A PENNY SAVED IS HALF A PENNY EARNED:
Pennsylvania's Third Party (Shared Savings) Financing Program
For Energy Conservation

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ABSTRACT

This paper describes the practical experience gained by the State of Pennsylvania in developing and implementing a third party financing program for energy conservation, coal conversion, and congeneration in public buildings operated by state government. It reviews the origins of Pennsylvania's program and the process of energy management and budgeting in state buildings. It describes the procedures, criteria, evaluation, and results of ranking state facilities as potential candidates for a pilot program in shared savings. It identifies the key features of the program's contractor selection process and the kinds of issues and questions that were raised in a bidder's briefings with third party financing firms.

The paper concludes with a list of lessons learned for state and local governments or others who are just beginning a third party, shared savings program of energy conservation.
If Ben Franklin was managing Pennsylvania's third party financing 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, greedy 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 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 paper is about the practical experience gained by the State of Pennsylvania in developing and implementing a third party financing 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 third party 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.

ORIGIN OF THE PROGRAM

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 (PRR). 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. 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; $1 million was approved for FY 84/85.

Enter third party financing. After hearing a presentation by Rich Esteves (then with GPU, the nation's expert on creative conservation financing if not nuclear power plant operation) the GEC retained the Alliance to Save Energy and Lane & Edson to offer workshops on third party financing in various regions of the state and at least 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 (TPF) 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 requested to identify sites within their jurisdiction that they would like to be 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 enthusiasm and cooperation 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 TPF.

The Task Force then formed a subcommittee to select a contractor to advise us 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 third party financing; all agreed we needed help.

Our selection committee, half of whom came from private industry, chose a group consisting of a local engineering firm (Greeley-Polhemus Group, Inc.), a national law firm (Wickwire, Gavin and Gibbs, P.C.) specializing in third-party financing, and a third-party financing firm (Middle States Energy, Inc.) The evaluation and scoring criteria used to select these advisers is available as a handout.
Site selection, perhaps the most important phase of a TPF 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 system were already underway. Still others were eliminated because they were applicants for the federal Institutional Conservation Program (ICP) 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 TPF advisors. Because of their data base and experience, we asked the Penn State group to identify, evaluate, and prioritize a list of 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 GPG 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 total 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 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 GPG 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 TPF) and savings measurement. They also found, as a result of site visits, that most of the institutions listed had already budgeted or were in the process of repairing defective steam distribution systems. GPG recommended and we have requested proposals for energy management systems on four out of our six projects. (Attachment)

THE HUMAN INTERFACE

Perhaps the most important criteria for site selection was the attitude of the management and staff at the institutions toward the TPF concept and the options it might provide them. Screening sites for a pilot program with numbers and formula 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 the TPF concept 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 were merely imposed at the top.

By dropping institutions and reordering heavily on this criteria, we obviously paid a price. For example, some of the state's best coal conversion projects may be deferred for want of TPF financing since the operators were in love with their maintenance free, clean, put your feet up on 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 TPF manual (contents available as a handout) 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 exposure. Most had 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 TPF as a prospective lifepreserver 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 TPF project on an almost "turn key" basis. The Task Force and the Energy Council were providing free all consulting and project selection services, ranging from the RFP, the contractor selection, engineering review, project evaluation, legal research and contract drafting, etc. Each institution would ultimately be obligated to honor its contract and each would be intimately involved 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 TPF without central support from a state after the "pilot" projects were completed.

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 TPF 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 insure thorough engineering work in advance of proposals we structured our RFP into two phases: the first, to prequalify two firms for each site, primarily based on their prior experience with measures we proposed for each site; and the second, to select from among these the firms who submit the best proposals for contract negotiations.

This approach caused much consternation at our bidder's conference. About a third of the attendees expressed a preference for an open access one phase process with no beauty contest; while the other two thirds were content with our chosen method. These preferences probably reflected the relative experience and resources of the potential bidders.

There probably is 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 and detailed projects and have a wider potential selection of TPF firms. Others might prefer to sole source their work on selected institutions based on experience. It was clear from our bidder's conference that many TPF firms are not used to competitive bidding.
2. Secure expert advisory services (engineering, legal, and TPF experience) before ranking and selecting sites for a pilot program. The attractiveness of TPF projects is often governed more heavily by tax and metering considerations than by face value engineering and economic considerations. 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 TPF variants.

3. Know with a good degree of certainty what you want the TPF 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 adjacent 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. Don't underestimate the size of the potential "turf" that TPF 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 don't 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 TPF 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 TPF 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 RFP.
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 third party programs underway. We regarded as invaluable our contacts with California, New Jersey, New York, Delaware, and Maryland — each of whom approached the opportunity differently and who confronted different problems.

9. Prepare a list of questions and answers for handout at your bidders' briefing. Our bidders' conference generated questions about the following:

   a) any prior audits or calculations performed on energy measures for the specific sites,
   
   b) the reasoning behind including or excluding specific measures at individual sites in the RFP,
   
   c) an explanation as to how proposals will be evaluated for shared savings when access to sites is denied (i.e. how to detect "low balling" in the beauty contest),
   
   d) how teamwork RPF's will be compared to single contractor bidders,
   
   e) how selections will be made where two bidders competing for one site but offering non-competing measures will be made,
   
   f) how many weeks will be allowed between phase one selections and final selection (we increased the period from 6 to 7 weeks to accommodate subcontracting),
   
   g) what limitations exist, if any, to the state signing long term cocontracts with cancellation penalties,
   
   h) what regulations govern the payment of prevailing wages and/or union activity, and
   
   i) what work rules, civil service laws, and/or union contract restrictions if any will apply to the operation and maintenance of installed equipment.
PARTING THOUGHTS

Even governments never get something for nothing. TPF, 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, TPF 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.

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

Moreover, TPF 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 (i.e., the two boilers in 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 TPF as a bridge to what we could call "the energy service era," a time when heat, steam, work, light service is privatized and provided to public facilities by a host of 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 shouldn't be transplanted to the States. It will probably be our next experiment.
Selected Sites and Suggested Projects

1. Warren State Hospital
   Warren, Pennsylvania
   a. Coal Conversion

2. West Chester University
   West Chester, Pennsylvania 19383
   a. Package Cogeneration at South Campus (about 200 kw, gas-fired)
   b. Centrally-Controlled Energy Management System for the main (North) Campus

3. Soldiers and Sailors Home
   3rd Street
   Erie, Pennsylvania 16507

4. Lock Haven University
   Lock Haven, Pennsylvania
   a. Coal Conversion (2 new 20,000 pph boilers) or Coal Gasification with Cogeneration
   b. Campus-Wide Energy Management System

5. Woodhaven Center
   Temple University
   2900 Southampton Road
   Philadelphia, Pennsylvania 19154
   a. Package, Cogeneration, gas-fired, at 6-8 buildings now totally electric
   b. Center-Wide Energy Management System
   c. Set of Individual Projects Recommended by the June 24, 1983 Energy Audit

6. Mayview State Hospital
   Bridgeville, Pennsylvania 15017
   a. Facility-Wide Energy Management System