

Utility Financing Programs for Industrial Customers

by

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

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Executive Summary

One of the greatest barriers to improving industrial energy efficiency is a shortage of capital to invest in projects. Industrial companies face competing needs from other types of capital projects, uncertainties about the longevity of the facility, and a lack of attention or priority given to energy costs. In addition, industrial companies are reluctant to obtain loans from banks, and most energy service companies (ESCOs) tend to ignore the industrial sector to focus on simpler and more lucrative markets.

To help overcome these obstacles and achieve greater energy savings from the industrial sector, some utilities provide loans to cover the costs of energy efficiency investments, repaid by the customer through monthly payments over a contract period such as 4-5 years. However, there are two main challenges for utilities which provide loans to industrial customers. First, industrial facilities have more complicated equipment and processes than commercial buildings, making it more challenging to identify and evaluate cost-effective energy efficiency projects for which these customers are willing to borrow money. To address this issue, utilities need to provide good quality technical assistance, through hiring contractors with industrial expertise or through hiring trained and qualified utility staff.

Second, industrial projects tend to require more money, using up a utility's financing funds very quickly compared to other customer classes. Utilities have several choices for obtaining capital from banks or other sources, including credit enhancement options to leverage utility funds, or relying solely on capital from banks or third-party lenders. In addition, utilities have other choices in program design, including whether to administer loan repayment through the utility bill or through a third-party administrator.

This report describes several good examples of utility financing programs that serve industrial customers. Since 2006, Wisconsin Focus on Energy has offered a very successful program to finance emerging technologies that improve industrial energy efficiency. Another program with high industrial participation and excellent energy savings result is available from Alliant/Wisconsin Power and Light. These and the other programs highlighted in this report demonstrate the energy savings potential available through offering financing to industrial customers.

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Industrial Energy Savings Opportunities and Challenges

The industrial sector accounts for 30% of total energy consumption and 26% of total electricity consumption in the U.S. In the six southwest states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, 29% of total electricity consumption is attributable to the industrial sector (EIA 2010). Industrial companies have significant potential for cost-effective energy savings, up to 20% over a ten-year period according to some studies (McKinsey 2009).

Capital Shortages

A shortage of capital to invest in projects is probably the greatest barrier to achieving more energy efficiency improvements in the industrial sector (Anderson 2010). Energy efficiency projects compete for capital with projects involving process improvements, new products, or marketing efforts, which are often considered more crucial to staying competitive than energy efficiency. Many companies also have low capital budgets for any investments. Although energy service companies (ESCOs) provide energy efficiency financing for many institutional and commercial buildings, they tend to ignore industrial companies, leaving a gap in financing needs for this sector.

As a result, requirements of short payback periods for energy efficiency projects are quite common in the industrial sector. According to a recent Johnson Controls survey, about 50% of industrial companies require energy efficiency projects to have payback periods of less than three years (Kapur 2011). In a 2012 survey by the Southwest Energy Efficiency Project (SWEET) of twenty-one leading industrial companies which participate in the Colorado Industrial Energy Challenge (CIEC) program,¹ 40% of companies require simple payback periods for energy efficiency projects of two years or less, and 15% require simple payback periods of no more than one year (see Appendix for results of the survey). 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.

Although it is often possible to find good energy efficiency projects that meet a 2-year simple payback period threshold, there will always be many more opportunities left on the table with this type of hurdle rate. The more progressive companies (i.e., those that consider projects' net present value (over a 10-year time period, for example) in addition to simple payback period, and/or set aside a pool of capital to invest in energy projects) are able to achieve much greater energy savings year after year (Kapur 2011).

Support from ESCOs?

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 working with industrial

¹ For a description of this program, see "Colorado Industrial Energy Challenge – Program Overview," Southwest Energy Efficiency Project, <http://www.swenergy.org/programs/industrial/ciec/index.html>

customers, and this is unlikely to change in the foreseeable future. However, there is a new entrant into this market, Metrus Energy, which has developed a promising new model for working with industrial and other large business customers.

Traditional ESCOs

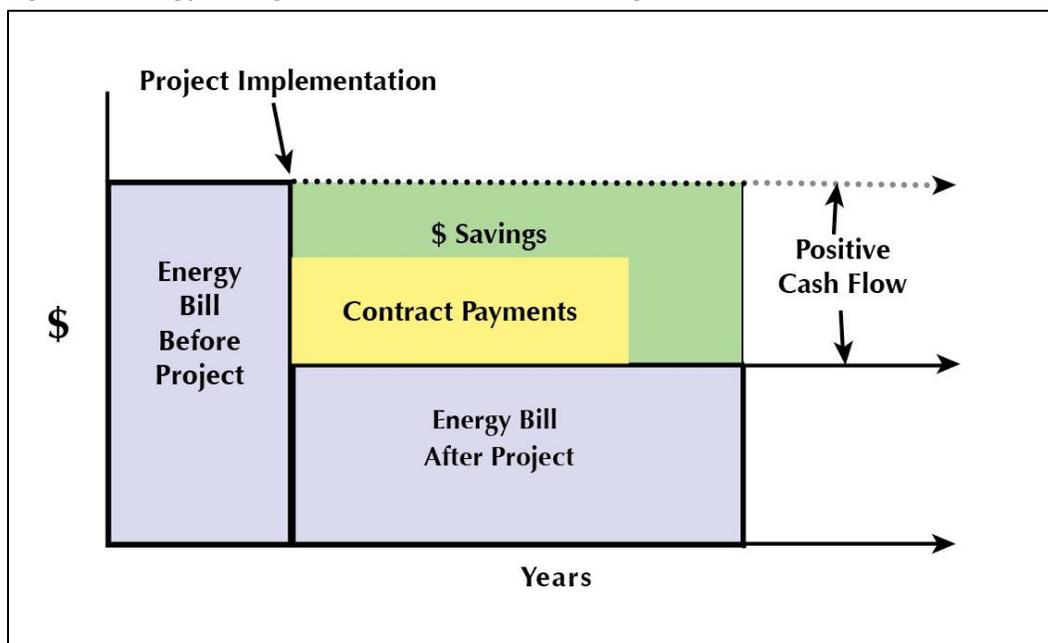
ESCOs help companies to identify energy efficiency projects and help provide financing for projects through “performance contracts.” Typically, a company pays back the loan through monthly payments designed to create at least “bill neutrality” compared to the company’s energy bills before the project. The total amount paid to the ESCO over the term of the contract period covers the cost of the project plus the ESCO’s fees for its services. Often, the contract terms are designed so that the customer receives some amount of “shared savings” or a minimum savings guarantee during the contract term, which makes the contract period slightly longer. After the contract period, the company receives all the cost savings benefit from the energy efficiency projects implemented (see Figure 1).

However, most ESCOs are not interested in working with the industrial sector, especially on smaller projects. Industrial projects account for only 4% of all projects implemented by ESCOs during 1990-2008 (Goldman 2012). The vast majority of ESCO projects (84% of ESCO revenues in 2008) come from the so-called “MUSH” market (municipal or state government, universities, schools, and hospitals) or the federal government (Satchwell 2010). For the MUSH and federal government sectors, the technologies are simpler and more consistent. Industrial energy efficiency projects are much more complex and varied, which significantly increases the ESCO’s transaction costs, including the initial project evaluations and the post-implementation measurement and verification of savings.

In addition, industrial customers are generally reluctant to enter into contracts longer than five years, which limits acceptable projects to those with shorter payback periods. From the ESCO’s point of view, industrial contracts longer than five years also carry greater risk that industrial customers will go out of business or that the process involving the equipment will change. At the same time, many industrial customers have already implemented some of the more lucrative projects (e.g., those with payback periods less than two years), which makes it difficult for ESCOs to find and bundle multiple projects together like they do for the MUSH or federal government markets.

The larger ESCOs (such as Johnson Controls, Honeywell, and Siemens) do some work in the industrial sector, but generally avoid smaller projects because the transaction costs are too high. For large energy efficiency projects (i.e., those with initial costs of \$1 million or greater) it is much more likely that an ESCO would be able and willing to provide financing and a shared savings deal with an industrial company over a project period such as 5-8 years (Berngard 2012).

Figure 1: Energy Savings Contract with Shared Savings



Note: In a typical shared savings agreement, the contract payments are generally designed to be somewhat less than the full amount of the potential energy cost savings for the project, so that the customer sees a reduced total monthly bill during the contract period compared to before the project. Source: Ambach 2009.

Metrus Energy

Offering an innovative new approach, San Francisco-based Metrus Energy, develops and finances energy efficiency projects at industrial, commercial and institutional facilities throughout the U.S.² Like the traditional ESCOs, Metrus Energy is mainly interested in financing industrial energy efficiency projects involving initial investments of more than \$1 million. Customers repay the project costs (plus administrative and service fees) through monthly payments over a contract period that is typically ten years, through an “energy services agreement” (ESA). Metrus provides the financing and hires an ESCO or other third-party contractor to design, implement and maintain the project. The monthly payments over the ESA period are designed to be equal to or less than the customer’s monthly energy bill before the project is implemented. After the ESA period, the customer is given the option to purchase the project/equipment and of course receives all the energy savings benefits at that point.

The main differences and potential advantages to industrial customers of the Metrus approach compared to the traditional ESCO model summarized below:

- Energy savings are guaranteed by Metrus, so the customer is guaranteed that its monthly payments will be less than before the project. (Typically, ESCOs do not guarantee savings.)

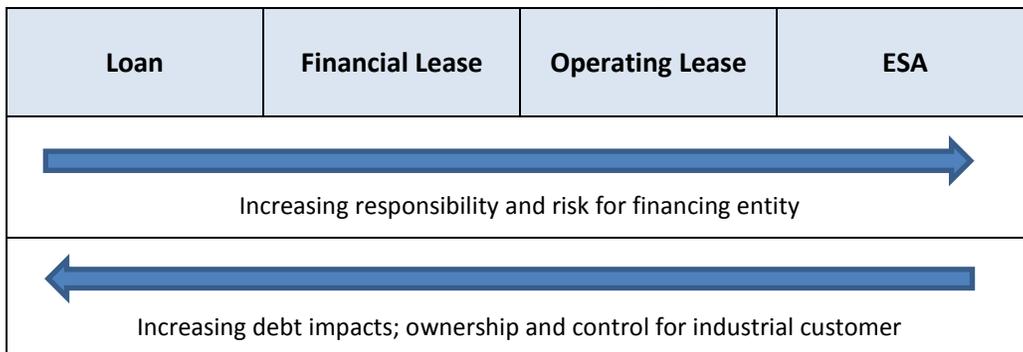
² For more information on Metrus Energy, see <http://metrusenergy.com/>. SWEET is not endorsing Metrus Energy. We are presenting its approach as an additional financing option to the traditional ESCO model, and we think there are advantages and disadvantages to its approach.

- Metrus owns and operates the equipment during the contract period, so the industrial customer does not have to report the project on its balance sheet. The customer does have the option to purchase the equipment, at or below market value, at the end of the contract period. (In a typical ESCO contract, the equipment is owned by the industrial company while it is paying off the financing.)
- All up-front project costs and ongoing costs of maintaining the equipment are covered by Metrus. (ESCOs do not always cover all the up-front project costs and usually do not cover maintenance costs.)

Through the guarantee of energy savings, Metrus assumes all the risk and only collects its fees based on actual verified energy savings. Fees include the cost of purchasing and installing the equipment, financing costs (interest), the services of the consultant/ESCO, and Metrus' fees to cover its administrative costs and the risks associated with the project. There is some flexibility regarding the split of savings and the contract period, but typically the customer pays Metrus a rate of approximately 90% of its normal utility rate (\$/MWh) for the energy saved by the project over the contract term. In other words, Metrus normally keeps about 90% of the project's annual energy cost savings over the term of the ESA, and the customer gets about 10%, which might be a smaller share of the projects' potential energy cost savings than many companies are willing to accept. However, the guarantee of some cost savings and no up-front costs may be attractive for customers with projects that have other important benefits in addition to cost savings, such as improved reliability from replacing aging equipment (Visciano, 2012).

The Metrus financing approach allows the customer to treat the project as an off-balance sheet expense, since Metrus Energy owns and maintains the equipment over the contract period. Some industrial customers may find this attractive. However, if the project directly affects the company's production process, many industrial customers insist on maintaining ownership and control of the equipment and will not accept this arrangement. (See Figure 2.)

Figure 2: Comparison of Risks and Responsibilities for Financing Options



Note: From the industrial customer's point of view, moving further to the right among these options involves less debt or ownership reported on the company's balance sheet, but also less company control of the equipment. From the utility or other financing entity's point of view, moving further to the right involves increasing responsibility for the success of the project and increasing risk.

Many industrial customers would be more comfortable with a capital lease than an operating lease or ESA, so that they can maintain some ownership and control of the equipment during the contract period. A capital lease allows the customer to take partial ownership of the equipment during the contract period, but the company can report the project/equipment on its balance sheet as a leased asset rather than debt. 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), which looks even better on the balance sheet than a financial lease. For an Energy Service Agreement (ESA), the company has even less control over the equipment during the contract period, and does not report any ownership of the equipment on its balance sheet.

If the equipment is related to a production process, the industrial customer will often want to have full ownership and control. However, if the project is not directly production-related, then being able to treat the project as an operating lease, or an off-balance sheet expense in the case of an ESA, may make the financing more attractive to many companies.

For industrial clients, Metrus partners with smaller and regional ESCOs that have industrial expertise (rather than the larger national ESCOs). To date, Metrus has financed projects for industrial customers worth about \$10 million, and is hoping to do \$50-60 million of business with commercial and industrial customers in 2012 (Visciano 2012).

Utility Financing Programs

Another possible solution for financing industrial energy efficiency projects is for utilities to provide the financing. Accepting a loan from the electric utility is more appealing to many industrial customers than accepting a loan from a bank. While 90% of the CIEC companies surveyed (mentioned above) would not consider taking a loan from a bank, 50% said they would consider a loan from their utility, paid back through monthly payments along with the normal utility bill (see Appendix).

Generally, utility financing programs offer a way for industrial and other customers to purchase and install energy efficiency equipment with no up-front costs. The utility provides the capital for an approved energy efficiency project, and the customer repays the project costs, plus a small administrative/interest fee, through monthly payments over a contract term of typically 4-5 years. The monthly payments are generally designed to create “bill neutrality”, meaning that the customer’s monthly utility bill plus the monthly financing payment should be equal to or less than the customer’s monthly bill before the project.

There are at least 16 utilities in the U.S. that provide financing programs for some of their customers, according to a recent report by ACEEE (Bell 2011). Most of these focus on residential and/or small business customers. There are only eight utility programs in the U.S. that include industrial customers.³ In the Southwest region, Arizona Public Service Co. (APS) began offering financing to residential and business customers in 2010 (APS 2012). In addition, the State of Utah offers a financing program for publicly-owned buildings, including state, tribal, municipal (city and county), public school district, charter school, public college, and public university facilities.

The purpose of any financing program is to complement and enhance the utility’s other energy efficiency program offerings in order to achieve greater energy savings. Utilities have several possible ways to structure a financing program. In particular, there are options that do not require the utility to use its own capital (either ratepayer or shareholder funds) and options for third-party billing (which avoids the need for potentially expensive upgrades to the utilities’ billing systems). The possible utility roles include the following (Brown 2011):

1. *Utility capital, with on-bill financing.* In this case, the utility provides the capital through its ratepayer or shareholder funds. The utility also does the billing for the loan, and originates and services the loans. (In this option, the utility does everything.)
2. *Utility capital, with third-party billing.* As with on-bill financing, the utility provides the capital, using its ratepayer or shareholder funds. But in this case, a third-party does the loan origination and servicing.
3. *Third-party capital, with on-bill invoicing.* The utility invoices for the energy efficiency financing using the customer’s utility bill. However, it does not provide the financing capital, which

³ Three of these eight are not included in the ACEEE report: Wisconsin Focus on Energy’s ET program, Alliant/WPL’s Shared Savings program, and Southern California Edison’s program.

instead comes from a bank, credit union, or other sources. The utility may or may not originate the loan.

4. *Third-party capital and billing, with credit enhancement.* In this case, the utility agrees to cover a specified amount of losses that the creditor (bank, credit union, etc.) may incur for making the loans to the utility's customers. The third party does the loan origination and servicing.

APS uses the fourth model above, in which the National Bank of Arizona provides all the financing and does the billing. APS provides credit enhancement in the form of loan loss reserves to share the risks of customer defaults (Dobberpuhl 2012). Another example of this option is Connecticut Light and Power's (CL&P) financing program for commercial and industrial customers. A third-party provides the capital and does all the loan origination and servicing, and CL&P buys down the interest rate (Motta 2012).

In addition, these options can be combined. For example, a utility could choose to credit-enhance a financing structure for which the utility provides the billing services.

Key Elements of Financing Programs for Industrial Customers

Once a utility has a financing program in place for residential or small business customers, it is possible to extend the program to industrial customers. However, industrial customers do present several challenges such as more varied and complex processes, and larger projects that require more money.

Funding Sources

For medium-size and larger industrial customers, energy efficiency projects can range in size from \$50,000 up to \$1 million or more. Generally, utility financing programs obtain the capital for loans from three different sources:

- energy efficiency program / public benefit funds
- funds from the utility's treasury
- funds provided by a bank or other third party

In order to provide financing for industrial projects, utilities may need to consider leveraging money from banks or other third parties. Using a bank or other third-party capital relieves the utility of this burden. The challenge is to find a third party willing to work with the utility in this way, and willing to charge reasonable interest rates for this service.

The APS and CL&P financing programs both rely on capital from third parties or banks, with some form of credit enhancement (interest rate buy-down or loan loss reserve) provided by the utilities. Since April 2012, CL&P has been working with two different third parties, Univest Capital (a bank) and M-Core (a leasing company). The third parties charge an interest rate of either 10% (for loans of more than 24 months or amounts of more than \$10,000) or 12% (for loans of 12-24 months or amounts less than \$10,000). For the commercial and industrial loan program, CL&P buys down the interest rates to 3% for comprehensive projects, and to 5% for single-measure projects (Motta 2012).

National Grid is in the process of making an agreement with a bank to provide the capital for its commercial and industrial (C&I) loan program. According to Bill Codner (2012), C&I Program Manager for National Grid, “The challenge with finding a bank to provide the capital for the loans is that the larger banks only want to provide loans of \$100 million or greater.” Many smaller banks are reluctant to participate, but some banks see this type of program as an opportunity. National Grid has reached out to 25 banks and is reportedly getting close to an agreement with one (Codner 2012).

If possible, using ratepayer or public benefit funds may be the next best option. Wisconsin’s Emerging Technologies program and Southern California Edison use public benefit funds for their financing programs. Since most loans will be paid back, the only costs to the ratepayers are the administrative costs for the financing program, the cost of any defaults, and the financing costs associated with the difference between the utility’s discount rate and the interest rate charged for the loans. Based on the experience of the five programs described below, default rates for industrial customers are very low, typically less than 1%.

Using funds from the utility’s treasury may make shareholders unhappy, unless the financing program provides a return on investment (ROI) comparable to the utility’s expected or allowed ROI for other types of investments. Alliant/Wisconsin Power and Light’s (WPL) financing program is designed to allow the utility to earn its expected ROI of 11.5%. To accomplish this, WPL charges financing customers 3% interest on the loans, and the remaining 8.5% comes from ratepayers through the energy efficiency fund (Dorn 2012). National Grid used its treasury funds for the financing program in 2010, but in 2011 National Grid’s board of directors decided to switch the financing program’s source of capital to the energy efficiency program funds. As mentioned above, National Grid is now looking for a bank that will partner with it to support the financing program (Codner 2012).

Quality Technical Assistance

Industrial customers often need help identifying good, cost-effective projects. In addition, because the projects can be complex, industrial firms often need reassurance from outside “experts” that specific projects will be successful, and that energy and cost-savings estimates are valid, before they feel comfortable borrowing money to finance them (Konicek 2012). As mentioned above, most ESCOs prefer to work with government or commercial customers on lighting or HVAC system upgrades, rather than working with industrial customers, due to the variety and potential complexity of industrial EE projects. Utility financing programs face this same challenge; in order to successfully engage industrial customers, utilities need to provide good quality technical assistance.

The two Wisconsin programs described below are good examples of how this can be done. Wisconsin Focus on Energy has contracted with CleanTech Partners to manage the Emerging Technology (ET) program, which is funded by Wisconsin utilities through a public benefits fund. The ET program relies on CleanTech Partners’ staff of engineers with industry experience to assist industrial companies. The engineers proactively reach out to industrial firms and offer assistance in identifying opportunities for emerging technologies that will produce significant energy and cost savings. For 2007-2011, the ET program was able to identify and finance emerging technology projects with an average payback period of about 1.5 years, which is quite impressive. “The main reason the program has been able to achieve

large energy savings is that the staff engineers have the expertise to go in and find process-related energy efficiency technologies/improvements,” said Tim Konicek, ET Program Manager. “That is where the big energy savings are.” (Konicek 2012)

After identifying potential opportunities, the ET staff engineers help the clients evaluate the opportunities, discuss the potential technical challenges, and persuade the companies to implement the projects with the help of the financing. Without this assistance and reassurance, most companies are resistant to trying out new technologies. The quality of technical assistance provided is definitely one of the keys to the success of the Emerging Technology program, along with the financing provided and Focus on Energy’s custom incentives. The shared savings element of the contract terms, which allows customers to receive 50% of the savings from the projects during the contract term, is also appealing to the customers (Konicek 2012).

For Alliant/WPL’s shared savings program, the technical assistance provided is also a key to success with the industrial sector, which accounted for 60% of the energy savings achieved by WPL’s financing program in the past five years (Dorn 2012). WPL has several well-trained and experienced staff, and brings in outside contractors as needed to help industrial customers. Customers of Alliant/WPL can also take advantage of Wisconsin Focus on Energy programs, including technical assistance/energy assessments.

Other Program Design Options

Utilities have several other choices in program design, including what interest rates to charge, the maximum contract term, whether to offer shared savings, and whether to offer leases as an alternative to loans. These types of choices and program differences are highlighted in Table 1 for five utility financing programs.

Interest rates. Some utility programs charge interest on the loans similar to the market rate, and some charge no interest. The purpose of the loan or financing program is to complement the utility’s other efficiency programs, including custom and prescriptive incentives. Therefore, it is certainly not necessary to buy the interest rates down to zero. Wisconsin Focus on Energy’s Emerging Technology program charges interest at approximately the market rate. This allows the program to demonstrate that customers only use the financing program if they are receiving benefit from the program (and not just taking advantage of free or discounted money).

Contract term. Another key choice is the maximum contract term. Three of the programs in Table 1 offer maximum contract terms of 5 years. National Grid has a maximum term of only 2 years, but it provides incentives of 50% of project costs and does not charge any interest. Limiting the contract period to no more than 5 years helps to limit the risk of the customer going out of business and defaulting on the loan. Industrial customers will also tend to prefer shorter contract terms such as five years or less.

After the maximum contract period is established, the allowed maximum payback period for the efficiency projects is determined by the combination of utility incentives, interest charges, and any amount of shared savings. For example, for a maximum contract term of five years, if the utility provides

incentives of 25% of the project costs, the maximum simple payback period of the project without the incentives would be 6.25 years. If the utility allows the customer to keep 25% of the savings during the contract period but still wishes to keep the maximum contract period at 5 years, then the maximum payback period (pre-incentives) would be five years. If the utility charged 4% interest, this would reduce the maximum pre-incentive payback period slightly, to about 4.8 years.

Shared savings. Some programs are designed to allow customers to share some of the energy cost savings from the project during the contract period. As explained above, this makes the contract period slightly longer. For example, if a project has an estimated payback period of four years, the program could allow the customer to receive 25% of the cost savings by lengthening the contract period from 4 years to 5.3 years (4×1.25). Colorado industrial companies surveyed by SWEEP indicated a preference for receiving some percentage of the savings during the contract term (see Appendix).

Table 1: Comparison of Five Utility Financing Programs for C&I Customers

Utility Program	Maximum Contract Term	Shared Savings Percentage	Interest Rate Charged to Customer	Source of Capital for Loans	Industrial Participation
Alliant/WPL – Shared Savings	5-yr	Varies depending on project and contract term	~3%	Utility treasury/ capital fund	About 60% of funds loaned to industrial customers
Wisconsin Focus on Energy – Emerging Technologies	5-yr	50%	~5% or approx. market rate	WI public benefit funds	100% industrial sector and emerging technologies
National Grid (in MA & RI) – On-bill Financing	2-yr	0%	0%	Previously from utility capital fund; currently using EE funds and looking for banking partner	Exact % unknown, but relatively low
Southern California Edison – On-bill Financing	5-yr	0%	0%	CA public benefit funds	6% of funds loaned to industrial customers
Connecticut Light and Power – Low-interest Loans	5-yr	25% (optional)	3% for multi-measure projects; 5% for single measures	Third-party	Exact % unknown, but relatively low

Sources: Personal communications with program managers.

Performance guarantees. None of the programs guarantee savings to the customer, so if the project(s) fail to achieve the estimated energy cost savings, the customer will either lose money or not achieve the estimated return on investment. And if the customer fails to make the monthly payments, the program loses money. However, the Wisconsin Focus on Energy Emerging Technologies program does typically obtain a performance guarantee from the technology vendors for a base level of energy savings. The program uses this guaranteed level as the basis for establishing the contract terms and monthly payment projections. If the energy savings are less than the base level, the vendor must repay the program for the difference, or remove the equipment and refund all the initial funding for the project to the program. This type of guarantee helps provide industrial customers the additional assurance they need to move forward with the emerging technology projects. Without the guarantee, if projects underperform, the customer would not realize the expected return on investment, or could even lose money in a worst case scenario. The guarantee also allows the program to expect a level of energy savings proportionate to the program funds invested, which insures a reasonable benefit to cost ratio (Konicek 2012).

Lease option. Another element that will help increase industrial participation is to offer capital or operating leases as an alternative to a loan. Many industrial customers are unwilling to accept a loan because it entails reporting more debt on the company’s balance sheet. In SWEEP’s survey of Colorado industrial companies, most companies indicated a preference for leases of either type rather than loans (see Appendix). The Focus on Energy ET program offers this choice to its customers, and has found that most industrial customers, if given the choice, prefer the capital lease option (Konicek 2012). This option allows the company to take some ownership and control of the equipment during the contract period, without having to report the financing as debt on the company’s balance sheet. (See Figure 2 above.)

Utility Industrial Financing Program Descriptions

There are currently at least eight utility programs in the U.S. that offer financing to industrial customers; two of these have high participation rates. For this report, we highlight the details of the five programs shown in Table 1 above.

The two Wisconsin financing programs have been able to achieve very good energy savings results, as shown in Table 2 below. Focus on Energy’s Emerging Technologies (ET) program is outstandingly cost-effective, achieving about eight times as much energy savings per dollar of financing provided as next-best Alliant/WPL’s program. The ET program was able to help customers identify and finance projects with large energy savings and relatively short payback periods, averaging only about 1.5 years (Konicek 2012), while Alliant/WPL’s average payback period was closer to five years.⁴ In addition about 40% of Alliant/WPL’s participants in the financing program were commercial customers, who pay higher rates than industrial customers for electricity and natural gas. (By comparison, 100% of the ET program’s customers are industrial.) Because of these energy price differences, projects with the same payback period will achieve more energy savings per dollar invested for industrial customers than for commercial customers.

Table 2: Results of Two Financing Programs with Significant Industrial Participation

Program	Financing (including utility interest costs), 2007-2011	Number of Projects	Total First Year Energy Savings* (MMBtu/yr)	First Year Savings per Dollars Invested (MMBtu/yr-thous \$)	Percent Industrial Participation compared to Total C&I
Alliant/WPL – Shared Savings	\$133 million	NA	3,600,000	27	60%
Wisconsin Focus on Energy – Emerging Technologies	\$5.2 million	30	1,095,000	211	100%

*Electricity savings were converted to MMBtu using 1 MWh = 10 MMBtu, to account for generation and transmission losses. Sources: Konicek 2012; Dorn 2012.

⁴ The typical contract term for WPL’s shared savings program is five years. Assuming the incentives provided are at least equal to the shared savings percentage (e.g., 20%), this means the typical pre-incentive payback period is about five years or greater.

National Grid and CL&P were not able to provide any data on energy savings for their financing programs, and SCE does not attribute any energy savings to its financing program. National Grid's and SCE's programs did succeed in funding many C&I projects in a short period of time, which at least is an indicator of the popularity of the programs with business customers. National Grid's and SCE's programs both had relatively small percentages of industrial participation (7% for SCE, unknown percentage for National Grid) (Levingston 2012).

Wisconsin Power & Light – Shared Savings Program

Wisconsin Power and Light's (WPL) shared savings program offers on-bill financing to commercial, industrial and agricultural customers for energy efficiency projects. In addition the program integrates technical assistance to help customers identify efficiency opportunities as well as available custom and prescriptive rebates. The financing program allows customers to purchase and install energy efficiency equipment with no up-front costs.

The customer repays the financing for project costs plus a small administrative/interest fee of approximately 3-4%, through monthly payments over a five-year or less contract term. The program will provide financing based on the estimated energy cost savings from the EE project over a five-year period. This means that unless customers provide some of the project funding themselves, projects must have an estimated simple payback period of five years or less (including the incentives and administrative fee).

Source of funds. In WPL's case, the funds to finance the energy efficiency projects come from the utility's treasury, rather than through ratepayer funds. WPL is authorized by the Wisconsin Public Service Commission (PSC) to charge an interest rate that allows it to earn its normal rate of return on capital investments. Ratepayers pay for most of the interest on the loans, and the customers pay for a portion. For example, if WPL is allowed to earn 11.5% on its treasury funds, for the shared savings loans the ratepayers would pay about 8.5% and the customer would pay the remaining 3%. This arrangement provides a low enough interest rate to make the program attractive for customers, and the program's energy savings are still cost-effective for the utility and its ratepayers.⁵ However, these interest rates make contracts of more than five years not feasible (i.e., they would not pass cost-effectiveness tests).

Summary of results. Table 3 provides a summary of energy savings for the Shared Savings program. The budgets and energy savings have declined since 2008, mainly due to competition with other programs such as those of Wisconsin Focus on Energy. Recent data on cost-effectiveness is not available. However, the shared-savings program achieved a benefit-to-cost ratio of 2.5 in 2002, using the Societal Test (Osterholz, 2003).

⁵ The energy efficiency projects are a cost-effective resource compared to supply-side alternatives for the utility, and the interest rate buy-down is viewed as an incentive paid by all customers in the same manner as more traditional rebates provided by utility DSM programs.

Table 3: Energy Savings from WPL Shared Savings Program

Year	Financing provided (thous \$)	First year electric savings (MWh)	First year fuel savings (MMBtu)
2005	29,905	71,789	214,038
2006	33,350	77,277	138,686
2007	40,742	81,112	385,433
2008	44,373	91,347	294,055
2009	27,812	61,990	141,566
2010	15,643	24,180	91,859
2011	4,601	8,588	14,981

Source: Dorn 2012

Industrial participation. The program provides free technical assistance to industrial customers to help them identify and evaluate EE opportunities, which is a key to success. If industrial customers are to feel comfortable borrowing money or taking a capital lease, then they need adequate reassurance that the project will be successful. This is especially true for industrial customers because EE projects in this sector vary a lot, and can be much more complicated than the typical lighting or HVAC system upgrades that are common in the commercial sector. However, WPL’s experience is that if the program provides good technical assistance, then industrial customers are quite willing to participate (Ambach, 2009).

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Wisconsin Focus on Energy – Emerging Technologies Program

Wisconsin Focus on Energy has developed a financing program for any industrial customers in Wisconsin.⁶ The program, managed by CleanTech Partners, Inc., will pay the initial project costs for qualifying projects that involve “emerging technologies.”⁷ Customers repay the project costs through monthly payments, similar to the utility programs described in this section. The monthly payments are set up to allow the customer to receive about 50% of the energy cost savings during the contract, while using the other 50% to repay the project costs and interest. This formula of shared savings is attractive to customers, and helps encourage them to move forward with projects.

To allow the project costs to be repaid in five years, projects need to have a simple payback period (after including any custom incentives) of slightly less than 2.5 years. CleanTech Partners performs the analysis to evaluate the projects and estimate the potential energy savings, and encourages the customers to implement the projects.

⁶ Wisconsin Focus on Energy’s programs are available to customers of any of the state’s investor-owned utilities, and to customers of participating municipal and electric cooperative utilities.

⁷ The program defines an emerging technology to be a product that will significantly reduce the consumption of energy in a commercial or industrial setting. In addition the product has been fully developed and tested, but has seen limited implementation in Wisconsin.

Source of funds. Funds for the financing program come from public benefits charges, which in Wisconsin are collected from all utility customers statewide. The program charges about 5% interest on its loans, although the interest rate can vary. For example, the program can decide to charge a higher interest rate to a customer that appears to be a higher credit risk. The program generally charges an interest rate that is slightly lower than the market rate.

The program offers financing for emerging technology projects in the form of either loans or capital leases. Some customers prefer capital leases, because their companies may not want to take on more debt, and leases are treated differently on the company's balance sheet. With a capital lease, the program owns the equipment initially, and gradually more and more of the ownership is transferred to the customer as it makes the monthly payments. Therefore, the program takes more precautions with capital leases, for example requiring the technology provider/installer to guarantee a minimum level of performance in terms of energy savings. With a loan, the customer immediately takes ownership of the equipment, so there is less risk to the program. However, the program still may advise the customer to obtain some type of similar guarantee from the technology provider.

The program could also provide an operating lease to a company/customer, although it has not yet done so. In the case of an operating lease, the customer would not own the equipment, but would have the right to purchase it at "fair market value" at the end of the contract term. Since the company does not own the equipment during the contract term, the project would not have to be reported on its balance sheet at all.

Summary of results. The program has been operating in its current form, focusing on emerging technologies, since about 2006. Since that time, it has financed 30 projects, with total initial costs of \$5-6 million. These projects have achieved total energy savings of 30-35 million kWh/yr and about 10 million therms/yr, and have achieved peak demand savings of about 3 MW. So far, there have been no defaults on any of the loans. However, out of these 30 projects, there have been two or three which have failed to achieve significant energy savings, mainly because the technology did not "integrate" with the customer's process or facility. For example, one project was not successful because of water quality issues which resulted in corrosion of the equipment.⁸

The metrics for measuring cost-effectiveness of the emerging technology financing program have changed considerably since the program has been in existence. Despite the challenges of promoting emerging technologies, the program has roughly the same order of cost-effectiveness as Focus on Energy's other industrial programs, with a benefit-cost ratio of about 3.0 using the Utility Cost Test.

Technical assistance. Good technical assistance is a key to the program's success. The program's engineers must be able to evaluate technologies, which are sometimes complex, and to convince the customer's technical staff that the technologies will work. Sometimes this requires challenging the assumptions of the company's staff, and requires actual measurements/data collection.

⁸ In these cases, normally the vendor must pay the customer for the unachieved cost savings, as explained above (See the section on "performance guarantees, p. 11).

The Wisconsin Focus on Energy program is restricted to financing projects which employ “emerging technologies” rather than proven ones, in order to help new energy efficiency technologies overcome the hurdles associated with new product development (see Table 4). There would be less risk with more proven technologies and industrial best practices. This program demonstrates that the perceived risks of industrial energy efficiency projects can be overcome with good technical assistance, even with a focus on emerging technologies.

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Table 4: Examples of Emerging Technologies (Wisconsin Focus on Energy)

<i>Term Loan at a Wisconsin paper company</i>	
<i>Technology:</i>	Bio-oil combustion (wood oil waste product used to supplant natural gas)
<i>Installation Cost:</i>	\$375,000 complete
<i>Energy Savings:</i>	900,000 Therms/yr
<i>Dollar Savings:</i>	\$450,000/yr @ \$0.50/Therm
<i>Simple Payback:</i>	10 months
<i>Financing Structure:</i>	18-month term loan at 5% interest. Terms set to insure the customer is cash flow positive.
<i>True shared savings capital lease at a Wisconsin ethanol producer</i>	
<i>Technology</i>	Fermenter cooling loop control system (employs variable frequency drive (VFD) technology, controls and control algorithms to manage the fermenter pump based on measured process variables)
<i>Installation Cost:</i>	\$130,000 complete
<i>Dollar Savings:</i>	\$200,000/yr @ \$0.07/kWh
<i>Simple Payback:</i>	8 months
<i>Energy Savings:</i>	295 kW demand; 2,850,000 kWh/yr
<i>Financing Structure:</i>	Focus on Energy covered all installation costs and is paid pack with 50% of the actual measured savings. Interest rate of 5% included in the payback amount. Ownership of the equipment transfers to the customer in less than 2 years.
<i>True shared savings capital lease at a Wisconsin foundry</i>	
<i>Technology:</i>	Advanced oxidation (sand treatment technology used to reduce scrap rates, mold-bond materials, and VOC emissions)
<i>Installation Cost:</i>	\$175,000 complete
<i>Energy Savings:</i>	120 kW demand; 700,000 kWh/yr
<i>Dollar Savings:</i>	\$100,000/yr (energy @ \$0.07/kWh + bond material savings)
<i>Simple Payback:</i>	1 year, 9 months
<i>Financing structure:</i>	Focus on Energy covered all installation costs and is paid pack with 50% of the actual measured savings. Interest rate of 5% included in the payback amount. Ownership of the equipment transfers to the customer in about 4 years.
<i>True shared savings capital lease at a Wisconsin plastics converter</i>	
<i>Technology:</i>	Radiant heater bands (plastics equipment heater band that uses ceramic insulation and radiant heat)
<i>Installation Cost:</i>	\$100,000 complete
<i>Energy Savings:</i>	85 kW demand; 600,000 kWh/yr
<i>Dollar Savings:</i>	\$50,000/yr @ \$0.08/kWh
<i>Simple Payback:</i>	2 years
<i>Financing structure:</i>	Focus on Energy covered all installation costs and is paid pack with 50% of the actual measured savings. Interest rate of 5% included in the payback amount. Ownership of the equipment transfers to the customer in less than 5 years.

National Grid – On-Bill Financing Program

National Grid (NG) offers on-bill financing (OBF) for energy efficiency projects to commercial and industrial customers in Massachusetts and Rhode Island. (It also offers on-bill financing to small businesses in New York.) In addition the program offers technical assistance to help customers identify efficiency opportunities (the customers pay for half the cost of detailed studies), and custom and prescriptive rebates. As in WPL’s program, customers can purchase and install energy efficiency equipment with no up-front costs.

Projects are eligible for rebates of up to 50% of the project costs. The projects generally need to have a simple payback period of 2 years or less after rebates (or 4 years or less before the rebates). The customer repays the financing for project costs (with no administrative fee and 0% interest) through monthly payments over a two-year contract term.⁹

Source of funds. Beginning in 2011 NG’s management approved a budget of \$7 million for the OBF program from the energy efficiency fund. The program does not do credit checks; however, out of 400 business loans provided in the last three years, there was only one default.

For the future, National Grid will rely on private banks to provide capital for the OBF program, and is very close to signing contracts to move forward (Codner 2012). NG would like to have about \$30 million annually to spend on this program, and is creating a separate entity to manage the loan/financing program while keeping the money off of NG’s balance sheet. NG will buy down the interest rate offered by the bank to 0% through its ratepayer-funded energy efficiency programs. The banks would issue a separate monthly bill to National Grid’s customers in order to repay the on-bill financing.

Summary of results. National Grid was not able to provide any data on energy savings achieved through this program, or on the percentage of industrial customers (compared to total C&I customers) participating. Program manager Bill Codner indicated that National Grid doesn’t have a high percentage of industrial customers, but he commented, “In my opinion, if we make the capital available, industrial customers will take advantage of the loans (in addition to our rebates)” (Codner 2012).

Contacts. Bill Codner, C&I Energy Efficiency Program Manager, William.codner@us.ngrid.com

Southern California Edison – On-Bill Financing Program

Southern California Edison (SCE) offers on-bill financing (OBF) to its commercial and industrial customers for energy efficiency projects. In addition the program offers technical assistance to help customers identify efficiency opportunities, and custom and prescriptive rebates. As in WPL’s and National Grid’s program, customers can purchase and install energy efficiency equipment with no up-front costs.

The OBF program is designed to create bill neutrality for the customers. Maximum contract term for industrial customers is 5 years, which means the maximum payback period for energy efficiency projects

⁹ Providing incentives of up to 50% of project costs and buying down the interest rate to 0% is extremely generous. We would not expect many utilities to be able to replicate this.

is also five years (after incentives). The program charges no interest. There is no guarantee of savings, but the estimated savings and the loan term monthly payments are adjusted after the project is installed and reviewed.

Of the 486 business customers participating, only 7% (34) were industrial, and they accounted for only 6% of the funds used. SCE expects to increase industrial participation through efforts to market the program to industrial customers and to educate them about the OBF program and its benefits.

Source of funds. The funds to finance the energy efficiency projects come from public benefit funds. SCE does not charge any interest. It ran out of money in 2011 because the program was so popular; SCE distributed \$16 million in only four months. Now the program has been allocated an additional \$31 million for 2012.

Summary of results. SCE considers the program to contribute to the energy savings of its other incentive programs, so no savings are attributed to the financing program separately.

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Connecticut Power & Light – Low-Interest Loans for Commercial & Industrial Customers

Connecticut Power and Light (CP&L) offers low-interest loans for energy efficiency projects to its commercial and industrial customers. It offers the loans through a third party, which CP&L chose through a competitive bid process. As of April 2012, CP&L buys down the interest rate to C&I customers to 3% on loans involving several measures, or 5% for loans involving only a single measure. This is to encourage customers to take a more comprehensive view of energy efficiency opportunities at their facilities and to implement multiple measures. CP&L also offers technical assistance in the form of studies/energy assessments, for which customers pay 50% of the costs, which encourages customers to take the studies more seriously. CP&L also offers custom and prescriptive incentives to complement the loans. The loan program is designed to create bill neutrality for the customers. The maximum contract term for industrial customers is 5 years.

So far, there has been little participation from industrial customers, but CP&L expects to increase this in the next few years through marketing and outreach efforts.

Source of funds. The funds to finance the energy efficiency projects are provided by the third party, which also handles the loan origination and background credit checks on the C&I customers, as well as the billing. CP&L buys down the interest rate for the loans.

Summary of results. No results are available.

Key contacts. Jim Motta, C&I Supervisor, Conservation and Load Management Department, mottaj@nu.com

Conclusions and Recommendations

There are several challenges for utilities interested in creating a financing program to serve industrial customers and several choices in program design to help address these. Industrial financing may require access to greater amounts of capital than financing for other customer groups, which may require the utility to access funds from a third-party source to complement its own funding sources. Developing a request for proposal (RFP) for a bank or other third party to provide the capital is a good option, and some utility programs use the utility funds to cover the risks of any defaults, or to buy down interest rates. Another option is to use a third party for origination and servicing of the loans, which takes a large burden from the utility.

Another challenge in serving industrial customers is being able to offer good quality technical assistance to help customers identify and evaluate potential projects. Utilities need to have their own well-trained staff, or choose skilled and experienced contractors. In addition to identifying projects, well-qualified staff or contractors can also help industrial facilities overcome doubts or hesitation about moving forward with projects affecting their production processes.

In addition, SWEEP recommends the following best practices:

- In addition to loans consider offering capital or operating leases to industrial customers, to help alleviate the concern of reporting more debt on the company's balance sheet.
- Consider obtaining a performance guarantee for a base level of energy savings from the equipment vendor or consultant.
- Offer an interest rate that is slightly better than the market rate. It is not necessary to buy the interest rate down to zero for industrial and commercial business customers. The financing option should complement other utility custom and prescriptive incentive programs, rather than being seen as a stand-alone solution.
- Offer contract periods of up to five years to accommodate projects which have longer simple payback periods but still offer reasonable (such as 20% or better) pre-rebate returns on investment.
- Consider offering some amount of shared savings during the contract period, such as 25%, which will make the financing more appealing to many customers.

By offering good quality technical assistance and with thoughtful program design, it is possible to develop successful financing programs such as those implemented by Wisconsin Focus on Energy and Alliant/Wisconsin Power and Light. Adding a successful financing component will allow the utility to significantly increase its annual energy savings from industrial customers, while helping these customers improve their profitability and competitiveness.

Appendix: Results of SWEEP Survey of Industrial Companies in Colorado

SWEEP interviewed a group of large industrial companies who are participants in the Colorado Industrial Energy Challenge (CIEC) program concerning their challenges in financing energy efficiency projects. (For more information about CIEC, visit [www. http://swenergy.org/programs/industrial/ciec/index.html](http://swenergy.org/programs/industrial/ciec/index.html).)

The company representatives interviewed are typically facility managers with part-time (or in a few cases full-time) responsibilities for energy management.

Following is a summary of responses to specific questions asked in these interviews and/or surveys. The first three questions and responses are based on phone or in-person interviews of 21 large companies in the CIEC program; interviews took place between September, 2011 and August, 2012.

1. *What is your company's typical required simple payback period or return on investment for investments in energy efficiency (EE) projects?*

- 8 (38%) have required simple payback periods of 2 years or less. Three of these companies require simple payback periods of about 12 months or less.
- 13 (62%) have minimum ROI's less than 50% (equivalent to simple payback period of 2 years). Five of these have minimum ROIs of 20%.

2. *Is there a different hurdle rate for process-related investments?*

- About one-third reported that there is a different hurdle rate for other business investments, which can vary quite a bit. And about two-thirds said no, the company uses the same hurdle rate, even if it's high, like a 2-year simple payback.

3. *Does your company have a dedicated pool of capital set aside for EE investments?*

- Only two companies have a dedicated pool of capital for energy efficiency projects.

The following four questions and responses are results of a survey of ten companies at a networking meeting in Boulder, CO on April 27, 2012. (This was a relatively informal straw poll.)

For energy efficiency projects that do not quite achieve your required hurdle rate (or for which there is no internal capital available) but that have a rate of return of greater than ~25% (~4-yr payback or less):

4. *Would your company consider taking a loan from a bank (assuming you could get one, at current interest rates of about 5%)? If not, why not?*

- 90% (9 out of 10) said no, the company would not consider taking a bank loan. One company said yes, they would consider a bank loan.

5. *What if the loan was provided by your utility (at or below market interest rates), and paid back thru monthly payments along with your regular energy bill, in a way that the total monthly payment (including your energy bill) was less than or equal to your current bills?*

- 50% (5 out of 10) said yes, they would consider this.
6. *If you answered “no” to questions 4 and 5: **What if the loan for the EE project was in the form of a capital or operating lease, and paid back in the same way as in b? Would this make it more attractive to your company?***
- a. Of the five companies that said no to a loan from the utility (question 5 above) 40% (2 out of 5) said they would be interested in the capital leasing option. 80% (4 out of 5) said they would be interested in the operating lease option.
7. *If you answered “yes” to either question 5 or 6: **Would it be even more attractive if your company received a portion of the savings from the project over the contract term (e.g., 25% of the annual savings), with the contract term extended accordingly?***
- Of the 9 companies interested in either a loan or one of the leasing options from the utility described above, seven said it was more attractive to receive some savings during the contract period.

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