Tax Incentives for Combined Heat and Power (CHP)

By Charles Goulding, Spencer Marr and Taylor Goulding

Charles Goulding, Spencer Marr and Taylor Goulding discuss the potential energy efficiency and greenhouse gas reductions afforded by the use of Combined Heat and Power, along with the total economic benefits related to the technology, including the tax incentives that are available to facilities that install CHP systems.

Introduction

Combined Heat and Power (CHP), or "cogeneration," as it is more commonly referred to, is the simultaneous generation of usable heat and electric power in a single process. In other words, it uses the heat produced in electricity generation rather than releasing it wastefully into the atmosphere. These systems, which currently account for approximately seven percent of U.S. electrical generation, produce a fraction of the nitrogen oxides as conventional systems do. As a result of the potential energy efficiency and the greenhouse gas reductions, both the U.S. Department of Energy and the Environmental Protection Agency have the achievable goal of doubling the number of these CHP systems in the United States.[1]

Because CHP is a very energy efficient technology, many building owners and facilities managers would purchase CHP systems if they were fully aware of the total economic benefits related to the technology, including the tax incentives available to them. Their time has come. As a result of recent federal tax law changes, CHP now has its most favorable tax treatment ever provided for in the U.S. tax system, making 2011 the ideal time to install CHP.

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Expanded Tax Incentives for CHP

Pursuant to the American Recovery and Reinvestment Act of 2009,[2] there are 10-percent tax credits available to buildings owners who install CHP systems through January 1, 2017. These systems are normally depreciated on a five-year MACRS basis, but recent changes to the U.S. tax systems collapse this depreciation down to one year, meaning that building owners who install CHP systems after September 8, 2010, and before December 31, 2011, can take 100-percent tax bonus depreciation. Even if building owners miss this 2011 window, they can enjoy a 50-percent tax bonus depreciation on equipment placed in service from January 1, 2011 through December 31, 2012.[3]

Further, CHP installations that are eligible for the 10-percent tax credit from January 1, 2009, can also elect to receive an equivalent cash grant.

See Exhibit 1 below for an illustration of the potential tax savings available through December 31, 2011.

Combined Heat and Power Defined

Combined heat and power refers to the simultaneous production of electricity and heat from a single fuel source, such as natural gas, biomass, biogas, coal, waste heat or oil. It is not a single technology, but

Exhibit 1. Sample Combined Heat and Power Tax Savings from September 9, 2010 through December 31, 2011

$1,000,000 Project Example

Tax Benefit Description	Tax Benefit Calculation	Tax Benefit	
10% Tax Credit or Grant	*10% * $1,000,000*		$ 100,000
Added Depreciation	*50%*$100,000*	$ 50,000	
Remaining Bonus Depreciation	*$1,000,000 less $100,000 credit*	$ 900,000	
Total Depreciation		$ 950,000	
Tax Benefit of Depreciation at 40%	*40%*$950,000*		$ 380,000
Value of First Year Tax Benefits			$ 480,000

an integrated energy system that can be modified depending upon the needs of the energy end user.[4] However, common throughout all types of CHP systems is on-site generation of electrical power; waste-heat recovery for heating, cooling, dehumidification or process applications; and the integration of a variety of technologies, thermal applications and fuel types into existing building infrastructure.

The two most common CHP system configurations use a gas turbine or engine with heat recovery unit or a steam boiler with steam turbine, both of which realize substantial energy savings relative to conventional fossil-fueled power plants. The average efficiency of fossil-fueled power plants in the United States is 33 percent. By using waste heat recovery technology to capture a significant proportion of this wasted heat, CHP systems typically achieve total system efficiencies of 50 to 80 percent for producing electricity and thermal energy.[5] Because CHP is more efficient, less fuel is required to produce a given energy output than with separate heat and power. When the current historically low cost of natural gas is factored into this equation, energy costs are driven down further.[6]

The Advantages of Combined Heat and Power

The energy lost in the United States from wasted heat in the utility sector is greater than the total energy use of Japan. The major advantage of CHP is that it creates on-site energy, so there is no energy lost in the distribution process. In the typical building situation electricity is distributed from a generation location, which means that a substantial portion of the energy generated at a remote location is wasted while end users are exposed to price and supply volatility.[7]

CHP system is an independent system that remains operational during power outages. This is helped in part by the fact that CHP offers flexibility in fuel selection and can take advantage of both fossil fuels and locally sourced and renewable fuels like biomass or ethanol. This means that when traditional fuel sources like coal and oil spike in cost, CHP systems offer certainty and insulation from volatility.

Because CHP's greatest advantage is its maximization of energy efficiency, the best candidates for CHP are high-energy-use buildings, large buildings and building complexes/campuses. Ideal users are often universities and colleges, airports,[8] hospitals,[9] data centers,[10] sports stadiums,[11] pharmaceutical complexes,[12] hotels[13] and casinos.[14]

CHP Project Management

In order to immediately spur the development of large-scale CHP projects, the U.S. Environmental Protection Agency has assembled a comprehensive 85-page guide to assist building developers through the installation process from start to finish.[15] This guide is intended to help building owners take advantage of the unique opportunity that CHP presents by walking them through whether they would make a good CHP candidate, procuring financing for the project, selecting a design team/contractor, getting the necessary building permits and operating and maintaining a CHP system.

After calculating the energy savings using the guide's cost and emissions calculator, it is possible to see the total savings between tax and energy so that

Continued on page 43

Endnotes

1. *KFC Corp. v. Iowa Dept. of Rev.*, SCt Ia., 792 NW2d 308, [Ia.] St. Tax Rep. ¶ 201-296 (Dec. 30, 2010). *Cert. denied*, Dkt. 10-1340 (Oct. 3, 2011).
2. *Lamtec Corp. v. Dept. of Rev.*, SCt Wash.246 P3d 788, [Wash.] St. Tax Rep. ¶ 203-241 (Jan. 20, 2011). *Cert. denied*, Dkt. 10-1289 (Oct. 3, 2011).
3. *Miller Brewing Co. v. Indiana Dept. of St. Rev.*, Ind. Tax Ct., No. 49T10-0607-TA-69 (Aug. 18, 2011).
4. *Utelcom, Inc. & Ucom, Inc. v. Bridges*, La. Ct. App., No. 2010 CA 0634 (Sep. 12, 2011).
5. *BIS LP, Inc. v. Director, Division of Taxation*, N.J. Super. Ct. App. Div., No. A-1172-09T2 (Aug. 23, 2011).
6. *Whirlpool Properties, Inc. v. Director*, N.J. SCt, *Div. of Tax'n*, No. A-25-10, [N.J.] St. Tax Rep. ¶ 401-587 (July 28, 2011).
7. Notice (N.J. Div. of Taxation Sept. 7, 2011).
8. *Matter of Petition of Kellwood Co.*, No. 820915 (N.Y. Tax App. Trib. Sept. 22, 2011).
9. S.B. 580.
10. N.C. Gen. Stat. §105-130.5A; H.B. 619.
11. Consumer's Use Tax Amnesty Program (Ohio Dep't of Taxation), available online at *http://tax.ohio.gov/divisions/sales_and_use/index_use.stm*.
12. H.B. 153.

Combined Heat and Power

Continued from page 10

users can see just how substantial their overall savings will be. Going one step further, the guide provides recommendations for Energy Star appliances and known CHP contractors.

State and Utility Incentives

The federal tax incentives can be combined with local state initiatives in order to realize even greater overall energy and tax savings. Below are four examples of the kinds of incentives available at the state level in high electrical cost locations.

New York

New York's ConEdison power company makes funding available for up to $1.65 per project in the New York City metropolitan area on a first-come, first-served basis to building owners and operators who incorporate CHP systems into new building construction. The incentives are meant to offset up to 75 percent of the incremental capital costs associated with new energy efficient building construction.[16]

Pennsylvania

The Pennsylvania Department of Community and Economic Development recently renewed its 2008 Alternative and Clean Energy Program, which provides $650M worth of funding to provide support for energy-efficient technology installations in new or existing buildings. The state provides one-percent loans for energy efficient projects, loan guarantees in the event of a financing default and cash grants for up to $2 million depending on the type of building project.

New Jersey

The New Jersey Clean Energy Solutions Capital Investment program is intended to provide grants and loans for end users that install CHP systems (among other efficient technologies). In order to qualify for assistance, applicants must be New Jersey-based commercial, industrial or institutional entities.

Eligible projects must have minimum capital equipment costs of at least $1 million. So long as they meet certain standards related to social utility, such projects are eligible for zero-interest loans with terms of up to 10 years. Loans are provided for up to 50 percent of project costs at a maximum of $5 million. A portion of the loan may be issued as a grant, with the grant/loan split based on project's environmental and economic development impact. Grants can be issued for up to $2.5 million, though they may not exceed 80 percent of the amount requested.

Massachusetts

Among the nation's leaders in incentivizing energy-efficient investments, Massachusetts' National Grid utility offers energy strategies, technical assistance and financial incentives to customers who are building new facilities, adding capacity for manufacturing, replacing failed equipment or undergoing major renovations. In particular, the state sees the value in encouraging CHP systems installation, as they are currently offering to pay up to 70 percent of the incremental costs for the high efficiency CHP materials and systems or buy down the incremental investment to a 1.5-year simple payback. Some rebates vary by capacity, building size or efficiency.

Conclusion

Our federal government hopes that CHP installations will soon double in order to support 14 percent of U.S. electrical generation needs. Understanding the tax opportunities, and particularly the enhanced tax opportunities in 2011, along with utility incentives should help our country achieve this goal.

Endnotes

13. Charles R. Goulding, *Energy Investment Credit, Practical Analysis*, Emergency Economic Stabilization Act of 2008 Law, Explanation and Analysis, at ¶ 530.
14. American Recovery and Reinvestment Act of 2009 (P.L. 111-5).
15. Note: The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312) provides for 100-percent tax depreciation bonus for equipment placed in service after Sep. 8, 2010, and through Dec. 31, 2011. For equipment placed in service after Dec. 31, 2011, and through Dec. 31, 2012, the new law provides for a 50-percent tax depreciation bonus.