



Financing Options for Combined Heat and Power Systems

By Neil Kolwey
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For facilities considering the installation of a new combined heat and power (CHP) system, one of the greatest challenges can be finding and justifying the needed capital. Fortunately, several financing options are available. The spectrum of financing options includes loans from a bank, financing through an energy service company (ESCO), two kinds of leases, and ownership of the CHP system by a third-party developer. For CHP systems larger than two megawatts (MW), either a lease or third-party ownership arrangement may provide a winning solution.

Shortages of Capital and Financing Options

A shortage of capital to invest in energy projects is one of the greatest barriers to achieving more energy efficiency improvements in both the commercial and industrial sectors. This is especially true for CHP projects, which tend to have larger initial costs and longer simple payback periods than many other types of energy efficiency projects. For industrial facilities, energy efficiency projects compete for capital with projects involving process improvements, new products, or marketing efforts, which managers often consider more crucial than energy efficiency for staying competitive. In addition, many companies have low capital budgets for investments of any type.

At the same time, many industrial companies are unwilling to borrow money from a bank to help finance energy efficiency projects, mainly because shareholders and chief executive officers do not like to see more debt on the company's balance sheet. Another alternative to a bank loan is to

obtain financing through an energy service company (ESCO). However, even the larger ESCOs in the U.S. have demonstrated little interest in financing CHP projects because of their complexity compared to more traditional building energy efficiency upgrades (which mainly focus on improvements to lighting and heating, ventilating and air conditioning systems).

Capital for CHP projects can be tough to find, but lease options and third-party ownership can fill the financing gap for systems larger than two megawatts.

Other options for financing include leasing the equipment from a CHP developer or allowing the developer to completely own the CHP system on the facility's property and contracting to buy the thermal energy and power from the system. The latter option is referred to as an energy service agreement (ESA). The main benefit of either a lease or third-party ownership option is that the commercial or industrial facility does not need to provide any capital up-front in order to implement the project.

Leases and Energy Service Agreements

There are two types of leases: financial leases and operating leases. Both types provide the customer with partial ownership and control of the CHP system, but they have slightly different impacts on the customer's balance sheet. A financial lease (sometimes referred to as a capital lease) allows the customer to have partial ownership of the

equipment during the contract period, but the company can report the project and equipment on its balance sheet as a leased asset rather than debt. If the equipment is related to a production process, the industrial customer may want to maintain at least partial ownership and control through a financial lease.

For an operating lease, the customer operates but does not claim ownership of the equipment until the end of the contract period (assuming the customer chooses to buy the equipment from the financing entity at that point, generally for a greatly discounted price). This tends to look even better on the balance sheet than a financial lease. If the project is not directly production-related, then being able to treat the project as an operating lease may be attractive to many companies.

An energy service agreement (ESA) allows the customer to treat the project as an off-balance sheet expense, since the CHP developer owns and maintains the equipment over the contract period. For an ESA, the company has essentially no direct ownership or control over the equipment during the contract period (see Figure 1).

Figure 1 | Comparison of Risks and Responsibilities for Financing Options



Size Thresholds

Many CHP project developers offer leasing or ESA options for systems larger than a certain size threshold, typically 2-3 MW. Under either leases or ESAs, the energy cost savings are shared between the facility owner and the CHP developer. For

smaller projects, the return on investment is too small to make the financing worthwhile. In addition, many investors—the source of capital for the CHP developers—have a minimum size threshold for their investments.

For example, Recycled Energy Development, LLC offers leasing or ESA options for engine- or gas turbine-based CHP systems, while financing options for back-pressure steam turbine systems are available through its subsidiary, Turbosteam. For engine- or gas turbine-based CHP systems, the minimum size threshold is generally 3-5 MW. The back-pressure turbine projects are simpler and less capital-intensive, with generally more favorable returns on investment, so a lease or ESA could work for projects as small as 2 MW.¹ Ormat Technologies, Inc., another CHP developer, will provide a lease or ESA option for waste heat to power systems larger than about 3 MW.²

Project Economics and Contract Terms

For either a lease or energy service agreement, the developer recovers its costs through monthly payments from the customer. The developer’s costs will include the costs of the CHP equipment, design and installation, financing, maintenance, and the developer’s fees. A typical ESA contract period is 15-20 years, depending on the project’s expected return on investment. Contract periods can be shorter for lease agreements.³

In a typical shared savings agreement, the contract payments are generally set so that the customer sees a reduced total monthly bill during the contract period compared to before the project. However, the total monthly payments over the contract period need to repay the project developer for the initial project costs, the developer’s fees, and interest. For a given project, there is a trade-off between the length of the contract period and the share of energy cost savings. In other words, if the contract period is

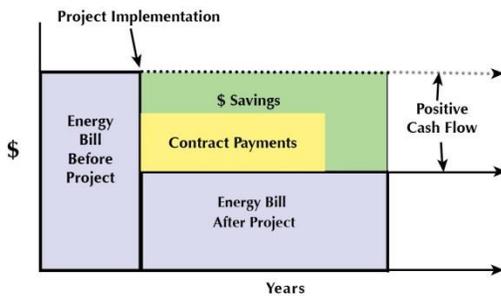
¹ Melissa Mullarkey, Recycled Energy Development, LLC, personal communication, July 3, 2013.

² Colin Duncan, Ormat Technologies, Inc., personal communication, July 16, 2013.

³ Ibid., July 22, 2013.

shorter, then the customer will get a smaller percentage of the energy cost savings during the contract period. After the contract period, the customer is normally given the option to purchase the project or equipment at a discounted price, and of course the customer receives all the energy savings benefits from that point forward (see Figure 2).

Figure 2 | Energy Savings Contract with Shared Savings



For an ESA, the CHP developer essentially sells the power generated (and waste heat where applicable) from the project to the customer through a long-term (15-20 year) power purchase agreement. The electricity from the CHP system would typically be sold at 10 to 20 percent less than what the customer was paying for electricity before the project. (Similarly, waste heat would be sold at a discount compared to the customer's natural gas costs before the project.)

Typically, the contract terms also include a project "buy-down" price table, which allows the customer to purchase the CHP system from the developer at any time during the contract period or at the end of the contract period. The contract may also require the customer to purchase the system if the customer goes out of business or otherwise terminates the contract early. The contract also normally includes conditions regarding the minimum amount and reliability of power and heat to be supplied to the customer.

State Regulations on Third-Party Ownership

Most states allow third-party owners of a CHP system to sell the power back to the customer, as long as no power is sold beyond the customer's premises (over a public road). On the other hand, a few states (including Arizona, Colorado, and Utah) do not allow electricity to be sold by any company that is not a "public utility," even within the boundaries of a customer's site.⁴ However, even in these states, the CHP developer could lease the CHP system to the customer and thereby avoid this obstacle. Under either a financial or operating lease, as discussed above, the customer would have partial ownership of the CHP system, and therefore the CHP developer would technically not be selling the power back to the customer.

ABOUT SWEEP

The Southwest Energy Efficiency Project is a public interest organization dedicated to advancing energy efficiency in Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming. For more information, visit www.swenergy.org.

SWEEP's Industrial Energy Efficiency Program promotes strong and effective utility industrial efficiency programs throughout the Southwest region.

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⁴ In Utah, it is only allowed for certain fuels (waste heat to power or bio-fuels), certain types of organizations (government or non-profit), and certain size ranges (up to 2 MW).