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INNOVATIVE APPROACHES TO FINANCING ENERGY CONSERVATION INVESTMENTS IN DEVELOPING COUNTRIES

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1 INTRODUCTION

Many economically advantageous opportunities to save energy are available in the industrial and commercial sectors of less developed countries (LDCs). Undertaking these investment opportunities will generally benefit LDCs in several ways. For example:

- Imported oil often accounts for a substantial share of the total energy budget for an LDC. Reducing oil imports should reduce external borrowing requirements and improve the terms of trade for LDCs. LDCs would need to export fewer resources and production in exchange for imported energy and other imported goods and services.

- Increasing the efficiency of energy use should enable a country to increase its real domestic income as a higher level of goods and services can be produced using the same amount of production inputs.

- Where indigenously produced energy resources are substituted for energy imports, the LDC will often benefit by higher employment. LDCs may also be able to acquire new labor skills for installing and maintaining energy-efficient equipment.

Despite the potential benefits from undertaking economically efficient conservation investments, investment opportunities remain largely unexploited in LDCs. Several barriers account for this lack of development, including inadequate knowledge of the conservation opportunities and the technology required to develop and maintain them; limited ability of the governments and countries to assemble the aggregate capital and foreign exchange resources needed to develop conservation; and limited access by the firms and individuals with conservation investment opportunities to the capital needed to develop those opportunities.

In this document, we focus on approaches to overcome the last of these three barriers. More specifically,

in Chapter 2, we examine five innovative arrangements that have recently been implemented in the United States and other developed countries to assist in financing energy conservation. These financing arrangements could be used in LDCs to facilitate the flow of capital to the firms and individuals that may develop potential energy conservation projects. In Chapter 3, we briefly outline potential roles for the public sector to assist in promoting these financing arrangements in LDCs.

A common barrier to undertaking conservation measures in developing countries is the limited ability or reluctance of energy users to acquire and deploy the capital needed to develop these opportunities. This limitation is often based on the financial condition of the consumer. Industrial firms, for example, have had frequent opportunities in recent years to benefit from the use of new, more energy-efficient production technologies, but insufficient internal cash, combined with an inability to raise debt or equity capital under favorable terms (e.g., because of a highly debt-burdened balance sheet), have often prevented firms from funding these investments.

In other circumstances, firms able to raise the capital (e.g., by borrowing) needed for energy-related investments remain reluctant to do so. The reasons for this reluctance include:

- Competition for available capital between energy-related investment opportunities and investments required to maintain or expand market share and production output levels

- Aversion by borrowers to assuming the fixed-repayment obligations associated with a traditional loan

- Concern for the uncertainty of technical performance and level of economic return that may be achieved by an energy conservation investment

- Lack of tax-related incentives (e.g., accelerated depreciation and tax credits) needed to achieve an adequate return on an investment in conservation

- Inability of business investors to use available tax-related incentives because of

insufficient tax liability*

- High front-end costs that may have to be incurred simply to evaluate the technical and economic feasibility of an energy conservation investment.

Confronted with such impediments to mobilizing capital for conservation investments, some financiers and entrepreneurs in industrialized countries have recently implemented five innovative arrangements for financing conservation and other energy-related investments. These arrangements, which may have benefits for developing countries as well, are:

1. Shared savings arrangements
2. Energy service agreements
3. Joint-venture arrangement between an energy user and an external investors
4. Variable-payment loan
5. Limited-term, guaranteed-payback loans.**

The benefits to the energy user vary among the different financing arrangements; however, each arrangement is generally designed to achieve several of the following benefits:

- Reduce the front-end cash outlay needed to undertake a project

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*The relevance of this impediment in LDCs varies from country to country, depending on provisions of the tax code and the extent to which the tax code is effectively enforced.

**Another financing arrangement not included in this list or in the report is the true lease. Interest in using leases for energy project financing has increased in recent years. However, the application of a lease is highly dependent on the tax rules of a country. In addition, a lease generally offers fewer financing benefits than the other arrangements.

- Shift certain technical or economic risks from the energy user to an external investor or creditor
- Relieve the fixed-payment burden that is associated with traditional debt financing
- Relieve firms from needing to use their corporate balance sheets to secure externally-provided financing
- Transfer tax benefits to an external equity investor who may value such benefits more highly than the energy user.*

In return for receiving these benefits, the energy user usually must relinquish some of the potential return that might have been gained if the energy user had financed the project independently. This exchange may be acceptable if the energy user's only alternative is not to undertake the project. Although he has to relinquish some of the potential return, the energy user can still receive significant benefits (that otherwise would have been foregone) by using one of the innovative financing arrangements.

We discuss these five financing arrangements below. For each arrangement, we describe its structure and operation; the distribution of risk between the energy user and the creditors/external investors; and the financial benefits that accrue to the energy user. In addition, we illustrate each financing arrangement with an example, based on an energy conservation project being considered by a major textile manufacturing facility in Sri Lanka. More specifically, the estimates of investment cost and energy cost savings used in each example are based on retrofitting an existing oil-fired boiler with a wood gasifier. The wood gasifier retrofit was identified as a cost-effective conservation investment opportunity after an intensive analysis of energy consumption and potential process modification, equipment retrofits, and new equipment purchases that could reduce energy requirements.

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*As indicated above, the significance of this benefit will vary, depending on a country's tax code and the effectiveness of enforcement and collections.

SHARED SAVINGS ARRANGEMENTS

Shared savings is a conservation financing arrangement pairing an energy user who is unable to finance conservation investment with an external investor willing to finance the project. In return for providing project financing, the investor receives a share of the value of energy savings (or production, if appropriate) and, usually, the tax-related benefits associated with ownership of the investment.

The foremost financing benefit of a shared-savings arrangement is that the energy user obtains potentially significant economic benefits through installation of capital improvements for which the user has no financial obligation or liability. The energy user is not required to make any up-front cash outlays, and the downstream payments by the energy user to the shared-savings firm/external investor are contingent upon the technical/economic performance of the conservation improvement. That is, no performance means no payments. Accordingly, a shared-savings financing will generally qualify as off-balance-sheet/off-credit financing and should not impair a user firm's borrowing or equity-raising capability. Indeed, if carefully reviewed by astute creditors and investors, a shared-savings arrangement should enhance the value of a user firm and its terms of access to capital.

Shared savings has gained increasing favor over the past 5 years. For example, in the United States, the shared-savings arrangement is offered by over 100 conservation financing firms. This arrangement has been used to finance a wide variety of energy-related investments, including energy management systems in institutional, commercial, multi-family residential, and industrial applications; process-related modifications in industry; and cogeneration plant installations for industry and institutions.

Arrangement Structure

A shared-savings financing arrangement is typically structured and undertaken as follows. A shared-savings firm first identifies and evaluates the conservation investment opportunities at the energy user's facilities. This evaluation is usually undertaken at no cost to the energy user. However, the energy user will usually be liable for reimbursement of the cost of the detailed

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engineering and financial evaluation if the shared-savings firm identifies investment opportunities that it is willing to finance but the energy user refuses the firm's financing offer and undertakes the investments on its own.

On the basis of the evaluations by the shared-savings firm and, occasionally, independent evaluations undertaken by the energy user, the shared-savings firm and the energy user negotiate the shared-savings agreement. The agreement includes procedures for establishing the quantity and value of energy savings and a formula for sharing the value of the energy savings. A typical procedure for measuring and valuing energy savings involves projecting the energy user's utility or fuel costs on the basis of his historical energy consumption patterns and current energy prices.* Actual energy costs after an improvement has been installed are then subtracted from the projected costs based on historical consumption patterns to arrive at the gross value of energy savings (i.e., the value of energy savings before deducting capital costs or operating expenses). With regard to a sharing formula, a common arrangement is for the shared-savings firm to receive 60 percent of the value of savings for the first 5 years following installation of an improvement, and 40 percent for the second 5 years. At that point, the energy user typically has the option of purchasing the improvement or renewing the contract. In addition to receiving a share of the gross value of savings, the shared-savings firm also usually receives any tax benefits associated with the investment (i.e., tax credits and depreciation).

The energy user retains the residual value of energy savings not distributed to the shared-savings firm. Since the savings share retained by the energy user is

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*Establishing the baseline energy consumption data is often one of the more difficult aspects of negotiating a shared-savings agreement since the baseline data are used to estimate total energy savings produced by the conservation improvement. To minimize the potential future disagreements over actual energy savings resulting from the conservation improvement, the energy user and shared-savings firm usually agree on specific adjustments to the baseline data (e.g., to reflect climatic conditions) that will be made in determining energy savings occurring in a specific time period.

based on gross savings instead of net savings (i.e., the value of energy savings after deducting capital costs and/or operating expenses), the energy user in effect receives a royalty on the value of energy savings produced by the shared-savings firm's investment.

The shared-savings agreement also addresses such matters as procedures for managing and maintaining the conservation improvement. Since income to the shared-savings firm depends on the performance of the improvement, the shared-savings firm has a strong interest in ensuring that the improvement is maintained and operated efficiently. Accordingly, the shared-savings firm usually accepts (and, indeed, usually demands) responsibility for maintaining and managing the improvement. This responsibility is also important in establishing ownership of the improvement for tax purposes. Occasionally, the requirement for a shared-savings firm's involvement in maintaining and managing a conservation improvement reduces the energy user's willingness to accept a shared-savings agreement. This concern is more likely to be important if an improvement involves a modification to a production process.

Once the shared-savings firm and the energy user have negotiated the shared-savings agreement, the shared-savings firm finances and undertakes the conservation improvement. The shared-savings firm may remain the sole owner/investor in the project and finance the improvement from its own financial resources. Or, as an increasingly frequent alternative, the shared-savings firm may syndicate the investment as a limited partnership, with other investors then providing the bulk of the investment funds. The typical financial structure of a shared-savings arrangement would be 30 to 40 percent equity leveraged with 60 to 70 percent debt. Occasionally, the debt may be project-secured; however, the debt more generally must become a general obligation of the equity investor(s). After the improvement is completed, the shared-savings firm and the energy user operate under the negotiated agreement, sharing the value of energy savings according to the savings formula.

In a shared-savings financing arrangement, the energy user is able to eliminate all or part of several important risk elements that it would otherwise bear in undertaking a conservation investment. Specifically, the shared-savings firm or its associated external investors assume fully the risk associated with the

uncertainty of improvement cost and project operating and maintenance expenses. The external investors and the user firm generally share risks associated with uncertainty about the conservation project's technical performance, the utilization rate of the conservation improvement, and the price of energy (for valuing energy savings). A shared-savings arrangement may also contain special terms that shift these risk elements in different ways from those embodied in a standard shared-savings arrangement. For example, an external investor may require that shared-savings payments be made on the basis of a specified minimum utilization rate for an improvement, even though the energy user may actually operate the improvement at a lower rate than the specified minimum. In this way, the external investor reduces the risk associated with uncertain utilization of the conservation improvement.

Example of a Shared-Savings Financing Arrangement

To assist in understanding the various financing arrangements, we constructed an example energy conservation investment under each arrangement. The example investment is based on an actual project to retrofit an existing oil-fired boiler with a wood gasifier at a textile mill in Sri Lanka (see Exhibit 2.a for a summary of the financial and tax assumptions used in the analysis).

The accounting flows associated with a shared-savings arrangement to finance this investment are shown in Exhibit 2.b. The investment requires a capital outlay of U.S. $485,000 and achieves a 40-percent reduction in energy use (and cost). Without taking account of any financial structure or tax considerations, the investment would achieve payback in less than 2 years following the initial capital outlay.* We assume that the investment is depreciated over a 5-year period on a straight-line basis, and also qualifies for a 10-percent investment tax credit (ITC).

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*On the basis of our own experience in evaluating conservation opportunities in LDCs, investment opportunities with this payback potential are frequently available and unexploited in industrial, commercial, and institutional facilities.

Exhibit 2.a

Financial and Tax Assumptions for Illustration of Conservation Financing Arrangements

Project description: Retrofit an existing oil-fired boiler with a wood gasifier.

Total capital outlay for improvement: U.S. $485,000.

Depreciation method: 5-year straight line.

Investment tax credit rate: 10 percent.

Expected reduction in energy use from investment: 40 percent.

Marginal tax rate on income for energy user and external investor: 50 percent.

Interest rate on debt financing: 14 percent, except for guaranteed payback loan at 18 percent.

SOURCE: Hagler, Bailly & Company.

Exhibit 2.b

EXAMPLE OF INNOVATIVE APPROACH TO CONSERVATION PROJECT FINANCING
FINANCING APPROACH: SHARED SAVINGS

TIME PERIOD	1	2	3	4	5	6	7	8	9	10	11
CAPITAL RELATED ACCOUNTS											
C al Outlay for Improvement	485000										
Investment Tax Credit (0.10 x Capital Cost)		48500									
Depreciation (5 year Straight Line)		97000	97000	97000	97000	97000					
ENERGY COST SAVINGS											
Energy Cost without Improvement		637000	712000	797000	894000	1001000	1121000	1256000	1406000	1575000	1764000
Energy Cost with Improvement		382200	427200	478200	536400	600600	672600	753600	843600	945000	1058400
Value of Energy Savings		254800	284800	318800	357600	400400	448400	502400	562400	630000	705600
RETURNS TO THE SHARED SAVINGS INVESTOR											
(1) Equity Outlay (0.35 x Capital Outlay)	169750										
Debt Payments (65% of Capital Outlay Financed Over 7 years at an Interest Rate of 14%)		73514	73514	73514	73514	73514	73514	73514			
(2)-Interest Payment		44135	40022	35333	29988	23894	16947	9028			
(3)-Principal Payment		29379	33492	38181	43526	49620	56567	64486			
(4) Investor's Share of Energy Savings (.6 x Value of Energy Saved)		152880	170880	191280	214560	240240	269040	301440	337440	378000	423360
(5) Depreciation		97000	97000	97000	97000	97000					
(6) Investor's Taxable Income [(4)-(2)-(5)]		11745	33858	58947	87572	119346	252093	292412	337440	378000	423360
(7) Investment Tax Credit		48500									
(8) Investor's Income Tax [(0.5 x (6))-(7)]		-42628	16929	29473	43786	59673	126046	146206	168720	189800	211680
(9) Investor's After Tax Cash Flow [(6)-(8)+(5)-(1)-(3)]	-169750	121994	80437	88293	97260	107853	69480	81720	168720	189000	211680
RETURNS TO THE ENERGY USER											
(10) Energy User's Share of Energy Savings (.4 x Value of Energy Saved)		101920	113920	127520	143040	160160	179360	200960	224960	252000	282240
(11) Tax on Energy User's Increase in Before Tax Income [.5 x (10)]		50960	56960	63760	71520	80080	89680	100480	112480	126000	141120
(12) Energy User's After Tax Cash Flow [(10)-(11)]		50960	56960	63760	71520	80080	89680	100480	112480	126000	141120

Present Value of Investor's After Tax Cash Flow at 20%: 237436

Present Value of Energy User's After Tax Cash Flow at 20%: 264200

The structure of the shared-savings agreement provides the external investor with 60 percent of the value of energy savings over a 10-year period, plus the ITC and depreciation. The energy user receives the remaining 40 percent of the value of energy savings, and is responsible for paying actual energy costs subsequent to the improvement. The external investor's outlay is financed with 35 percent equity cash and 65 percent debt. The debt is structured as constant principal and interest repayment to be repaid over a 7-year period at an interest rate of 14 percent. Debt payments are solely the responsibility of the external shared-savings investor, and are subordinate to the distribution of energy savings revenues between the energy user and the external investor.

As a result of this investment structure, the present value of after-tax cash flow to the external investor is almost $240,000 at a discount rate of 20 percent and assuming a marginal tax rate of 50 percent. The internal rate of return on after-tax cash flow for the 11-year period is 65.1 percent. Accordingly, in this arrangement, the external investor would receive an attractive return on equity. At the same time, the energy user would receive an after-tax cash flow (again, assuming a 50-percent tax rate) with a present value of more than $264,000 at a 20 percent discount rate. The energy user achieves this improvement in cash flow and corporate net worth with no cash outlay.

JOINT-VENTURE ARRANGEMENT BETWEEN AN ENERGY USER AND AN EXTERNAL INVESTOR

A joint-venture arrangement between an energy user and an external investor is essentially a variation of the shared-savings agreement. As in a shared-savings agreement, an external investor provides the capital investment (or most of it) required to undertake an energy conservation project. The energy user provides the site/opportunity for the investment. However, in contrast to the shared-savings agreement, the investor and the energy user have more flexibility in tailoring the joint-venture arrangement to suit their specific risk/return objectives. The flexibility afforded by the joint-venture arrangement makes this financing arrangement attractive for large industrial projects where both the energy user and the external investor wish to control the construction and operation of the project.

Arrangement Structure

In a joint-venture arrangement, the external investor and the energy user form a separate investor entity to manage the construction and operation of the conservation project. The investor entity might be a corporation, a general partnership, or a limited partnership. For example, in a limited partnership, the energy user may assume the role of general partner, with the external investor(s) acting as the limited partner(s). Under this arrangement, the energy user retains management control over the construction and operation of the conservation improvement, while the external investor/limited partner receives the tax benefits of project ownership.

The financial structure of a joint venture is usually similar to that of a shared-savings agreement, and typically consists of 30 to 40 percent equity and 60 to 70 percent debt. For some investments (e.g., those involving substantial capital assets with resale value), the debt may be project-secured. However, the debt more generally will have to be supported by the assets of the external investor or the energy user or both.

The financing benefits of a joint venture depend on the terms of the specific agreement. Generally, the external investor is responsible for providing the bulk of the capital required for the conservation project. As such, the energy user will receive its share of the benefits of the conservation improvement with little or no front-end investment required. Whether a joint venture will provide off-balance-sheet/off-credit financing will depend on the extent of minimum payment and debt support obligations assumed by the energy user.

A joint-venture agreement specifies procedures for sharing the benefits of constructing and operating the conservation improvement. As in a shared-savings agreement, revenue to the joint venture is generally determined by first estimating the energy costs the user would have incurred in the absence of the conservation improvement, and then subtracting actual energy costs from the estimated costs.

In a joint venture, income to both the external investor and the energy user is generally subordinate to the repayment of project debt. This provision represents a key difference in the financial risk accepted by the external investor (assuming the external investor serves

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as guarantor for the debt) in a joint venture relative to a shared-savings agreement (i.e., in a shared-savings agreement, debt payments are solely the responsibility of the external investor). Other elements of project risk are shared by the energy user and the external investor on the basis of the terms of the joint-venture agreement.

A joint-venture agreement also usually contains various provisions for sharing the project's non-energy operating costs; ensuring minimum project utilization rates (and associated payments from the energy user to the external investor); and, as we noted above, managing other elements of project risk (e.g., the use of special formulas to manage the risk of uncertain energy prices).

Example of a Joint Venture

To illustrate the joint-venture arrangement, weuse the textile mill investment opportunity that we used in the shared-savings example. The accounting flows for the joint-venture example are presented in Exhibit 2.c. In this example, the energy user assumes the role of general partner in a limited partnership and is responsible for 5 percent of the capital outlay for the investment opportunity. The limited partner/external investor is responsible for 95 percent of the capital outlay, which is again financed at 65 percent debt and 35 percent equity cash.

During the operation of the joint venture, the energy user remains responsible for paying the actual energy costs that are incurred after the conservation improvement has been made. Revenue to the partnership is defined as the value of energy savings. Repayment of the limited partner's debt is senior to the distribution of revenues between the general partner and limited partner. Specifically, the limited partner/external investor receives 30 percent of the value of net energy savings (i.e., gross energy savings less debt payments), the general partner receives 70 percent of the value of net energy savings. The limited partner also receives the depreciation, investment tax credit, and interest deduction benefits. As a result of these distributions, the limited partner/external investor receives a cash flow with a present value of more than $135,000, discounted at 20 percent and assuming a 50 percent marginal tax rate. The limited partner's after-tax cash

Exhibit 2.c

EXAMPLE OF INNOVATIVE APPROACH TO CONSERVATION PROJECT FINANCING
FINANCING APPROACH: JOINT VENTURE (LIMITED PARTNERSHIP WITH ENERGY USER AS GENERAL PARTNER)

TIME PERIOD		1	2	3	4	5	6	7	8	9	10	11
CAPITAL RELATED ACCOUNTS												
Capital Outlay for Improvement	485000											
Investment Tax Credit (0.10 x Capital Cost)			48500									
Depreciation (5 year Straight Line)			97000	97000	97000	97000	97000					
ENERGY COST INFORMATION												
Energy Cost without Improvement			637000	712000	797000	894000	1001000	1121000	1256000	1406000	1575000	1764000
Energy Cost with Improvement			382200	427200	478200	536400	600600	672600	753600	843600	945000	1058400
Value of Energy Savings			254800	284800	318800	357600	400400	448400	502400	562400	630000	705600
RETURNS TO THE LIMITED PARTNER/EXTERNAL INVESTOR												
Limited Partner's Capital (95% of total)	460750											
(1) Equity Outlay (0.35 x Capital Outlay)	161263											
Debt Payments (65% of Ltd Partner's Outlay Financed Over 7 years at an Interest Rate of 14%)			69836	69838	69838	69838	69838	69838	69838			
(2)-Interest Payment			45323	41891	37979	33518	28433	22637	16029			
(3)-Principal Payment			24515	27947	31860	36320	41405	47201	53810			
(4) Investor's Revenue (.30 x Value of Energy Savings less Debt Payments)			55489	64489	74689	86329	99169	113569	129769	168720	189000	211680
(5) Depreciation			97000	97000	97000	97000	97000					
(6) Investor's Taxable Income [(4)-(5)+(3)]			-16997	-4564	9548	25649	43573	160770	183578	168720	189000	211680
(7) Investment Tax Credit			48500									
(8) Investor's Income Tax [(0.5 x (6))-(7)]			-56998	-2282	4774	12824	21787	80385	91789	84360	94500	105840
(9) Investor's After Tax Cash Flow [(4)-(8)-(1)]		-161263	112487	66771	69914	73504	77362	33184	37979	84360	94500	105840
RETURNS TO THE ENERGY USER												
(10) Energy User's Capital (0.05 x Outlay)	24250											
(11) Energy User's Revenue (.70 x Value of Energy Savings less Debt Payments)			129473	150473	174273	201433	231393	264993	302793	393680	441000	493920
(12) Tax on Energy User's Increase in Before Tax Income [.5 x (11)]			64737	75237	87137	100717	115697	132497	151397	196840	220500	246960
(13) Energy User's After Tax Cash Flow [(11)-(10)-(12)]		-24250	64737	75237	87137	100717	115697	132497	151397	196840	220500	246960

Present Value of Investor's After Tax Cash Flow at 20%: 135492

Present Value of Energy User's After Tax Cash Flow at 20%: 368718

flows yield an internal rate of return of 50.6 percent. The present value of cash flow benefits to the energy user/general partner is almost $369,000, discounted at 20 percent and assuming a 50-percent marginal tax rate.

ENERGY SERVICE AGREEMENT

An energy service agreement is similar to a shared-savings financing arrangement in that an external investor provides the capital for conservation improvements at the facility of the energy user. As with the shared-savings agreement, the energy user makes no cash outlays and incurs no financial obligations in allowing the energy-related capital improvement to be installed. However, the agreement differs from the shared-savings agreement in the manner in which the energy service firm/external investor receives its financial return.

Arrangement Structure

Under an energy service agreement, the energy service firm/external investor agrees to provide the energy user with specified energy services (e.g., heat and air conditioning, hot water, lighting and refrigeration) at a fixed aggregate cost or unit price that is less than the cost the energy user would incur for the specified energy services in the absence of the conservation improvement. The aggregate cost or unit price will often be specified as a fraction (e.g., 80-90 percent) of the energy costs that would have been incurred in the absence of any energy-related investments. In other agreements, the price is set at a fixed value subject to escalation with energy prices.

The energy service firm installs those conservation improvements that it has identified as being economically advantageous and necessary to earn an adequate return, given the pricing agreement for providing energy services. After installing the conservation improvements, the user firm no longer makes direct payments to utilities and fuel suppliers for its energy use; instead, the user pays the energy service firm, and the energy service firm is responsible for all payments to utilities and fuel suppliers.

The energy service firm earns a return on its conservation investment by providing the specified energy services at a cost (including current operating and

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maintenance expenses and an allowance for recovery of and return on the capital invested for the conservation improvement) that is less than the amount paid by the energy user to the energy service firm/external investor for the energy services. In addition, the energy service firm generally receives the tax benefits (i.e., depreciation and investment tax credits) associated with ownership of the conservation improvement. The energy service firm may finance the conservation improvement from its own corporate resources or syndicate the investment to other investors (e.g., through a limited partnership).

As in a shared-savings agreement, the energy service firm is fully responsible for maintaining the conservation improvement during the term of the energy service agreement, which typically ranges from 7 to 15 years. At the end of the service agreement, the energy user generally has the option of renewing the agreement or purchasing the conservation improvement.

In an energy service agreement, the energy service firm fully assumes the risks associated with the uncertainty of an improvement's capital cost, operating and maintenance expense, and technical performance. Unless the service agreement contains a provision allowing the energy user's payment to the service firm to escalate with energy prices, the energy service firm also fully assumes the risk of uncertain energy prices. The user firm and the energy service firm generally share the risk associated with uncertainty about the facility's utilization rate. However, depending on the structure of the agreement, the nature of risk distribution may be adversarial rather than collaborative. That is, if the agreement involves a fixed payment for energy services, the user firm benefits as the rate of facility use (and presumably energy use) increases; however, the energy service firm incurs a higher energy cost as the rate of facility use increases. To offset this risk, the energy service firm may insist that the energy consumption level on which the user firm's monthly payments are based be adjusted to reflect higher-than-anticipated facility utilization rates.

The chief financing benefit of an energy service agreement is that the energy user obtains the benefits of energy conservation improvements without any front-end cash outlay. However, whether an energy service agreement will qualify for off-balance-sheet/off-credit financing depends on the terms of the agreement.

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Specifically, most energy service agreements involve minimum fixed payments, an obligation that, like a lease, might have to be reported in a firm's financial statements. Whether an energy service agreement would have to be reported as a financial liability will depend on the magnitude of the energy service payments and accepted accounting practices regarding such matters as fuel contracts. For example, many firms enter fuel or power purchase contracts that involve minimum-take provisions;* however, under typical accounting conventions, such commitments are not usually reported in financial statements.

Example of an Energy Service Agreement

The accounting flows associated with an energy service agreement used to finance the wood gasifier retrofit at the textile mill are shown in Exhibit 2.d. The major difference in the accounting flows between the shared-savings agreement, and the energy service agreement is that in the energy service agreement, the energy service firm is responsible for paying the energy costs for the energy user. Accordingly, the external investor receives a payment from the energy user that is based on gross energy costs without any conservation improvement instead of the value of energy savings as in the shared-savings arrangement. In our example, the external investor receives a payment equal to 90 percent of the energy costs that would have been incurred without the retrofit improvement. As a result, the energy user receives a benefit equal to 10 percent of the energy costs without the improvement. The external investor also receives the depreciation and ITC benefits that result from the project.

The investment is financed by the energy service firm/external investor with 35 percent equity cash and 65 percent debt, to be repaid over 7 years at an interest rate of 14 percent. At a discount rate of 20 percent and an assumed 50 percent marginal tax rate, the present value of after-tax cash flows to the energy service

*That is, the purchaser agrees to pay for a specified minimum quantity of fuel even if he does not need it (or, for that matter, receive it) in a contract period. Another name for such an arrangement is a take-or-pay contract.

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Exhibit 2.d

EXAMPLE OF INNOVATIVE APPROACH TO CONSERVATION PROJECT FINANCING
FINANCING APPROACH: ENERGY SERVICE AGREEMENT

TIME PERIOD	1	2	3	4	5	6	7	8	9	10	11
CAPITAL RELATED ACCOUNTS											
Capital Outlay for Improvement	485000										
Investment Tax Credit (0.10 x Capital Cost)		48500									
Depreciation (5 year Straight Line)		97000	97000	97000	97000	97000					
ENERGY COST INFORMATION											
Energy Cost without Improvement		637000	712000	797000	894000	1001000	1121000	1256000	1406000	1575000	1764000
Energy Cost with Improvement		382200	427200	478200	536400	600600	672600	753600	843600	945000	1058400
Value of Energy Savings		254800	284800	318800	357600	400400	448400	502400	562400	630000	705600
RETURNS TO THE ENERGY SERVICE FIRM/INVESTOR											
(1) Equity Outlay (0.35 x Capital Outlay)	169750										
Debt Payments (65% of Capital Outlay Financed Over 7 years at an Interest Rate of 14%)		73514	73514	73514	73514	73514	73514	73514			
(2)-Interest Payment		44135	40022	35333	29988	23894	16947	9028			
(3)-Principal Payment		29379	33492	38181	43526	49620	56567	64486			
(4) Investor's Revenue (.90 x Energy Cost Without Improvement)		573300	640800	717300	804600	900900	1008900	1130400	1265400	1417500	1587600
(5) Energy Cost Paid by Investor		382200	427200	478200	536400	600600	672600	753600	843600	945000	1058400
(6) Depreciation		97000	97000	97000	97000	97000					
(7) Investor's Taxable Income [(4)-(2)-(5)-(6)]		49965	76578	106767	141212	179406	319353	367772	421800	472500	529200
(8) Investment Tax Credit		48500									
(9) Investor's Income Tax [(0.5 x (7))-(8)]		-23518	38289	53383	70606	89703	159676	183806	210900	236250	264600
(10) Investor's After Tax Cash Flow [(7)-(9)+(6)-(1)-(3)]	-169750	141104	101797	112293	124088	137083	103110	119400	210900	236250	264600
RETURNS TO THE ENERGY USER											
(11) Energy User's Savings [Energy Cost Without Improvement - (4)]		63700	71200	79700	89400	100100	112100	125600	140600	157500	176400
(12) Tax on Energy User's Increase in Before Tax Income [.5 x (11)]		31850	35600	39850	44700	50050	56050	62800	70300	78750	88200
(13) Energy User's After Tax Cash Flow [(11)-(12)]		31850	35600	39850	44700	50050	56050	62800	70300	78750	88200

Present Value of Investor's After Tax Cash Flow at 20%: 336511

Present Value of Energy User's After Tax Cash Flow at 20%: 165125

firm exceeds $336,000. The investor's after-tax cash flows yield an internal rate of return of 74.2 percent. The present value of cash flow benefits to the energy user is more than $165,000. That the external investor receives a higher return under this arrangement than under shared savings does not mean that energy service agreements are always less advantageous to the energy user than shared savings arrangements. This difference results from the numerical terms used to illustrate the financing arrangements.

VARIABLE-PAYMENT LOAN

The variable-payment loan differs from the three preceding financing arrangements in that the external funds are provided through debt rather than an equity-oriented financing, and ownership of the conservation improvement accordingly rests with the energy user. The variable-payment loan incorporates two features that are designed to assist the energy user in financing a conservation project:

1. The debt payment schedule is structured to maximize the likelihood that the debt payment in any period will be less than the value of energy savings achieved in that period. As a result, an energy user should achieve a positive cash flow on a conservation investment immediately following installation of the conservation improvement and throughout the period during which the loan is being repaid.

2. Subject to a minimum payment, loan payments are set to vary directly with the value of energy savings. That is, the higher the implicit cash flow from energy savings during a period, the higher the energy user's debt principal payment in that period. The variable-payment provision is designed to reduce the aversion of many energy users to assuming fixed-repayment obligations for conservation improvements that produce energy savings that may vary over time and that are virtually certain to produce negative cash flows at some point, usually early in the repayment period.

Variable-payment loans have been issued in developed countries by organizations such as electric utilities, government entities, and occasionally banks and other

traditional creditors. The loan arrangement has been used primarily to finance conservation projects in the commercial, institutional, and residential sectors (although it could be applied in other sectors. For example, Citizens Conservation, Inc., a conservation financing organization operating in Massachusetts, has arranged numerous variable-payment loans to finance conservation improvements in low-income multi-family housing units and in non-residential structures owned or occupied by non-profit organizations. In addition, a similar financing program is being considered for implementation in the Philippines under joint sponsorship of the Philippine government and the Agency for International Development.

Arrangement Structure

The specific structure of a variable-payment loan depends on the willingness of a creditor to accept an uncertain debt retirement stream. Under a typical structure, the conservation financing organization or other creditor evaluates the conservation opportunities at an energy user's facility. For economically attractive opportunities, the creditor extends a loan to cover a substantial share (e.g., 80 to 100 percent) of the cost of installing the conservation improvement. The creditor and energy user then agree on a formula for estimating the cost of energy that the energy user would incur without the improvement. The energy user agrees to pay the creditor a loan payment in each period equal to a fraction (e.g., 75 percent) of the energy cost savings in a period. The savings equal the difference between the projected energy costs without the improvement and actual energy costs. In addition, the loan agreement specifies a minimum loan payment, which is usually the payment required to retire the loan in 1.5 to 2 times longer than the repayment period that would occur if the improvement performs to expectations in achieving energy savings.

In some variable-payment loan programs, the energy user makes utility or fuel payments directly to the creditor organization. These payments are generally set at the level of estimated energy costs that would occur in the absence of the conservation improvement. The creditor, in turn, makes a payment equal to the energy user's actual energy cost to the utility or fuel supplier. The residual is used to repay the loan and rebate a

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"dividend" to the energy user according to the terms of the loan agreement.

Under the variable-payment loan arrangement, the energy user assumes the risks of project technical and economic performance. The creditor assumes the risk of loan default that would normally be accepted by a creditor; in addition, the creditor accepts greater than usual risk associated with the uncertainty of the rate at which the loan will be repaid. Of course, the creditor may shift some market-related risks to the energy user by using a variable interest rate loan. In addition, the extent of default risk accepted by the creditor will depend on the debt security required by the creditor. Usually, this loan arrangement has been used by utility firms, which may collect on defaulted loans through utility rates, or in conjunction with a government-provided credit guarantee. In these cases, the energy user/debtor would not usually be required to post any collateral security to support the loan.

Because the energy user remains liable for minimum loan payments in each period, the variable-payment loan generally does not provide off-balance-sheet/off-credit financing for a conservation project. However, as noted above, the loan arrangement offers significant financing benefits by providing the energy user with positive cash flow immediately following installation of the conservation investment and by largely reducing the risk associated with the fixed-payment obligations of a traditional loan. Moreover, since external financing is provided through a loan, the energy user retains ownership of the conservation improvement and accordingly receives the tax benefits (i.e., depreciation and tax credits) associated with the conservation project.

Example of a Variable-Payment Loan

To illustrate how the variable-payment loan could be used to finance the wood gasifier retrofit at the Sri Lanka textile factory, we assume that a creditor will extend credit for 90 percent of the capital outlay of the conservation improvement (see Exhibit 2.e). The loan terms include a minimum payment of $101,788 per year, which is based on a 7-year loan term at an interest rate of 14 percent. Actual debt payments until the debt is fully retired are the minimum payment or 75 percent of the value of energy savings, whichever is greater.

Exhibit 2.e

EXAMPLE OF INNOVATIVE APPROACH TO CONSERVATION PROJECT FINANCING
FINANCING APPROACH: VARIABLE PAYMENT LOAN

TIME PERIOD	1	2	3	4	5	6	7	8	9	10	11
CAPITAL RELATED ACCOUNTS											
Capital Outlay for Improvement	485000										
Investment Tax Credit (0.10 x Capital Cost)		48500									
Depreciation (5 year Straight Line)		97000	97000	97000	97000	97000					
ENERGY COST INFORMATION											
Energy Cost without Improvement		637000	712000	797000	894000	1001000	1121000	1256000	1406000	1575000	1764000
Energy cost with Improvement		382200	427200	478200	536400	600600	672600	753600	843600	945000	1058400
Value of Energy Savings		254800	284800	318800	357600	400400	448400	502400	562400	630000	705600
RETURNS TO THE ENERGY USER											
(1) Equity Outlay (0.10 x Capital Outlay)	48500										
(2) Value of Energy Savings		254800	284800	318800	357600	400400	448400	502400	562400	630000	705600
Minimum Debt Payment (90% of Capital Outlay Financed Over 7 years at an Interest Rate of 14%)		101788	101788	101788	101788	101788	101788	101788			
Remaining Principal Balance		436500	306510	135821	0	0	0	0	0	0	0
Actual Debt Payment (75% of Energy Savings)		191100	213600	154836	0	0	0	0	0	0	0
(3)-Interest Payment		61110	42911	19015	0	0	0	0	0	0	0
(4)-Principal Payment		129990	170689	135821	0	0	0	0	0	0	0
(5) Depreciation		97000	97000	97000	97000	97000					
(6) Energy User's Taxable Income [(2)-(3)-(5)]		96690	144889	202785	260600	303400	448400	502400	562400	630000	705600
(7) Investment Tax Credit		48500									
(8) Energy User's Income Tax [(0.5 x (6))-(7)]		-155	72444	101393	130300	151700	224200	251200	281200	315000	352800
(9) Energy User's After Tax Cash Flow [(2)-(3)-(4)-(8)-(1)]	-48500	63855	-1244	62571	227300	248700	224200	251200	281200	315000	352800
RETURNS TO THE CREDITOR											
(10) Extension of Credit	436500										
(11) Repayment of Principal and Interest		191100	213600	154836	0	0	0	0	0	0	0
(12) Creditor's Revenue Stream [(11)-(10)]	-436500	191100	213600	154836	0	0	0	0	0	0	0

Present Value of Energy User's After Tax Cash Flow at 20%: 481865

Present Value of Creditor's Revenue Stream at 14%: 0

As shown in Exhibit 2.e, the high value of energy savings from the wood gasifier retrofit means that actual debt payments are based on energy savings, not on the minimum payment. In the example, the actual debt repayment period is less than 3 years. Debt payments by the energy user are first applied to interest on the outstanding debt balance and the residual is applied to principal. In this way, the creditor is assured of receiving its 14 percent annual interest return on the loan, even though the principal repayment schedule does not match the expected 7-year repayment profile. The equivalence in value of the actual and expected loan repayment profiles is demonstrated by computing the present value of the creditor's net revenue stream at a discount rate of 14 percent. As illustrated in Exhibit 2.d, the present value of the creditor's revenue stream (treating the initial extension of credit as a negative revenue entry) is zero.

In this arrangement, the energy user receives 25 percent of the value of energy savings until the loan is repaid and 100 percent thereafter. In addition, since the energy user remains the legal owner of the conservation improvement, the energy user receives the investment tax credit and depreciation tax benefits. As a result of this financing arrangement, the energy user receives a present value of after-tax cash flow of almost $500,000 (discounted at 20 percent). The return received by the energy user is higher than under the other financing arrangements, since the energy user has accepted a greater risk in undertaking the investment.

LIMITED-TERM, GUARANTEED-PAYBACK LOAN

The limited-term, guaranteed-payback loan is similar to the variable-payment loan in that the:

- Energy user makes loan payments that vary with the value of energy savings in any time period
- Sum of payments for actual energy use and loan repayments cannot exceed the energy cost that would have been incurred in the absence of the conservation improvement.

However, in a key difference with the variable-payment loan, the creditor in a limited-term, guaranteed-payback loan accepts the risk that a conservation improvement may not achieve payback within a specified

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period of time. Thus, the creditor shares directly in the risk of the project's technical and economic performance.

The guaranteed-payback loan is currently being used by the Canadian national conservation financing organization, Canertech Conservation, Inc., to finance conservation improvements in industrial and commercial applications.

Arrangement Structure

Procedures for initiating a limited-term, guaranteed-payback loan are similar to those for a shared-savings financing arrangement. The creditor first evaluates conservation investment opportunities at an energy user's facility, and then provides debt financing for up to 100 percent of the capital requirements of those opportunities that meet the creditor's expected return criterion. The debt repayment terms include a guarantee from the creditor that the value of energy saved by the improvement will be adequate to retire the loan within a specified period of time (i.e., the limited term), typically 1.5 to 2 times the loan amortization period that would be anticipated if the improvement achieves the expected level of technical and economic performance.

The debt repayment mechanism works as follows. After installing an energy improvement, the energy user makes periodic payments to the creditor equal to energy costs that would have been expected without the conservation improvement. The creditor pays the energy user's energy or utility bills and uses the residual to amortize the loan. Depending on the terms of the loan agreement, the creditor may provide a cash rebate to the energy user to offset the energy user's net cash tax liability on income generated by the conservation improvement.* If the energy savings are insufficient to

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*An energy conservation investment by a business enterprise should have the effect of reducing operating costs and (assuming revenues are not adversely affected) thus increasing net operating income (i.e., revenues less operating costs). In the simplest case, the entire value of energy savings would become taxable income to the enterprise. However, the tax codes of most countries will generally allow the income generated by

retire the loan within the specified term limit on the loan, the creditor forgives the remaining principal balance on the loan.

In this arrangement, the energy user keeps the tax benefits associated with project ownership, which partially offset the tax liability on the incremental income from the project. After the loan has been retired or forgiven, the energy user resumes responsibility for energy and utility payments and receives the full value of energy savings produced by the conservation improvement. Accordingly, the energy user has an incentive to maintain the conservation improvement and achieve maximum energy savings during the loan repayment period.

Under this arrangement, the creditor accepts the normal risks of loan default. In addition, the creditor shares with the energy user the risks associated with the uncertainty about the project's technical and economic performance. Because of this added risk, the creditor requires an interest rate several points (e.g., 2 to 4) higher than the rate that would be offered on conventional secured loans to commercial/industrial organizations.

The guaranteed-payback loan generally offers significant financing benefits to the energy user. For example, under this financing arrangement, conservation improvements are installed at little or no out-of-pocket cost to the energy user. In addition, the loan arrangement generally qualifies for off-balance-sheet/off-credit financing because the energy user is not obligated to retire the loan or, indeed, even to make loan payments.

(cont.)
an investment (such as a conservation improvement) to be offset by depreciation of the capital outlay. In addition, interest payments are usually tax-deductible (not, however, that principal payments are not generally tax-deductible). As a result, the net taxable income from a conservation investment will generally be positive but less than the value of energy savings. In this light, if the energy user is to avoid negative cash flow on the investment, the user must, in effect, set aside a fraction of the value of energy savings to cover the incremental tax liability and thus cannot apply the full value of energy savings to loan repayment.

Example of a Limited-Term, Guaranteed-Payback Loan

To illustrate the limited-term, guaranteed-payback loan, we again assumed the creditor would extend financing for 90 percent of the capital cost of the conservation improvement at the Sri Lanka textile plant (see Exhibit 2.f). The terms of the loan include a guarantee by the creditor that the value of energy savings will be adequate to retire the loan at an 18-percent interest rate in no more than 8 years. The creditor requires a higher interest rate on the loan than in the variable payment arrangement to compensate for the risk that the creditor will have to forgive a portion of the loan if energy savings are less than expected. During the loan repayment period, the textile plant remits to the creditor the estimated energy cost that would be incurred if the improvement were not undertaken. The creditor first applies the payment to cover actual energy costs, and then uses the residual to make loan payments.

In this example, the creditor rebates an amount to the energy user that is adequate to cover the energy user's tax liability on the income from the conservation improvement, net of depreciation and interest expenses. Without such a provision, the energy user would incur incremental negative cash flow during the loan repayment period if the entire value of energy savings were applied to loan repayment (i.e., only interest, and not principal payments, are deductible from income before taxes; principal payments are made from after-tax cash). As a result of this provision, the fraction of energy savings applied to debt repayment averages about 80 percent.

On the basis of expected annual energy savings (i.e., 40 percent of $637,000), the loan would be repaid in approximately 27 months. In the example, the loan is repaid in this time period as actual energy savings equal the expected value in the first 3 years of projected operation. Loan payments are first applied to interest at the rate of 18 percent on the outstanding debt balance; the residual is used to repay principal. As a result, the present value of the creditor's revenue stream discounted at 18 percent is zero.

The energy user's after-tax cash flow is zero in the first 2 years of improvement operation, except for the receipt of the ITC, which offsets the equity cash outlay for the improvement. In the third year following

Exhibit 2.f

EXAMPLE OF INNOVATIVE APPROACH TO CONSERVATION PROJECT FINANCING
FINANCING APPROACH: LIMITED TERM, GUARANTEED PAYBACK LOAN

TIME PERIOD	1	2	3	4	5	6	7	8	9	10	11
CAPITAL RELATED ACCOUNTS											
Capital Outlay for Improvement	485000										
Investment Tax Credit (0.10 x Capital Cost)		48500									
Depreciation (5 year Straight Line)		97000	97000	97000	97000	97000					
ENERGY COST INFORMATION											
Energy Cost without Improvement		637000	712000	797000	894000	1001000	1121000	1256000	1406000	1575000	1764000
Energy Cost with Improvement		382200	427200	478200	536400	600600	672600	753600	843600	945000	1058400
Value of Energy Savings		254800	284800	318800	357600	400400	448400	502400	562400	630000	705600
RETURNS TO THE ENERGY USER											
(1) Equity Outlay (0.10 x Capital Outlay)	48500										
(2) Value of Energy Savings		254800	284800	318800	357600	400400	448400	502400	562400	630000	705600
Remaining Principal Balance (90% of Capital Outlay Financed at 18%; Guaranteed Payback Within 8 Years)		436500	299885	135975	0	0	0	0	0	0	0
Actual Debt Payment (100% of Energy Savings Less an Allowance for Tax Liability)		215185	217890	160450	0	0	0	0	0	0	0
(3)-Interest Payment		78570	53979	24475	0	0	0	0	0	0	0
(4)-Principal Payment		136615	163910	135975	0	0	0	0	0	0	0
(5) Depreciation		97000	97000	97000	97000	97000					
(6) Energy User's Taxable Income [(2)-(3)-(5)]		79230	133821	197325	260600	303400	448400	502400	562400	630000	705600
(7) Investment Tax Credit		48500									
(8) Energy User's Income Tax [(0.5 x (6))-(7)]		-8885	66910	98662	130300	151700	224200	251200	281200	315000	352800
(9) Energy User's After Tax Cash Flow [(2)-(3)-(4)-(8)-(1)]	-48500	48500	0	57688	227300	248700	224200	251200	281200	315000	352800
RETURNS TO THE CREDITOR											
(10) Extension of Credit	436500										
(11) Repayment of Principal and Interest		215185	217890	160450	0	0	0	0	0	0	0
(12) Creditor's Revenue Stream [(11)-(10)]	-436500	215185	217890	160450	0	0	0	0	0	0	0

Present Value of Energy User's After Tax Cash Flow at 20%: 470531

Present Value of Creditor's Revenue Stream at 18%: 0

installation (year 4 in Exhibit 2.f), cash flow turns positive as the loan is paid off. In subsequent years, the energy user receives the full value of energy savings and achieves a present value of after-tax cash flow of more than $470,000 (discounted at 20 percent and assuming a marginal tax rate of 50 percent).

The innovative financing arrangements described in the preceding pages could benefit LDCs by assisting the flow of capital into conservation investments that might otherwise go unfunded. However, using these financing arrangements requires financial institutions able to evaluate the technical and economic risks associated with energy-related investments. In addition, the institutions must be willing to assume certain risks associated with the innovative financing arrangements. In return for accepting these risks, the creditors can expect commensurately higher returns than might be obtained by offering conventional loans to finance energy-related investments. Government can play various roles in promoting the develoment of the needed financial infrastructure and the use of these innovative financing arrangements. We outline several potential assistance roles below.

The most direct public-sector role to assist in promoting use of innovative financing arrangements for energy-related investments would be to form a publicly-chartered finance corporation* that would be authorized to engage in any of the financing activities discussed in the preceding section. This corporation would be initiated with public capital. However, after a period of start-up operations, the corporation would be able to gain access to private capital and perhaps become completely independent of government support.

Several financing organizations in developed countries that were publicly chartered for the purpose of introducing new financing methods or financial instruments have subsequently been able to tap private capital markets and operate without government support. Two examples in the United States are the Federal National Mortgage Association and the National Corporation for

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*As an alternative, existing public-sector finance corporations in LDCs (e.g., the Development Finance Corporation of Ceylon (DFCC) in Sri Lanka) could be used. The main sources of capital to such corporations are the multilateral development banks.

Housing Partnerships. Both corporations have been successful in increasing the flow of capital into the housing sector, and both currently operate without public support.

Another government role would be to sponsor demonstrations of the financing arrangements. Such demonstrations would be conducted jointly by a public agency and a private organization (e.g., a commercial bank, investment bank, or utility firm). The public agency would provide technical assistance in identifying appropriate investment opportunities and in structuring the financing arrangements. The government might also guarantee the return of capital for the projects or provide other incentives (e.g., special tax credits) if such incentives were needed to entice private-sector participation in the demonstrations. Demonstration programs have been helpful in encouraging the use of energy-saving technologies and innovative methods for financing investments in conservation technologies. For example, the Philippines government and the Agency for International Development are currently implementing a program to demonstrate the application of new conservation technologies, together with innovative arrangements for financing conservation investments.* The program will initially support debt-oriented financing arrangements (e.g., the variable-payment and the limited-term, guaranteed-payback loans). After the first year or two of activities, the program will consider sponsoring equity-oriented arrangements (e.g., shared savings). These demonstrations and subsequent dissemination of program results are expected to encourage wider use of the innovative financing arrangements.

A third role for government is to provide training and certification programs in energy auditing, and to instruct financing organizations on how to interpret audit results as a basis for evaluating a conservation investment opportunity. Creditors and other external investors often cite the inadequacy and inconsistent quality of engineering/economic evaluations of conservation projects as a reason for not providing capital for those projects. Certification of auditors and technical assistance with energy audits and analyses are

*Technology Transfer for Energy Management Project, sponsored by AID in cooperation with the Philippine Bureau of Energy Utilization.

programs that have been successfully used by governments in developed countries to increase the willingness of creditors and investors to provide capital for conservation projects.