a windfall share of such easily gathered savings.

In addition to estimates of equipment cost and savings, the energy agent should analyze the options for financing building improvements. The analysis should consider self-financing, government grants (and the lost energy savings that are created by having to meet the grant requirements—audits, applications, budget cycles,

etc.), tax-exempt installment sale contracts, simple borrowing, and energy services company contracts.

If the local government accepts the recommendations of the energy agent, the agent begins to arrange financing of the equipment to be installed. This includes completing grant paperwork, issuing a request for proposals to select an energy services firm, contacting an equipment leasing firm or doing other spadework needed to arrange financing.

At this point the energy agent recommends either that the local government enter into some form of performance based contract with an energy services company for the engineering, financing and installation of the needed equipment, or that the local government borrow the money needed for the equipment in a manner that allows the energy agent's fee and other associated costs to be capitalized and thus paid off over the term of the loan.

Whatever financing mechanism is chosen, the energy agent then assists the local government in developing the documents needed to procure the desired services and equipment. Additionally, the energy agent assists in evaluating responses to requests for proposals. The energy agent also assists the local government in negotiating a financing arrangement with the energy service company or other financing source. At each step of this process, the interests of the energy agent are very close to the interests of the local government: to create the best arrangement for the local government and thus maximize the local government's bottom line.

Finally, after financing is arranged, it is in the interest of the energy agent to insure that the equipment is installed, operates properly and, if performance based contracting is used, that the savings are measured accurately. Accordingly, the energy agent should oversee the installation and make sure that a performance based contractor does not overbill or fail to maintain the equipment.

MEASURING PERFORMANCE

The method of measuring savings is perhaps the most important aspect of a performance contract. At the heart of performance measurement is the baseline agreement, which predicts what the building would have consumed but for the efforts of the performance contractor. Ideally, a baseline agreement should be fair, simple enough to be understood by a non-technical person, and yet

sophisticated enough to deal with the myriad factors that can influence energy consumption.

The baseline is hypothetical—what would the building owner and the performance contractor expect the energy bills of the building to be in the future if the performance contractor had not performed his or her service? Of course, buildings change over time, with or without a performance contractor in the picture. Equipment is added or removed; remodeling takes place; occupancy rates change. The savings calculation method should be able to predict how these changes would have affected the energy consumption of the building if there had been no energy management program implemented by the performance contractor.

Any good savings calculation requires an adequate database and a methodology for analyzing the data. In most baseline methodologies, the required data fall into three categories: energy consumption history, building characteristics, and weather variables.

The starting point is the building's past energy consumption. The main area of negotiation in regard to the energy consumption history is whether there are discontinuities or trends that make the period chosen an inappropriate baseline period. The second area of negotiation includes the characteristics of the building. It is important to inventory all significant energy using equipment in the building and to list them in the baseline agreement, because a change in this equipment will have an impact on the building's energy consumption. Likewise, the building's general characteristics must be identified, so that any remodeling can be quantified and its energy impact computed. Determining the correct building data can be a problem, particularly because some of the data, such as past thermostat settings, are not known and must be estimated. Finally, climate criteria must be agreed to. Generally, federal government weather data for the base period are used.

After agreement is reached on the basic energy, building and weather data, the parties must agree on how to assess the data. Different companies use different baseline computation methodologies. It is beyond the scope of this paper to delve into the intricacies of the different methodologies. However, there are a few basic thoughts to keep in mind in negotiating a baseline agreement.

First, it is extremely important to recognize that random effects can cause variations in energy usage. Energy curves are rarely steady; even factoring in weather and all known variables, energy consumption can vary 5 or 10 percent for unknown reasons. Consequently, it can be expected that in some months a 5 to 10

percent "energy savings" may be measured without any effort from anyone. To eliminate the potential of paying for random energy savings, the contract should require a certain level of energy savings before any payment is due.

Second, it is in the interests of all parties to keep the baseline agreement as simple as possible. To this end, many baseline agreements ignore weather variations, on the theory that while some months may have weather that increases energy consumption relative to the baseline, other months will have weather that decreases energy consumption. The chances are that over a 60 month contract these variations will cancel themselves out. This theory will prove correct if the base period weather is very close to the long-term average weather for that location. Thus, the building owner should be familiar with the relationship between the base period weather data and the area's long-term weather patterns.

Finally, absolute baseline accuracy is a laudable goal, but almost impossible to achieve. What is achievable is fairness. There should be an equal probability that the measured savings are higher or lower than the "actual" savings. Under a fair baseline agreement it is likely that one or the other parties may come out a little ahead. However, neither party will know which is the winner. In a successful project, neither will care.

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Financing Energy Conservation.

Performance Contracting: Planning for Change in Taxes, Regulations and the Market

Michael Garland

"It is not the coming out of port, but the coming in, that determines the success of a voyage." - Henry Ward Beecher

The Office of Energy Assessments (OEA), a branch of the California Department of General Services, is responsible for improving the energy efficiency of state facilities. OEA estimates that state energy use can be reduced by over 30 percent through cost effective energy-efficiency measures and that 80 percent of the remaining thermal load and over 100 percent of the remaining electrical use can be replaced by alternative energy supply technologies during the next ten to fifteen years.

In the past five years, we at OEA have been exposed to nearly one thousand companies offering various energy-related services and have negotiated more than 15 different types of performance contracts for energy investments. These projects have involved energy-efficiency measures, solar and geothermal heating as well as cogeneration projects. Through this extensive experience we have learned that the success or failure of performance contracts and the firms who manage them depends on two principal factors: the quality of project management and the overall regulatory and market climate for energy investments. The quality of project management is controlled by the particular firm. The regulatory and economic climate is not. This chapter focuses on ways to plan for and cope with those factors beyond the direct control of the participants.

DETERMINING PROJECT VIABILITY

To develop a successful energy project one must address many variables. These include access to capital markets, capital constraints on investment risk and return, changing energy price forecasts, regulatory policies including the associated avoided costs or retail rates, design options, labor disputes, equipment performance guarantees, future energy use, changing tax laws and regulations, and many other factors. In particular, the developer of a project based upon performance contracting must understand:

- *The general trend of basic economic conditions* such as interest rates and inflation over the next decade, but particularly over the financing period.
- *The specific trends of energy economics,* including international oil prices, the relationship between oil and other energy prices, and trends in local energy prices over a similar period.
- *The regulatory climate under which the project operates,* including retail rates, marginal costs, etc., and what the long-term trends in these regulatory approaches will mean for the value of the project.
- *Any environmental issues that may affect the project,* such as indoor air quality, the costs and operating impacts of pollution control requirements, permits, and offsets.
- *The long term viability of the site itself.* Will there be a hospital, factory, prison, etc., operating on this site for the life of the project? Will it be operating at a higher or lower level over the life of the project?
- *The economics of the specific technology being used.* What will be the actual operating costs, the actual maintenance costs, the costs of any replacement parts, what are the guaranteed levels of performance, and what should a guarantee cost?
- *The various tradeoffs involved in the specific piece of equipment being installed.* Will it meet the needs of the site, will it operate as promised, can it be installed on time and within its budget, and is it better than the other options?
- *The strengths and weaknesses of the various members of the development team.* What is the strength of the warranties and guarantees of the members and their track record?
- *All the contractual relationships that need to be established for the project.* These can include a ground lease, energy sales agreements, all utility services, maintenance agreements, procurement documents for the equipment, warranties and

performance guarantees, engineering design and construction contracts.

- *The complex requirements of project finance and the operations of capital markets.* What are the debt or lease coverage ratios? What is the amount of leverage?
- *How to fit all these pieces together into a coherent schedule.*

Some of these factors are beyond the direct control of an individual developer, but their outcome and the interactions among them will determine the success or failure of the project. Considering the number of diverse factors which can determine the viability of energy investments, the number of successes is phenomenal. The three external factors which require the greatest judgments—tax laws and regulations, regulatory environment, and the energy outlook—are discussed below.

TAX LAWS AND REGULATIONS

Not only are the tax laws a critical issue for performance contracts, but the tax code in this area changes constantly. These changes can be the result of congressional action as well as rulings and opinions of the Internal Revenue Service (IRS) or decisions by the courts.

One of the most important aspects of energy performance contracts is the provision that distinguishes between service contracts and leases. (See Chapter 1 and its bibliography.) This decision determines the ownership of the energy services equipment for tax purposes. For example, if it is determined that the arrangement is a service contract, then the host facility is merely buying a service. The performance contractor is considered to be the owner of the equipment for tax purposes, so the investment will qualify for both investment tax credits and accelerated depreciation. The performance contractor would enjoy all the tax benefits and liabilities. However, if the arrangement is determined to be neither a service contract nor a "true lease," then the transaction will be considered a conditional (or installment) sale. Such a determination would mean that the host facility is considered the owner of the equipment for tax purposes. If the host is a public entity, the investment will not qualify for some or all of the tax benefits. If the host is a private entity, then the host would share in both the tax liabilities and benefits.

Overall, the determination of whether a performance contract is a service or a lease can significantly affect the financial attractiveness of these investments. However, this determination is usually not clear-cut, but requires a careful judgment of how the overall arrangement will operate and how it will appear to the IRS.*

In 1984 Congress passed the Deficit Reduction Act (DRA), which significantly revised the ground rules for negotiating performance contracts. Before DRA a performance contractor could offer some form of a simple sharing of the project's net benefits (i.e., the income remaining after subtracting all legitimate business expenses). DRA limits the benefit sharing arrangements by precluding the appearance of the host facility having a controlling interest in the day-to-day business decisions. In response to this limitation, some performance contracts have been negotiated with only some form of fixed rent or royalty. Such an approach can result in these royalties being determined on a "worst case" basis. To avoid a low fixed rent based on a worst case analysis, we at OEA have been negotiating agreements where the rent or royalty formula is based upon the key measurable variables, such as kWh's produced, fuel prices and utility rates, which will allow participation in the "upside" of the project's performance.

In many cases new tax laws are applied retroactively, usually as of the date that the bill was introduced. Developers need to be able to monitor the provisions of proposals to revise the tax code, to evaluate the consequences of these proposals for any projects that are being considered and to weigh the risks of these proposals being enacted. If the proposals are extremely wide ranging and controversial, such as the various tax simplification schemes, then the project may need to be deferred until after the legislation is close to its final form.

After tax legislation is enacted there can be substantial delay and uncertainty about its implications until the IRS issues its interpretations and regulations. Moreover, these regulations may substantially modify the expected impact of the new laws. The IRS took several years to develop regulations for the conservation tax credit for industrial and commercial efficiency equipment. The final regulations substantially limited the eligibility of equipment for these credits. For example, most energy-efficiency investments in

* See Chapter 1 and related bibliography for a more extensive discussion of the interrelation between the precise provisions of the performance contract and the intricacies of the tax codes and also the specific requirements for a "true lease."

commercial buildings are considered to be part of the building shell and accordingly can neither be leased nor have a short depreciation schedule. The same equipment in an industrial application would receive a more favorable tax treatment.

Most developers had assumed that an energy management system (EMS) would qualify as personal property rather than real property. As personal property an EMS system would quality for both the investment tax credit and five year depreciation under the accelerated cost recovery schedule (ACRS) while as real property they would be limited to 15 year depreciation. Several tax criteria could be used to make this determination. In revenue ruling 83-146 the IRS decided that the principle test was that this equipment relates to the operation of the building. Therefore, it would be considered real property.

The courts become involved in interpreting tax laws and regulations. The courts took strong action against some of the developers and investors in solar energy systems and EMS projects, when these projects were determined to be "abusive tax shelters." These charges are based upon gross inflation of the cost of energy equipment and thus excessive tax credits. We have adopted some simple threshold requirements in our performance contracts to eliminate any potential for such tax abuses. Principal among these requirements is that projects must be cost effective without considering any tax benefits and must stay within certain cost limits for their depreciable base.

Not only are these tax considerations quite complex, but they require constant monitoring. Tax considerations for energy investments have less case law and established regulation than more traditional investments, such as real estate. Accordingly, the uncertainties are much larger. In addition, there have been major revisions in the tax code almost every few years for the past decade. Each major change requires years to be both adopted by Congress and implemented by the Internal Revenue Service. If developers awaited certainty in tax laws, investments would have ceased years ago.

For any significant project a developer and the host facility must rely heavily upon both tax counsel and a certified public accountant (CPA). Even with such professional services, there can still be complications. For example, we once spent six months negotiating an agreement and reached full concurrence with the developer's tax counsel on the contract. Three days after concluding the negotiations, we received a call from the developer's lawyer saying that

they had reconsidered and could not write a legal opinion supporting the financing. We then spent the next six months negotiating a new agreement. The lesson is to use experienced tax lawyers and have them make a commitment to the feasibility of financing the proposed performance contract early in the negotiations.

REGULATORY ENVIRONMENT

Regulatory policies and their implementation can also significantly affect the long term viability of energy investments. Most project managers expect the basic ground rules that apply at the start of a project to govern the evaluation of the project throughout its life. Such regulatory certainty would limit the bargaining to the exact language and conditions on the permit or contract. However, significant shifts in regulatory policies and implementation of regulations can occur in the middle of project development and either result in substantial changes in the project or even undermine the viability of the project. A good project manager must assess the likelihood of changing regulatory conditions significantly affecting the project's development or operation.

Three regulatory agencies have had the greatest influence upon the viability of energy projects: state public service commissions, the Federal Energy Regulatory Commission (FERC), and local environmental agencies. This section will address in turn those agencies that influence the value of the product and the construction and operating costs of the project.

Public Service Commissions

State utility regulatory commissions determine both the rates charged for electricity and gas sales to the host facility and the price paid for any power purchased by the local utility. Utility ratemaking is a complex and volatile blend of law, tradition, economic theory, accounting principles and state energy policies. The often conflicting interests of stockholders and ratepayers must somehow be balanced to determine the appropriate overall revenue requirements. These revenue requirements must then be translated into rates for each group of ratepayers. Complex and rather cumbersome regulatory proceedings have evolved to deal with these thorny issues.

Until the early 1970s, ratemaking was marked by promotional rates and incentives designed to encourage greater consumption of electricity or gas. During the 1970s, the cost of new supplies began to exceed the average cost of power. Utility conservation programs were developed to reduce shareholder risks and ratepayer costs. Rate structures were revised to increase price with greater consumption. Customer conservation efforts were encouraged in many states by both utilities and state regulatory commissions.

In 1978 the Public Utilities Regulatory Policies Act (PURPA) established the right for small power producers to sell their power to utilities at the utility's avoided cost and to receive backup power from the utility at a non-discriminatory rate. These small power producers could reduce the need for utilities to invest in new large central station coal and nuclear power plants.

The combined effect of price-induced conservation, a variety of conservation programs, rate shocks associated with new coal and nuclear power plants and the development of small power producers is changing the underlying economics of utility regulation. For the next five years the energy systems are expected to be "buyers" markets. The overall regulatory outcome is heavily influenced by this perceived imbalance between loads and resources. For example, planners in the 1970s forecast that the west coast would need substantial new resources. This resource need exceeded the financial capability of the utilities. Hyper-inflation dramatically reduced the utilities' construction programs. Incentives for conservation and small power producers were developed by the regulators to meet the expected resource gap.

Now the west coast is a buyer's market for electricity. The expected growth in demand has not materialized. Billion dollar utility power plants are being completed and are being used primarily to displace existing oil and gas power plants. Conservation and small power production have become major new resources. The Bonneville Power Administration has shifted from a major resource acquisition program which included conservation and renewable resources to marketing efforts for the surplus power that is expected to last throughout the rest of this century. In Oregon the regulatory commission has dismantled utility conservation programs and is offering special incentive rates to lure cogenerators back onto the utility grid. In California, the regulatory commission has gradually reduced the funding for utility conservation programs and is considering "sun setting" these efforts.

Retail rates that were oriented towards the conservation ethic are being replaced by promotional rates (at least for off-peak periods). The California commission has reduced avoided energy payments to levels below even "baseline" electric rates as it attempts to throttle back the explosive rate of development of small power production in California. California utilities feel that they are on a tightrope, where they must in the short run encourage enough additional consumption to more efficiently use existing resources, but preserve the conservation and small power production industries to minimize the need for new power plants over the long term.

As the foregoing discussion makes clear, performance contractors need to minimize the impact of future public service commissions' decisions on rate design or avoided costs. A developer must understand state laws and regulations that will determine the current commissions' decisions on retail rates and avoided costs, be able to monitor the proposals of the utility and staff in the various regulatory proceedings, participate in these proceedings to protect their interests, and anticipate the likely future trends in utility regulation. Generally a developer should consider contracting with legal and economic service firms to provide such an assessment.

In addition, a developer should consider the ratepayer's interests when structuring the pricing arrangement. A "reasonable" business arrangement will have greater regulatory stability than a contract with an obvious subsidy from the ratepayers. If a negotiated contract or utility rate is formally reviewed and approved by the regulatory commission, then the likelihood of future regulatory changes is significantly reduced. Such a special review can take a significant amount of time and effort. Alternatively, a developer can purchase insurance to cover the financial impact of future regulatory changes. Finally, the developer can negotiate an agreement with the utility that is considered "below the line," i.e., any risks or rewards flow through to the utility's shareholders rather than their ratepayers.

Federal Energy Regulatory Commission (FERC)

The Federal Energy Regulatory Commission (FERC) regulates most wholesale utility transactions and some aspects of avoided cost pricing. FERC-approved rates for wholesale transactions can act as a disincentive for conservation, since they have a large fixed cost component. In addition, FERC adopted the regulations implementing PURPA. It established the overall policy context for

avoided cost pricing, but left the details of implementation to the states .

One of the more controversial elements of these regulations has been the efficiency standard for cogeneration projects. Currently, a cogeneration system that is based upon a combined cycle configuration can meet these efficiency standards even if it has little on-site thermal use. Such a cogeneration project has been called a "PURPA machine," since it is primarily a mini-utility power plant. Concerns have been raised about the thermodynamic efficiency of such a power plant and about its implications for the type of fuel used in the utility system. Over the long term FERC may increase its thermal efficiency requirements to remove the potential for this type of system.

Finally, FERC determines which small power producers qualify for avoided cost pricing. Plants that use "waste" fuels are qualified. However, the definition of a "waste product" is not clear-cut and could change over time. For example, the markets for petroleum coke and low quality natural gas are currently depressed—but are they (and will they always be) really waste products? If FERC later decides that these are no longer waste fuels, the utility would not have to purchase the power, and the project would no longer be exempt from the Federal Power Act. The consequences of this decision would be devastating to the investors.

Local Environmental Agencies

Environmental agencies can also affect the financial viability of energy investments. In particular, energy developers need to consider the impact of air quality regulations upon their project. Indoor air quality is also a potential concern for energy-efficiency measures which seal the building shell. Similarly, the costs of technologies for disposal of toxic waste or control of air and water emissions could erode the financial viability of a specific firm or a particular project.

Sometimes, environmental control regulations require the use of innovative technologies that have not been demonstrated commercially. Such a requirement can add enough uncertainty to a project to render it unsuitable for performance contract financing. For example, the South Coast Air Quality Management District in Los Angeles, California revised its regulations in 1984 to require that cogeneration projects use a new control technology, selective catalytic reduction (SCR), for the control of nitrogen oxides. While

SCR has been used in Japan for several years on large (over 100 MW) gas turbines, it has not been demonstrated in the United States nor applied to small (25 MW) gas turbines. The long term operating costs and performance of SCR were not guaranteed by the manufacturers. If the technology does not perform to its expected level of pollution control or if the costs for operating and maintaining SCR are prohibitive, the district could close down the cogeneration project.

A performance contractor cannot easily absorb these types of risks. Three project developers were notified on the 179th day of the 180-day statutory period for review of air quality permit applications that their projects were now subject to the SCR requirement of the new regulation.

In conclusion, a project needs to be alert to regulatory changes, which can occur at any time and dash the viability of projects. As projects become larger and more complex, they take longer to develop, have a greater potential environmental impact and are consequently more vulnerable to regulatory constraints.

THE ENERGY OUTLOOK

The energy outlook is the underlying driving force behind performance contracts for energy projects. Developers, financiers, regulators, and the owners of host facilities share common expectations about the energy future and the relative bargaining position of the various parties.

In the past few years energy has faded from a crisis to another aspect of the "infrastructure problem." After the oil price shocks of the 1970's, the price of fuels was forecast to double in five to ten years in response to worsening supply shortages. In response to higher prices, the demand for energy has dropped and the supply of energy has increased. Indeed, there is a current surplus of oil, gas, and electricity generating capacity. However, market forces go in cycles. Low demand and excess supplies dampen prices. Reduced prices encourage additional demand and discourage the development of new resources. Eventually higher demand and dampened supplies lead to higher prices. Over the lifetime of a specific project, any developer has to anticipate several such cycles. Yet revenues from the project must be accurately forecast over at least the financing period. The developer, therefore, has to anticipate swings in the general energy outlook and the perspectives of

regulators. What initially appears to be a robust investment may deplete its financial reserves in the first decade and be considered awash in windfall profits in the second decade.

Occasionally, regulatory perceptions are frozen in past expectations. For example, in California many regulators perceive cogenerators as "cash cows," which can support innovative pollution control technologies and other exotic forms of regulation. This perception was based upon forecasts of the financial viability of cogeneration projects when rapid escalation in fuel prices was anticipated. However, current expectations for fuel prices increases are substantially lower. In effect, the value of the output from these projects, as perceived by the financial community, has substantially eroded in the past two years. Many of the previously solid projects are now marginal and may be eliminated by increased regulatory burdens created by reactions to the short-term energy outlook.

One way to reduce the effect of shifts in the energy outlook is to focus on energy-efficiency projects rather than producing power for sale to a utility. The revenues from projects that sell power to utilities are expected to follow marginal energy costs which fluctuate with the cycles of supply and demand. The revenues of energy conservation projects, on the other hand, are related to average retail rates which are generally more stable and predictable.

CONCLUSIONS

The demand for performance contracting will continue to grow and expand in scope, especially for public facilities. For example, in 1984 Governor Deukmejian's Infrastructure Task Force predicted that there will be a shortfall of public funds in California of $29 billion for deferred maintenance and $40 billion for new infrastructure construction over the next ten years. More than 20 percent of this shortfall will be for energy-related facilities. Integrating energy services projects with those for other service needs, such as telecommunications and waste treatment, will offer new challenges and opportunities. Moreover, a recent study by the U.S. Department of Energy estimated that cogeneration will grow to over 39,000 MW nationally by the year 2000 and that 40 percent of that cogeneration will be developed through performance contracting.

For these performance contracts to succeed, developers need to address relevant external factors such as tax laws, the regulatory climate and the general outlook for energy. The performance

contracting industry will need to take greater responsibility for these external factors through direct involvement in congressional and state legislative forums, participation in public service commission ratemaking and avoided costs proceedings, and by generally educating public officials and policy makers about the perspective and needs of the industry. This active regulatory role will require dynamic trade associations, such as the National Association of Energy Service Companies and the California Independent Energy Producers.

Until energy policies are more predictable, the most successful projects will minimize exposure to the impacts of changes in tax laws, utility and environmental regulations, and energy prices. They will accomplish this by focusing on the conservation or displacement of retail sales of electricity rather than by selling power to utilities. The best projects will be kept as simple as possible, striking a reasonable business arrangement that provides benefits to the ratepayers and taxpayers. Finally, the successful projects will involve participants who do not expect too much too soon.

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Financing Energy Conservation.

Municipal Solar Utilities: The Promise and the Reality

Jan Hamrin

INTRODUCTION

It is called a municipal solar utility (MSU). It could just as well be called an energy services company, a community development corporation, a micro-utility, or any number of other titles. It is a method of packaging, marketing, financing, and implementing the delivery of energy efficiency and renewable energy projects in an organized fashion at the local level. This chapter examines MSU leasing and micro-utility programs as forms of performance contracting, in which the private sector (typically, but not always) provides the financing while the public sector develops the organization and guidelines to deliver that financing. The principal lesson learned in the MSU experience is that there are several ways for public entities to structure their involvement in the delivery of energy services. With imagination and an understanding of the needs of the private sector, municipalities can create innovative energy programs which benefit all involved.

WHAT IS A MUNICIPAL SOLAR UTILITY LEASING PROGRAM?

Under an MSU leasing program, a community uses public or tax sheltered private investor funds to buy, install and maintain solar devices, such as water heaters, on privately owned buildings. The solar systems are leased to the building owner for a monthly fee which is less than what the consumer would pay for conventionally

heated hot water. The consumer does not have to provide any money to buy the system; he or she must simply make monthly lease payments. If the city purchases the system with public funds, it keeps the lease payments. If third party investors pay for the equipment, the city keeps a portion of the lease payment in exchange for its brokerage service, and forwards the balance to the investor.

This amounts to performance contracting for hot water. Most consumers will lease the solar water heater only if the lease payments are less than what the water heating bill would otherwise be. The consumer saves money on water heating bills and the city and/or third party investor make a profit in that the lease payments more than pay for the investment over the life of the equipment. (Third party investors get most of their profit from tax credits, which they obtain as the purchasers of the equipment.)

The MSU leasing program helps overcome the barrier to solar commercialization posed by high capital cost. It also enables solar heating to reach low-income, rental, multifamily, and commercial markets which would be slow to make solar investments under normal market conditions.

The initial cost is only one of the significant barriers to solar energy use. A lack of general public confidence in solar technologies is also a barrier, due in part to technical innovation, fear of obsolesence and the fact that the solar industry is relatively young and does not yet have a long-term performance record.

Through solar leasing programs, local governments play a major role in providing consumer protection by establishing procedures and processes to: 1) ensure that the solar systems available for lease are of good quality, 2) assure that leasing companies that are permitted to participate are sound companies, 3) ensure that installers are appropriately licensed and do competent work, and 4) require that leases specify full service and maintenance at no cost to the consumer along with other consumer protection provisions.

Description of a Typical Lease Transaction

1. A property owner hears about the city's solar leasing program and calls the city to obtain a list of the names and telephone numbers of participating leasing companies (or the customer might contact a leasing company representative directly).

2. The customer compares the equipment and lease terms available from the various companies and selects the lease that best suits his or her needs.
3. A lease is signed and the owner or installer applies to the city for a permit to install a solar system.
4. Once the system is installed, it is inspected by a city building inspector to ensure that it is installed and operating correctly.
5. If the city is going to do the billing, a copy of the lease and inspection approval is submitted to the city, which then adds the lessees name to the city's billing roles. The lessee can cancel the lease at any time within the terms of the contract.
6. If there is any problem with the system, the lessee contacts the company listed on their contract to make timely and appropriate repairs. (All maintenance is included in the lease agreement.)
7. Should any dispute arise which cannot be promptly settled through reasonable discussion, the lessee may request a hearing before the arbitration board.
8. If the city is doing the billing, the city remits a portion of the lease payment back to the management and leasing firms according to the terms of their agreements with the city.

The critical element of the leasing program is tax credits. Because of the federal energy investment tax credits, investors are able to obtain tax shelter benefits from investing in solar systems that are leased to residential customers. Because of the tax benefits, investors need little in the way of income for them to invest in equipment for a solar leasing program. When the federal tax credits expire at the end of 1985, this type of program will lose its primary attraction.

After 1980, California property owners leasing such equipment were eligible to receive a tax credit for the portion of the lease applied to the principle payment of the system. In addition, many owners or renters of multi-family property were also eligible for a $9 per month per unit rebate from their local utility for having installed solar water heating on their rental units. When added to the following cash flow analysis, these tax credits and rebates make solar equipment leasing even more attractive.

Table I illustrates that leased solar systems with the corresponding California state solar tax credits (55 percent for single family and 25 percent for multi-family) are cost effective in all cases where electricity is used to heat water. They are marginally cost effective in multi-family residences that use gas to heat water. If

TABLE 1. Sample Solar Leasing Costs and Savings (with solar tax credits—55% single family, 25% multi-family).

		Electric	Gas
Single Family	Cost to heat H_2O		
$25/month lease payment	without solar:*	$427.00	$149.93
= $300 x .55 = $135	Net cost of lease:	$135.00	$135.00
	Savings:	$292.00	$14.00
	Back-up energy expenses:	$115.46	$50.98
	TOTAL NET SAVINGS:	$176.54	(-$36.98)
Multi-Family	Cost to heat H_2O		
$10/month lease payment	without solar:	$348.91	$139.51
= $120/year x .25 = $90/year	Net cost of lease:	$90.00	$90.00
	Savings:	$258.91	$49.51
	Back-up energy expenses:	$52.75	$47.43
	TOTAL NET SAVINGS:	$206.16**	$2.18**

there are additional federal deductions available to owners of multi-family units, then the net savings will be even greater.

Besides the benefits to the citizens of the community, solar leasing programs provide direct benefits to the city itself in the form of revenue. A community with an MSU solar leasing program frequently charges leasing companies a fee of 3—10 percent of the gross receipts in exchange for the services provided by the city (billing, marketing, arbitration, inspection, etc.). Table 2 provides a sample cash flow for a city program. The net revenue can then be used to operate the city's energy office.

MICRO-UTILITIES

The solar micro-utility utilizes the same federal tax incentives as a solar leasing company in acquiring capital to procure solar equipment. The primary distinguishing characteristic between the two is the manner in which they collect revenues.

A solar leasing company uses a predetermined, flat rent to generate revenue. A micro-utility essentially sells heated water, (or

* Using 1983 utility rates (Southern California Edison and Southern California Gas).

** Federal business deduction (25%) could add $30 to the net savings for multi-family.

TABLE 2. Solar Leasing Program Revenue Estimates for a City Charging a 5% fee.

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue to City	$2,700	$14,400	$23,400	$32,400	$41,400
Cost to City	16,000	10,000	10,000	10,000	10,000
Net revenue	(-$13,300)	4,400	13,400	22,400	31,400
Balance forward	0	(-13,300)	(-8,900)	4,500	26,900
Cumulative revenue estimate	(-13,300)	(-8,900)	4,500	26,900	58,300

ASSUMPTIONS:

Number of units leased:	1st year - 500	After - 1,000
City's share of gross:	0.05	
Constant for even distribution:	0.60	
Initial cost to establish program:	$6,000	
Cost per year to administer program:	$10,000	
Average lease payment:	$15	

heat) and its revenue is determined by the amount of energy the solar equipment produces. The more energy produced, the higher the revenue generated.

Generally, a micro-utility company will lease roof space for a minimal sum from an apartment owner. Equipment is installed to service the building's hot water needs. Revenue is determined by the savings resulting from the use of the solar heating equipment. A base level of therms is determined by month or quarter of the historic energy use of the building (1 to 3 years). These savings are then shared by the owner and the leasing company (usually on a 20/80 basis).

Many cities have chosen to encourage micro-utilities rather than establish an MSU leasing program. The micro-utility approach guarantees consumer protection with no up-front cost, since the customer only pays if there are measured energy savings.

HISTORY OF MSUs

In the late 1970's there was a rapid increase in publicly financed conservation and renewable energy programs in California. Between 1975 and 1980 the California Legislature enacted 20 pieces of solar energy legislation, including a 55 percent solar tax credit (the largest tax incentive of any state) passed in 1977. There

were hundreds of thousands of dollars in grants and loans for conservation and renewable energy development at schools, hospitals and local government facilities. The federal government provided millions of dollars for weatherization programs, job training in energy related fields and rehabilitation of substandard housing. The California Energy Commission (CEC) instituted a testing, certification and labeling program for flat-plate solar collectors. Local governments, however, were at the forefront in developing innovative programs to stimulate the actual use of solar and conservation devices.

In 1976, the City of Santa Clara initiated the first municipal solar utility program in the country. With public funds, it financed the purchase, installation, and maintenance of solar systems, which were leased to private swimming pool owners. This was the first time a local government had become involved in the marketing and installation of solar devices on private property. The capital for beginning and expanding the operation was borrowed from the city utility reserves.

The Santa Clara program was successful because it provided for actual solar performance: 1) Solar energy equipment could be utilized without having to incur the up-front capital costs for the purchase of a system. 2) The city's installation and maintenance of the systems assured lessees that the equipment would perform properly and effectively, and demonstrated that solar installations would save energy and money. 3) By publicizing the cost-effectiveness and performance of solar equipment, the MSU encouraged private parties to purchase their own solar heating systems.

This successful program captured the imagination of many, including the then young and enthusiastic California Energy Commission. Because of the favorable response to the Santa Clara program, the CEC funded a pilot project in 1979 for the development of MSUs in six cities: Oceanside, San Dimas, Palo Alto, Bakersfield, Ukiah and Santa Monica. Under the CEC program, the cities were to use the Santa Clara model as an example and then develop an MSU energy plan tailored to the needs and characteristics of each jurisdiction.

Changing economic and political circumstances were beginning to eliminate the federal, state and local monies available for energy programs. The pendulum was shifting away from heavily government-financed projects toward public/private sector joint ventures in the energy area.

In 1980 technical changes in California solar tax credit language allowed tax credits for leased systems and systems placed on multi-family housing. This was just what the City of Oceanside needed. Oceanside designed its MSU program to incorporate leasing, particularly for multi-family residences, through a joint venture with private sector companies. In this mannner, even tenants could enjoy the benefits of solar water heating without having to buy the equipment.

Many communities do not have the funds to finance a program like the one developed in Santa Clara. Therefore, the solar leasing program developed in Oceanside rapidly became the most popular variation for marketing solar equipment within a Municipal Solar Utility.

By the end of 1982, MSU leasing programs had been established in three communities (Oceanside, San Diego and Monterey Park) and forty other California communities had passed enabling ordinances expressing their intention to implement similar programs. Unfortunately, just about this time, things began to unravel.

What Happened ?

1. First, the California tax credits came under attack, and everything stopped while the legislature tried to decide whether to extend them or cancel them retroactively.
2. The California tax credits were extended, but at the last minute the language with regard to leased systems was changed to allow credits for systems leased in non-MSU cities as long as they complied with the guidelines laid down by the California Energy Commission. The CEC did not immediately promulgate rules and regulations. Because of the lack of CEC action, it became easier for leasing companies to lease in non-MSU cities than in communities with MSUs, since MSU cities had regulations governing leasing and non-MSU cities did not. The CEC is still developing rules and guidelines for tax credit eligibility for leased solar equipment in non-MSU areas.
3. The money for utility rebates to multi-family units with solar systems ran out, so another incentive was lost.
4. The IRS decided to begin a wholesale investigation of companies involved in leasing solar systems and/or directly involved in solar rebate programs.
5. The tax shelter aspects of these programs caused solar system prices to become inflated. It will be very difficult for them to be reduced.

6. Micro-utility and other types of shared savings programs have begun to emerge as more attractive options to owners of commercial property, though they are compatible with an MSU program.
7. Natural gas rates have not escalated quite as rapidly as expected. Although this has not been a major problem for straight leases, it does affect micro-utility programs. Since the solar company gets 80 percent of the potential savings, any loss of enthusiasm is most likely on the part of the solar companies considering going into this business.

PRESENT STATUS OF MSU PROGRAMS

Of the six original MSU cities, San Dimas, and Bakersfield never developed programs, and Palo Alto and Santa Monica had plans for MSU leasing programs but never formally initiated them. (These two cities do have very active conservation and solar programs, which are not labeled as MSU programs). Ukiah is involved with an MSU program which encompasses the county of Humboldt. They have instituted an active MSU leasing program described below.

The cities of San Diego, Santa Barbara and Monterey Park all developed and tried to implement MSU leasing programs in 1983-1984. Santa Barbara and Monterey Park have as yet had no leasing companies take an interest in instituting programs there, so both those programs are on hold. San Diego (City and County) cancelled their program after the 1983 changes in the California tax legislation pertaining to leased systems.

Because of the success of the original Oceanside MSU leasing program, numerous companies came to the Oceanside/San Diego area with lease and micro-utility programs. As a result, approximately 15,000 multi-family units were equipped with solar water heating systems between 1982 and 1984, saturating the multi-family market in San Diego County. However, there is still a significant market potential in the multi-family sector throughout the rest of the state. For example, the City of Palm Springs has adopted and is planning to implement a program similar to Oceanside's.

The Oceanside program must be declared a total success. Their target was 1,000 multi-family units served by solar systems within five years. They reached that number after only two years.

All of these were done in conjunction with the utility rebate program, which made them very cost-effective. Now, two of the leasing companies have developed reasonably priced packages for single family residences, and the city is looking forward to success in this area as well. While leasing and micro-utility programs are designed primarily for sites with significant hot water use, some single family residences will yield attractive economic returns under these alternative financing options.

Over the two years the leasing program has been in existence, there have been no problems with maintaining or servicing the equipment. In addition, during that time three single family homeowners who had leased solar systems sold their homes. The leases were transferred through with no problem. The model has definitely worked, and the city has acquired sufficient revenue to operate its other energy programs.

The new Humboldt County program is also looking very good. In this case, the community is doing a vigorous publicity and marketing program for the leasing companies, with TV ads on Good Morning America and the CBS Evening News. In exchange, they collect a 10 percent marketing fee. Because the program is on a county-wide basis and includes both single- and multi-family installations, they should be able to generate enough revenue to pay for the advertising and pay for the operation of the Redwood Community Action Energy Office. There are plans to expand this program into Mendocino and Lake Counties.

In addition, much preliminary time was spent developing leasing programs using local investment money. This is another first. Because even the investment capital is local, the county receives the additional benefit of sales tax revenues from the equipment sales.

ANALYSIS AND PROSPECTS FOR THE FUTURE

The idea of joint venture between the public and private sector is a good one. The MSU as an institutional structure for organizing, financing, publicizing, and marketing solar and other conservation and renewable energy devices as well for providing consumer information is also a good idea. It works. The Oceanside program has been an outstanding success. The Humboldt program looks as though it too will be very successful.

An MSU leasing program, lease purchase and/or micro-utility program is still an excellent concept for new, highly capital-intensive technologies. Such a program would be particularly appropriate for the dispersed application of photovoltaics, which face the same commercializaton barriers as solar water heating—high initial cost and low public familiarity and confidence in the product.

The success of MSU programs hinges on the availability of investment capital for initial purchase of the solar equipment. If the federal energy investment tax credits were extended a few more years, many other communities could establish MSUs. Without the tax credits, there are few sources for financing the equipment. One possibility is the use of local retirement fund monies or insurance funds. Another option is to apply petroleum violation escrow account funds (monies being refunded to the states from oil companies which overcharged for their products several years ago) if they ever materialize. Barring the development of new financing sources, the demise of federal energy tax credits at the end of 1985 could spell the end of solar leasing programs as we have known them. The saying that "those who live by the tax credit die by the tax credit" is particularly relevant.

In the meantime, some useful structures are in place, and others are ready to go. The idea of a program which provides energy savings or equipment at no initial cost to the consumer, provides information and standards for operation, provides for all maintenance and repair, provides a forum for arbitration of disputes and may cycle enough revenues back to the community to fund other energy programs is one worth rescuing. This program deserves some critical thinking and creative suggestions for its transition into the next phase.

TIPS FOR STARTING A MUNICIPAL SOLAR UTILITY

In analyzing the feasibility of implementing a public/private program for the leasing of solar equipment, the following activities should be undertaken:

- Develop overall program goals and objectives.
- Assess consumer demand for leased solar equipment.
- Develop an appropriate model through which solar equipment leasing can be conducted as a public/private program.

- Estimate the proposed program's impact on the existing resources of the public sponsor with recommendations for securing additional resources if needed.
- Estimate a program's potential to generate revenue for the public sponsor, (if appropriate).
- Estimate a program's potential to conserve nonrenewable energy resources.
- Identify the specific relationships to be fostered between the public sponsor and private businesses participating in the program.

If the leasing program is considered to be feasible, then the following additional tasks must be undertaken:

- Draft required ordinance(s) establishing the proposed program.
- Prepare program criteria for the assurance of consumer protection (solar system and installation guidelines, establishment of an arbitration board, guidelines for private sector participation).
- Develop job descriptions for additional staff identified as being necessary for program implementation (if appropriate).
- Present the proposed program to community organizations and to appropriate local government bodies.
- Establish a liaison between the public sponsor implementing the program and other parties undertaking similar programs.

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Financing Energy Conservation.

General Public Utilities: Buying Residential Energy Conservation

George Reeves and Marilyn A. Brown

INTRODUCTION

Securing a measurable reduction in residential energy use has always been a major problem in conservation programs. Programs which work well in theory or even under controlled tests seldom show similar success in the field. The problem is not in the measurement. The problem is frequently with the programs.

Let us propound a theory to explain the problem. The theory is: "Conservation Programs Generally Aren't!" What the public normally thinks of as conservation programs and even what the so-called experts think of as conservation programs are not that at all. They are promotional programs for measures or practices which we believe will probably result in conservation.

For example, low- and zero-interest loan programs promote loans; federal energy tax credits promote purchases of solar and conservation equipment; and energy-efficiency rating incentives promote the purchase of new, high efficiency air conditioners. There are many more examples of similar programs that promote or subsidize equipment or materials that we believe will lead to conservation. Unfortunately, all we know is that subsidizing loans will result in more loans and that paying for insulation will result in more insulation. While there is some correlation between the amount of money spent on insulation and energy conservation, it is not always as high as we had expected and seldom as high as proponents would have us believe. This leads to a correlary to our previous conservation theory: "Don't pay for insulation...Buy conservation."

The message is as straightforward as it should have been obvious. If we want insulation, energy audits and weatherstripping, we should pay for insulation, energy audits and weatherstripping. But if we want conservation, we should pay for conservation. A program called RECAP offers a good way to do just that.

The Residential Energy Conservation Action Program (RECAP) was conceived by New Jersey's Senator Bill Bradley. Public Law 96-275, sponsored by Senator Bradley, authorized the U.S. Department of Energy (DOE) to sponsor demonstrations of the concept. DOE had previously funded research at Princeton University to quantify the residential sector's technical potential for saving energy. With the RECAP concept, DOE saw an opportunity to test and expand this technical research on a larger scale and in a commercial environment. General Public Utilities (GPU), a holding company for several utilities in New Jersey and Pennsylvania, began working with DOE to conduct a pilot test of the program.

GPU's largest utility, Jersey Central Power and Light (JCP&L), took the lead and participated in a 1,000-home pilot test in Lakewood, New Jersey. Based upon the results and experience of the pilot test, GPU initiated five large-scale programs covering up to 12,000 homes. Three of these are located in the JCP&L territory, two in the Metropolitan Edison territory, and at least one future project is anticipated for the Pennsylvania Electric Company.

This chapter focuses on GPU's experience with RECAP. Has RECAP been a success? What is the potential for wider application of the concept? Also, what lessons were learned in the initial pilot program?

WHAT IS RECAP?

Without getting into the details of the individual contracts, let's look at the RECAP basics.

First, the utility enters into a contract with one or more energy conservation companies (ECCOs) to provide conservation retrofits to a specified number of the utility's customers. The ECCO can be a private contractor, a nonprofit community organization, or some other type of organization.

Second, the conservation company conducts free energy audits for residences in a particular geographic area. If the conservation

company finds a need for conservation retrofits and determines that they are cost-effective, then the ECCO installs them at no charge to the occupant or owner.

Third, the utility does not pay the conservation company for the measures installed. There is never any obligation on the utility to pay for the retrofits. Rather, the conservation company is paid by the utility for actual reductions in energy consumption—and these must be measured savings! Since GPU is an electric-only utility, payment is based on a reduction in kilowatt-hours billed and metered, weather adjusted. Thus, electrically heated homes are the market, although the RECAP concept can work with any measurable heating system. (Gas homes were included in the RECAP pilot effort.)

Fourth, the payments are made and savings monitored over a period of several years to insure that the conservation company has a continuing interest in the conservation efforts for each participating home. This schedule improves the incentives for good workmanship and quality control and gives the ECCO a financial incentive in long-term educational programs for that residence—even after there has been a change of occupant. It is to the benefit of the utility not to have the payments and measurements stretch out too long, but a minimum of three years is recommended to assure long-term cost-effectiveness.

While RECAP is free to the customer, there are several requirements for household participation. First, households must accept timer control of their electric water heater. A time-of-day meter is connected to a relay that turns off the water heater during peak periods (weekdays from 8:00 a.m. to 8:00 p.m.). An override is also installed so that the hot water heater can be turned on for a short period during these peak hours. Second, the utility places the customer under a "non-time-of-day" rate. Energy savings are tracked for the customer and when the value of the savings equals the cost of the incentive, the customer is then switched to the "time-of-day" rate. This ensures that the value of the incentive is not subsidized by the entire customer base.

CURRENT STATUS

After completion and evaluation of the initial pilot project, GPU elected to modify the program and offer it in each of its three operating companies.

Metropolitan Edison attracted energy conservation companies through a request for proposals (RFP). The RFP specified two market areas centered on the Pennsylvania cities of Reading and York and their surrounding counties. Following the selection process, negotiations led to a contract with one firm to implement the RECAP in the York area and another ECCO for work in and near Reading. The contracts were signed during the spring of 1983, and work began soon thereafter.

Between August and October 1983, JCP&L signed contracts with three ECCOs. GPU's third operating company, Pennsylvania Electric Company, is currently negotiating with several ECCOs to implement RECAP in the Erie, Pennsylvania area.

By the end of 1984, several of these contracts had been canceled because contract staff and attorneys determined that the insurance policy of the contractor was not sufficient protection for GPU. At the time of the cancellation, the ECCO had already retrofitted 400 homes. For those homes, GPU and the contractor negotiated a revised estimate of savings. Other contracts went more smoothly, and one firm implemented nearly 2500 retrofits for JCP&L and 1500 for Metropolitan Edison by late 1984.

EXPECTED COSTS AND BENEFITS

Because GPU is paying directly for energy conservation rather than receiving it through some indirect method, the cost of the conservation has been relatively low. The actual costs are a negotiated item and vary depending upon the ECCO and the conditions negotiated. At JCP&L, electric rates have more than tripled over the past ten years. Rates have doubled in that same period for the Pennsylvania companies. Because the payment for conservation is fixed by contract, the RECAP benefits to customers and GPU itself will increase over time if electric rates continue to go up. Engineering estimates suggest that participating customers can reduce their total household electricity use by 16 to 26%.

Acquiring resources through RECAP also compares very favorably with the cost of new generating capability. In the contracts negotiated to date, average costs to the utility are running less than three cents per kilowatt-hour saved plus about $50 per kilowatt of demand reduced. This compares to new capacity cost of about $3,000 per kilowatt for a nuclear plant to go on line later this decade and about $2,000 for a nuclear plant just coming on line

now. A new coal plant costs slightly less. Depending on the utility, the cost of existing capacity usually falls in the $400 to $700 per kilowatt range.

Next to its low cost, the single most important aspect of the RECAP concept is its reallocation of the financial risk associated with conservation efforts. In most conservation programs, the group that benefits most and usually makes the most promises is the private contractor/installer/equipment dealer. These participants also have the least amount of risk because they are paid and get all the benefits due them even if the measure does not result in any energy efficiency improvement. It is the homeowner, the local community, and the utility company that typically wind up absorbing the risks (and they are significant) that conservation investments will not perform as anticipated.

Under RECAP this is not the case. If conservation is less than expected, there is no risk to the resident, community or utility. In no instance do they have to pay for unrealized conservation. Instead it is the private ECCO who is responsible for selecting and installing the measures and who absorbs all of the costs of not fulfilling its promises. On the other hand, everybody will share in the benefits if the amount of conservation equals or exceeds the original estimate.

Because the ECCO is paid on the basis of how much energy is actually conserved, it has a great incentive to maximize savings. This incentive is very important not only because it helps to assure high-quality work, but because it helps keep costs low. The ECCO will try to minize costs since it will have the opportunity to share in additional payments if the conservation measures are more successful than anticipated.

LESSONS LEARNED

One frequently suggested variation to RECAP is that the resident pay for all or part of the conservation payments. GPU ran an extensive test to evaluate this alternative. Under such a program (call it RECAP Junior), the ECCO provides the customer with a free energy audit and implements cost-effective conservation retrofits. The resident then pays a monthly charge to the ECCO or makes a one-time payment for a smaller total.

The ECCO guarantees the occupant that the savings will exceed the monthly payments over the two or three years in which the payments are made. In the event of a one-time payment, the ECCO guarantees that the savings will exceed the total paid within two years. If savings do not exceed payments during the guarantee period, the ECCO refunds the difference to the resident.

JCP&L tested RECAP Junior (officially known as the "50/50 Program") in 2000 homes. About 8% of the target group contracted for the retrofits, with costs averaging $1,500 each. The level of success is well above the average for major conservation retrofit programs.

Nevertheless, GPU concluded for several reasons that full utility sponsorship was more attractive than the 50/50 program. First, implementation costs are usually 30 to 50 percent lower under the utility program. Under RECAP Junior the average cost was almost $1,500 per house. The same firm has installed basically the same sets of measures in two regular RECAP programs at an estimated cost of only $800 (in New Jersey) to $1300 (in Pennsylvania).

Utility sponsorship also assures uniform, universal application. This is an equal opportunity conservation program saving money and energy without regard to race, color, creed, age, national origin, income levels, type of housing, credit worthiness, educational levels, intelligence, civic-mindedness, etc. Analysis of other major conservation programs indicates that the normal purchasers of conservation retrofits tend to be people of above average income who own their own larger-than-average home. Few renters or low income people invest in energy conservation measures. This self-selecting discrimination does not happen in RECAP.

Since the utility pays directly for the program, it can influence which measures are installed, the quality of the workmanship and where the work is done. This influence is especially important by allowing GPU to include demand-reducing measures which will cut costs significantly while benefiting the customers many times over. Utility involvement also assures that payments, savings and guarantees are fully and accurately calculated. Finally, there are strong indications that it is less expensive for the utility company to pay for the conservation itself than to try to influence customers to pay through other programs.

KEY ISSUES

Three key issues currently relate to further implementation of programs like RECAP. These are: the youth of the performance contracting industry, criteria for selecting RECAP communities, and the choice of marketing activities by the utility companies and ECCOs.

The performance contracting industry is small—about 100 firms—but growing rapidly. While business is booming, the history of the industry is short. The large majority of performance contracts have yet to be completed. Further, performance contracting for energy conservation in the residential sector has lagged behind the other sectors. The lag in this sector can be largely attributed to the difficulty in achieving economies of scale. In a market of single-family homes, it is necessary to minimize transaction costs by using standardized procedures. Similarly, risk to the ECCOs is reduced if they must be concerned with controlling few or one point of energy use (as in a commercial facility) versus individual homeowners.

This infant industry status will lead to a number of barriers in implementing other RECAP programs. First, the small number of ECCOs, particularly those with experience, will make it difficult for utility companies to find local companies willing and able to implement such programs. Second, obtaining an "assured performance bond" or "energy performance warranty insurance" may be difficult for new, small ECCOs. This problem is complicated by the general inexperience on the part of ECCOs, utilities and others in developing workable and efficient program parameters. Finally, there is the issue of cash flow. Since there are no up-front payments under the RECAP programs discussed herein, revenues do not begin immediately to flow to the ECCO. The resulting strain on ECCOs is real and may require some form of up-front payment to ease this burden.

ECCOs working with GPU encountered several problems in regard to selecting the areas to be served by the RECAP program. First, it is expensive to work in geographically dispersed areas due to the high cost of transporting personnel and materials to retrofit sites. Directing marketing efforts to one or a small number of neighborhoods sequentially helped to reduce costs. The identification of compact areas for future RECAP efforts will be a key to maintaining reasonable program costs.

It is easier and less expensive to perform energy audits and retrofits on groups of similar houses with similar occupants than to

deal with widely varying housing stock and demographics. If audit and retrofit work cannot be replicated easily, costs soar. Another advantage of dealing with relatively homogeneous housing and communities is the likelihood of there being community leaders who might be willing to endorse the program.

Attached housing can be a difficult market area for programs like RECAP because of problems with "holdouts." The effectiveness of an energy-efficiency program in attached housing can be significantly diminished when only a subset of occupants participates. ECCOs should thus either avoid working with attached housing or emphasize marketing to minimize holdouts.

Turning to marketing strategies, it is clear that specific strategies must be tailored to each targeted community. For example, strict eligibility standards were introduced in one RECAP community. Because the community was very close-knit, ill-will was quickly generated. A "consolation package" was developed for those households deemed ineligible. Such consolation packages should be prepared in advance rather than as a reactive solution.

It may also be necessary to design eligibility requirements and promotional activities to suit different RECAP program goals. The ECCOs involved in RECAP thus far have tended to select one of two combinations: (1) eligibility and promotional activities aimed at achieving high program penetration of a streamlined retrofit, or (2) more stringent eligibility requirements and narrower marketing efforts resulting in lower adoption of a more thorough retrofit. It is unclear at this point if one combination is better than another; judgment must await analysis of energy savings.

Finally, other marketing strategies may be universally appropriate for RECAP projects. One example is civic group endorsement. The endorsement of RECAP by a condominium association was found to be invaluable in two retirement communities in New Jersey. This strategy might be expanded by securing the endorsement of civic associations such as state and local Chambers of Commerce.

CONCLUSIONS

While it is still too early in the process to comprehend the full possibilities of RECAP, GPU is very optimistic based on the limited experience to date. From 1983 to 1993, it is estimated that the current RECAP projects will save the utility and customers an

estimated $104 million in 1983 dollars. In the first 15 years, savings are estimated at $214 million. Payments to the RECAP contractors will be about $500,000 per year over the 15-year term of the agreements. Because the administrative costs to the utility are extremely small and since there are no costs to the participating customers, net benefits are very high.

The next rounds of RECAP will probably incorporate an up-front partial payment to the ECCOs to enhance the ECCOs cash-flow. GPU hopes that an up-front payment plan will attract smaller contractors to the RECAP program.

Meanwhile, some major issues will require additional analysis. What type of residences are entering the RECAP program? How do these differ from those who are not selected? What will this selection process mean for the utility in the future? Has the introduction of RECAP actually changed the energy use of customers who enter the program? Have RECAP participants chosen increased household comfort over reduced energy bills? Analysis of these issues will ensure an even stronger RECAP program structure in the future.

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George Reeves is the manager of General Public Utilities Corporation's $40 million per year conservation and load management program. His twenty year career has included posts as long range planning manager for the Edison Electric Institute and project manager on special assignment for the Electric Power Research Institute. Reeves is active in the American Society of Heating, Refrigerating and Air-Conditioning Engineers, where he has chaired that organization's Professional Development Committee and co-authored its handbook chapter on energy estimating and its national standard on energy conservation in new buildings. He has a bachelor of engineering degree in mechanical engineering from the Cooper Union and a masters of business administration in management from New York University.

Financing Energy Conservation.

Bonneville Power Administration's Purchase of Energy Savings

Harold (Skip) Schick and Leslie E. McMillan

INTRODUCTION

The Bonneville Power Administration (BPA) is the largest wholesale broker of electric power in the Pacific Northwest. In 1980, the Pacific Northwest Electric Power Planning and Conservation Act was passed mandating that BPA acquire cost-effective electrical energy conservation as the priority resource to meet future regional demand for power. Under the provisions of the act, BPA was authorized to borrow up to 1.25 billion dollars from the U.S. Treasury to finance its conservation efforts. Typically BPA borrows from the Treasury to finance the delivery of programs and repays that debt over a period of 20 years with funds collected through the sale of power. Although $1.25 billion may seem like a sizable amount, it falls far short of the dollars needed to finance the full cost-effective conservation potential identified in the region.

Since the agency has this upper limit on the amount which it can borrow from the U.S. Treasury, BPA has chosen to explore financial mechanisms which would pay for conservation out of monies received for electricity rates, or rate base payments, rather than funds borrowed from the U.S. Treasury. In order for BPA to rate-base payments for conservation, the program costs incurred in any one year must reflect benefits (i.e., energy savings) received during that year. In the commercial building sector, BPA has evaluated a

number of different financial incentive mechanisms designed to meet these criteria and stimulate investment in conservation technologies.

With the assistance of a consulting firm, BPA identified and studied more than 30 potential financial incentive options. These options were assessed in terms of their economic, institutional, and legal viability. Seven of these options were selected for more detailed analysis. This analysis led to a recommendation that BPA field test two financial incentive options, design a commercial conservation technical assistance effort, and conduct further research on an energy finance corporation. BPA's purchase of energy savings was one of the financial incentive options recommended for field testing.

Under the purchase of energy savings (PES) approach, BPA contracts with a sponsor such as an energy services company or architectural/engineering firm, to contact interested commercial building owners, audit the building according to BPA specifications, and recommend energy conservation measures as a result of the audit. Sponsors also are responsible for financing and installing these measures as well as maintaining them over the term of the contract. In turn, BPA makes payments to the sponsors on either an estimated or measured savings basis for the energy savings which occur over the life of the agreement. BPA's background analysis indicated that the relatively low energy prices in the Northwest resulted in lower return on energy-efficiency investments than for other parts of the country. Hence, PES was viewed as a means to increase the relative attractiveness for private companies to make energy-efficiency investments.

In the PES field test initiated in the spring of 1984, BPA awarded contracts to five sponsors to retrofit 29 commercial buildings (see Appendix.) In most cases, sponsors had no prior experience providing comprehensive energy conservation services, but the quality of their proposals and the work completed to date indicate that the sponsors have the ability to successfully complete a majority of the projects.

BENEFITS OF THE APPROACH

In conducting our analysis of the different financial incentive mechanisms, it became apparent that the purchase of energy savings approach could provide significant benefits to BPA and the

sponsors/building owners. One major benefit to the approach is its ability to meet BPA's borrowing constraints.

Unlike a grant or rebate program which offers an up-front lump sum of money, the purchase of energy savings approach enables BPA to make payments over a number of years, as the energy savings occur. This makes the approach ideal for rate-basing payments and preserving BPA's limited U.S. Treasury borrowing authority. Another major benefit is that BPA incentive payments are based directly on energy savings. This direct link to energy savings increases the awareness on the part of sponsors and consumers that BPA is buying conservation as a resource. A sponsor enters into a contract with BPA for a number of years and payments are made over the contract term to match the energy savings. This approach forces the sponsor to be accountable to the building owner as well as to BPA.

Most importantly, the purchase of energy savings approach has the ability to attract to the program a wide variety of sponsors, financing, and commercial buildings. Sponsors can include energy services companies, architectural and engineering firms, equipment manufacturers, utilities, and building owners. Proposals were received from these different types of entities under the field test. Proposals were submitted by large, nationwide companies, as well as small, local firms. Several new local firms were formed concomitant with, and perhaps in response to, the field test. Although BPA does not provide the up-front capital to finance the installation of energy conservation measures, the approach is compatible with a range of different types of financing. Field test sponsors are financing transactions through loans, leases, and shared savings arrangements. Finally, the purchase of energy savings approach is suited to many types of buildings within the commercial sector. Building types submitted for participation in these field tests include restaurants, hotels, motels, office buildings, supermarkets, retail stores, recreational facilities, and warehouses. The approach can also work well in the institutional or industrial building sectors.

PROGRAM DESIGN FEATURES

The program design includes features which fall into three main categories: technical, administrative, and financial. BPA requested potential field test sponsors to address these features in their

proposals. These proposals were evaluated and ranked. Contracts for the purchase of energy savings were then negotiated with the winning sponsors.

Technical Design Features

Technical design features include reliable energy audits for predicting energy savings, the methodology for measurement of energy savings, and environmental considerations such as indoor-air quality. To assure reliable energy audits, minimum requirements were established which specify qualifications for the auditor and the hardware used to perform the job. Sponsors requesting payments based on measured savings were asked to provide a methodology for measuring savings. The methodology was expected to establish a baseline from which to measure energy savings and identification of necessary adjustments (i.e., weather, occupancy) to the energy savings calculations. Environmental considerations such as indoor-air quality were handled by relying on professional engineering standards.

Administrative Design Features

Administrative design features include the ability and background of potential sponsors; the work plan and schedule necessary to complete the job, including coordinating the audit, financing, installation of the energy conservation measures, and the operation and maintenance of those measures. A description of each entity to participate in the field test and brief resumes of each member of the proposed project team were requested to evaluate the ability and background of potential sponsors. Experience in all relevant areas, such as auditing, financing, and project management, were considered. The work plan and schedule necessary to complete the job were evaluated to assure that all tasks mentioned above were included and could be completed in a reasonable amount of time. A description of personnel required to operate and maintain the energy system, the procedures to be used to do so, and the frequency of activities was requested.

Financial Design Features

Financial design features include the type of financing to be used (shared savings, leasing, internal financing, etc.), documentation of the financial stability of the sponsor and the participants, the terms of the contractual agreement, and the incentive level necessary to attract sponsor and consumer participation. BPA asked the

sponsor to describe the type of financing to be used to retrofit commercial buildings, including how the sponsor plans to secure the financing, the names of any financial entities to be involved, and copies of any financial documents. This information was reviewed for completeness and reasonableness. Documentation of the financial stability of the sponsor, such as an annual report or financial statement, and the number of years in business were considered as an indication of the sponsor's potential continued existence until termination of the agreement between the sponsor and BPA. The proposals submitted specified the term of the agreement (5—12 years) and an incentive level (cents per kWh saved) which is based on either estimated or measured energy savings up to a maximum amount of 4.0 cents per kWh.

LESSONS LEARNED: REDESIGN OF THE PROGRAM

BPA has now redesigned the program to incorporate lessons learned through field testing the approach. The major elements addressed in the redesign process include the incentive structure and level, the payment for energy savings, building eligibility and marketing. Additional sponsors have been solicited under the second phase of the program. Through this second phase, it is BPA's intention to build a program infrastructure capable of retrofitting many more commercial buildings and delivering significantly more cost-effective energy savings.

Incentive Structure and Level

As mentioned previously, BPA is seeking to identify and purchase the energy savings from all cost-effective energy-efficiency measures. In doing so, BPA does not want to pay any more than is necessary to stimulate conservation activity up to this level. For the field test, BPA stated that the total of BPA incentive payments would be no more than the cost of the installed measures. Sponsors responding to the solicitation for the field test requested rather high incentive levels and short payback periods for the commercial buildings to be retrofitted.

The problem with setting incentives based on the cost of the job is that the approach does not recognize the value of the energy savings to the sponsors/building owners. For example, if a job cost $20,000, BPA would pay the same fraction of that amount

regardless of whether there were 1,000 kWh saved annually or 100,000 kWh saved annually. Obviously, there is a big difference in dollar savings to the sponsor/building owner from these two different energy savings figures. BPA's objective in redesigning the incentive structure and level was to take into account the value of the energy savings from a specific job.

In its redesign of the incentive structure BPA considered two alternatives: payback method and paying based on rate of return. Using the payback method, BPA would offer to bring any package of cost-effective measures into a payback range acceptable to the sponsors/building owners. For example, if a sponsor identified a job with a four-year payback on all cost-effective measures, BPA would offer an incentive which would bring the payback down to a two- or three-year period. The primary disadvantage of using this method stems from the fact that BPA's incentive payments would be made all within a two- or three-year period rather than over a seven- or ten-year contract term, calling into question whether or not BPA's payments should be rate based rather than borrowed from the U.S. Treasury.

In its redesign of the program, BPA has chosen the second alternative, a rate of return method for calculating the incentive level to be paid to sponsors. Under this approach, BPA negotiates an acceptable rate of return with each sponsor for any building they retrofit under their contract. Once costs and energy savings have been identified through the audit, BPA's incentive can be calculated as the amount needed to assure the sponsor this acceptable rate of return. The primary advantage of using this method is that sponsors accept rate of return as an appropriate way of determining whether or not an investment is economically attractive enough. The primary disadvantage of rate of return centers on its potential complexity. The calculation must be clearly presented to avoid any misunderstanding about what is involved.

The Payment Method for Energy Savings

Within their proposals, field test sponsors identified whether they expected to be paid based on an estimated or a measured savings approach. Under the estimated savings approach, BPA and the sponsor agree on the conservation measures to be installed in a commercial building and the energy savings which are expected to occur. BPA then accepts the risk that the energy savings will actually occur by paying the sponsor a fixed amount on a periodic

basis. This fixed amount is simply the energy savings estimated to occur during the payment period times the incentive agreed to by both parties. Under the measured savings approach, BPA and the sponsor again agree on the conservation measures to be installed in a commercial building and the energy savings which are expected to occur. However, the sponsor then accepts the risk that the energy savings will actually occur by allowing its payments from BPA to fluctuate on a periodic basis. This fluctuating amount is the energy savings which actually occur, as measured by an agreed-upon methodology, times the incentive level agreed to by both parties.

In the field test, it was BPA's desire to encourage as many sponsors as possible to use the measured savings approach. BPA offered potential sponsors a choice of payment methods because of a concern that sponsors initially would be unwilling or unable to participate if the risk of achieving the expected energy savings was entirely theirs. Through negotiating contracts with sponsors for both payment methods, it has become clear that the program can be very different depending upon the payment method chosen. To choose the proper payment method for purchasing energy savings, the objectives of the purchaser must be considered. In BPA's case, if minimizing risk is the most important consideration, the measured savings approach seems appropriate. If maximizing participation is the most important consideration, the estimated savings approach may be most appropriate. Because BPA is seeking to attract participation to the program, sponsors can choose to be paid on either measured or estimated savings.

Building Eligibility

Only privately owned commercial buildings were eligible for participation in the initial field test of the purchase of energy savings approach. Included in this definition were office buildings, wholesale and retail outlets, hotels and motels, large multi-family dwellings, restaurants, and other small businesses. Excluded from this definition were any portions of a building which contain manufacturing/industrial processes and institutional buildings such as hospitals, government buildings, schools, etc.

In redesigning the program, BPA decided to expand the list of eligible buildings to include institutional, as well as privately owned, commercial buildings. BPA is confident that the technical design features developed for the program can be applied to both categories of buildings. Research indicates that the purchase of

energy savings approach can be particularly attractive to institutions due to their budget constraints and their limited ability to generate large sums of up-front capital. An entity such as an energy services company can provide the up-front capital to retrofit institutional buildings over time. Those institutional building owners with some flexibility to make investments on their own could become sponsors of the purchase of energy savings program. In doing so, they could receive the full benefit of the conservation savings within their buildings. State energy offices or large municipalities could consider this option.

Marketing

A variety of entities are capable of delivering commercial sector energy savings to BPA under the approach just outlined. These include energy services companies, architectural and engineering firms, equipment manufacturers, utilities, and building owners. Due to the low response rate on the solicitation for field test sponsors, an interview was conducted by a consulting firm of a sample of those entities which showed an interest by requesting the solicitation, but did not submit proposals. The results were revealing. We discovered that the mailing list contains a 50 percent built-in non-response potential due to multiple requests, ineligible requesters, and entities that requested information but never intended to respond. Of the potential sponsors left, 10 percent identified resource constraints, such as time and money to prepare a proposal, as reasons why they were unable to respond. Programmatic reasons for non-response accounted for the remaining attrition in the sample.

One programmatic reason potential sponsors did not respond to the RFP for the field test was the difficulty in locating building owners willing to participate. This is a concern because BPA needs to reach a significant portion of the commercial building stock through any programmatic effort offered. The problem seems to have two roots. First, within this program's design, BPA payments for energy savings will be made over a number of years. For this payment method to be attractive, the building owner or the lessee must have a long-term interest in the building and its energy use. Second, resolving economic constraints to implementing conservation measures is not a guarantee for successful conservation efforts. A lack of awareness about potential savings from conservation measures restrains much activity. Even when the benefits of

conservation activities are known to building owners, a lack of knowledge about how to initiate the activity may prevent any action.

In its efforts to increase sponsor participation for the second phase of the program, BPA has initiated an updated marketing effort. The objectives of the strategy are twofold: first, to disseminate information regarding the purchase of energy savings to as many potential sponsors and building participants as possible; and second to explain the purpose, objectives, and obligations of BPA, potential sponsors and participants, so that these entities have a sound basis for deciding whether to get involved in the program. BPA focused on developing a more comprehensive target market by updating its existing mailing lists to reflect additional energy services companies, architectural and engineering firms, equipment manufacturers, and utilities. State and local governments were also added to the list for receipt of the RFP. Prior to the issuance of the RFP, those entities targeted as potential sponsors received a pre-solicitation notice alerting them to its pending release. This pamphlet outlined the features of the program, the purpose and benefits of the approach, and the responsibilities of a purchase of energy savings sponsor. To help sponsors prepare their proposals and update others about the program, BPA conducted a series of workshops and bidders conferences in the Pacific Northwest.

Institutional

The final set of "lessons learned" has been in-house, regarding the viability of developing and implementing a purchase of energy savings program. Two prime elements stand out. First, program development and implementation take a long time. Secondly, once contracts are signed, significant work remains to monitor the projects and ensure that the program operates as planned.

Developing a "first-of-a-kind" program is complex and time consuming, due to the need to educate staff working on the project as well as support staff throughout BPA. From the initiation of planning to the signing of first-round contracts with sponsors took 22-months. The assistance of outside contractor support which had previous experience with performance contracting was a significant plus. Still, a successful new project requires that project design be judiciously approached. When a project is conducted over such a lengthy period, key staff leave or difficulties arise which further press schedules. For BPA, it will be critical to cut down on the

lead time required for project implementation if the purchase of energy savings effort is to be institutionalized as a region-wide program.

There is still a lot of work to complete projects once they have begun. Ensuring that detailed audits are in line with preliminary studies, inspecting installed equipment, reviewing billing information, and making timely payments are just some of the activities staff are faced with. As mentioned earlier, because pilot projects require long lead times, some building ownership changes and others drop out completely. Success is a reflection of the efforts of ongoing, active project management.

CONCLUSION

With the issuance of the second request for proposals, BPA expects the purchase of energy savings approach to evolve from a field test to a programmatic framework for purchasing energy savings. In initiating the field test, BPA developed a contract which identifies the responsibilities of BPA and the sponsor, and outlines the sequence of events required for the sponsor to obtain payments. Although BPA completed negotiations with five sponsors and was willing to accommodate their individual needs within the contract, the result of the process was a standardized contract applicable to all sponsors. This was one of the major accomplishments of the field test.

Under the redesign of the program, sponsors will be offered a contract which will allow them to add buildings incrementally instead of responding to the RFP with all buildings in hand. There will be periodic reviews of contractor performance in order to identify those sponsors who are active or inactive and BPA will reallocate the program's budget accordingly. Much of the internal administrative processes will be shifted to BPA's regional offices in order to expand administrative capabilities and allow the program to grow. BPA will also be adding an amendment process to the contract so the program can evolve as additional improvements are identified or necessary changes become apparent. By instituting this programmatic structure for purchasing energy savings from commercial buildings, BPA will have the capability to tap a significant amount of energy savings in the Pacific Northwest as additional resources are needed.

APPENDIX: FIRST ROUND SPONSORS

PROJECT 1

A leading world-wide supplier of energy systems will be retrofitting one office building, one major hotel, and a radio and broadcasting station. They will be installing energy management systems which they manufacture and energy-conservation measures produced by other companies. The firm has negotiated with participating building owners to fund the projects either through an installment plan or a shared savings agreement wherein the firm and the building owners would share the savings as they occur over time. The cost and energy savings of the projects, as identified in the preliminary audit, are as follows:

Building Type	Annual Savings (kWh)	Total Savings (kWh)	Cost of Project
Office Building	256,000	1,280,000	$ 40,142
Hotel	2,967,000	14,835,000	$459,262
Radio and TV Station	286,800	1,434,000	$ 49,186

PROJECT 2

This project involves one of the nation's largest energy services companies. The project will include 14 buildings, most of which are in the Portland area. The energy services company will use internal funds to audit the building and to purchase, install, monitor, and maintain energy-efficiency measures with the customer on a 50/50 basis. The equipment installed in each building is owned by the energy services company for the term of the contract. At the end of the contract term, the building owner may purchase the

equipment at the fair market value, renegotiate the terms of the shared savings agreement with the contractor or request that the equipment be removed from the facility. The following is a list of the projects.

Building Type	Annual Savings (kWh)	Total Savings (kWh)	Cost of Project
Golf Club	143,895	719,475	$ 9,800
Athletic Club	911,000	4,555,000	$40,650
Hotel	239,503	1,197,575	35,300
Resort	702,184	3,510,920	$55,000
Community Center	247,970	1,239,850	$16,860
Office Building	248,864	1,244,320	$11,247
Office Building	576,691	2,883,455	$20,410
Office/Retail	600,949	3,004,745	$25,350
Office Building	44,720	2,223,600	$21,846
Office Building	244,376	1,221,880	15,090
Office Building	764,000	3,820,000	$37,800
Office Building	172,000	860,000	$15,865
Office Building	177,925	889,625	$15,000
Office Building	121,313	606,565	$ 8,500

PROJECT 3

An independent energy development company will be retrofitting seven buildings throughout Washington State and Idaho. The firm will use several financing methods to fund these projects depending on each building owner. The company anticipates that some building owners will use internal funding, assuming an attractive rate of return. Projects financed by the company will be done on either a lease or shared savings basis. Funding sources for such financing will be a combination of equity and bank loans. In all cases, the firm will enter into an energy services agreement with the building owner. The following is a summary of the projects:

Building Type	Annual Savings (kWh)	Total Savings (kWh)	Cost of Project
Hotel	683,000	4,781,000	$ 64,000
Office Building	630,330	4,412,310	$167,000
Office Building	338,400	2,268,800	$ 63,300
Office Building	245,725	1,720,075	$ 38,900
Supermarket	253,000	1,774,500	$ 16,200
Warehouse	1,400,000	9,800,000	$103,100
Motel	100,890	672,320	$ 45,500

PROJECT 4

A unique company providing energy-related consulting products and construction for the residential and commercial sector, will be retrofitting four buildings, all in the area of Klamath Falls, Oregon. The financing of each project will be the responsibility of the building owner. Building owners are expected to use either internal funding or direct bank loans. The firm will act as a conduit for passing BPA payments on to the building owner. The projects are summarized below:

Building Type	Annual Savings (kWh)	Total Savings (kWh)	Cost of Project
Community Center	150,450	1,310,000	$31,245
Motel	81,795	1,514,932	$32,200
Office Building	94,500	1,744,560	$32,280
Church	17,115	171,150	$ 7,020

PROJECT 5

A country club, located in the Puget Sound area, submitted their proposal to retrofit their club facilities with the aid of the Snohomish County Public Utility District. The country club will be installing an energy management system as well as a heat recovery system for the indoor swimming pool area. The country club will be financing their project through a loan from a local lending institution.

Building Type	Annual Savings (kWh)	Total Savings (kWh)	Cost of Project
Country Club	256,561	1,282,805	$25,018

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Financing Energy Conservation.

The Canadian Experience: Canertech Conservation, Inc.

J.T. Brett

OVERVIEW

Canertech Conservation Inc. (Canercon) is a wholly owned subsidiary of Canertech Inc., a crown corporation of the government of Canada, established in the fall of 1980 to provide venture capital for energy conservation and renewable energy technology companies. The government felt that progress in conservation and renewables was slow, in part due to the weak and fragmented industrial infrastructure in those sectors. This chapter discusses Canercon's effort to develop and implement performance based financing for energy savings in Canada and compares Canadian and American experience in this field.

Judging that its early prospects for success lay more in conservation than in renewables, Canertech created and funded Canercon to serve the building retrofit market. Canercon was modeled on Econoler, Inc., a company operating in the Province of Quebec. Econoler and Canercon were created to meet a large, untapped market for turnkey building retrofit projects which had not been exploited for lack of capital, management and technical expertise. Many energy conservation studies had been done, but few were being acted upon. Canercon felt that a one-stop shopping approach was needed, whereby one firm would take responsibility for all phases of a project, from financing to operation and maintenance. The publicly-owned firms took the initiative because there was a need to be filled and because there was no private sector firm in the retrofit market in Canada at that time. Part of the early rationale for Econoler was the fact that many of the institutions

(hospitals, schools, etc.) owned or financially supported by the government of Quebec were energy inefficient. Econoler provided a convenient way to achieve large energy savings and therefore reduce provincial expenditures.

Canercon has an agreement with Econoler to use Econoler's system and know-how to create similar energy retrofit businesses across Canada. Canercon has no formal relationship to government energy programs, although it maintains close relations with the federal and various provincial governments. Canercon's clients are eligible for whatever government programs are generally available, such as incentive grants to do energy audits or retrofits. For retrofits, Canercon can arrange hybrid financial packages, which are part Canercon funds, and part government grants.

Canercon has established a separate operating company in each province where it conducts business. These operating companies are majority owned by Canercon, but each has minority shareholder(s)—typically engineering firms with expertise in energy management. These operating companies are public-private sector corporations. They are run as private businesses, with an objective of making profits, but enjoy the indirect financial sponsorship of the federal government. Canercon is a management company, which, having established the local companies, assists in marketing, training, financing, and quality control.

Canercon and the local engineering firm partner provide the equity capital for each operating company. The company, with the assistance of Canercon, arranges with a major bank for a revolving credit line up to three times the equity base. The bank lends to the company rather than to individual projects. Both Canercon and its operating companies are taxable entities. As Canercon moves into the commercial and industrial markets, tax considerations might affect the financing of the companies, or of individual projects. For example, it is important to ensure that the energy savings payments made by the private owners are deductible as a business expense in the year in which they are made.

BUSINESS HISTORY

Canercon has been in operation since 1983. Operating companies are established in Ontario, Nova Scotia, New Brunswick and

Prince Edward Island, and Canercon hopes to establish similar companies in the four western provinces. Negotiations have been completed for the establishment of Canercon subsidiaries in the provinces of Manitoba and British Columbia. These transactions will be closed in 1986. The proprietary software and much of the know-how necessary to develop these businesses has been licensed from Econoler. To date, Canercon, like Econoler, has concentrated on the institutional market. Projects are underway in several hospitals, universities, municipal buildings, and schools. Canercon is just beginning to enter the commercial market.

The Canadian government intended from the outset to turn over Canercon to the private sector once the market for energy efficiency retrofits was established. In November 1984, as part of a general expenditure reduction program, the government decided to terminate the operations of Canertech, Canercon's parent company. Recognizing the valuable role of Canercon in the energy services industry, the government decided to maintain Canercon by transferring responsibility for its financing and management to Petro-Canada, the national oil and gas company. The government also instructed Petro-Canada to sell Canercon to a privately owned Canadian company(ies) as soon as possible.

CANERCON'S SERVICES

Financing

Canercon provides all capital required for retrofits, including labor and equipment, engineering, and energy management. Canercon overheads, including project management fees and profits, are capitalized, and the client repays the total project cost out of energy savings. Canercon takes all the savings until the project cost, plus interest (at prime), has been repaid. From then on the client retains the full savings. In addition, Canercon guarantees that the project will be repaid in under five years, so the client pays the lesser of project cost or five years worth of savings. Canercon forgives any project cost balance outstanding after five years. (Canercon chose five years as a guarantee period since most of its projects have paybacks in the 3-1/2 to 4 year range.)

Project Management

Canercon acts as general contractor for retrofit jobs. Working closely with the building owner it organizes and schedules the job, puts subcontracts out for competitive bid, selects and signs agreements with subcontractors, and chooses the equipment. (It may pre-buy equipment if long lead times would otherwise delay the job.) This role allows Canercon to control costs and to ensure that the project is completed on time and within budget. Cost reductions realized by good construction management, bulk purchasing, etc., are passed on to the client in the form of a lower total project cost.

Energy Study

The Canercon study is comprehensive, detailed, and carefully costed. It uses propriety software, licensed by Canercon from Econoler Inc. The software allows the quantitative aspects of the study to be done very quickly and ensures that all the operating companies use the same basic approach. More time can then be spent on detailed cost estimates, which are necessary in order to give the client a realistic price and to complete the project within budget. Cost, savings, and paybacks are given for each retrofit proposal, and all base year and projected energy consumption are shown on a monthly basis.

Engineering

Design and specification work is performed by personnel from the engineer-partner's firm in each operating company. Having done the energy study, the engineering firm is able to estimate fairly closely the amount of engineering work required for each retrofit proposal. The estimate is a maximum, in order to give the operating company greater control over project costs. In developing the final engineering proposal, Canercon may choose to contract out engineering work to outside firms since no proprietary systems are used.

Energy Management

For Canercon, energy management involves the systematic application of technical know-how to the building's energy consuming systems to ensure that they are working at maximum efficiency and are in good repair. This is done to ensure that energy savings, once achieved, are not dissipated. Additional savings of five to eight percent are usually achieved by good energy management.

The work is performed by experienced technicians on the staff of the engineer-partner. Monthly visits are made to the client's building, maintenance employees are encouraged and informally trained, and lists of preventive and corrective actions are provided to both maintenance and administrative staff.

OTHER PLAYERS IN THE INDUSTRY

As mentioned above, the government's rationale for entering the retrofit market was to encourage private firms to enter the field. Since Canercon began operation, two other firms have started to offer similar services. The first of these is Petrosave Ltd., an engineering and computer services firm, in a joint venture with the Ontario Energy Corporation, a company controlled by the provincial government in Ontario. This company offers the client a guaranteed reduction in its energy bill over the term of the contract, which is typically about 6 to 10 years. Petrosave installs equipment at its cost, provides energy management services, pays the energy bills, and guarantees a reduction of, say, 5 to 7 percent in year one, with increased savings thereafter. The company has concentrated initially on the institutional market, inculding municipal facilities, and recreation complexes.

The second new entrant is Maple Leaf Ltd., a wholly-owned subsidiary of Imperial Oil Ltd., the largest oil company in Canada. Maple Leaf offers a variety of financing approaches, but most often uses an operating lease from a third-party leasing company. It arranges for the energy study and other engineering services to be provided by an engineering firm, but that firm works on contract and does not own any part of the service company. Maple Leaf is focusing initially on the commercial and industrial markets.

Companies which manufacture and sell microprocessor-based building energy control systems are simultaneously collaborators with, and competition for, the new energy services companies. Since Canercon and its two competitors do not manufacture or distribute equipment, the controls companies are bidding to supply them with equipment. On the other hand, the controls companies have large sales and maintenance forces, and they are aggressively selling their systems to existing building owners to save energy and perform other building management functions. Some of them also provide various financing programs. For these reasons, the energy services companies must achieve an early high profile and encourage the controls companies to collaborate with them in their comprehensive retrofit approach to existing buildings.

Utilities in Canada have not yet become active in the turnkey retrofit business, with the exception of Hydro-Quebec and an Alberta company, Transalta Energy Systems, Inc. Transalta's initial thrust is as a Canadian distributor for Andover Controls' products. Hydro-Quebec is indirectly involved in performance contracting as a major shareholder in Econoler. Consumers Gas, an Ontario gas utility, has recently taken a significant equity position in an energy management consulting firm. Other Canadian utilities are examining the field but have not yet become actively involved.

MARKETING STRATEGIES

In Canada, the budgets of major institutions, especially hospitals, are heavily supported by the government. In order to penetrate these markets it is necessary to convince the provincial governments of the benefits of energy savings financing so that they will agree to consider a payment to Canercon equivalent to a payment to a fuel supplier in determining their operating subsidy to the hospital, and more generally, encourage them to give an incentive to the hospital administrators to save energy. One province, New Brunswick, has done this by allowing them to reinvest the savings in approved health care projects for their facility.

Once the provincial government is in agreement, the institutions are generally very receptive to performance-based financing. These institutions are nearly all short of capital, and there are several competing demands for whatever little discretionary capital there is. They appreciate the long-term stability of Canercon, which has funding guaranteed for the medium term and can assure them that it will be in existence for at least the 3 to 4 year term of the contract. While stressing the commercial nature of the arrangements, Canercon does remind clients that the federal government is the ultimate underwriter of the funding. At the same time, Canercon is in the marketplace as a private business, with private sector shareholders and bottom-line objectives. While clients may like the aura of federal government sponsorship (they view it as a form of insurance), they do not want to deal with government in a business transaction.

The other attractive features of the Canercon service are project management and energy management. It is important that Canercon provide the client with turnkey project management since many institutional clients do not have personnel with these skills in-house, and it would often not be cost-effective for them to hire

such people full-time. The same is true, incidentally, for many major commercial property owners in Canada. They are run very efficiently, with minimal operating and engineering staff, and they do not have the management depth to undertake a series of retrofit projects in their buildings. Similarly, Canercon's energy management program is a means of upgrading the skills of the clients' maintenance staff.

From Canercon's point of view, institutions provide an ideal initial market because they offer excellent energy-savings opportunities (we have estimated the institutional retrofit market in the Province of Ontario alone at $600 million) and the credit risk is minimal. Thus, the energy services company can use its own capital to pay for the job with no risk of failure to get it back due to a bankruptcy of the client. This fact can simplify the transaction, as there is less requirement for security interests, insurance, buy-out clauses, etc.

Canercon will enter the commercial/industrial market as soon as specific tax, legal and financial issues relating to these sectors are resolved. There is excellent potential in these markets, but some features of the performance contract may have to be changed. For example, it appears that many industrial clients prefer a fixed price retrofit contract, leaving Canercon the opportunity to earn larger profits or incur larger losses, depending on performance.

DECISION MAKING PROCESS

Institutions often take a long time to make decisions. For example, in a typical large hospital or university, it is necessary to convince the executive director, the chief financial officer, the superintendent of physical plant, the building and maintenance committee, the executive committee, and the board of directors or board of trustees to approve a project. Powerful individual board members may have to be convinced. The process can easily take several months. There is not a set procedure for accomplishing this, but a few general principles emerge from the projects Canercon has worked on:

- Try to find a sponsor for the project in a position of real power and influence, such as a board member, or a chairman of a key committee.
- Having done this, touch the other important bases, such as the executive director, who will not be an ally unless he or she is brought into the discussions early on.

- Make the initial marketing presentation as close to the top as possible—ideally with the executive director or the chairman of the board. Failure to do this could mean being trapped and stonewalled by, say, the director of physical plant, who, for personal reasons, may not want the energy savings project to proceed. Once such a middle manager turns down a project it is more difficult to go over his head. (It is critical, however, that the physical plant or engineering department come to appreciate their important role in the project and see it as their own, or at least, have a vested interest in its success. It is very nearly impossible to have a successful energy savings project without their cooperation.)
- Recognize that senior financial officials of the organization will usually be strong proponents of the project. They receive many requests for capital appropriations, and will appreciate the fact that the energy-efficiency project being proposed will not require money from their budget.
- A very good combination of personnel for an early meeting is a group including the executive director, the chief financial officer, and the director of physical plant. In such a meeting you get all the interests and reservations out on the table quickly.
- Although performance contracting is intrinsically attractive to clients, it is still novel, and there is a tendency for people to look for hidden snares and loopholes. Patience and perseverance are required, as well as a flexible attitude to certain contractual provisions. For example, Canercon has found that some clients are worried about paying $15,000 or so for an energy study only to find that there is no viable retrofit project. To counter this concern, Canercon has sometimes said that in the event there is no retrofit project, it will refund the study cost.

CRITICAL FACTORS IN SUCCESSFUL PROJECTS

Once a contract is signed, the first key to its successful completion is competent project management. Canercon assigns this responsibility to the general managers of the operating companies and their staff. The general managers are all engineers, primarily chosen for their experience in construction project management, since each retrofit is, in essence, a mini-construction project. To have a

satisfied client, and to build important credibility for the company and the industry, it is imperative that the project come in on time and budget, with minimal disruption to the operation of the building. Client preferences regarding equipment and contractors should be respected, in the context of full information on relative costs and past track records. Good project management means open communications with the client through all stages of the project. The people responsible for operating the client's building must accept the projects as their own and must be in a position to take credit for its success with senior management.

While Canercon is in large part a specialized financing business, the key to attracting clients is often the perceived technical competence of the organization. The clients must be convinced that their facilities will not be disrupted by implementation of the retrofit. Initially, selling the project to clients takes substantial time and effort. This is due to the need to educate end-users, develop the appropriate package for installation, and negotiate a final contract. The longer the delay in project implementation, the more likely some issue will arise that will threaten the life of the project. Keeping the project on track is crucial and requires quick responses from those involved, especially the engineers who are central to system design and operation.

COMPARISON OF CANADIAN AND U.S. PROGRAMS

The basic principles of the energy services business are the same in Canada and the U.S., although there are differences in the application of these principles because of differences in energy prices, tax structure, and other legislation.

Electricity prices tend to be considerably higher in the U.S. than in Canada, which leads to more potential for cogeneration projects in the U.S. Conversely, lower electricity prices in Canada make possible many innovative heat pump applications. Tax shelter provisions are generally more restricted in Canada, making it more difficult to arrange third-party financing for energy projects. While efforts are now being made to make these provisions more flexible, this will take time. Regulatory hurdles similar to those in the U.S. exist in Canada. For example, municipalities are restricted in their authority to sign multi-year contracts. These restrictions can be overcome through persistent effort with provincial regulatory authorities. Like the U.S., Canada has had experience with fraudulent players who have, to a limited degree, cast a pall over the

marketplace. In summary, the similarities between the two markets are more important than the differences.

GENERAL OBSERVATIONS

First, there is no mystery to the energy services business. There is very little proprietary knowledge other than analytical software. The technology on the product side is well known. The arithmetic of dividing up the stream of savings produced is fairly straightforward, whether one talks in terms of shared savings, guaranteed prices, or some hybrid arrangement. Users are becoming more sophisticated. All of this suggests that the companies who will succeed must offer a fair financial deal to clients. The deals must be profitable to the service companies too, but the era of huge windfall profits, if it ever existed, will fast come to a close, as competition increases and clients become more sophisticated in calculating their returns.

The second point is that clients, at least in Canada, exhibit a preference for dealing with companies with substantial financial resources and staying power. It is no accident that the three successful energy services companies operating in Canada to date enjoy very strong financial sponsorship. It seems to be imperative for new entrants into this field to develop close links, ideally corporate rather than contractual links, with well-capitalized institutions or businesses.

Third, the banks in Canada are potentially very important supporters of the industry. Canercon has spent a great deal of time informing and educating the large banks about the potential of the energy retrofit market and the nature of the business. Particularly in the commercial and industrial markets, the banks will take a more direct role since they are the best judge of the client's credit. Canercon's objective is to arrange financing packages in these sectors where the banks provide the funds with a Canercon guarantee on the cash flow from the project. The bank would then assume the underlying credit risk. The national nature of our banking system also makes it possible for a bank, once knowledgeable about the business, to prepare a "package deal" for use by all of its major branches.

Finally, performance contracting lends itself very well, on the financial side, to "package deals" of one kind or another; as with a chain of department stores, a national property management

company or a nursing home chain. With clients of this kind, marketing expenses are reduced, project management and energy management costs are rationalized, and larger scale financing can more easily be arranged. Profitability should increase accordingly.

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Section II Bibliography

Entries are arranged in two categories: case studies and additional information sources.

CASE STUDIES

• *Demonstration Financing Field Tests for Commercial, Industrial and Multifamily Buildings: Case Studies.* Prepared by Martin Klepper, et. al., Lane and Edson for the Bonneville Power Administration, November 1984, 106 pp. Volume one of two. Details the selection and implementation of six financing field tests in the Pacific Northwest. Demonstration projects include shared savings and guaranteed cash flow leasing arrangements in commercial, industrial, public housing, and multifamily buildings. Each case study describes the steps involved in negotiating agreements. Technical and contractual barriers are presented, along with recommendations and lessons learned.
Available from: Bonneville Power Administration, Planning and Evaluation Division, P.O. Box 3621-KE, Portland, OR 97208, free of charge.

• *Demonstration Financing Field Tests for Commercial, Industrial and Multifamily Buildings: Exhibits.* Prepared by Martin Klepper, et. al., Lane and Edson for the Bonneville Power Administration, November 1984, 200 pp. Volume two of two. Contains proposals, financial projections, and energy services contracts resulting from six financing field tests in the Pacific Northwest. Demonstration projects include shared savings and leasing arrangements in commercial, industrial, public housing, and multifamily buildings.
Available from: Bonneville Power Administration, Planning and Evaluation Division, P.O. Box 3621-KE, Portland, OR 97208, free of charge.

• *Energy Shared Savings Program.* City of Kansas City, Missouri, 1983, 2 pp. Shared savings contract summary sheets for Municipal Court and City Hall. Indicates contract objectives, status, progress to date, and work planned for upcoming fiscal year. Also includes graph depicting projected utility costs and city/contractor savings shares for each contract year.
Available from: Tom Eblen, Finance Department, City Hall, 3rd Floor, 414 E. 12th St., Kansas City, MO 64106.

• *Innovative Financing for Energy Efficiency Improvements. Phase III Report: Summary and Conclusions from Field Test Experience.* Martin Klepper and Joseph Sherman, Lane and Edson, June 1983, 270 pp. Third in a three-report series prepared under contract to the U.S. Department of Energy. Summarizes phases I and II of the study and details field tests of innovative financing conducted in industrial, commercial, and multifamily buildings. Describes procedures used to locate, select, and evaluate energy service sponsors, review proposals, select field test sites, and determine appropriate financing mechanism. Findings and recommendations are included.
Available from: Bonneville Power Administration, Planning and Evaluation Division, P.O. Box 3621-KE, Portland, OR 97208, free of charge.

• *Performance Contracting for Energy Efficiency: An Introduction with Case Studies.* Prepared by Technical Development Corporation for the New York State Energy Research and Development Authority, January 1984, 115 pp. Describes the characteristics of various leasing, shared savings, and energy services contracts including the allocation of benefits and risks to building owners, contractors, and investors. Includes 23 case studies of actual energy finance transactions in commercial, institutional, and public buildings. Case studies provide contractor, client, and facility profiles and summarize financing arrangements, services or improvements performed, project cost, and results.
Available from: New York State Energy Research and Development Authority. Two Rockefeller Plaza, Albany, NY 12223, report #84-2, $3.

• *Practical Lessons in Energy Conservation Performance Contracting.* Government Institutes Inc., C 1984, 159 pp. Course notebook distributed at 1984 Energy Technology Conference. Papers address advantages and limitation of performance contracting in federal, state, and local government sectors, evaluating shared savings proposals; and performance contracting for single family homes. Includes bibliography and sample contract.

Available from: Government Institutes, Inc., 966 Hungerford Dr., #24, Rockville, MD 20850.

ADDITIONAL INFORMATION SOURCES

• *American Solar Institute (ASI).* Energy Financing Clearinghouse. Under contract to the U.S. Department of Energy, ASI offers a comprehensive bibliography of energy financing materials. Includes case studies, guidebooks, model documents, evaluation reports, and computer models. ASI does not supply materials directly, but the bibliography lists sources and prices.
Available from: American Solar Institute, 1001 Connecticut Ave., NW, Suite 728, Washington, D.C. 20036.

• *Energy User News.* This weekly publication reports on innovations and developments in performance contracting, legislative and tax issues, conferences, and new publications.
Available from: Energy User News, 7 East 12th St., New York, NY 10003, 1-800-447-4700, $45 for 52 issues.

• *National Association of Energy Service Companies.* Publishes a monthly newsletter, free to members, which charts legislation, tax updates, summaries of recent transactions and trends, lists contracting and marketing opportunities as well as conferences and seminars in the energy financing field. Other publications include financing studies, contracts, procurement materials, guidebooks, case studies and evaluation reports. Costs of materials vary.
Available from: National Association of Energy Service Companies, 2300 M Street NW, Washington, D.C. 10037.

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Section III: Looking Ahead

Sections I and II present the tools and concepts of performance contracting and the experiences of pioneers who have translated these concepts into operating projects. In this section the perspective shifts, as several authors offer their views on the forces shaping the future of the performance contracting industry.

To a large extent performance contracting will develop in a pattern common to many industries. Enthusiastic entrepreneurs often lead the way. A few succeed. As early projects develop they attract competition. The number of firms and projects grows rapidly. Established firms enter the industry or become a market for its services. The market and the industry mature. Although the level of activity in the expanded market is larger, the growth rate shows. Competition increases, and many of the pioneering firms collapse or are absorbed by established firms. Successful enterprises are characterized less by creativity and entrepreneurial zeal, and more by skills in management and marketing. Eventually, new products and ways of doing business emerge and the once-infant industry must compete or change to maintain its market share.

The outlines of this story are fairly familiar. Both electric utilities and personal computers started as fledging industries. However, the life cycle of every industry is unique and has its share of surprises. Drawing upon extensive experience in the field of performance contracting, the authors of this section outline overall trends and directions, as well as predicting some specific problems this industry will face in the future.

Martin Klepper identifies the major challenges the industry will face over the next decade and proposes approaches for dealing with them. Klepper sees the industry struggling to establish credibility, develop legal, financial and technological expertise, achieve a

balanced role for small businesses, and provide services to unique and difficult markets such as new buildings and small users. The pursuit of these goals will result in a more sophisticated industry, states Klepper, characterized by more standardized procedures and transactions.

Mike Weedall examines the trends in performance contracting among governments at the local, state, and federal levels. The public sector will continue to serve as a key—and sometimes captive—market for the performance contracting industry. Government has also emerged as a key promoter of performance contracting services (often to other levels of government) and also as the primary regulator of the industry.

Weedall projects that local governments will continue to serve primarily as a market and testing ground for performance contracting approaches. The federal government will continue to regulate the industry through the tax code and other laws and will continue to slowly adopt performance contracting in the campaign to achieve enhanced efficiency in federal facilities. State governments will continue to assume creative roles in performance contracting and will maintain their positions as a catalyst for growth in this field.

In the next chapter, Mike Weedall examines the emerging role of utilities in the performance contracting industry. Utilities have exhibited a wide range of responses to the emerging energy services industry. Some (such as the Bonneville Power Administration and General Public Utilities), have promoted performance contracting as part of a campaign to provide energy services to their customers at the least possible cost. Other utilities have fought what can be seen as a rear guard action against their perceived competition in fear of eroding sales or the loss of prime customers. The trend in the 1980s, however, is for utilities to join the industry by establishing unregulated energy services subsidiaries or affiliates. Weedall's paper focuses on this trend and on the decision-making criteria being applied by utilities considering diversification into performance contracting.

Finally, George Schaeffer offers his perspective on another set of key actors in the energy services field—the financial institutions. Performance contracting involves project financing. Project financing requires reliance upon the economics of the project rather than the credit-worthiness of the sponsor. Schaeffer outlines the increasingly sophisticated analysis used to determine the risks associated with these transactions and the techniques used to mitigate these

risks. Although much of this analysis is more involved than the criteria used in many performance contracting projects for energy efficiency today, the essential features—risk assessment and containment—will become increasingly important as the industry matures.

To understand how the performance contracting industry is evolving, one needs to examine the interactions among the key actors—the energy services firms, their clients, regulators, and competition (the utilities), the equipment suppliers, and the financial community. As in any field, however, there will always be surprises. The only real certainty in forecasting the future is that we can never know exactly what is going to happen.

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Issues in Performance Contracting: An Agenda for the Next Ten Years

Martin Klepper

INTRODUCTION

Performance contract financing of energy-efficiency improvements is no longer a gleam in the eye of a few innovative entrepreneurs. Performance contracting is now a full-fledged industry that has successfully passed through the early stages of product birth and market testing, and now appears as an important, if not critical, factor in the energy-efficiency industry. There are now more than 100 firms that will finance and install energy conservation measures on a performance contracting basis. Over 2000 buildings have had energy measures installed under an energy services agreement. Energy services companies are being created every month to finance and provide a full range of energy-efficiency services. Lawyers and business consultants, bankers, underwriters, insurance brokers, and accountants are all beginning to provide the essential support services necessary to nurture this new industry.

What will happen to the energy services industry in the future? What are the most significant issues facing the industry today? How will the industry respond to those issues? Will they be able to meet the financial and structural challenges required to satisfy a multi-billion dollar marketplace? We must consider what impact energy services companies will have on building owners, energy-efficiency contractors, and equipment suppliers. For example, will the energy services market be dominated by subsidiaries of utilities? Subsidiaries of large financial institutions? Equipment manufacturers? What will this mean for small businesses? For small building owners?

To answer these questions, I have identified ten critical issues that will face the performance contracting industry during the next ten years. After describing each issue, I have suggested a variety of steps that can—and perhaps will—be taken within the next ten years to deal with each of these issues. Taken together these steps constitute an agenda for the future of the energy services industry.

TEN CRITICAL ISSUES FACING THE INDUSTRY

1. Credibility

Credibility is the Achilles heel of the energy services industry. Building owners do not believe that energy-efficiency measures will *really* reduce energy costs, at least not by the amount promised. They lack confidence in the firms selling energy-efficiency products and services and in the products themselves.

What has created this "credibility gap"? I suggest it is a result of some opportunistic firms installing improper equipment in the wrong buildings under financing terms that are unfair and often outrageous. The credibility of the performance contracting industry has been damaged by firms that take advantage of uninformed building owners and by tax-oriented programs that cry out for Internal Revenue Service review. Trade publications relish publishing stories alleging abuses of performance contracts. For each such story, dozens of success stories are required to overcome the negative image created in the reader's mind.

The industry must take a number of steps to improve its credibility. Without public confidence, performance contracting can never succeed. Credibility must be the cornerstone for the industry's future growth and development. To achieve credibility, the energy services industry must strive for an informed public able to choose between the competent and the incompetent energy services provider. As building owners become more sophisticated in their understanding of energy services transactions, they will become more discriminating in their selection of energy services companies. Eventually, the marketplace will serve its intended role of policing the behavior of "bad firms doing bad deals" by excluding those firms from the marketplace.

The energy-efficiency marketplace is clearly many years away from operating as an "efficient" regulator of business behavior. What, then, can be done now to improve credibility? There are a number of answers, each of which will make a small and complementary contribution.

- Large national firms will begin to provide performance contracts, either directly or through financial institutions. Their presence will be a signal that energy services is viewed as an attractive business opportunity by experienced professionals developing a strategy for corporate America. The financial and technical resources of these firms, their track record in other areas, and their general stature will lend credibility and immediate acceptability to the energy services industry.
- Well respected *Fortune 500* firms will enter into performance contracts as users (building owners). These corporate giants, like smaller firms, must allocate their capital among many competing investment opportunities. Equipment, advertising, and plant improvement budgets often prevail over energy investments. In such instances, performance-based financing of energy projects presents an attractive, low-risk means of reducing energy costs and increasing productivity. Their willingness to enter into energy services transactions will be a guiding light to hundreds of smaller firms who say: "If it makes sense for IBM, it must be a good idea."
- Documented case studies of energy services transactions will be compiled and widely disseminated, providing hard, verifiable data describing the results of energy services arrangements. A major source of this data will be the many innovative financing demonstration projects currently operating and financed by the U.S. Department of Energy, various state governments, and other public and private entities. These demonstrations have research and evaluation components that will provide such case study reports. Trade associations representing the energy services industry will be available to reliably document case studies involving commercial and industrial transactions.
- Firms providing energy services based solely on tax shelter oriented financing will be unable to raise large amounts of capital efficiently; they will disappear from the marketplace.

2. Lack of Financial Expertise

Many of the firms entering the energy services business today lack experience handling financing transactions. They have no experience reviewing the credit-worthiness of buildings or building owners. They have not arranged independent financing transactions as a regular part of their business. They lack the expertise in tax, legal, accounting and banking issues needed to consummate performance contracts. Those firms that have developed some

experience handling financing transactions are often expanding those skills on a project by project basis. They have developed the expertise necessary to complete one or more deals. Their knowledge is often limited to the issues that arose in those early deals.

The lack of financial experience will, to some extent, solve itself. As more firms undertake energy services transactions, they will develop financial experience. As the market expands, they will hire bankers, accountants, lawyers and other individuals who can apply to energy transactions financial expertise obtained in real estate, leasing or other industries. Larger firms drawn into the market as the industry expands will apply their financial expertise to energy projects. Once the energy services pebble begins to roll downhill, it will, by accretion, attract the necessary experts.

It may take ten years to attract those experts. In the interim, the industry will go through an important, and probably painful, "shake out." Financially inexperienced or "unsophisticated" firms will find themselves unable to cope with the complex details needed to successfully consummate a growing number of transactions. Others will not be able to afford or attract highly skilled personnel with the necessary financial expertise. Still others will refuse to recognize the complexity of financing deals or their need to involve themselves in the financial aspects of the transactions. As a result, some companies will terminate their energy services programs, others will merge and/or absorb one another. Still others will create joint ventures to pool their skills.

During this interim period, users of energy services (building owners, property managers, etc.) should exercise extraordinary care in selecting providers of energy services. Explicit contract provisions should give the building owner flexibility to terminate energy services agreements in the event the energy services provider fails to perform as promised.

3. Anticompetitive Aspects of Small vs. Large Energy Service Providers

The Small Business Administration ("SBA") and trade associations representing electrical, mechanical and other energy services contractors are waging a battle in Congress to prevent utilities from entering the energy services business. These efforts have focused primarily on the provision of residential energy conservation

services (RCS), including the RCS audits and the installation of measures recommended in those audits. Similar issues have been raised with regard to commercial, industrial and institutional buildings. Small contractors may lack "sophistication" in financial transactions, but they offer a range of important advantages to consumers. There are literally hundreds of small contractors with excellent reputations in their communities, with good working relationships with building owners, and with the ability to consummate performance contracts, often by working in a joint venture with other firms. Will the small contractor be excluded from the marketplace? Do they face potential "anticompetitive" behavior by utilities or other large corporations?

I do not believe that anticompetitive behavior, as currently defined by our federal antitrust laws, will pose a real threat to small businesses. However, I do believe that many small firms will be "squeezed out" of the market by the resources of larger firms, the same way small firms are squeezed out of dozens of markets for products throughout the United States. The energy services industry will require substantial amounts of capital over a long period of time. Larger firms usually have much greater access to that capital than smaller firms. Absent national legislation (e.g., continued energy tax credits, loan guarantees, or stricter and broader prohibitions on utility involvement in performance contracting, and other growth incentives specifically assisting small energy firms), the energy services industry will be composed of national firms, regional firms, and joint ventures between financial institutions and firms with expertise in designing, installing, manufacturing and/or maintaining various types of energy efficiency and alternative energy equipment. Small firms may find that their overall volume of business will increase by providing contract services to one or more larger firms (e.g., utilities). We may also see an amalgam of small energy contractors joining forces to create a national network that obtains the resources needed to compete with the national firms.

Successful energy services companies will combine three critical skills: marketing ability; technical skills in the design, engineering, installation and maintenance of energy efficiency measures; and the financial and legal resources needed to consummate transactions.

Small firms may find market "niches" that provide attractive business opportunities without requiring head-to-head competition with national firms. "Boutique" energy services companies may develop to specialize in the unique energy needs of, for example, psychiatric hospitals, large universities or supermarkets.

4. Measurement of Energy Savings

The ability to fairly, accurately and easily measure energy savings is critical to any energy services program. Unlike the supply of electricity, natural gas, or oil, energy savings are not easily metered. The savings measurement can involve simple or very complex calculations. Two questions must be addressed in connection with any energy savings measurement. First, is the measurement technically fair and accurate? Second, is it easy to understand and to independently verify? The answer to these questions depends on whether and how the measurement methodology takes into account such factors as changes in the use of a building, or changes in the operating efficiency of various types of equipment. The energy services industry has worked very hard to develop energy savings measurement formulae that address these issues. Some firms have modeled energy use in hundreds of buildings and developed comprehensive computer regressions and other analyses that are used to adjust energy use for dozens, if not hundreds, of building variables. Other programs are so simple that they can be calculated on the back of an envelope.

Complicated computer programs often do not instill confidence in the building owner. He cannot clearly and easily understand the calculation and therefore lacks confidence that the measurement will be fair and accurate. While simple formulae can easily be understood, they obviously overlook important variables that affect energy use. Thus, an energy measurement methodology may fail to instill confidence if it is too simple or too complicated.

There are now dozens of firms that have installed and measured energy use in hundreds of buildings. As these data from performance contract projects become more readily available, confidence in measurement methodologies will increase. Ultimately, however, the energy services industry will develop a standard energy management methodology that will combine sufficient detail to accurately reflect changes in energy use while being simple enough for most building owners to calculate. Just as commercial spreadsheets are now common in business use of personal computers, similar programs will be developed and widely adopted to measure energy savings. Industry trade associations such as the National Association of Energy Service Companies (NAESCo) might provide the forum for developing these standards, perhaps with support from federal and/or state governments.

5. Small Buildings with Low Energy Bills

Performance contracting has been used primarily in buildings requiring efficiency improvements costing more than $50,000. While some firms have installed measures in the range of $10,000 or more, few firms are interested in financing deals where the investment is less than $10,000. There are thousands, if not hundreds of thousands, of buildings throughout the U.S. with the potential for cost-effective energy conservation measures that involve expenditures of less than $10,000 per building. The high transaction costs required to enter into an energy services agreement with a large number of owners of small buildings, and the cost of servicing the measures installed in those buildings (and measuring energy savings) have been the principal barriers in the small building market. Those same barriers apply to the residential building sector.

As the energy services marketplace expands and the cost effectiveness of energy-efficiency measures continues to increase, there will be more firms interested in taking advantage of energy saving opportunities in small buildings. This market is likely to continue to lag far behind the market for larger buildings. Energy services will be provided to small buildings where there is the ability to aggregate a group of similarly situated buildings. For example, a local chamber of commerce or a trade association of retail manufacturers could enter into a master contract to provide energy services to a large number of small buildings within a particular region. That association could then enter into one or more contracts with private firms to provide the necessary energy services.

In other situations, firms might standardize their contracts and their energy audit, installation and energy-saving methodologies to a point where it is cost-effective to market and sell energy services in a specific geographical area to a large number of small building owners. As the energy services concept spreads in a community, the marketing time required for each transaction will be reduced.

Small buildings will continue to be a very high risk market due to the relative instability of small businesses. One solution is to develop a credit guarantee for payments based on energy savings. For example, the equivalent of a Small Business Association guaranteed loan could be provided for energy investments. Similar federal loan programs are currently provided for small businesses and multifamily housing projects. This type of program is now more likely to come from the states rather than the federal govern-

ment. In the residential sector, utilities could provide this source of credit support and may do so in the future.

6. Legal Issues

Energy services agreements for installations costing over $500,000 are usually negotiated with lawyers representing both sides of the transaction. Some transactions between $50,000 and $500,000 have included lawyers, although some of these transactions have been entered into without careful legal attention. Transactions of less than $50,000 are generally entered into without legal review. Is this a responsible approach? Are there unique or important legal issues that should be addressed in energy services transactions that differ from each transaction or in each jurisdiction?

Based on my experience negotiating dozens of energy services agreements over the last few years, I am convinced that there are significant legal issues that should be addressed in every transaction. The parties may make a business decision to avoid the costs of legal review for smaller transactions, but they should realize they are assuming certain risks that hopefully will never surface as problems. The legal issues are of three types.

a) Questions regarding contract terms. The terms of an energy services agreement (ESA) are unique. An ESA is a combination of a sale or lease of equipment, a long-term maintenance or service agreement, and a financing transaction. All of the critical elements normally contained in each of these separate transactions must be combined in one energy services agreement. Legal concepts that have been developed over many years to apply to real estate transactions, banking transactions and commercial business transactions must be re-defined and applied to this hybrid agreement.

The ESA must also reflect the law of the jurisdiction in which the building is located. Contract terms must be carefully examined to be certain that they comply with local law. Various provisions regarding assignment of contracts, liquidated damages, default, insurance, and the remedies available to the parties must all be considered with respect to the specific transaction being undertaken. In addition, the business terms of the contract must be interpreted and applied to the specific facility.

b) Questions of security and authority to execute the contract. Since the ESA is also a financing transaction, careful attention to the credit and security (collateral) aspects of the transaction is required. In particular, the parties should consider: the authority of the energy provider to place liens on property; the credit-

worthiness of the building owner; and the authority of the building owner to enter into a long-term contract and/or to obligate (commit) future funds to satisfy its obligations under the ESA.

c) Tax issues. The final set of legal issues relates to tax laws. Do one or more of the measures installed in the project qualify for any investment or energy tax credit? What type of depreciation is applicable? Are there any state tax benefits available for the installation? Does the property meet the standards for an energy services transaction? Is tax-exempt financing a more attractive option than taxable financing? All of these issues and dozens of related subsidiary questions are often considered before entering into a significant energy services transaction. These questions are currently surrounded by uncertainty and ambiguity. These tax laws will probably change in complex ways in the future.

Within the next few years I believe there will be a standard energy services agreement developed by the industry that will resolve many of the legal issues surrounding ESAs. The industry will no longer be burdened by the need to reinvent the wheel for every deal, but rather will have a standard format to use and modify to meet the specific needs of each transaction. Legislation will be enacted in dozens of states clarifying the treatment of energy services contracts under local law. Legal issues to be considered and acted upon by state legislatures will include competitive bidding requirements and multi-year contracting. A significant effort also will be undertaken to obtain clarification of the tax benefits available for various types of energy-efficiency measures. Those efforts have already begun in connection with passage of the Tax Reform Act of 1984 which establishes a "safe harbor" for certain energy services transactions that involve cogeneration or otherwise generate electric or thermal energy (the "Wallop Amendment").

Unfortunately, the 1984 tax act does not resolve many of the tax issues that plague energy-efficiency projects. For example, many conservation measures are unfairly classified by the Internal Revenue Service as real property, rather than personal property. As a result, investments in energy efficiency are less favorably treated than the purchase of almost any other type of business investment (computers, typewriters, etc.). Perhaps the energy-efficiency industry has failed to make a compelling case that tax benefits are critical to the growth of the industry. Part of this failure may be due to ambivalence within the industry over the economic need for tax benefits.

Efforts will continue, both administratively, legislatively and perhaps judicially, to resolve these tax issues. Comprehensive, authoritative studies will be prepared justifying any added tax benefits and quantifying the effects of proposed tax benefits on increased economic activity, job creation and federal revenues. Studies will also be prepared documenting the economic benefits of energy services programs. These efforts will lead to a better appreciation of performance contracting among Congressional leaders and government officials. As the industry grows, increased resources will be devoted to clarifying these issues.

Clarification of the most pressing issues will enhance the credibility of transactions and provide certainty to financial institutions, investors and the parties packaging energy services deals. Within ten years, the tax treatment of energy services agreements will be as clearly established as most other types of "accepted" investments.

7. New Buildings

Performance contracting for energy efficiency has been confined, almost exclusively, to retrofitting existing buildings. Little national effort has been devoted to encouraging or financing energy-efficiency investments in new buildings. Mandatory energy conservation standards for new buildings have, to date, been adopted only in California and the Pacific Northwest. Why has the energy financing industry not penetrated the new building marketplace?

One reason is that the energy services industry is overwhelmed with the need for energy services within existing buildings. As new buildings are constructed, they immediately become candidates for energy services programs because they continue to be constructed with significant energy-inefficiencies. In addition, there will continue to be new technologies developed that can further reduce energy use in a building. Therefore, the retrofit market is likely to continue.

There is a place for performance contracting in new building construction. All new buildings are financed by a third party: a bank that provides the mortgage loan. Lenders should be willing allies of the energy-efficiency industry in its efforts to penetrate the new building marketplace. Initial efforts to convince the secondary mortgage market (Fannie Mae, etc.) to consider energy costs in their underwriting criteria have achieved a few minor successes but have generally not obtained the level of support that would result in significant improvements in energy efficiency in new residential buildings. It is the marketplace—the desire of a homeowner to

have low energy bills—that is driving the market toward building more energy-efficient homes. That demand is currently absent from the commercial, industrial and institutional building markets. Location and the type of structure continue to be the dominant forces in office and space location decisions. In most markets, there is very little competition for space based on the energy efficiency of a building.

Two steps could change these conditions. First, developers of new office buildings could seize the initiative on the energy cost-saving issue, while also appealing to the known forces driving the rental market. Developers could sweeten their pie by guaranteeing and fixing tenant energy costs. More specifically, developers could guarantee tenants that energy costs would not increase by more than a fixed amount and set a fixed energy budget. Such measures would remove the risk currently borne by tenants to pay the full cost of increased energy bills. The building owner would then have a specific economic interest in making the buildings as energy efficient as possible. The less energy used in the building, the more profit gained by the building owner. Alternatively, tenants may begin to negotiate fixed lids on their energy costs, similar to the caps on operating costs that are part of the new federal health care regulations. Those lids on increased operating costs would provide the building owner with a direct economic incentive to improve the energy efficiency of buildings.

Second, financial institutions that provide construction and permanent loan financing for new buildings could include an energy budget in deciding how large a loan to grant for the building. Two major motivating factors for lenders to consider energy efficiency in their financing decisions are: energy-efficiency measures increase the value of building property and energy cost-savings improve the cash flow of a building owner thereby improving the owner's potential ability to repay a loan. As calculations of projected energy use in a building become more sophisticated, mortgage lenders will be able to prepare, review and verify calculations of energy costs made by others. Lenders will then be more willing to include capital intensive additions to the design of the building if those items will increase the energy efficiency of the building.

8. Dealing with New Technologies and Alternative Energy

A firm that is able to produce energy cost-savings through the installation of energy-efficiency measures can also offer to produce energy cost-savings by installing cogeneration, solar, photovoltaic,

fuel cell or other alternative technologies. Energy services agreements usually give the energy services provider the ability to install modern, updated equipment in the building in an effort to further reduce energy costs. The energy services industry must raise the capital needed for these future installations, and they must obtain the technical expertise to successfully install and operate such measures. Firms dealing in five or ten year energy services contracts will be constantly challenged to try new products in buildings they service. Careful selection of products that meet the specific needs of particular buildings must be linked with appropriate financial analysis to insure a satisfactory payback.

In addition to installing energy-efficiency measures, some energy services companies will market systems to generate energy for single buildings or small groups of users. There will be a group of firms that provide the full range of energy installations and products, designed to meet the unique needs of each facility, in light of the economic, legal, regulatory and institutional circumstances of the building.

Expansion into these technologies will create new problems and challenges for the industry. Firms with conservation expertise will be forced to acquire complex engineering skills in a variety of new technologies, or enter into joint ventures or mergers with firms that have those skills. Firms providing packaged alternative energy projects will be forced to address conservation opportunities in buildings. Energy savings estimates will need to be carefully adjusted to account for the impact of new energy generation equipment.

9. Making Energy Services Transactions Work

Most performance contracts for energy services have occurred within the last few years. Hundreds of installations have been contracted for but have not yet been completed. Hundreds of others have not had more than one full year of operating experience. The results of these installations offer a critical test of the industry. Will energy services companies provide the level of maintenance and service necessary to insure a continued stream of energy savings? Will the energy savings methodologies hold up over time as building energy use changes? Will building owners continue to respect the terms of contracts entered into two, three and four years after they have experienced a lower level of direct energy costs?

What will happen to energy services agreements when the terms of the initial contracts expire? For example, at the end of the

seven year term of an energy services agreement, what will be the relationship between the "fair market value" of the installed equipment and its original cost? Will building owners be faced with the requirement to make substantial payments to the energy services company in order to acquire the system they feel they have already "paid for" out of energy savings? Will energy services companies walk away from energy equipment installed in buildings without requesting any payment, as many of them have stated they would do? Will building owners decide to renew and continue the energy services agreement because of the outstanding level of maintenance, service and perhaps even continued upgrading of the energy efficiency of the building over time? What will be the experience of the insurance industry that is currently insuring energy savings? Will there be large claims for payment and, if so, will the claims be honored?

As in any new industry, there will be successes and failures. History suggests that the successes should far exceed the failures. The hardest steps are a child's first ones. Lessons learned from mistakes will be used to strengthen programs and enhance future results. Experience in buildings will lead to more precise estimating of potential energy savings. Maturation of the industry will lead to an increase in credibility and reliability of products, vendors, and contractors.

The pace of the industry's growth will depend on the industry's ability to authoritatively evaluate and disseminate the results of energy services transactions in different types of buildings. The success stories must be carefully documented to dispel the public's "disbelief" and to enable the industry to learn from past mistakes.

10. Governmental and Institutional Marketplace

The energy services industry must respond to the growing interest of federal, state, and local governments and institutions in energy services. Public sector energy consumers have different needs, legal requirements and institutional characteristics that must be addressed by the energy services industry. A few companies have specialized in this market and have been extremely successful in doing so. But the surface of this market is just being scratched. It requires different approaches to marketing and legal, financial and technical issues due to the nature of the buildings and the type of owners involved. Will energy services go the way of cable television franchises, with companies avidly competing with each other for the right to "service" an entire city or group of buildings within

a city? Will cities retain firms to provide energy services the same way they retain other service contractors (e.g., engineers and architects)? Will energy services companies be able to provide governments with the assurances needed to satisfy them that small businesses are not being excluded from the marketplace and that local firms are fairly represented in any work undertaken by the energy services company? Will local governments develop the skills to fairly evaluate and implement energy performance contracts?

In the near term, large national energy services companies probably will be the major service providers for the public sector. However, the growing demand for energy services by the public sector will stimulate local engineering firms to consider, test and implement a performance contracting approach in bidding on public projects. It is likely that this trend will continue and that smaller firms will work with third-party investors in competing for public energy savings dollars.

Federal, state and local governments can play a critical role over the next decade in coordinating economic development and energy conservation policy. Real opportunities exist for job creation in the conservation area, and state and local governments can assist in expanding the energy-efficiency market while simultaneously creating and sustaining an energy-related job market.

CONCLUSION

As a new industry born a few short years ago, energy services is experiencing an exciting stage of expanding horizons and opportunities. The demand for energy services and products is established and growing. The benefits provided by performance contracts are tangible and shared by user and investor.

Now that the industry has taken the initial steps toward maturity, it faces a host of critical issues. Most of these issues have been addressed by other new technological industries. Although such issues only arise in industries that successfully pass through the birth of a product or concept, their resolution will determine the industry's future. Careful deliberation and planning, along with appropriate, coordinated actions on public policy issues, will provide the basis for a long and prosperous industry life.

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Financing Energy Conservation.

The Emerging Role of Performance Contracting In the Public Sector

Mike Weedall

INTRODUCTION

Performance contract financing of energy projects is growing, particularly among public institutional buildings. The public sector is unable to raise up-front capital, has increasingly tight budgets, and owns building stock that tends to be old and energy inefficient. Thus, the marriage of performance contracting and the public sector appears to be one that any matchmaker would be proud of.

This chapter identifies major performance contracting issues and opportunities facing local, state and federal governments now and in the future. The final section focuses on general conclusions and trends.

TYPES OF PROGRAMS

Governments can be involved with performance contracting in three ways—as clients, promoters and regulators. Public officials are attracted to performance contracting because it allows them to implement sorely needed energy efficiency programs at little cost to their budget. More state and local governments are entering performance-based contracts as public officials come to better understand the advantages and disadvantages of this approach. Trailblazing programs developed by California and New York City are being emulated by more and more public entities.

Public entities are promoting energy performance contracting in a number of ways. Approaches taken to date include reducing or eliminating regulatory or legal barriers which hinder implementation of programs, developing information or demonstration programs, providing technical assistance, holding workshops to educate potential end-users, matching energy services companies with local governments and, in some instances, actually delivering performance contracting services. The operating programs vary widely, reflecting local conditions. For example, the State of New Jersey has a comprehensive promotional program. Laws have been changed to allow municipalities and school districts to enter into multi-year performance contracts. Direct technical assistance is available to local municipalities in developing, evaluating, and implementing third-party transactions. Printed resource materials are available and workshops have been conducted. The New Jersey program essentially "brokers" energy services companies and local markets. In contrast to New Jersey, the City of Santa Clara, California has established a Municipal Solar Utility to deliver solar water heating systems to its citizens through lease arrangements. (See chapter in this book by Janice Hamrin.)

Governments have regulated performance contracting in two major ways. First, they have provided incentives, such as tax benefits. These have been the single greatest incentive to the development of the performance contracting industry. The availability and structure of tax benefits will continue to be a formative influence on the flow of investment dollars in the industry but will not be as dominant a factor as in the past.

FIGURE 1. Performance Contracting at Different Governmental Levels. The figure shows the types of performance contracting programs and degree of activity at the local, state and federal government levels.

	Local	**State**	**Federal**
Market For Performance Contracting	significant & growing	significant & growing	small & growing
Promoter	little	significant & growing	little
Regulator	little	significant	significant

Secondly, the public sector provides consumer protection and enforces tax laws. Internal Revenue Service crack-downs on abusive tax-shelters are an example of this type of activity. Federal and state regulation of energy services and competition by utilities is another important government role.

As Figure 1 shows, all levels of government have tried a wide variety of programs. The following sections consider the future of performance contracting at each governmental level.

LOCAL GOVERNMENT ACTIVITY

Until recently, local governments have been the primary end-users of performance contracting in the public sector. Municipal budgets tend to be very tight, leaving local officials little discretionary spending for energy-efficiency projects. Yet, rising energy costs increase the pressure for localities to trim energy bills. As a result, energy services companies have targeted this sector as a significant potential market. This trend will continue to accelerate as local officials come to better understand how to implement performance contracting programs.

Several sub-sectors of local government offer particularly ready markets for performance contracting. School districts and hospitals have been the most active. Both have energy-intensive operations. School districts have been especially hard hit by budgetary considerations and are looking to trim operating expenses in any manner possible. Hospitals have also been pressed to hold down costs. Public housing is another large potential market. Lack of up-front investment capital pulls this building sector to the performance contracting option, but many existing public housing regulations such as reimbursement procedures for energy bills, will have to be changed if performance contracting is to have much impact on this sector. Finally, more municipalities and counties are issuing requests for proposals to develop energy projects for their facilities.

Some local governments are trying other innovative programs for delivering energy services. Oceanside, California leases solar systems to community residents. However, this model will not be widely adopted by most localities due to the administrative burden and cost of buying and maintaining the solar systems. Thus, while many localities will use performance contracting primarily to finance energy projects, there will be isolated projects which a local

government undertakes because of characteristics and needs specific to that community. The ability of local entities to implement innovative projects will depend greatly on the availability of increasingly scarce resources from the state and federal levels of government.

Laws which prohibit local entities from signing multi-year contracts, and regulations which require competitive bidding for services have slowed the use of performance financing. Many localities have worked to eliminate such legal and regulatory barriers. Eliminating these barriers is the essential first step for many entities. Such legislative and regulatory changes have occurred in Michigan, New Jersey, California, and several other states.

Besides legal and regulatory barriers, local governments face other challenges in developing performance-based programs. One of the principal barriers is the inherent complexity of performance contracting transactions. Performance contracts require a high level of expertise on the part of the local government. Due to inexperience in developing performance financing transactions and a lack of expertise with energy-efficiency technologies, many localities have not successfully implemented performance contracting programs.

Two developments now underway will make it easier for localities to become involved in performance contracting. First, transactions are becoming standardized, allowing local officials to follow a "cookbook" approach. This trend will continue. The bibliography in the first section demonstrates the plethora of resource materials now available. However, the nature of performance-based financing is to structure transactions which reflect the specific characteristics of individual facilities. A pure "cookbook" approach cannot meet all needs.

Consequently, there will be a continuing need for some degree of specialized expertise on the part of any end-user of performance contracting, particularly in legal, financial and engineering areas. Assistance from outside entities is especially important for smaller units of government which have few in-house resources to draw upon. Many state energy offices are developing the capacity to help local governments through this process.

The states, however, will not be able to meet all the local needs for comprehensive technical assistance. Localities will therefore turn to consultants with increasing regularity. Some private groups are already providing this service. The situation is analogous to the way local governments use bond counsel to supplement in-

house legal staff in developing bond financing. Philip Yates' chapter on energy agents provides an excellent model of how private consultants can provide much-needed expertise.

Another barrier to wide-spread adoption of performance contracting by localities is that many entities are too small to meet current investment criteria. As Martin Klepper states in his chapter on future challenges in the industry, many energy programs remain undone because the small user cannot attract investors. Klepper sees standardized contracts and increased competition as two factors that will overcome some of these problems. The key to achieving economies of scale and meeting investment criteria for these smaller investments will be to package groups of them into a single transaction with enough investment potential to attract an energy services company. A group providing technical assistance to match buildings with performance contracting financiers can help put together these packages.

A number of barriers to packaging together projects from several localities will have to be overcome. For example, will a number of local governments agree to one contract? What happens to a transaction when one locality demands unusual contract provisions because of a change in membership of the city council? Similarly, what if the energy equipment is operating to specifications in one locality but is not performing well in the next town? What about the longer lead-time required to combine transactions and the extra expense associated with working with a pool?

While these questions and others will indeed be challenging, they will not be show-stoppers. Viable programs will be developed and implemented. Several entities around the United States are attempting already to pool transactions. To reach economies of scale, some larger municipalities offer all of their facilities under one umbrella contract. Individual facilities which might be marginally attractive by themselves become very attractive when part of a larger package. Lansing, Michigan has entered just such an arrangement with an energy services company.

In summary, the trend will be for continued, steady growth of performance-based financing at the local level, because of budgetary considerations, and lack of up-front capital and technical expertise. Existing barriers to wide-spread adoption of performance contracting will be removed through changes in legislation and regulation, as well as through the increased standardization of contracts. Consultants are available to offer the needed expertise and assistance in developing the best program for each locality.

STATE ACTIVITY

Although localities have been the biggest institutional market for performance-based financing, states have developed the greatest number of program initiatives as a market, promoter, and regulator. Performance-based program initiatives have been tried or are under investigation in nearly half the states. The level of activity is even more impressive when one considers that in 1980 only a few states had some form of performance financing program. The prognosis for the future is for continued growth as more states see the successes of their counterparts.

What are the issues and trends at the state level? Each state must first determine what type of program to pursue. Should the state provide technical assistance to its local governments, or is it enough to build staff capability and use performance contracting to deliver energy projects to state facilities? Is it appropriate for the state to provide an incentive and enhance capital availability through a state financing corporation? What form of incentives might be appropriate?

Politics, energy and resource mix, and local characteristics will all help shape the programs that states adopt. Rather than one approach becoming the norm across the nation, a patchwork quilt of programs will be developed. Many states will choose not to develop performance contracting programs.

As states gain more experience with performance financing, contracts and procurement activities will continue to be streamlined and standardized. While single prototypes will never be achieved, enhanced experience with competitive bids and contract awards will increase market acceptance. In fact, because of the visibility of state government activity, the major prototype solicitations and contracts are likely to come from the state level.

Within existing state programs, the trend is to apply performance contracting to reduce state expenditures for energy. California has been a leader in using performance based financing to implement energy projects at state-owned facilities. Recently, California launched a new program to use performance contracting for energy projects in facilities which the state leases. While building owners will ultimately get the benefit of the equipment, the state will save money over the term of the lease.

Just as the space program led to the introduction of a number of new products in the United States, states will share their experiences with other states and localities. In fact, one of the great challenges in public sector performance contracting will be to develop a

network for information sharing. Two efforts have been initiated to develop resource centers for energy financing materials. The U.S. Department of Energy has expanded a clearinghouse for federal energy managers to include materials of interest to state and local government officials. In addition, the National Association of Energy Service Companies (NAESCO) offers resource materials developed by its members. Since many of NAESCO's members are public entities, many public resource documents are available.

At the same time, states will build networks within their own boundaries. These networks will be very different from the national system linking states. The national network will share resource materials while focusing on broader policy and program issues. Within the states, interest will center on specific transactions and the need for technical assistance. State networks will match localities with energy services companies, provide technical assistance to evaluate potential transactions, and help develop performance contracts.

In addition to the resource centers which have recently arisen, there is an informal network operating to share information and experiences among units of government. This network includes various consulting groups offering assistance in performing contracting as well as key individuals working in the public sector. This network helps meet the need to directly share experience or provide commentary on the resource materials most applicable to various circumstances. An informal network can be at best "hit or miss," and the challenge remains for the formalization of a "peer matching" program to ensure that public entities getting started can benefit from the experienced pioneers who have preceded them.

Legislative and regulatory changes at the state level will continue to reduce or remove existing barriers to the adoption of performance contracting. Since each state has individual characteristics and goals, variable legislative and regulatory changes will develop. States will have a significant impact on the shape of the energy services industry by regulating the manner in which utilities can become involved. Because of their size and access to resources, utilities will be a major market force. However, some feel that utility involvement is inappropriate on anti-trust grounds. (This issue is discussed in detail in this author's chapter on utility diversificaton into energy services.) States will also play an important role by providing (or withholding) incentives, especially through the state tax structure. Many states have emulated the

federal government and adopted some form of energy tax incentive. While state tax incentives are typically not as significant as the federal tax incentives, their combined effects can provide a powerful stimulus.

There is no clear trend in state tax incentives. Some states, such as North Dakota, are still adding tax benefits, while others, including California, are diminishing theirs. However, it is likely that the states will follow the lead of the federal government in this area. Since the federal government is currently moving to simplify the tax structure, reduce energy tax incentives, and enhance revenues at the national level, it is likely that this trend will trickle down to the states. Reduced tax incentives will cause fewer transactions to meet investment criteria. Other factors, however, such as standardization of contracts and pooling of smaller projects into single contracts, might ensure continued growth for the energy services industry.

The states have an important leadership role to play in performance contracting. To justify continued funding for performance financing programs, state officials should document the cost savings and benefits which these programs generate for the state economy. At the same time, innovative programs should be developed to raise funds for on-going performance contracting programs. The State of California has developed a program in which two percent of the capital costs of performance contracting done with participating localities are paid back to the state for additional technical assistance.

In summary, states will continue to be leaders in performance contracting, developing a variety of programs which will reflect each state's priorities and characteristics. Some states will choose not to get involved with performance based financing. Performance contracting networks will provide valuable services within and among states. Because success will depend on the availability of program funds, state officials should begin planning now for future performance contracting program funding requirements.

FEDERAL ACTIVITY

The potential for performance contracting in the federal government—the largest user of energy in the United States—is significant. As with other levels of government, federal funding is becoming increasingly scarce for discretionary projects such as energy-efficiency measures.

Within the vast labyrinth of the federal structure, a few active performance contracting programs have developed. The Department of Defense (DOD) has conducted extensive background investigations of performance contracting and is instituting a demonstration program. DOD expects these demonstrations to be followed by a full scale program. Within 5—10 years, the agency expects to be using performance-based financing for extensive energy projects in its huge building stock. DOD wants to test performance-based financing because it does not require up-front capital expenditures, and thus frees up dollars to be directed toward other military needs.

Another federal agency, the Bonneville Power Administration (BPA), has investigated the potential for performance-based financing of an ambitious energy efficiency program in the Pacific Northwest. Currently, BPA has a number of performance contracting demonstration projects underway. BPA has learned—as did DOD—that performance financing programs cannot be developed or implemented quickly. It takes time for staff to master the procedures and for the program to be integrated into the organizational structure.

Within the remainder of the federal government, performance contracting programs have been limited and sporadic. The Department of Housing and Urban Development is currently conducting a demonstration to investigate whether energy efficiency can be effectively delivered to public housing using this mechanism. The U.S. Department of Energy (DOE) conducted three field tests in 1982 and has added a number of tests in different building sectors. The Federal Energy Management Program (FEMP) has conducted a number of studies on implementing performance contracting in other federal facilities. As mentioned in the discussion of state programs, the FEMP Office also operates a resource center for energy-financing materials. In addition, individual performance contracting projects have been proposed or tried by regional staff of several agencies. Interest has also been expressed in using performance contracting mechanisms as the matching share for institutions under DOE's institutional building grant program. Discussions are underway regarding whether a performance-based financing program could replace the grants to institutions.

Before there can be a significant increase in federal activity, the existing federal prohibition against entering multi-year agreements for energy projects must be eliminated. Currently proposed national legislation would eliminate this barrier. When that legislation is passed, it can be expected that federal activity to use

performance-based arrangements in facilities will increase dramatically. Yet, this limited federal activity is consistent with current policy. That is, the private sector is operating successfully to establish a solid industry base. Therefore, there is no need for federal assistance. Limited demonstrations are conducted to enhance public sector capability in working with this financing approach. Where the federal government is the landlord or where BPA wishes to acquire energy-efficiency resources, performance contracting is being pursued to determine its appropriate use.

In the future, performance contracting will be accepted and implemented with increasing regularity at the federal level. The keys will be implementing legislation and regulations which overcome existing barriers, developing staff capable of working with this financing approach, and evaluating the results of today's demonstration programs. As with programs at the state and local level, development of effective federal performance contracting will take time.

Besides promoting and providing a market for performance contracting, the federal government will shape major trends in energy finance by regulating tax benefits. In many instances, federal tax incentives make performance contracting transactions very attractive. The private sector has responded to these federal incentives and moved aggressively into the energy arena.

A manifestation of federal concern is more active regulation and review of financing packages structured as tax shelters. To enhance federal revenues, the Internal Revenue Service has bolstered enforcement staff and developed regulations making it easier to disallow "abusive tax shelters" of all kinds. It can be expected that growing pressure will be put on energy projects which are structured solely on the basis of tax benefits.

Just as the federal government will be pressuring tax shelters, so too will there be a trend to reduce or eliminate tax deductions and credits in the energy area. This will not be the deathknell of performance-based financing of public sector buildings. However, many currently viable projects would no longer be attractive, leaving a smaller group of financeable projects. Performance financing will become more difficult to use on a wide scale. It is imperative that the federal government clearly understand the tradeoffs between lost tax dollars versus enhanced energy efficiency and a stronger national defense.

It is also important that the federal government appreciate the impact of its actions on the market. For example, under current

regulations, tax credits are precluded for structural property, which essentially becomes a permanent part of the building. This has shifted energy investment away from insulation and solar panels to energy management systems, which are not deemed structural. This federal policy impact on an imperfect market must be carefully considered and measured against national policy objectives.

The final regulatory role open to the federal government will be the regulation of utility involvement in the delivery of energy services. A number of federal agencies have interest in the topic, including the Justice Department, Small Business Administration and the Federal Trade Commission. While no action has been taken to date, it is only a matter of time before guidelines and regulations for competition are promulgated. These decisions will determine the extent to which utilities can be active players in the market. (For a more complete discussion of this issue, see Chapter 15.)

In summary, the federal government will pursue performance contracting programs to install energy measures in federally owned facilities. As with state and local governments, developing the capability to implement these programs will take time. Changes in federal tax benefits will result in restructuring of the performance contracting industry. Many marginal transactions will no longer be feasible. A national clearinghouse has been funded to provide information on performance contracting to all levels of the public sector. The federal government will shape the structure and future of the performance contracting industry by regulating the involvement of utilities in the delivery of energy services.

CONCLUSIONS

Public sector use of performance contracting will continue to grow, regardless of the availability of federal and state tax incentives. Significant potential earnings for the energy services industry in the public sector marketplace will drive this growth. Older building stocks and the pressing need of the public sector to reduce energy bills make this an attractive area for investment. The public sector is almost a captive market. The need for energy efficiency is so great in the public sector that energy services companies may one day be hard-pressed to meet the demand for services.

The prime force behind the growth of performance contracting in the public sector will be the growing capability of public officials

to understand the complexities of performance contracting. As they gain this experience, standardized procedures and documents will be developed. While some elements of transactions will still need to be individually tailored, networking between public officials will help them to structure programs which best meet their needs. Private firms will provide essential technical assistance to public entities. The two resource centers for energy financing will further assist public officials in building performance contracting programs.

The decision by public officials to use performance financing will rest on the pressure they feel to lower energy bills in light of tightening budgets and on the attractiveness of this form of financing given their particular circumstances. Advantages such as shifting operating and maintenance responsibility to an energy services company might be just as important as using someone else's capital. The rate at which performance-based financing is accepted and adopted by the public sector hinges on the development of technical assistance programs and practical prototypes to overcome public officials' present lack of expertise.

Small energy users will continue to have difficulty with performance contracting. It will be primarily up to the states to develop workable programs for those with small energy bills.

Each level of government has a key role to play. Developing the capability to implement performance contracting programs is essential for local governments. Localities will be involved primarily as a market for energy services. Local governments must find the resources to take advantage of this opportunity.

A broad range of programs will develop at the state level. This is where the innovation and refinement of performance contracting in the public sector will occur. In addition to using third-party financing to install energy projects in state facilities, states will develop the model documents and prototype contracts. Because of individual approaches by states, progress will be uneven.

There is an enormous potential market for performance contracting to deliver energy efficiency to federal government facilities. Federal tax legislation and regulation of utility involvement with the delivery of energy services will be prime forces in shaping the industry. The future will see more growth and further acceptance of performance contracting at all levels of government.

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Financing Energy Conservation.

Utilities and Performance Contracting

Mike Weedall

INTRODUCTION

Historically, the underlying compact between utilities and their regulators has been that the utilities receive an exclusive service franchise (and thus a guaranteed market) in return for an obligation to provide service to all customers within their franchise (even those least profitable to serve) at a regulated rate of return. This compact was cemented by the economies of scale achieved with larger loads. Through the 1960s, these economies of scale brought lower rates to utility customers. Serving greater loads required larger rate bases, which resulted in greater returns to utility stockholders. In the 1970s a variety of economic, technical and political factors shifted the utilities' marginal costs above their average costs. The cost of new generating capacity began to rise. Utility marketing efforts shifted from promoting sales to conservation. In the 1980s the penetration of energy-efficient technologies has led to expectations of slowed or negative demand growth. Utility marketing programs are evolving towards demand management—dampening demand in the periods of high production costs and increasing demand in the periods of low operating costs.

At the same time that the cost of electricity has risen and projections indicate slowed demand growth, the energy services industry has entered the picture, offering performance contracts for energy-efficiency improvements and cogeneration projects. In effect, the energy services companies are reducing utility sales and capturing a portion of the utilities' lost revenues. Utilities are responding to this increasingly competitive environment by diversifying into a number of unregulated activities. A 1985 survey conducted by the American Supply Association identified 90 utilities with

unregulated business activities [1]. Many utilities are considering establishing their own energy services companies. Given their background and experience in energy along with their access to capital and their extensive network of customer contacts, utilities have the potential to be significant actors in the energy services industry. Indeed, if the utilities were to adopt an expansive role in the energy services field, they could become the dominant force in the industry.

What is the status of utility involvement in energy services today? Who are the leaders and why are they moving into the field? What are the likely trends for utility involvement in the future? How will other entities, such as the public sector, be affected by utility activity? What will be the central issues influencing utility involvement?

To explore these questions, an informal survey was conducted of 30 utilities interested in energy services. Interviews with representatives of those utilities sought to ascertain key criteria by which the utilities determined if it was appropriate or inappropriate to pursue energy services. Research was also conducted into regulation and legislation that governs utility diversification.

This investigation revealed that a growing number of utilities are developing an energy services capability or analyzing that option. In the future this utility activity will increase, although not all utilities will conclude that energy services is appropriate for them. Legislation and regulation must be adapted to provide clear guidelines governing utility involvement.

UTILITY INVOLVEMENT TODAY

Of the 30 utilities surveyed, nine have established an energy services subsidiary, and 15 are considering such a course. Five have decided not to form an energy services subsidiary. As Table 1 shows, a wide range of utility types—gas, electric, public, and private—from all over the country are exploring energy services. This level of activity indicates a strong interest in and a growing understanding of the issues affecting utility diversification into energy services.

Table 2 summarizes the position of those utilities surveyed who were willing to discuss their reasons for adopting their chosen course. It is important to remember that each utility examines the energy services option based on the criteria and characteristics

Table 1

Utilities with an Energy Services Subsidiary	
Washington Gas	Potomac Electric Power Company
CP National Corporation	Portland General Electric
Central Hudson Gas & Electric	Northern States Power
New England Electric	Puget Power & Light
Florida Power & Light	
Utilities Considering an Energy Services Subsidiary	
Connecticut Natural Gas	San Diego Gas & Electric
Consumer's Gas	Utah Power & Light
Georgia Power	Brooklyn Union Gas
Florida Power	Consolidated Natural Gas
Gainesville Regional Utility	Niagara Mohawk
Snohomish Power & Light	Trans Alto Utilities
Northeast Utilities	Pacific Gas & Electric
Pacific Power & Light	
Utilities Pursuing Energy Services without a Subsidiary	
Seattle City Light	Arkansas Power & Light
General Public Utilities	Bonneville Power Administration
Utilities which Have Determined Not to Pursue An Energy Services Subsidiary	
Minnegasco	

particular to their service territory and their history and tradition. Thus, a publicly held electric utility district with an abundant source of power will view energy services from a much different perspective than will a privately owned gas utility that is pushing diversification. Because economic and regulatory conditions often limit potential returns, diversification is being viewed increasingly as a way to supplement regulated returns. Thus, investor-owned

Table 2

Points of Concern	UTILITY														
	SDG&E	PGE	NEE	PEPCO	WAGAS	TA	NU	NS	CH	PP&L	BPA	GPU	APL	MGAS	SCL
Business Opportunity	X	X	X	X	X	X		X	X	x					
Respond to Customer Needs			X	X	X				X	X					
Based on Existing Skills	X				X										
Respond to Private Competition	X						X	X	X						
Opportunity for Employees	X														
Already has an Unregulated Subsidiary	X					X									
Help Shape Utility's Load Curve				X			X								
Ordered by PUC							X								
Utility Does not Have Entrepreneurial Skills											X	X	X		X
Other Divestiture Options Showed More Promise														X	
Instability of the Field															
Excess Capacity, So Conservation Makes No Sense													X		
Other More Pressing Issues												X			
Projected Return Not Great Enough														X	
Legal Problems											X				X
Lack of Cash												X			

Legend to Table 2.

SDG&E = San Diego Gas & Elect.	NS = Northern States Power
PGE = Portland Gen. Electric	CH = Central Hudson Electric
NEE = New England Electric	BPA = Bonneville Power Admin.
PEPCO = Potomac Elect. Pwr. Co.	PP&L = Pacific Power & Light
WA GAS = Washington Gas	GPU = General Public Utilities
TA = Trans Alta Utility	AP&L = Arkansas Power & Light
NU = Northeast Utilities	MGAS = Minnesota Gas Company
SCL = Seattle City Light	

utilities are more likely than public utilities to be interested in diversification options.

Business opportunity was the justification most commonly cited by those utilities that had established an energy services operation or were considering doing so. Some utilities stated that the return from an energy services operation could help offset the utility's loss in revenues as customers turned to energy-efficiency technologies. Customer service and response to private competition were cited as compelling reasons to take action. Utilities felt they needed the ability to offer a full range of services to their customers while ensuring that customers could choose between several, competing firms in the marketplace. In other cases utilities were taking advantage of the fact that private competitors were not yet offering a full range of energy services to the utility's customers.

Several respondents felt that utilities have the skills required for energy services. Engineering and auditing expertise, access to capital, and knowledge of their customers' energy needs give utilities a strong base for action. Closely tied to this was the opportunity to provide new challenges for utility employees through diversification into energy services. Energy services was seen by some utilities as a source for additional resources and as a means to shape load curves. Efficiency improvements have become increasingly attractive as a way of mitigating the tremendous expense and risk associated with acquiring additional generating capacity. Two utilities in the survey were ordered by their regulators to develop an energy management program.

In contrast to the 25 utilities in the survey that are considering or developing energy services, five utilities responded that they are not developing subsidiaries. Four of these utilities have adopted another form of energy services while one utility has totally rejected this option.

The principal reason, cited by these five utilities for choosing their course of action, was that they did not have the necessary skills to successfully compete against private firms in the energy management arena. This is an interesting contrast to other utilities, which felt that their skills made them strong candidates in the energy services market. Nonetheless, the utilities deciding against direct involvement with the delivery of energy services cited their lack of entrepreneurship and familiarity with fuel types beyond their traditional speciality. Entrepreneurship is critical since energy services requires aggressive marketing and risk-taking, which are not necessarily fostered in the traditional utility environment. Some utilities pursuing the subsidiary course have solved this problem by bringing in entrepreneurial skills from outside the utility.

Other utilities also pointed to the lack of adequate return in energy services. When compared to other diversification options, energy services was not as attractive. Potential rates of return will vary by service territory, depending on local energy prices and the opportunities for efficiency improvements among the various customer classes.

Finally, some of these utilities stated that programs other than an energy services subsidiary would better meet their needs. For example, a joint venture between the utility and a private energy services firm would bring together complementary skills. The utility understands the market and customer needs and has access to capital. The energy services firm brings the entrepreneurial spirit and familiarity with the competitive market place.

It is interesting that not one utility cited regulatory concerns as a reason for rejecting energy services. While both public and private respondents have regulatory concerns, they believe that existing issues can be resolved. The utilities consistently mentioned that the best strategy is to deal positively with the regulators and to demonstrate the significant benefits of energy services to utility customers.

REGULATION, COMPETITION AND PRACTICAL EXPERIENCE

As utilities continue to consider energy services opportunities, three areas will be paramount: regulation, competition, and the experience of other utilities in the field. Several laws already affect

utility involvement in energy services, and it can be expected that further legislation in this area will be developed. In addition regulatory bodies at the federal and state levels will continue to play a prominent role in shaping utility activity.

The Public Utility Holding Company Act of 1935 was developed to eliminate abuses by utility holding companies. The act limits utility business involvement to those activities which are functionally related to the utility system. Exemptions can be applied for by those utilities governed by the act, and several utilities have successfully developed an energy services operation in this manner. Although this law will not stop utility involvement in energy services, it will help to shape utility activity because approval for action must be sought from the Securities and Exchange Commission

The National Energy Conservation Policy Act of 1970 (NECPA) charged the Federal Trade Commission to study and report on the effects on private competition of utility involvement in conservation programs. The act originally prohibited public utilities from supplying, installing and financing energy conservation measures in residential facilities. The restriction on utility financing of residential programs was later removed by the Energy Security Act (ESA) of 1980. This act mandated utility audit programs for the commercial, industrial and multifamily sectors, and placed no restrictions on utility delivery of energy services in those sectors. Although these laws assure federal oversight of competition in utility conservation programs, many complain that the ESA's mandate that utilities deliver audits enhances the opportunity for utilities to enter the market with a decided advantage.

Because there is concern that utility subsidiaries delivering energy services programs may be in violation of antitrust statutes, there has been significant analysis in this area. These analyses have identified a set of practices a utility should follow to minimize antitrust criticism, e.g. not mixing funds of the subsidiary and utility while separating operating functions. Although these antitrust guidelines have shaped utility activity to date, there is a rising demand from some sectors of the private market for greater restrictions on utility activity. Should those pleas be heard and acted upon in legislation or regulations, utility involvement in energy services could be limited.

Three federal agencies are currently looking at utility activity with energy services. The Justice Department and the Federal Trade Commission (FTC) are investigating complaints of unfair

competition. Although no complaints have yet been considered worthy of prosecution, both agencies are demonstrating a continuing interest in the issue. They are aware that problems such as utility cross-subsidization may be very difficult to detect. Nonetheless, their vigilance will lead many utilities to ensure that antitrust guidelines are adhered to. Recently the FTC concluded a study of utility diversification and its anti-trust implications. While this report has not yet been finalized, there is a possibility that the FTC may use it to increase regulation of utility diversification activities.

A third federal entity, the Small Business Administration (SBA), has issued the report, "Utility Competition with Small Businesses: Recommendations for States on Utility Energy-Related Programs and the Commercial and Apartment Conservation Service Program" [2]. The report concludes that the potential for abuse, whether planned or unintentional, is great. Because of their extensive resources, many utilities are able to subsidize losses and offer lower prices than private competitors. Avoiding unfair competition is not easy, but it is possible. The report states that "...the goals of energy conservation and load management can generally be achieved without significant harm to small businesses if the energy program is properly structured." The report cautions, however, that, "...in our experience, the state regulatory process has not, and cannot practicably, eliminate the problem of cross-subsidization of utility supply and installation programs. Many state utility commissions are understaffed to handle their current workload, and small business intervenors rarely have the resources or knowledge to address this issue." The SBA has followed up this initial report by examining 15 case studies of complaints brought against utilities. As with the FTC report, there may be more of a basis for regulatory action when the conclusions of the case studies are finalized.

Given their current workload, state regulatory bodies will be hard pressed to comprehensively analyze utility involvement in energy services. A number of states have already begun to take action, however. State regulators are further challenged by the specific issue of regulated and unregulated utilities. For unregulated utilities, the opportunities to enhance earnings for investors are readily apparent and offer one perspective for regulators to consider. Regulated entities present the need to consider what is the proper use of ratepayer funds as well as how energy services operations complement overall utility activity. Appropriate tests must be developed to guide involvement for both regulated and unregulated entities.

To assist in this process, the National Association of Regulatory Commissioners developed guidelines for utility diversification [3]. How these directives are translated into action remains to be seen. In October 1985, the California Public Utility Commission held "generic" hearings to explore the ramifications of diversification activity. While no specific conclusions were announced, this exploratory process is setting the foundation for regulatory guidelines.

As with any new business venture, the utility pioneers in energy services are being watched closely as they break ground. If they are successful, many more utilities are likely to follow their lead and move rapidly into the field. Those utilities with operating subsidiaries are currently operating at different levels of activity, dependent on their experience and target markets. As the utilities learn how to better operate in a competitive environment, their force in the marketplace will expand rapidly.

EFFECTS ON OTHER ENTITIES

If utilities become very prominent actors in the energy services field and squeeze out much of the competition, it can be argued that the market will suffer. However, this scenario is unlikely to develop. The current focus of regulatory interest on competition and utility involvement in energy services is unlikely to result in unlimited freedom for utilities. For example, a bill has been passed in California that prohibits utility installation of projects involving more than $200 in labor and materials. Independent contractors have to be used for projects exceeding that value. This middle course will allow utilities to get involved in energy services but will prevent them from monopolizing the field.

Because of the capital intensive nature of energy services, the bulk of the industry could become dominated by a few giants. The situation may be analagous to the personal computer industry, where several companies dominate the market. Utilities could become one of those dominant forces, given their access to capital and the importance of capital in the delivery of energy services.

One of the critical elements in a successful energy services transaction is the knowledge and confidence that the energy services firm will be in existence and provide ongoing service through the term of the contract. Utilities have that stability and track record and thus could bring greater credibility to the field. Development

of successful operations by utilities may be a key to overcoming skepticism on the part of customers who have dealt with unstable or unreliable energy service companies. Recognizing the benefits of being associated with stable institutions, private energy services firms are likely to explore possible joint ventures with utilities.

Central to any success utility subsidiaries might experience will be the ability to adapt entrepreneurial skills. As cited earlier, several utilities stated that the risk-averse environment of utilities is not conducive to developing an agressive energy services operation. Whether those skills can be adapted by utilities is likely to be the single most important factor outside the regulatory arena.

FUTURE TRENDS

For utilities today, diversification is one of the most important issues on their agenda. The forces pushing toward diversification are great, and utilities are already exhibiting significant movement into the area. How that diversification ethic is perceived by regulators and what controls they develop will ultimately determine the form and guidelines under which utilities operate. Since the principal level of regulation will be taken on by the states, there will not be a uniform set of guidelines resulting in divergent programs.

As a subset of the larger diversification issue, establishment of subsidiaries to deliver energy efficiency will be considered as only one business opportunity by individual utilities. The same analysis and business acumen which considers whether real estate is an appropriate venture will be applied to the energy services option. Then a second level of analysis will be applied to determine if the energy services option has special merit to the utility, e.g. will regulators view this positively and might this be a good public relations program with the utility's customers?

The background research for this paper discovered a great deal more activity than was originally expected. In the study undertaken, nine utilities were identified as having an energy services operation, 15 utilities are studying the option for possible future activity, four utilities have opted for an energy services option other than a subsidiary, and one utility rejected the concept outright. Given the limited size of this sample, it can be concluded that there is even greater activity around the United States.

While the movement to utility diversification is apparent with utilities already demonstrating significant interest in the energy

services subsidiary, continued growth would be expected. Yet there remain many issues which must be resolved before utility activity might really burgeon. For example, what will be the specific experiences of those utilities which have already established subsidiaries? With these leaders being watched closely, what will be the perception of other utilities? How will the regulators respond? Will private competitors seek to form more joint ventures with utilities to take advantage of their resources?

As the whole utility diversification movement evolves over the next few years, the future of utility subsidiaries to deliver energy services will be determined.

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Financing Energy Conservation.

Planning for Risk in Project Financing

George P. Schaefer

INTRODUCTION

Project financing—the heart of performance contracting—is an off-balance-sheet financing technique in which a financing institution looks at the cash flow and collateral value of a project for repayment of its investment. This chapter explores the strategies financial institutions use to evaluate, allocate, and mitigate the risks associated with project financing.

The author works for the General Electric Credit Corporation (GECC), a firm with extensive experience in project financing—including commitments of more than $800 million to 13 major energy projects. While GECC has focused its efforts on large energy projects, the same approach to risk assessment and containment strategy that GECC employs for an $85 million geothermal plant can be valuable to firms involved in building retrofits costing tens or hundreds of thousands of dollars. As the performance contracting industry matures, the ability to plan for and deal with risk will be a major factor in distinguishing successful firms and projects from those that fail.

RISK ASSESSMENT AND ALLOCATION

At the outset of large and small projects alike, the financier of a performance contract should carefully consider the risks involved. He should *identify* all risks associated with the project, *quantify* their implications, and *allocate* the risks to the parties willing and best able to handle them. Well contained risks and a carefully planned and executed project comprise the best formula to assure the success of an energy project.

Obviously, unforeseen events will occur in every project, confirming Murphy's law almost daily. Sophisticated financial institutions understand that every project risk cannot be contained. However, the financial community needs to be comfortable that the project has some margin, so that its capital will be returned when things do not happen exactly as planned. Generally, the financial institutions seek this level of comfort and test the project's economics under a wide variety of scenarios and assumptions. However, even with this margin the parties must assign the risks for when the inevitable problems do occur. Financial institutions typically consider four categories of risks: 1) design and engineering risks, 2) risks related to construction, 3) risks that exist during commercial operation, and 4) other risks associated in general with the project. For each category of risks this discussion will identify the major concerns and the key components of the containment strategy.

Design and Engineering Risks

Design risks contain the following concerns. Is the technology feasible? Can the project be built as planned using the proposed materials and equipment? Is it reasonable to expect the equipment to perform according to its specifications? The viability of the investment can be destroyed if there is a fundamental design flaw in the project.

There are two components to the strategy of containing and allocating design risks. First, the design engineers must be capable, experienced parties, who are familiar with the proposed type of project. Second, the project must employ existing technology which has been proven on other similar projects.

As part of the evaluation of a project, we at GECC commission a technical review of the project by outside engineers to fully evaluate the scope of the project. This outside engineering firm is asked to review the project's technical feasibility, the reasonableness of the construction cost and timing estimates and the projected operating costs and performance of the completed project. This technical review is extremely important and goes a long way towards identifying not only design risks, but other project risks which are discussed below. There are additional actions, such as obtaining a performance bond to ensure that the design work is completed satisfactorily, which can further reduce design risks. However, the ultimate protection is to fully assess the design of the

project and to participate only in those projects that are feasible and technically sound.

Construction Risks

There will always be unforeseen events in the construction period, regardless of the thoroughness of the evaluation. Anyone who has ever built or remodeled a house has experienced such surprises, and few of them are pleasant. The risks in the construction period are relatively large. Consequently, the challenge during the construction period is to insure that the project is built within cost, on schedule and as designed. Having successfully met this challenge, the chances are greater that the project will perform as expected when it is completed.

The strategy for containing and allocating construction risks has three components. First, the contractor, major equipment suppliers and other key players must be experienced and tested participants in this type of project. Second, the general contractor must be the strong focal point of the project and must ultimately be responsible for all phases of the construction. Third, outside engineering consultants should be retained to monitor the construction work and its progress. This external, independent engineering review should not only oversee the general progress of the construction, but should also audit requests for draws upon the construction loan and review all design changes.

In addition to this overall strategy, we implement measures aimed at the cost, timing and completion risks, First, the impact of excessive cost overruns is clear—a completed project may be too expensive to be supported by its cash flow, so that all the project participants lose. Cost risks can be contained by requiring fixed-price or maximum-price construction contracts and firm prices for all major equipment and materials orders. These fixed, firm price quotes shift the risks of controlling costs to both the construction firms and the equipment vendors, who should be able to deal with this type of risk.

The timing risks can be even more important than the risks of cost overruns. Construction delays can be potentially devastating—not only can they result in increased interest on the construction loan, but they can also cause deferral of revenues, loss of tax benefits, loss of regulatory permits, and may trigger adverse consequences in the supporting contracts.

The first element of defense against timing risks is the outside technical review which was performed in the design stage. This

review should identify any flaws or vulnerabilities associated with the proposed construction schedule. The next defense is the on-site review performed by the consulting engineers throughout the construction phase. These engineers should spot delays as they develop, which means corrective actions may be implemented. Finally, construction timing risks can be mitigated by construction contracts which contain incentives to encourage timely completion. For example, the construction contract may contain liquidated damage clauses, provisions for delay penalities, or bonus payments for early completion. These contract provisions can encourage on-time construction and shift the costs of construction delay to the general contractor, who is the party best positioned to control the construction schedule.

The final construction risk is that of satisfactory completion. Will construction be completed? Will the project be constructed in accordance with its design specifications? The strategy for containing and allocating the risk of construction is to clearly assign this risk to the general contractor, the party responsible for building the facility according to its design. For example, the construction contract should require the general contractor to deliver a completed project which meets specified standards. In addition, the general contractor is required to post a performance bond, which will warrant all of the contractual obligations under the construction contract and will provide funds if the general contractor fails to fulfill these obligations. While the performance bond may make a certain amount of money available to cover specific obligations, it will not cover deficiencies arising from a flaw in the project's basic design. Therefore, the ultimate protection is again the outside technical review and construction monitoring. Essentially, the time to thoroughly review the project's engineering feasibility is during the design and construction stages, not upon completion.

Risks in Commercial Operations

Once construction has been completed and the project has successfully completed its initial performance tests, we now begin to face all the risks associated with commercial operation. This new set of risks includes ongoing performance, supply of the project's fuel and other inputs, the market for the project's output, and the linkage between its costs and revenues. Before committing to finance a project, it is critical to implement a containment and allocation strategy for these risks. We will examine each of these risks and its associated control strategy in turn.

Performance Risk. One of the first questions that must be addressed is whether the project will operate as intended. Will it operate efficiently and effectively at a reasonable capacity level on an ongoing basis? Will there be more down time than anticipated? Will it require more fuel per unit of output than specified? The best risk containment strategy for ongoing performance risk is the outside technical review in the design phase and on-site monitoring in the construction phase. However, there are additional actions that can further limit these performance risks. For example, while the standard equipment warranty usually is for one year, longer warranties can sometimes be obtained for a higher cost to help mitigate against the performance risks.

One of the best ways to ensure the long-term performance of a project is to enter into a long-term operating and maintenance (O & M) contract with proven, experienced operators who will guarantee the cost and ensure the adequacy of the O & M procedures. If the developer is not a substantial, experienced project operator, such a contract is essential. In addition, the project developer may be required to establish reserve funds before any of the project's benefits are distributed among the participants. Finally, where state-of-the-art technology is being utilized, it may be prudent to obtain systems performance insurance to guarantee that the overall project will operate at a certain minimum level of capacity. Under such an insurance policy, if this specified operating level is not reached, then the insurance carrier will pay the difference between actual revenues and the revenues which would have been received if the plant had operated at the guaranteed level.

During the operating phase, there are supply risks associated with fuel and other project inputs. These supply risks include not only the availability of the inputs, but also the costs which the project must bear to obtain these inputs. For example, a dominant cost to a cogeneration project is the fuel. Therefore, fuel supply contracts are required for the entire term of the financing. The fuel supplier should be a substantial, reliable fuel source who has adequate fuel reserves and the financial strength to stand behind the contract. Long-term transportation contracts may also be required to further assure the availability and cost of fuel. For example, in coal-fired cogeneration projects, transportation costs can be as much as 50 percent of the mine-mouth cost of the coal, and, accordingly, the transportation contracts are as important as the supply contracts.

In many energy-efficiency projects, fuel supply contracts may not be relevant. However, the same approach is necessary for any

required dominant input to the project. For example, low-wattage bulbs are often installed to replace existing lights as part of efficiency improvement projects. The financier should anticipate the labor involved in making the initial and subsequent bulb changes and should recognize that the more efficient bulbs cost more to replace when they burn out.

Market Risk. Once the inputs to the project have been secured and the facility has demonstrated its performance capability, the next concern is whether there will always be a ready market for the project's output at a satisfactory price. For a power producing project—such as cogeneration or alternate energy projects—the Public Utilities Regulatory Policies Act (PURPA) of 1978 provides the framework within which long-term power sales contracts with the utility can be negotiated. While the regulatory environment and utility receptivity to energy projects vary, there are plenty of opportunities for project developers to obtain attractive long-term power sales contracts.

A cogeneration project will also need a long-term steam sales contract, which establishes firm obligations to purchase steam and provides price certainty for the steam sales. While steam sales contracts are beyond the scope of PURPA, there are minimum levels of steam sales necessary in order to qualify the facility as a cogeneration project under PURPA. Quite often maintaining qualified facility status as a cogeneration project is a requirement under the power sales contract.

Energy-efficiency projects have similar market risks and require an assured market for their energy services at a certain price throughout the term of the financing. The host company has to anticipate the risks that the industry will change or that the facility will become obsolete. Although a company may find it difficult to assume the risks that a particular steel mill, refinery or pulp and paper plant will be in operation for the next fifteen years, one of the attractive features of public-sector facilities is that state or local governments can assume such risks for prisons, schools and hospitals. In almost all project financing arrangements the host facility is required to absorb the risks of long-term viability of the facility through some form of minimum-take arrangement. Typically, the host facility is in the best position to assess the long-term viability of the facility and has the most control over this issue.

Cost-Revenue Risk. The last risk associated with the commercial operation phase is the cost-revenue linkage risk. The risk is the correlation between the costs and the revenues. An increase in the

costs of the inputs must be covered by the project's revenues. To contain this risk, the terms of the supply and sales contracts must be coordinated. Otherwise, a project could be crushed in a vice of narrowing spreads between costs and revenues. For example, the power sales contract for a cogeneration project should be structured in terms of a fuel price and a heat rate—the efficiency of the utility system in converting this fuel into power. If the cogeneration project relies upon the same fuel as the utility system, such a heat rate contract would guarantee that both the revenues and expenses move in tandem.

General Project Risks

Besides the design, construction and operational risks that have been discussed so far, there are a number of other more general project risks that are beyond the control of any specific developer. These "macro-level" considerations are discussed in more detail in Michael Garland's chapter from the perspective of the project developer. In this chapter, these considerations are viewed from the outlook of the financial community. These broader risks include: regulatory considerations, interest rates, tax benefits, force majeure, and form of financing. Each of these factors will be addressed in turn.

Regulatory Considerations. Many regulatory licenses and permits are required before an energy project can be constructed and operated. These regulatory requirements include zoning, construction, water, air, etc. The best strategy for dealing with these risks is to retain outside, independent, experienced counsel to research all federal, state and local regulatory requirements and to have them review and oversee the permit acquisition strategy. While the responsibility for acquiring the permits rests with the project developer, the outside counsel can double check that all permitting requirements have been met. This outside review should address not only today's requirements, but it should also attempt to anticipate future regulatory actions. While it is difficult to predict the future, the risks of new regulations can be evaluated by considering such factors as regulatory and legislative history, and public sentiment. Obviously, it is easier to accommodate shifts in the permit requirements in the design rather than the operational phase.

Moreover, as discussed in Michael Garland's chapter, the long-term viability of a project can be devastated by shifts in the regulatory environment that establish the value of energy. What if the local public utility regulatory commission or utility decide to target

special energy rate discounts at the facility? Would the project still have any economic rationale? Again, the outside counsel must assess the potential for such shifts in regulatory policy.

Interest Rates. The interest rate risk is the danger that if interest rates increase above their anticipated level, financing costs will also go up. Financial institutions often structure project financings so that the interest rate risk is borne by the project during the construction phase and by the financing source during commercial operation. In other words, the construction loan has a variable interest rate, while the permanent financing has a fixed interest rate. The interest on the construction loan is capitalized and simply concluded during the total cost of the project. However, changes in the interest rate during the relatively short construction period of energy-efficiency projects generally have a modest impact upon the total cost of the facility and thus the overall project economics. Therefore, the project can easily accept the interest rate risk during the construction period. During commercial operation, the cash flows of the project are usually not correlated with the interest rate. Therefore, financial institutions often accept the interest rate risk during the operating phase of the project.

Tax Benefits. The risk of changes in the assumed tax benefits will impact any project in which tax benefits have been factored into the assessment of the project's economics. For example, if the project has been financed with a leasing arrangement, then the investment tax credit, depreciation deductions and tax rate assumptions are embedded in the financing costs. Changes (or uncertainty) in any of the tax assumptions could increase the costs of financing. The only way to address this concern is to retain outside, experienced tax counsel and certified public accountants to independently assess the tax benefits associated with each project. An additional strategy for containing this risk is to select projects whose economic viability is driven by the revenues produced rather than by the tax advantages associated with the investment. Finally, the project should be so economically attractive that it could support the higher financing costs associated with reduced tax benefits. One means of assuring this margin of safety in the financing is to require that the project's cash flow before financing (i.e., all revenues net of operating expenses) are projected to provide a coverage ratio to the financing costs of 1.3 to 1.5. As the coverage ratio is increased, the financing risks are decreased.

Force Majeure Force majeure risks are those risks which arise from the weather, acts of God, strikes, war and other events beyond the control of the project participants. Some of these risks are covered

by the property and casualty insurance that would normally be carried. Other risks, such as the loss of revenues resulting from such events, can be covered by business interruption insurance. Force majeure risks should be analyzed on a project-by-project basis to determine the appropriate strategy for risk containment.

Form of Financing. There are risks associated with the form of financing that is used in a project. For example, the more participants there are in the financing, the more complex the negotiations, and the more difficult it is to arrive at a consensus when problems arise. Similarly, the form of the financing vehicle can also introduce unique risks. For example, it may be more difficult to secure additional funds if needed from a limited partnership than from a single financing institution providing a loan or lease.

Finally, what most distinguishes project financing from conventional financing is the level of recourse that the financial institution has to the energy project's sponsor. All financings must provide a level of security and economic viability to repay the loan or lease. However, the form of financing, whether full, limited, or nonrecourse, can be tailored to meet the customers' unique financial needs and also the upside and downside potential of the project.

CONCLUSION

The basic tenet of any risk containment strategy is to identify, quantify, and allocate risks to the participant that can best assess and control them. For example, the engineering firm should guarantee the design of the project, the general contractor should absorb the construction risks, the equipment vendors should bear the risks for the equipment performance, the project operator should bear the O & M risks and the financier should absorb the risks of changes in the financial market. The host facility should be responsible for the consequences of changes in the operation of the specific facility.

Another component of risk containment is to rely upon seasoned and experienced participants and upon demonstrated technologies. There will always be surprises and unexpected events in any project. The long term viability of the project will be enhanced if there are no surprises from the technology or in the design and construction of the project. This rule of thumb should not be applied absolutely rigidly, however. While there are greater risks if a project relies upon less established technologies or project

participants, the potential benefits may be great enough to warrant an innovative approach.

Finally, expect the investors to act as partners in the project. Although project participants can take whatever risks they determine are prudent, they do need to understand the implications of the risks. Without this understanding how can they absorb the financial consequences of the risks or insure that they are properly rewarded for the risks that they absorb?

Participants in projects should be willing to pay a premium to reduce the risk of catastrophic losses. Better contractors or equipment generally are higher priced. Insurance costs money. Expert advice from outside engineers, certified public accountants and outside counsel can seem expensive. All these costs reduce the expected profits from a project, but can also limit surprises. Generally, if you skimp on project costs you will certainly pay later.

Project financing should be the wave of the future in the investment community. The foundation for these arrangements will be risk assessment. While many energy performance contracts may be relatively small investments or involve very simple technologies, the opportunities are limitless. Any participant in these projects should follow the lessons learned by GECC in project financing—understand and contain your risks.

George P. Schaefer is manager of the energy program at the General Electric Credit Corporation (GECC), where he is responsible for managing the development of innovative financing packages for alternative energy projects throughout the United States. Currently, the efforts of his group are focused on projects which use technologies such as coal and gas-fired cogeneration, waste heat recovery, hydropower, wind, geothermal and atmospheric fluidized bed boilers. Prior to joining GECC, George was director of energy finance for Ultrasystems, Inc., a design, engineering and construction company based in Irvine, California. He has held management positions with Booz, Allen and Hamilton, and the Orkand Corporation. George was also employed in the federal government, where he held a senior analytical position in the Department of Energy. George received his master of public administration degree from Syracuse University and his B.A. in economics and political science from The American University.

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Financing Energy Conservation

Pioneers in performance contracting share their experiences in lively case studies set in various organizational structures. They discuss basic implementation issues relevant to designers and managers of any government program.

Performance contracting, energy service contracts, and shared savings programs are the business arrangements in which payment for goods and services rendered is contingent upon their successful operation.

Such arrangements can be economically viable in the post-tax-credit era, especially if participants can benefit from the experiences shared by the contributors to **Financing Energy Conservation.** The authors were participants in ACEEE's 1984 Biennial Summer Study, which brings together outstanding researchers, program managers, policy makers, and practitioners in the field of energy conservation in buildings.

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About ACEEE

The American Council for an Energy-Efficient Economy (ACEEE) is a non-profit organization which conducts research and analysis on energy efficiency to stimulate the adoption of energy conserving technologies and practices. ACEEE staff and associates gather, evaluate, and disseminate information useful to government officials, utility personnel, business people, and individual consumers.

ISBN 0-918249-0-31