PROCUREMENT GUIDE:
CHP FINANCING

1. Overview

The decision of whether and how to finance a CHP system is a critical step in the development of a CHP project. CHP systems require an initial investment to cover the cost of equipment, installation, and regulatory/permitting costs; these costs are then typically recovered through lower energy costs over the life of the equipment.

A company might decide to invest in a CHP project if the value of the future stream of cost savings is greater than the up-front investment in equipment. The structure of financing can impact project costs, control, and flexibility, and affect the company's long-term economic health and ability to generate cash. Creative techniques can help spread risk among different participants and help overcome any capital constraints a prospective host may have.

Financial investors have a primary motive that is based on a return on their investment/capital. There are a variety of capital providers in the market, and different investors have different objectives and appetites for risk. The terms under which capital is provided vary from source to source, and will depend on such factors as the lender's appetite for risk, the project's expected return, and the time horizon for repayment.

This section discusses various financing methods for CHP, and identifies some advantages and disadvantages of each. The primary financing options available to CHP projects include:

- Company earnings or internal cash flow
- Debt financing
- Equity financing
- Lease financing
- Bonds (for public entities)
- Project or third-party financing
- BOO options including energy savings performance contracting

CHP projects have been financed using all of these approaches.

2. Financing: What Lenders and Investors Look For

Most lenders and investors decide whether or not to lend or invest in a CHP project based upon its expected financial performance and risks. Financial performance is usually evaluated using a projection of project cash flows over time. Known as a pro forma, this cash flow analysis estimates project revenues and cost over the life of the project including escalations in project expenses, energy prices, financing costs, and tax considerations (e.g., depreciation, income taxes). Thus, preparing an investment grade pro forma is an important step in ensuring the financial feasibility of a CHP project.

A lender or investor usually evaluates the financial strength of a potential project using the two following measures:

- ***Debt coverage ratio***
  The main measure of a project's financial strength is the host's/owner's ability to adequately meet debt payments. Debt coverage is the ratio of operating income to debt service requirements, usually calculated on an annual basis.

- ***Owner's rate of return (ROR) on equity***
  Required RORs for internal funds typically range from 12 to 20 percent for most types of CHP projects. Outside equity investors will typically expect a ROR of 15 to 25 percent or more, depending on the project risk profile. These RORs reflect early-stage investment situations; investments made later in the development or operational phases of a project typically receive lower returns because the risks have been substantially reduced.

The economic viability of a particular CHP project is also determined by the quality of

CHP Project Risks and Mitigation Measures

- ***Construction***—Execute fixed-price contracts, include penalties for missing equipment delivery and construction schedules, establish project acceptance standards and warranties.

- ***Equipment performance***—Select proven, compatible technologies; get performance guarantees/warranties from vendor; include equipment vendor as project partner; ensure trained and qualified operators; secure full-service O&M contracts.

- ***Environmental permitting***—Initiate permit process (air, water) prior to financing.

- ***Site permitting***—Obtain zoning approvals prior to financing.

- ***Utility agreements***—Confirm interconnection requirements, schedule, and fees; have signed contract with utility.

- ***Financial performance***—Create detailed financial pro forma, calculate cash flows, debt coverage, maintain working capital/reserve accounts, budget for major equipment overhauls, secure long-term fuel contracts when possible.

supporting project contracts and permits, and by risk allocation among project participants. The uncertainties about whether a project will perform as expected or whether assumptions will match reality are viewed as risks. To the extent possible, the project's costs, revenues, and risk allocation are negotiated through contracts with equipment suppliers, fuel suppliers, engineering/construction firms, and operating firms. The box below summarizes the principal project risk categories (viewed from the beginning of the development process) and presents possible risk mitigation strategies, the most important of which are usually obtaining contract(s), securing project revenues if applicable, and applying for environmental and site permitting early. Potential lenders and investors will look to see how the owner or project developer has addressed each risk through contracts, permitting actions, project structure, or financial strategies.

3. Project Financing Options

3.1 Company Earnings or Internal Cash Flow

A potential CHP project owner may choose to finance the required capital investment out of cash flow generated from ongoing company activities. The potential return on investment can make this option economically attractive. In addition, loan transaction costs can be avoided with self-financed projects. Typically, however, there are many demands on internal resources, and the CHP project may be competing with other investment options for internal funds including options tied more directly to business expansion or productivity improvements.

3.2 Debt Financing

Commercial banks and other lenders can provide loans to support CHP projects. Most lenders look at the credit history and financial assets of the owner or developer, rather than the cash flow of a project. If the facility has good credit, adequate assets, and the ability to repay borrowed money, lenders will generally provide debt financing for up to 80 percent or more of a system's installed cost. Typically, the loan is paid back by fixed payments (principal plus interest) every month over the period of the loan, regardless of the actual project performance.

Debt financing usually provides the option of either a fixed-rate loan or a floating-rate loan. Floating-rate loans are usually tied to an accepted interest rate index like U.S. treasury bills.

For small businesses, the Small Business Administration (SBA) can guarantee bank loans up to $750,000 for energy efficiency projects. The SBA guarantee could improve a borrower's ability to secure a loan.

Another potential source of loans is *vendor financing,* in which the vendor of the CHP system or a major component provides financing for the capital investment. Vendors can provide financing at attractive costs to stimulate markets, which is common for energy technologies. Vendor financing is generally suitable for small projects (below $1,000,000); however, some large vendors do provide financing for larger projects.

Host or facility owners should ask potential developers and equipment suppliers if debt financing is a service they can provide. The ability to provide financing may be a key consideration when selecting a developer, equipment vendors, and/or other partners.

3.3 Equity Financing

Private equity financing has been a widely used method for financing certain types of CHP projects. In order to use private equity

financing, an investor must be located who is willing to take an ownership position, often temporarily, in the CHP project. In return for a significant share of project ownership, the investor is willing to fund part or all of the project costs using its own equity or privately placed equity or debt. Some CHP developers are potential equity investor/partners, as are some equipment vendors and fuel suppliers. Investment banks are also potential investors. The primary advantage of this method is its applicability to most projects. The primary disadvantage is its higher cost; the returns to the host/owner are reduced to cover the off-loading of risk to the investor.

Equity investors typically provide equity or subordinated debt for projects. Equity is invested capital that creates ownership in the project, like a down-payment in a home mortgage. Equity is more expensive than debt, because the equity investor accepts more risk than the debt lender. (Debt lenders usually require that they be paid before project earnings get distributed to equity investors.) Thus the cost of financing with equity is usually significantly higher than financing with debt. Subordinated debt gets repaid after any senior debt lenders are paid and before equity investors are paid. Subordinated debt is sometimes viewed as an equity-equivalent by senior lenders, especially if provided by a credit-worthy equipment vendor or industrial company partner.

The equity investor will conduct a thorough due diligence analysis to assess the likely ROR associated with the project. This analysis is similar in scope to a bank's analyses, but is often accomplished in much less time because equity investors are more entrepreneurial than institutional lenders. The equity investor's due diligence analysis will typically include a review of contracts, project participants, equity commitments, permitting status, technology, and market factors.

The key requirement for most pure equity investors is sufficient ROR on their investment. The due diligence analysis, combined with the cost and operating data for the project, will enable the investor to calculate the project's financial performance (e.g., cash flows, ROR) and determine its investment offer based on anticipated returns. An equity investor may be willing to finance up to 100% of the project's installed cost, often with the expectation that additional equity or debt investors will be located later.

Some types of partners that might provide equity or subordinated debt may have unique requirements. Potential partners such as equipment vendors and fuel suppliers generally expect to realize some benefit other than just cash flow. The desired benefits may include equipment sales, service contracts, or tax benefits. For example, an engine vendor may provide equity or subordinated debt up to the value of the engine equipment, with the expectation of selling out its interest after the project is built. The requirements imposed by each of these potential investors are sure to include not only an analysis of the technical and financial viability, but also a consideration of the unique objectives of each investor.

To fully explore the possibilities for private equity or subordinated debt financing, host or facility owners should ask potential developers if this is a service they can provide. The second most common source of private equity financing is an investment bank that specializes in the private placement of equity and/or debt. Additionally, the equipment vendors that are involved in the project may also be willing to provide financing for the project, at least through the construction phase. The ability

to provide financing can be an important consideration when selecting a developer, equipment vendors, and/or other partners.

3.4 Lease Financing

Leasing can be an attractive financing option for smaller CHP projects. The operating savings resulting from the installation of CHP—the bottom-line impacts on facility energy costs—are used to offset the monthly lease payments, creating a positive cash flow for the company. Lease financing encompasses several strategies in which a facility owner can lease all or part of a project's assets from the asset owner(s).

Typically, lease arrangements provide the advantage of transferring tax benefits such as accelerated depreciation or energy tax credits to an entity that can best use them. Lease arrangements commonly provide the lessee with the option, at pre-determined intervals, to purchase the assets or extend the lease. Several large equipment vendors have subsidiaries that lease equipment, as do some financing companies.

Leasing energy equipment has become the fastest-growing equipment activity within the leasing industry. The lease payments may be bundled to include maintenance services, property taxes, and insurance. There are several variations on the lease concept, including operating, capital, and leveraged leases.

An ***operating lease*** appears as an operating expense in the financial statement. Operating leases are often referred to as "off-balance-sheet" financing and usually treated as operating expenses. To qualify as an operating lease, the agreement must NOT:

- Transfer ownership of the equipment at the end of the lease term.
- Contain a bargain purchase option.
- Have a term that exceeds 75 percent of the useful economic life of the equipment.
- Have a present value at the beginning of the lease term of the minimum lease payments greater than 90 percent of the fair value at the inception of the lease, using the incremental borrowing rate of the lessee as the discount rate.

Capital lease obligations are reflected on the balance sheet and may be subject to lender or internal capital budget constraints. The general characteristics of a capital lease are:

- It appears on the balance sheet as debt for purchase.
- It requires transfer of ownership at the end of the lease.
- It specifies the terms of future exchange of ownership.
- The lease term is at least 75 percent of the equipment life.
- The net present value of lease payments is about 90 percent of the equipment value.

In a ***leveraged lease,*** the lessor provides a minimum amount of its own equity, borrows the rest of the project capital from a third party, and is entitled to the tax benefits of asset depreciation.

3.5 Project or Third-Party Financing

Project or third-party financing is an approach to obtaining commercial debt financing for the construction of a project in which the lenders look at the credit-worthiness of the project to ensure debt

repayment rather then at the assets of the developer/sponsor. Third-party financing can involve the creation of a "legally independent project company financed with non-recourse debt and equity for the purpose of financing a single purpose industrial asset."[2] This entails establishing a company (e.g., a limited liability corporation) solely in order to accomplish a specific task, in this case to build and operate a DG/CHP facility. Lenders look primarily to the cash flows the asset will generate for assurances of re-payment. Moreover, they are explicitly excluded from recourse to the owners' underlying balance sheets.

In deciding whether or not to loan money, lenders examine the expected financial performance of a project and other underlying factors of project success. These factors include contracts, project participants, equity stake, permits, and technology. A good project should have most, if not all, of the following completed or in process:

- Signed interconnection agreement with local electric utility company
- Fixed-price agreement for construction
- Equity commitment
- Environmental permits
- Any local permits/approval

Lenders generally expect the owners to put up some level of equity commitment using their own money and agree to a fixed-term (8- to 15-year) repayment schedule. An equity commitment demonstrates the owner's financial stake in success, as well as implying that the owner will provide additional funding if problems arise. The expected debt-equity ratio is usually a function of project risk.

Lenders may also place additional requirements on the project owners. Requirements may include maintaining a certain minimum debt coverage ratio and making regular contributions to an equipment maintenance account, which will be used to fund major equipment overhauls when necessary.

The transaction costs for arranging project financing can be relatively high, driven by the lender's need to do extensive due diligence; the transaction costs for a 10 MW project may be the same as for a 100 MW project. For this reason, most of the large commercial banks and investment houses have minimum project capital requirements on the order of $10 to $20 million. Developers of smaller CHP projects may need to contact the project finance groups at smaller investment capital companies and banks, or at one of several energy investment funds that commonly finance smaller projects. Depending on the project economics, some of the investment capital companies and energy funds may consider becoming an equity partner in the project in addition to providing debt financing.

3.6 Build-Own-Operate Options

A final third-party financing form is the BOO option, in which the CHP facility is built, owned, and operated by an entity other than the host and the host purchases heat and power at established or indexed rates from the third party.[3] There are also build-own-transfer projects, which are similar to BOO projects except that the facility involved is transferred to the host after a predetermined timeframe. Such projects may be implemented by an energy services company (ESCO) or sometimes by

[2] Esty, Benjamin. Modern Project Finance: A Case Book. 2004.

[3] This approach is often called "chauffage."

equipment suppliers and project developers acting as ESCOs.

In a BOO project, the ESCO finances the entire project, owns the system, and incurs all costs associated with its design, installation, and maintenance. The ESCO sells heat and power to the host at a specified rate that offers some savings over current energy expenditures, or can enter into an energy savings performance contract (ESPC) with the host. In an ESPC, the ESCO and the host agree to share the cost savings generated by the project; in return, the ESCO guarantees the performance of the CHP system. An ESPC mitigates the risks associated with new technologies for facility owners, and allows operation and maintenance of the new system by ESCO specialists.

ESPCs are frequently used for public-sector projects. There are no upfront costs other than technical and contracting support. Traditional ESPCs have three components:

- A project development agreement
- An energy services agreement
- A financing agreement

As such, an ESPC is not a financing agreement by itself, but it may contain the financing component. Most lending institutions prefer to see the financing section as a stand-alone agreement that can be sold into the secondary market. This helps create demand for this financial instrument, usually resulting in better pricing.

The host must usually commit to take a specified quantity of energy or to pay a minimum service charge. This “take or pay” structure is necessary to secure the ESPC. The project host gives up some of the project’s economic benefits with a BOO or ESPC in exchange for the ESCO becoming responsible for raising funds, project implementation, system operation, system ownership or a combination of these activities. Some of the disadvantages of this approach to financing include accounting and liability complexities, as well as the possible loss of tax benefits by the facility owner.

3.7 Financing Options for Public Entities

Public sector facilities have additional financing options to consider.

Bonds. A government entity (e.g., municipality, public utility district, county government) can issue either tax-exempt governmental bonds or private activity bonds, which can be either taxable or tax-exempt, to raise money for CHP projects. Bonds can either be secured by general government revenues (revenue bonds), or by specific revenues from a project (project bonds). The terms for bond financing usually do not exceed the useful life of the facility, but terms extending up to 30 years are not uncommon.

The primary benefit of governmental bonds is that the resulting debt has an interest rate that is usually lower (1 to 2 percent) than commercial debt. However, in addition to initial qualification requirements, many bond issuers find that strict debt coverage and cash reserve requirements may be imposed on an energy project to ensure the financial stability of the issuer is preserved. These requirements may even be more rigorous than those imposed by commercial banks under a project finance approach.

To qualify for a tax-exempt governmental bond issue, a project must meet at least two criteria:

- *Private business use test*
  No more than 10 percent of the bond proceeds are to be used in the business of an entity other than a state or local government

- *Private security of payment test*
  No more than 10 percent of the payment of principal or interest on the bonds can be directly or indirectly secured by property used for private business use.

Federal government facilities. The Federal Energy Management Program (FEMP) of the Department of Energy has signed indefinite quantity contracts with ESCOs on a regional basis for streamlining energy efficiency improvements, including CHP, at federal facilities. The Energy Policy Act of 2005, Section 105, extended the authority for all federal agencies to use ESPCs until September 30, 2016. Realizing that awarding a stand-alone ESPC can be very complex and time-consuming, FEMP created streamlined *Super ESPCs.* These "umbrella" contracts allow agencies to undertake multiple energy projects under the same contract. An agency that uses a Super ESPC can bypass cumbersome procurement procedures and partner directly with a pre-qualified ESCO to develop an energy project. With Super ESPCs, FEMP has already completed the Federal Acquisition Regulations (FAR) procurement process, in compliance with all necessary requirements, and awarded contracts to selected ESCOs. Federal facilities can place and implement a Super ESPC in much less time than it takes to develop a stand-alone ESPC. As a result, Super ESPCs are being used more frequently by federal agencies, and they appear to have largely supplanted stand-alone ESPCs.

Another way for federal agencies to implement efficiency and CHP projects is through partnerships with their franchised or serving utilities. Federal agencies can enter into sole-source *utility energy service contracts* (UESCs) to implement energy improvements at their facilities. With a UESC, the utility typically arranges financing to cover the capital costs of the project. Then the utility is repaid over the contract term from the cost savings generated by the energy efficiency measures. With this arrangement, agencies can implement energy improvements with no initial capital investment. The Energy Policy Act of 1992 authorizes and encourages federal agencies to participate in utility energy efficiency programs offered by electric and gas utilities and by other program administrators (e.g., state agencies). These programs range from equipment rebates (i.e., utility incentives) to delivery of a complete turnkey project. Federal legislation and numerous legal opinions demonstrate that agencies have full authority to enter into utility energy service contracts as well as take advantage of utility incentive programs.

3.8 Capital Cost Effects of Financing Alternatives

Each financing method produces a different weighted cost of capital, which affects the amount of resources required to cover CHP system installation costs. Generally speaking, the financing methods are ranked from lowest cost to highest cost as follows:

- Internal cash flow financing
- Governmental bond financing
- Commercial debt financing
- Project financing
- Private equity financing

Governmental bond financing achieves its advantage through access to low-interest debt. Project finance generally produces a higher financing price because funds are required to pay interest charges as well as ROR on equity. Private equity can be the most expensive option because it usually demands a higher return on equity than project finance, and equity often makes up a larger share of the capital requirement. BOO and ESPC options remove capital financing from the users' responsibilities.