

Distributed Generation and Energy Efficiency Investment Guide



Colorado Energy Office PO 17-7107

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1. INTRODUCTION

For Task 2 of Colorado Energy Office (CEO) PO 17-7107, Energetics and Barretto Bay Strategies have created an investment guide that serves as an in-depth review of accounting strategies, program opportunities, and financing opportunities that are available from the local to the national level for industrial customers interested in investing in distributed generation (DG) and energy efficiency (EE) projects.¹

Sections 2-5 of this report focus on informational resources on financial mechanisms, technical support organizations, utility offerings, and tax incentives. A preliminary set of these informational resources was used to support the survey and interview efforts administered in Task 3 (Industrial EE/DG Survey and Interviews). The survey and interviews assessed industrial energy users' understanding and interest in financing and accounting strategies, audits and technology improvement recommendations, tax incentives and rebates, and information on local, State, and Federal technical assistance programs. Industrial entities reported being unaware of the majority of informational resources presented to them, citing a difficulty identifying and understanding information.

Committed industrial firms need up-to-date and accurate information available to support their personnel, accelerate their processing systems, and inform their decision-making. However, simply publishing a list of informational resources may not increase EE/DG investment on its own and active engagement from technical support programs, financiers, utilities and other stakeholders may be necessary to get industrial firms to take advantage of the available resources. The combined findings from the informational resources assessment in Task 2 and the survey and interview analysis in Task 3 inform final recommendations and strategies, discussed in Section 6 of this report.

The strategies and recommendations in Section 6 focus on both the mindset and actions required by industrial firms and those required by industrial energy engagement programs to enable increased EE and DG investments. While some industrial firms have committed to ambitious energy and sustainability goals, there is still significant opportunity for all firms to access additional resources and multiply their efforts at low or no cost. In particular, industrial firms can leverage both internal and external financing sources to support both energy and non-energy projects and remain cash flow positive from day 1. Industrial energy engagement programs can also strive to build multi-year relationships and actively engage both the firms that participate in its programs and those that it wants to recruit.

The results from Task 2 helped to identify valuable informational resources that can be shared with industrial firms in CO. Additionally, the report provides financial, behavioral, and engagement strategies that could be used by industrial firms and support programs to encourage additional DG/EE investment in the state.

¹ In this report, DG is also referred to as “on-site renewable energy generation” and focuses on technologies and energy sources that are acceptable under the Colorado Renewable Energy Standard, colorado.gov/pacific/energyoffice/renewable-energy-standard

2. FINANCIAL MECHANISMS FOR DG/EE INVESTMENT

There are many ways to finance energy efficiency (EE) and distributed generation (DG) projects. Section 2 describes several financing mechanisms that are available to industrial companies in CO. These financial products, shown in Figure 2-1, include traditional funding methods, such as: internal funding, equipment leases, and commercial bank loans; newer specialized financing approaches, such as: power purchase agreements (PPA), on-bill financing and repayment (OBF/OBR), Colorado Property Assessed Clean Energy (C-PACE), Energy Performance Contracts (EPC), and Energy Services Agreements (ESA/MESA); and government loan and grant programs. Each funding approach has advantages and disadvantages and should be evaluated on case by case basis. The traditional funding approaches require available capital resources up-front and/or the ability to pay off leases or loans over time. Conversely the specialized financing approaches may enable an organization to avoid capital expenditures all-together, however the cost reductions from energy savings must be shared with the funding provider over the duration of the agreement. While Section 2 provides a high-level assessment and background information on the various funding options, Section 0 provides more strategic recommendations, including funding considerations, to successfully achieve EE and DG projects.

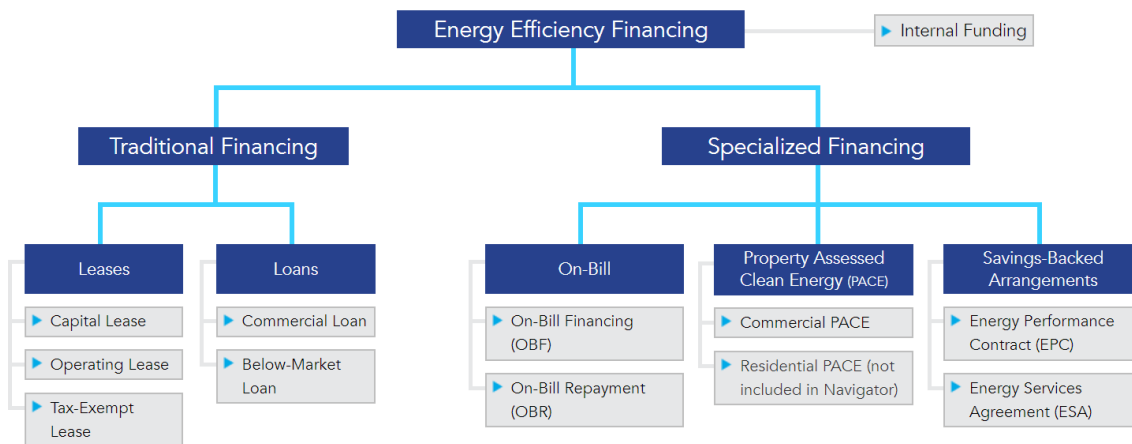


Figure 2-1. Energy Efficiency Financing Landscape (US DOE Financing Navigator)

Figure from betterbuildingssolutioncenter.energy.gov/financing-navigator/explore

Information on industrial energy funding mechanisms is from various resources including:

- Database of State Incentives for Renewables & Efficiency (DSIRE)²;
- U.S. Department of Energy (DOE), Better Buildings Energy Efficiency Financing Navigator³;
- Current Practices in Efficiency Financings, 2016 report by Lawrence Berkeley National Laboratory⁴;
- Colorado Energy Office, March 2015 report on Energy Performance Contracting⁵;
- Southwest Energy Efficiency Project (SWEET), 2012 report on Utility Financing Programs for Industrial Customers⁶;
- Lender and finance provider websites; and
- In-depth interviews with lenders and specialty finance providers who are active in the state of Colorado.

² “Database of State Incentives for Renewables & Efficiency.” A joint project by the US DOE, Energy Efficiency and Renewable Energy, NC Clean Energy Technology Center, and NC State University. Available from, dsireusa.org/

³ “Better Buildings Financing Navigator.” U.S. DOE, Better Buildings. Available from, betterbuildingssolutioncenter.energy.gov/financing-navigator

⁴ Leventis, G. Fadrhonc, E.M. Kramer, C. Goldman, C. “Current Practices in Efficiency Financing: An Overview for State and Local Governments.” Lawrence Berkeley National Laboratory. November 2016. Available from, emp.lbl.gov/sites/default/files/lbnl-1006406_0.pdf

⁵ Paluzzi, J. “Colorado’s Venture into the Private Sector with Energy Performance Contracting: Considerations for a State Energy Office Program Offering.” Colorado Energy Office Final Report to the U.S. Department of Energy. March 31, 2015. Available from, colorado.gov/pacific/energyoffice/private-energy-performance-contracting

⁶ Kolwey, N. “Utility Financing Programs for Industrial Customers.” Southwest Energy Efficiency Project. September 2012. Available from, swenergy.org/data/sites/1/media/documents/publications/documents/Utility_Financing_Programs_Industrial1.pdf

2.1. Self Service, Internal Funding

Internal funding, summarized in Table 2-1, offers the quickest and simplest option for industrial firms to finance EE/DG projects at their facilities. Internal financing allows the organization to capture the full cost-savings of energy efficiency rather than paying a portion to a financing provider. Our interviews with industrial firms in CO have confirmed that firms of all sizes use self-financing as their primary approach to making energy related investments. Larger firms in particular often have a dedicated budget and energy managers who take a purposeful approach to energy efficiency and energy management at their plants. Unfortunately, not all organizations have sufficient resources to dedicate staff time and budgets towards energy related initiatives and in these cases external funding and third party support may be necessary to enable projects. Additionally, organizations may find benefits in external financing options on low-complexity projects with easily verifiable energy savings to free internal capital for use on competing business priorities.

Table 2-1. Internal Funding Summary Table

Internal Funding Advantage and Disadvantages	
<p>Advantages</p> <ul style="list-style-type: none"> • No negotiations with external providers, • Internal monies can be allocated at the discretion of energy managers and according to pre-existing energy plans 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Need to balance competing uses for internal capital • May require several levels of internal approval • Many firms do not prioritize or have adequate internal resources to fund and execute EE/DG projects
Providers	
<ul style="list-style-type: none"> • Uses the organization’s existing financial resources and staff 	

For more information on internal funding: Visit the U.S. DOE, Energy Efficiency Financing Navigator at, betterbuildingssolutioncenter.energy.gov/financing-navigator/option/internal-funding

2.2. Traditional Financing: Leases and Loans

Traditional financing sources include banks and credit unions who issue loans and lines of credit, as well as leasing companies, or manufacturers, who provide lease options to their customers. A benefit of traditional sources is the ease with which these programs may be accessed. While it is true that underwriting standards have tightened in recent years, it is still often true that a commercial loan or capital lease structure will close much faster than a specialty, or subsidized product with additional verification and eligibility criteria.

2.2.1. Leases

A commercial lease may be structured as a capital lease, in which the customer owns the equipment, or as an operating lease, in which the manufacturer owns the equipment and leases it back to the customer. Leasing is best applied in partnership with the equipment manufacturer, vendor, or installer.

The capital lease structure, summarized in Table 2-2, allows a firm to lease a piece of equipment, typically from a manufacturer, with no, or very low, up-front costs. This provides several advantages in terms of time, and especially when compared with loans that involve complicated underwriting procedures, high closing costs, down payments and other fees. The capital lease structure allows a firm to treat their leased equipment as a capital asset which means: 1) for all intents and purposes, the firm owns the equipment for the life of the lease, 2) a firm can treat leased equipment as an asset on their balance sheets, meaning they can depreciate the equipment value over time, and 3) monthly lease payments are treated as liabilities.

Table 2-2. Capital Lease Summary

Capital Lease Advantage and Disadvantages	
<p>Advantages</p> <ul style="list-style-type: none"> • Low up-front costs • Speed (less time investment for firms) • Can be booked as an asset on a company’s balance-sheet • End-of-term flexibility (buy, renew, or return equipment) 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Interest rates and terms may not be able to out-compete specialty financing products • Not available for large upgrades • No specialized benefits (e.g., performance guarantees of EPCs and ESAs or automatic transferability of C-PACE)
<p>Providers</p> <ul style="list-style-type: none"> • Equipment manufacturers • Vendors and/or installers of EE equipment 	

In an operating lease, summarized in Table 2-3, the lessor (such as equipment manufacturer) owns the equipment and the firm rents it at a fixed monthly payment. The operating lease structure has similar benefits in terms of time and ease of execution as the capital lease, especially when compared to more complicated loan deals.

Table 2-3. Operating Lease Summary Table

Operating Lease Advantage and Disadvantages	
<p>Advantages</p> <ul style="list-style-type: none"> • Low up-front costs • Speed (less time investment for firms) • Rental payments treated as an operating expense and are therefore tax deductible • End-of-term flexibility (buy, renew, or return equipment) 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Interest rates and terms may not be able to out-compete specialty financing products • Not available for large upgrades • No specialized benefits (e.g., performance guarantees of EPCs and ESAs or automatic transferability of C-PACE)
<p>Providers</p> <ul style="list-style-type: none"> • Equipment manufacturers • Vendors and/or installers of EE equipment 	

For more information on lease financing: Visit the U.S. DOE, Energy Efficiency Financing Navigator at, betterbuildingsolutioncenter.energy.gov/financing-navigator/option/lease-financing

2.2.2. Commercial Loans

Commercial loans are built on agreements between end-user firms and lending institutions. They are widely available from equipment manufacturers, vendors, and contractors as well as third-party banks and lenders. The lender provider will examine a borrower’s financial condition in order to determine the appropriate amount of debt to issue, which may result in limitations for the borrower. The lender and borrower agree to rates, terms, and other particulars, prior to signing a loan agreement, which can offer fixed or variable rates and be structured in a host of ways to meet the needs of both the borrower and the lender. Borrowers must commit to a repayment schedule which pays back both the principal amount as well as interest payments to the lending institution. Additionally, loans often require a down-payment of 20-25%, which may prevent projects from being cash flow positive from day one.

The list of lending providers across the US is extensive and industrial firms can depend on a robust supply of capital providers who can fund their EE and DG projects. Table 2-4 compares some of the advantages and disadvantages of working with multi-national banks and lenders and lists some of the providers. Table 2-5 compares advantages and disadvantages of working with local providers and offers two examples from lenders in Colorado.

Table 2-4. Commercial Loans, Multinational Banks and Lenders Summary Table

Commercial Loans, Multinational Banks and Lenders Advantage and Disadvantages	
<p>Advantages</p> <ul style="list-style-type: none"> • Well capitalized • Have ample staff to facilitate loan processes • Can lend out higher sums to qualified borrowers. 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Rigorous underwriting procedures that can be daunting for small to mid-size firms • Stringent credit requirements and due diligence procedures • No specialized benefits (e.g., performance guarantees of EPCs and ESAs or automatic transferability of C-PACE)
Providers	
<p><i>Including but not limited to</i></p> <ul style="list-style-type: none"> • Bank of America • Citi • GE Capital • HSBC • JP Morgan Chase • M&T Bank • Santander • TD Bank 	

Table 2-5. Commercial Loans, Local Institutions Summary Table and Examples

Commercial Loans, Local Institutions Advantage and Disadvantages			
<p>Advantages</p> <ul style="list-style-type: none"> • Local focus may enable easier relationship building for small and mid-sized firms • Unique accessibility to dedicated local funding and cooperative programs 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Less capital, staff, and resources than a larger institution • Interest rates and terms may not be able to out-compete national lenders or specialty financing products • No specialized benefits (e.g., performance guarantees of EPCs and ESAs or automatic transferability of C-PACE) 		
Example 1: Elevations Credit Union			
<p>Serves businesses in:</p> <ul style="list-style-type: none"> • Denver • Boulder • Ft. Collins 	<p>Partnerships with:</p> <ul style="list-style-type: none"> • Certifiably Green Denver • EnergySmart • Efficiency Works 	<p>Rate and Terms:</p> <ul style="list-style-type: none"> • Fixed rates start at 3.75% APR • 36, 60, 84, 120 month terms • Minimum loan, \$1,000 • 2% loan fee (loans over \$40k) 	<p>Contact: (800) 429-7626 energyloans@elevationscu.com</p> <p>Website: elevationscu.com/energyloans</p>
Example 2: Alpine Bank			
<p>Serves businesses in:</p> <ul style="list-style-type: none"> • Denver • Eagle County • Summit County • Grand Junction • Other throughout CO (see website) 	<p>Partnerships with:</p> <ul style="list-style-type: none"> • Local municipalities on community-based, EE, solar projects and clean energy collective investment opportunities 	<p>Rate and Terms:</p> <ul style="list-style-type: none"> • Rate-discounted "green" loans for fuel-efficient business vehicles and real-estate secured loans 	<p>Website: alpinebank.com/green-lending.htm</p>

For more information on loan financing: Visit the U.S. DOE, Energy Efficiency Financing Navigator at, betterbuildingssolutioncenter.energy.gov/financing-navigator/option/loan-or-debt-financing

2.3. Specialized Financing: PPA, OBF/OBR, PACE, and Savings-Backed Arrangements

In addition to the traditional financing options that are used to fund a variety of goods and services, there are specialized financing options that are specifically designed for EE and DG projects. These products come in various forms designed to mitigate or address barriers specific to energy investments. In particular, some specialized products guarantee energy savings, can be cash flow positive from day one, can be administered off a firm’s balance-sheet, can be transferable, or offer longer repayment terms than traditional options. However, the specialized mechanisms often take longer to put in place because they are more complex and less familiar to industrial companies and financial institutions than traditional funding options. Additionally, the process complexity and multiple variables that may influence energy consumption at an industrial facility can make it extremely difficult to agree upon a methodology through which energy savings can be accurately quantified and attributed toward an “energy savings guarantee”. Therefore, while specialized financing products have significant benefits that may expand access to capital for energy related investments, projects should be evaluated on a case-by-case basis to minimize complexity and find the most suitable financing option.

2.3.1. Power Purchase Agreements

Power Purchase Agreements (PPA) allow electricity customers to avoid up-front capital expenses for renewable energy systems by agreeing to pay a fixed price for each kWh produced over a contract term (10-25 years) to an independent power producer or electric utility.

PPAs are most commonly associated with roof based solar arrays, in which a solar technology developer will design the system and install it on the roof of a commercial, industrial or residential building. The developer will retain ownership to the equipment and sell the power back directly to the customer as part of the PPA. Additionally, as the equipment owner the developer is able to claim solar energy credits to offset the project development costs and may pass those savings back to the customer. In Colorado, the utility will provide grid-connected solar customers with a net metering device to track and credit the customer for any excess solar energy that is resupplied to the grid.

PPAs can also be established for off-site procurement of renewable electricity. In this approach, the project developer will rely on the utility for transmission and distribution of the generated power and will still negotiate the price per kWh and contract terms. This approach may be better suited for industrial firms without adequate space or renewable resources to generate their own energy on-site.

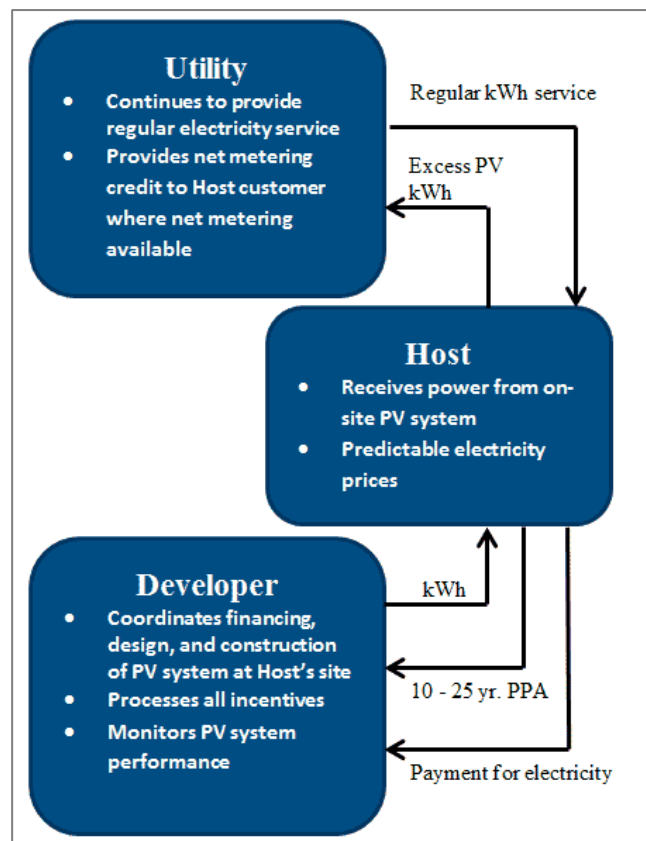


Figure 2-2. Solar PPA Structure and Roles for the Utility, PV System Host (customer), and Developer

Figure available from, seia.org/research-resources/solar-power-purchase-agreements

The survey and interviews from Task 3 indicated that solar PPAs are the most common form of distributed generation undertaken by industrial firms in Colorado and is useful for firms of all sizes. For large manufacturers and large-scale data centers the solar resources helped to offset a portion of their electricity consumption. In other cases, smaller firms reported being net electricity producers. Table 2-6 compares some of the advantages and disadvantages of PPA financing.

Table 2-6. Power Purchase Agreement Summary Table

PPA Advantages and Disadvantages			
Advantages		Disadvantages	
<ul style="list-style-type: none"> • Low or no up-front capital costs to the customer • Source renewable energy on-site at competitive rates • Developer assumes most of the technology risk • Colorado net metering laws require each utility to monitor energy production and credit customers for excess power • May reduce peak grid consumption charges 		<ul style="list-style-type: none"> • Might require additional investments in facility electrical equipment, roofing, or property to support installation • Customer often does not receive the generated renewable energy credits • Energy generation and consumption profiles may not align and typically requires grid connectivity/supplementation 	
PPA Attributes			
Accessibility:	Good fit for organizations that:	Rates and Terms:	Useful Links:
<ul style="list-style-type: none"> • Widely accessible • Mature process • Multiple providers in Colorado 	<ul style="list-style-type: none"> • Want renewable electricity on-site at no up-front cost • Have adequate roof space or land to accommodate a solar array • Can handle project financing negotiations and construction periods 	<ul style="list-style-type: none"> • No out-of-pocket expense • Normally fixed payment per kWh used over 10-20yr contract • Competitive with utility electricity rates (often slightly higher) • Excess energy returned to grid and credited by utility to customer 	<ul style="list-style-type: none"> • Colorado Solar Energy Industries Association • COSEIA Solar Installers List and Contractors

2.3.2. On-bill Financing and On-bill Repayment

On-bill financing (OBF) and On-Bill repayment (OBR) are financing options in which a utility or private lender finances an EE project and is repaid through regular payments on an existing utility bill. On-bill programs typically offer attractive terms such as low-to-zero interest rates, flexible repayment terms ranging from 2 to 15 years, is suitable for customers in leased space, and can be transferrable. Several states have enacted legislation to create on-bill pilot programs or to require utilities to offer on-bill options to their customers, however this has not occurred in Colorado. Utilities do have the right, at their own discretion, to introduce OBF/OBR options for their customers. In Colorado, the Efficiency Works Program (Section 3.1.4) offers on-bill financing to cover small scale residential solar voltaic, energy efficiency, and water conservation loans and Xcel Energy offers commercial energy efficiency loan financing (4.1.3). However, these programs are either not applicable to industrial customers (Efficiency Works) or structured more as a traditional loan (Xcel). Industrial firms interested in OBF/OBR should contact their utility to determine what options may be available. Table 2-7 compares some of the advantages and disadvantages of on-bill programs.

Table 2-7. On-bill Financing and On-bill Repayment Summary Table

On-bill Advantages and Disadvantages			
Advantages		Disadvantages	
<ul style="list-style-type: none"> • Low-to-zero interest rates • Flexible repayment terms (2 to 15 years) paid via utility bill • Suitable for customers in leased space • Can be transferrable 		<ul style="list-style-type: none"> • No legislation requiring OBF/OBR in Colorado • Programs vary and are only offered by select utilities. • Must contact your utility to inquire about OBF/OBR • Not suited for very large projects (typically max at \$350k) 	
On-bill Attributes			
Accessibility:	Good fit for organizations that:	Rates and Terms:	Useful Links:
<ul style="list-style-type: none"> • Limited offerings by select utilities • Might not be available for CO industrial firms 	<ul style="list-style-type: none"> • Own or occupy facilities served by utilities with OBF/OBR programs • Want to avoid up-front costs • Will not own or occupy facilities long-term (transfer obligations) 	<ul style="list-style-type: none"> • Up to 100% financing • Low-to-zero interest rates • 2 to 15 year contract terms • Payments made through an existing utility bill 	<ul style="list-style-type: none"> • DOE Navigator • State Summaries • Efficiency Works • Xcel EE Financing

2.3.3. Colorado Property Assessed Clean Energy

Commercial property-assessed clean energy, or C-PACE, enables owners of Eligible Commercial & Industrial Buildings to finance up to 100% of energy efficiency, renewable energy and water conservation eligible improvements. In the Colorado C-PACE program the New Energy Improvement District (NEID) will take a lien on the borrower’s property, which serves as a security guarantee for a commercial lender. Financing is provided by private capital providers at competitive rates with repayment terms up to 20 years. Repayment is facilitated through the county property tax assessment process to the NEID, which repays the private lender. In most cases the annual energy cost savings will exceed the annual assessment payment, thereby enabling capital intensive equipment upgrades.

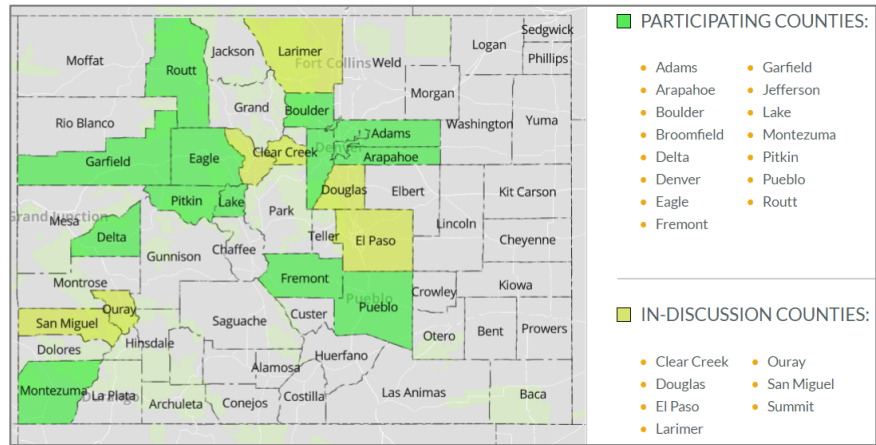


Figure 2-3. Colorado C-PACE Participating Counties as of May 4, 2017

Figure available from copace.com

Figure 2-3 shows the 15 counties currently participating in and 7 counties in-discussion to join the C-PACE program as of May 4, 2017. The C-PACE program is relatively new to Colorado, has primarily been used for commercial buildings, and has yet to be used for an industrial facility in the state of Colorado.⁷ However, industrial customers are likely to take advantage of the program as more counties opt-in and awareness spreads. In fact, one of the survey respondents from Task 3, a paper manufacturer in Boulder, responded that they are working with a contractor and their landlord to explore the C-PACE program as a way to finance HVAC systems in their leased building. Table 2-8 compares some of the advantages and disadvantages of C-PACE financing and highlights some key points regarding the Colorado program.

Table 2-8. C-PACE Summary Table and Colorado Program

C-PACE Advantages and Disadvantages			
Advantages		Disadvantages	
<ul style="list-style-type: none"> • 100% financing of project costs up-front (including soft costs) • Assessment transfers with property ownership • Technical and financial projections are confirmed by an independent 3rd party (high confidence in savings) • Annual energy cost savings often exceed the annual assessment payment (long-term financing) • Simpler repayment terms (vs ESA or EPC) 		<ul style="list-style-type: none"> • Not available in all counties • Limited financial partners in the CO program (but the program is still relatively new) • Requires sign off from mortgage holder • Industrial customers typically prefer <2 year payback periods • PACE interest rates are slightly higher than traditional debt • No performance guarantees (ESA or EPC) 	
Colorado C-PACE Program			
Accessibility:	Good fit for organizations that:	Rates and Terms:	Contact:
<ul style="list-style-type: none"> • 15 participating counties in CO • Dedicated C-PACE staff and 3rd party reviewers available 	<ul style="list-style-type: none"> • Own or occupy facilities located in participating counties • Are okay with long-term financing • Want to avoid up-front costs • Will not own or occupy facilities long-term (transfer obligations) 	<ul style="list-style-type: none"> • No out-of-pocket expense • Repayment terms up to 20 years • Competitive with commercial interest rates (slightly higher) • Payments made via separate line item on county property tax bill 	<p>(877) 325-1882 info@copace.com</p> <p>Website: copace.com/</p>

⁷ Phone interview with Jeffrey King and Paul Scharfenberger, of CEO on 1/9/17, conducted by Barretto Bay Strategies and Energetics

2.3.4. Energy Performance Contracts

An Energy Performance Contract (EPC), is a type of agreement that began as a component of commercial leasing structures for energy efficient equipment. In an EPC, an energy service company (ESCO) coordinates installation and maintenance of efficiency equipment in a customer’s facilities and is paid from the associated energy savings. The ESCO often provides energy auditing and assessment to determine which upgrades are available and cost-effective, including the identification of efficiency incentives or rebates. If the ESCO and customer enter into an EPC, the ESCO will typically manage the operations and maintenance, repair, service upgrades, and M&V of energy savings for the project. The customer may pay for the installation using internal resources, or it may seek financing from a third-party lender to cover some or all of the up-front cost using an on-balance-sheet financing mechanism such as a loan, capital lease, or bond issuance. Under these structures, the customer owns the equipment throughout the financing term. The EPC will also establish a repayment structure based on the energy cost savings. Typically, the ESCO and lender will be paid a very high percentage of the energy savings value for the term of the agreement (10-20 years), which services the underlying debt.

Although EPCs can help to increase the amount of funding attributed towards energy related initiatives and have become common in the commercial building space, industrial firms have been hesitant to enter into agreements due to the long contract terms and skepticism of the arrangements for M&V of energy savings and payment structure. A 2014 Colorado Energy Office research report on EPC’s found that some companies’ interest in these financing vehicles was driven by a reduced price for an investment quality technical energy audit from a pre-qualified ESCO. However, rather than continue with a full EPC project the firm would move forward with self-implementation of the identified improvement measures.⁸ A conversation with a representative at Citi also found that many firms will self-finance projects if deal structures cannot meet their internal requirements for a two-year payback period and that lenders are also unlikely to underwrite a project loan based on expected energy cost savings. The company must be credit worthy and pass all other underwriting hurdles.⁹ Table 2-9 compares some of the advantages, disadvantages, and attributes of EPC financing.

Table 2-9. EPC Summary Table

EPC Advantages and Disadvantages			
Advantages		Disadvantages	
<ul style="list-style-type: none"> • Energy savings guaranteed • Energy savings used to pay back financiers • Outsourced project management (ESCO handles project scoping, implementation, maintenance, and M&V of energy savings) • Standardized process for common EE equipment upgrades (e.g., lighting, HVAC, pumps, etc) 		<ul style="list-style-type: none"> • Requires internal capital or third-party financing for up-front costs • Long close times (complex agreements with extensive negotiations over the project scope and M&V process) • Building ownership constraints for firms in leased space • Size restrictions, ESCOs look for large projects only • Lower operating savings to firm vs other funding methods (a high portion of cost savings go to the ESCO and lender) 	
EPC Attributes and Providers			
Accessibility:	Good fit for organizations that:	Rates and Terms:	Providers:
<ul style="list-style-type: none"> • Large projects (\$1M or \$5M+) • Cannot exceed lease • Complex contracts with long close times • Equipment treated as asset on balance-sheet 	<ul style="list-style-type: none"> • Want a third party to take on performance risk and provide a savings guarantee • Are comfortable negotiating long-term energy savings payment terms • Have large projects (\$1M or \$5M+) • Have some available capital or are comfortable arranging financing 	<ul style="list-style-type: none"> • Internal or third-party financing to cover up-front costs • Savings pay back financier • 10-20 year agreement • Audits and savings methodology must be negotiated • Must be credit-worthy 	<ul style="list-style-type: none"> • BioStar Renewables • Citi • Bank of America • Hannon Armstrong <p>Useful Links:</p> <ul style="list-style-type: none"> • DOE Navigator • GM Case Study

⁸ Paluzzi, J. “Colorado’s Venture into the Private Sector with Energy Performance Contracting: Considerations for a State Energy Office Program Offering.” Colorado Energy Office Final Report to the U.S. Department of Energy. March 31, 2015. Available from, colorado.gov/pacific/energyoffice/private-energy-performance-contracting

⁹ Phone Interview with Bruce Schlein, Citi, conducted by Barretto Bay Strategies, Friday, January 27, 2017

2.3.5. Energy Services Agreements

An Energy Services Agreement (ESA) is a pay-for-performance, off-balance-sheet financing option with no up-front capital expenditure. In an ESA, the provider will obtain financing to acquire the equipment and pay for and manage a contractor for installation, maintenance, and M&V of actual energy savings compared to baseline energy use throughout the contract period. The ESA will establish a repayment structure per unit of energy saved for the term of the agreement (5-15 years). The customer enjoys an immediate reduction in operating expenses because the ESA provider handles all up-front costs and guarantees energy savings. Additionally, the ESA provider is responsible for identifying and leveraging utility incentives and rebates for projects wherever possible, as they are the official owner of all equipment under the ESA structure. ESA providers also actively search for unplanned savings that result from a project including reductions in labor and fuel costs. In a Managed Energy Services Agreement (MESA), an alternative ESA structure, the MESA provider assumes responsibility for all energy management of a customer’s facility, including responsibility for utility bills. The MESA provider charges the customer a fixed rate per unit of energy based on historical energy consumption, rather than collecting repayment per unit of energy saved.

According to ESA provider Metrus Energy, ESA’s can consolidate multiple energy efficiency improvements into one agreement. For example, energy efficient lighting upgrades can be paired with solar roof installations. Metrus is able to calculate a blended useful life for the project to account for the different technologies, allowing for one monthly energy savings rate and a fixed term for the entire project. Metrus has two active ESA projects in Colorado, one in Fort Collins and another in Pueblo.¹⁰ According to pos-en, another ESA provider, ESAs are emerging as a popular specialized financing structure. Pos-en has \$2.5 billion in projects financed nationally and is active in Colorado. Pos-en is working with the city of Boulder on a resiliency plan and has an agreement with an organization in Winter Park.¹¹ While the ESA providers expressed that ESA structures are currently preferred to C-PACE and other specialty financing approaches by their customers, each option has unique attributes that must be evaluated on a case-by-case basis for each project and firm. Table 2-10 compares some of the advantages, disadvantages, and attributes of ESA financing.

Table 2-10. ESA Summary Table

ESA Advantages and Disadvantages			
Advantages		Disadvantages	
<ul style="list-style-type: none"> No capital expense (off-balance-sheet accounting treatment) Service payments based on actual energy savings only Outsourced project management (ESA provider handles project scoping, implementation, and management) ESA provider responsible for incentive and rebate identification Energy savings guaranteed Project maintenance and M&V handled by ESA provider 	<ul style="list-style-type: none"> Long close times (complicated retrofits with no preliminary audits can take 9-12 months, extensive M&V negotiations) Building ownership constraints for firms in leased space Size restrictions, look for large projects only (\$1M+) Lower operating savings to firm vs other funding methods (a high portion of cost savings go to the ESA provider) End user does not own equipment 		
ESA Attributes and Providers			
Accessibility:	Good fit for organizations that:	Rates and Terms:	Providers:
<ul style="list-style-type: none"> Large projects (\$1M+) Cannot exceed lease Complex contracts with long close times Accounting treated as operating expense 	<ul style="list-style-type: none"> Do not want to spend capital Want a third party to take on performance risk and provide a savings guarantee Have large projects (\$1M) Are comfortable negotiating long-term energy savings payment terms 	<ul style="list-style-type: none"> No up-front cost Savings pay back financier 5-15 year agreement Audits and savings methodology negotiated Must be credit-worthy Contains buy-out options 	<ul style="list-style-type: none"> Metrus Energy BioStar Citi Bank of America pos-en Blue Hill Partners CPP
			<ul style="list-style-type: none"> Flywheel Hannon Armstrong NYCEEC SparkFund Abundant Power <p>Useful Link:</p> <ul style="list-style-type: none"> DOE Navigator

¹⁰ Phone Interview with Dylan Peters, Associate, Metrus Energy conducted by Barretto Bay Strategies on January 23, 2017

¹¹ Phone Interview with Daniel and Ben Gregory, pos-en, conducted by Barretto Bay Strategies, Monday, January 9, 2017

2.4. Government Loan and Grant Programs

The following subsections describe local, State, and Federal loan and grant financing opportunities to support EE and DG investments. These subsections differ from Section 3 of this report, which describes locally managed energy efficiency programs and State and Federal energy technical assistance programs. Government programs are unique compared to the private market and can offer highly competitive loan rates or simply will provide grants to fund projects of interest. However, obtaining these funding streams often requires an ability to deal with government bureaucracies and long timelines for contracts, funding, and approvals. Additionally, these programs have highly specific requirements that may only be relevant to a small portion of industrial firms in CO.

2.4.1. Colorado Hydropower Loan Programs

There are two hydropower loan programs in Colorado. The Colorado Water Conservation Board (CWCB) administers the Water Project Loan Program and the Colorado Water Resources & Power Development Authority (CWRPDA) administers the Small Hydropower Loan Program. The CWCB program is applicable to both private and public entities, whereas the CWRPDA program may only be industrially relevant for CO government owned wastewater treatment facilities.

Each program finances a broad array of water related technologies, however the most applicable technology is likely for conduit hydropower projects. Conduit hydropower fits electric generating technology in pipelines that carry water. This takes advantage of existing water flows and infrastructure and avoids the need for a large dam or reservoir.¹² The Federal Energy Regulatory Commission (FERC) provides a permitting exemption to certain qualifying facilities for conduit projects. Table 2-11 compares the two hydropower loan programs in Colorado.

Table 2-11. Colorado Hydropower Loan Program Summary Table

CWCB Water Project Loan Program	CWRPDA Small Hydropower Loan Program
<p>Accessibility:</p> <ul style="list-style-type: none"> Any private or public entity that can contract with the State and can establish and document the project need Sponsor must show project techno-economically feasibility Conduit hydropower is likely the only applicable technology option for industrial firms in Colorado to inquire about <p>Good fit for organizations that:</p> <ul style="list-style-type: none"> Own or occupy facilities with considerable water usage and disposal in their processes Can handle preparing a project feasibility study Can contract with State <p>Rate and Terms:</p> <ul style="list-style-type: none"> Minimum loan request of \$100,000 recommended 30yr loan term at 2% interest (lower rates for 10-20yr terms) 5-month processing time, subject to board approval <p>Contact: Anna Mauss (303) 866-3441 x3224 anna.mauss@state.co.us</p> <p>Website: cwcb.state.co.us/</p>	<p>Accessibility:</p> <ul style="list-style-type: none"> Relevant industrial borrowers include CO water districts, water and sanitation districts, and other public entities that may own or operate wastewater treatment facilities Projects must be 10MW or less (with FERC exemption) Conduit hydropower is likely the most applicable technology <p>Good fit for organizations that:</p> <ul style="list-style-type: none"> Are public entities that own or operate wastewater treatment facilities in CO Can handle preparing a project feasibility study Can contract with State <p>Rate and Terms:</p> <ul style="list-style-type: none"> Up to \$15,000 per project in 2017 Maximum 30yr loan term at 2% interest Upon approval, borrower has 6 months to execute the loan <p>Contact: (303) 830-1550 info@cwrpda.com</p> <p>Website: cwrpda.com/</p>

¹² "Conduit Hydropower." National Hydropower Association. Available from, hydro.org/policy/technology/conduit/

2.4.2. US DOE – Loan Guarantee Program

The US DOE has set aside \$4.5 billion in loan guarantee authority for the purpose of incentivizing energy efficient and distributed generation technologies including: geothermal electric; solar thermal electric; solar thermal process heat; solar photovoltaics; wind; biomass; fuel cells; landfill gas; and hydropower. Loans are primarily available to businesses that are willing to be early adopters of cutting edge technologies that may reduce air pollution and greenhouse gas emissions. Solicitations for the Loan Guarantee Program are offered periodically and the most recent solicitation deadline was November 30, 2016. These applications first evaluate project eligibility and then collect more specific detail. Table 2-12 summarizes the DOE Loan Guarantee Program attributes.

Table 2-12. DOE Loan Guarantee Program Summary Table

DOE Loan Guarantee Program Attributes			
Accessibility: <ul style="list-style-type: none"> Solicitations by project type Focus is on early adopters for cutting edge technology Broad technology applicability 	Good fit for organizations that: <ul style="list-style-type: none"> Have the capacity to respond to Federal solicitations Are willing to take on risk to deploy new or significantly improved technologies 	Rates and Terms: <ul style="list-style-type: none"> Full repayment required over the greater of 30yrs or 90% of the projected useful life of the physical assets Credit-based interest rate spread added to 100% guaranteed loans 	Useful Links: <ul style="list-style-type: none"> DOE Loan Programs Office DSIRE Overview

2.4.3. USDA – Biorefinery Assistance Loan Guarantee Program

The USDA offers a highly specific loan guarantee program for the development, construction and retrofitting of biorefineries. Biorefineries or industrial entities with plentiful waste biomass resources may be applicable to benefit from this program. Table 2-13 summarizes the USDA Biorefinery Assistance Loan Guarantee Program attributes.

Table 2-13. USDA Biorefinery Assistance Loan Guarantee Program Summary Table

USDA Biorefinery Assistance Program Attributes			
Accessibility: <ul style="list-style-type: none"> Highly specific for biorefineries and biomass consuming industries Focus on cellulosic and starch derived biofuels, waste biomass to energy, diesel fuels, and biogas from landfills and sewage 	Good fit for organizations that: <ul style="list-style-type: none"> Are biorefineries interested in construction or retrofitting Have sufficient equity capital to cover at least 20% of the project costs up front 	Rates and Terms: <ul style="list-style-type: none"> Max loan guarantee per project equal to the greater of 80% of the total project cost or \$250 million Loan term equal to the lesser of 20yrs or the useful project life 	Contact: Rural Business & Cooperative Service (202) 720-0410 EnergyDivision@wdc.usda.gov
			Useful Links: <ul style="list-style-type: none"> USDA Biorefinery Assistance Program DSIRE Overview

2.4.4. USDA – Repowering Assistance Cost Reimbursement Grants

The USDA also offers the Repowering Assistance Program that provides cost reimbursement grants to biorefineries in existence on or before June 18, 2008. The program provides funding for up to 50% of the total eligible project costs for biorefineries to install renewable biomass systems for heating and power at their facilities to replace fossil fuels. While, this program has limited applicability to the industrial sector it may be useful to any ethanol plants or biorefineries in CO that meet the eligible criteria.

The program is currently closed, but grants may become available again in the future. For more information visit the USDA program website and contact Fred Petok at (202) 690-0784 or frederick.petok@wdc.usda.gov.¹³

¹³ USDA Repowering Assistance Program Website. Available from, rd.usda.gov/programs-services/repowering-assistance-program

3. LOCAL, STATE, AND FEDERAL SUPPORT ORGANIZATIONS, PROGRAMS, AND INITIATIVES

There are numerous local, state, and Federal support organizations, programs, and initiatives designed to encourage EE and DG investments. These programs range from strictly information resources to those that offer funding, free audits, or connections to financing opportunities and partners. The local programs tend to have a strong focus on rebates, financing options, and local contractors. The Federal programs on the other hand position themselves more as information hubs to share best practices and help verify voluntary energy and sustainability targets.

3.1. Locally Managed Energy Efficiency Programs

3.1.1. Boulder County

Boulder County offers a variety of free, in-depth services to support businesses located in the county. In particular, the energy arm of the Partners for A Clean Environment service, EnergySmart, has expert energy advisors available to help businesses navigate incentives, and make appropriate energy efficient purchases for their firms. Additionally, the Small Business Development Center provides business consulting services to Boulder start-ups. The Center maintains direct links with program personnel at Boulder EnergySmart, ensuring members gain access to any available incentives, rebates, and financing programs for EE projects. Table 3-1 provides additional information on the two Boulder programs.

Table 3-1. Boulder EnergySmart and Small Business Development Center

Boulder EnergySmart Commercial Energy Efficiency Rebate Program			
Accessibility: <ul style="list-style-type: none"> • Businesses in Boulder County • EnergySmart is the energy arm of Boulder's, Partners for A Clean Environment service. 	Technical Support: <ul style="list-style-type: none"> • Free, in-depth support available • Answer EE questions • Help prioritize projects and schedule energy assessments • Connect with contractors and review contractor bids • Find and apply for all incentives • Support for waste, water, and transportation projects 	Rebates or Financing: <ul style="list-style-type: none"> • Advisors provide guidance to access rebates and incentives • Program has distributed \$3.2 million in rebates for more than 1,370 EE projects for businesses and commercial building owners • Custom rebates are available on a case-by-case basis • C-PACE financing available 	Contacts: Bill Hayes, Commercial Team (303) 441-1574 bhayes@bouldercounty.org Rebate Information: (303) 786-7223 info@PACEpartners.com Useful Links: <ul style="list-style-type: none"> • Partners for a Clean Environment • EnergySmart for Business • DSIRE Overview
Boulder Small Business Development Center			
Accessibility: <ul style="list-style-type: none"> • Small businesses in Boulder County • Non-energy focus, but has connections to energy support 	Technical Support: <ul style="list-style-type: none"> • Non-profit organization dedicated to economic development • Focus on business planning, market research, and other business services • Works with EnergySmart for energy related support 	Rebates or Financing: <ul style="list-style-type: none"> • Small Business Development Center Members are directed to EnergySmart and Partners for A Clean Environment for information on rebates, incentives, and financing 	Contacts: Boulder: (303) 442-1475 Request Appointment Useful Links: <ul style="list-style-type: none"> • Boulder Small Business Development Center

3.1.2. Denver

Certiably Green Denver offers free sustainability advising and certification to businesses, including industrial firms, throughout Denver County. The program helps firms identify EE opportunities and access any relevant incentives, rebates, grants, and financing options. Through Certifiably Green Denver, the City and County of Denver offers low-cost energy loans for Denver's business community managed by Elevations Credit Union. Denver businesses can also eligible for C-PACE through which they can finance up to 100% of eligible EE, DG, and water conservation improvements. Table 3-2 provides additional information on Certifiably Green Denver.

Table 3-2. Certifiably Green Denver

Certifiably Green Denver			
Accessibility: <ul style="list-style-type: none"> • Businesses in Denver • Certifications have been awarded to breweries, offices, print shops, and more • Flexible to working with all businesses 	Technical Support: <ul style="list-style-type: none"> • Free, confidential, non-regulatory environmental assistance to businesses to help them improve efficiency and profitability • Sustainability advisers begin by visiting your business to identify energy and sustainability opportunities 	Rebates or Financing: <ul style="list-style-type: none"> • Assistance accessing rebates, tax incentives, grants, and financing • Low-cost energy loans available • C-PACE financing available 	Contacts: Janet Burgesser, Program Manager (720) 865-5457 certifiablygreendenver@denvergov.org Sign up now Useful Links: <ul style="list-style-type: none"> • Certifiably Green Denver • Elevations Credit. Energy Loans

3.1.3. Garfield Clean Energy Challenge for Business

A part of Garfield Clean Energy, the Garfield Green Energy Challenge provides energy coaches to help businesses track energy use, get an onsite energy evaluation, develop an energy action plan, and access rebates and incentives. The program also provides resources to identify contractors, energy savings opportunities, and financing options. Additionally, Garfield Clean Energy actively promotes Colorado’s C-PACE program for businesses and residents looking for creative ways to finance energy efficiency projects. Table 3-3 provides additional information on Garfield Clean Energy and the Garfield Clean Energy Challenge.

Table 3-3. Garfield Clean Energy Challenge

Garfield Clean Energy Challenge			
Accessibility: <ul style="list-style-type: none"> • Garfield County Businesses • No industry restrictions 	Technical Support: <ul style="list-style-type: none"> • Free energy coaching • Help tracking energy use • Free energy assessment • Energy action planning • Identify contractors • Learn about rebates, incentives, grants, loans, and financing 	Rebates or Financing: <ul style="list-style-type: none"> • Assistance accessing rebates, tax incentives, grants, and financing • Community clean energy “Bonus” rebates • C-PACE financing available 	Contacts: Contact a Free Energy Coach (970) 704-9200 ActNow@GarfieldCleanEnergy.org Sign up now Useful Links: <ul style="list-style-type: none"> • Garfield Clean Energy Challenge • Utility and Community Rebates

3.1.4. Efficiency Works – Estes Park, Fort Collins, Longmont, and Loveland

Business customers receiving electric and/or water service from Estes Park Light and Power, Fort Collins Utilities, Longmont Power & Communications, or Loveland Water and Power are eligible to sign up for a free facility assessment, receive efficiency rebates, and access local Efficiency Works Providers to implement energy efficiency projects. Table 3-4 provides additional information on the Efficiency Works Program.

Table 3-4. Efficiency Works – Estes Park, Fort Collins, Longmont, and Loveland

Efficiency Works – Estes Park, Fort Collins, Longmont, and Loveland			
Accessibility: <ul style="list-style-type: none"> • Customers served by Estes Park Light & Power, Loveland Water and Power, Fort Collins Utilities, or Longmont Power & Communications • Recommended providers available 	Technical Support: <ul style="list-style-type: none"> • Free facility assessment via • Help tracking energy use • Free energy assessment • Energy action planning • Identify contractors • Learn about rebates, incentives, grants, loans, and financing 	Rebates or Financing: <ul style="list-style-type: none"> • Efficiency Works provides funding for lighting, cooling, building envelope, water, and other EE upgrades • Custom rebates for all other EE projects with measurable and verifiable savings 	Contacts: (877) 981-1888 info@efficiencyworks.co Useful Links: <ul style="list-style-type: none"> • Efficiency Works for Business • Efficiency Works Providers • Case Studies • Custom EE Rebate Guidelines

3.2. State Programs

3.2.1. Colorado Green Building Guild

The Colorado Green Building Guild is a statewide membership organization that promotes EE, healthy buildings, and sustainable communities. Industrial businesses can learn about commercial EE/DG project financing and identify certified contractors that carry out projects in CO. The Guild’s website also provides a detailed listing of utility and local, state, and federal government incentives and rebate opportunities. Additionally, the Guild provides information on EE rating systems that firms can use to ensure that their contractors are in compliance with local and federal standards. Table 3-5 provides additional information on the Colorado Green Building Guild.

Table 3-5. Colorado Green Building Guild

Colorado Green Building Guild			
Accessibility: <ul style="list-style-type: none"> • CO statewide • Focus on building efficiency • Some rebate and incentive information is also applicable to industrial processes 	Technical Support: <ul style="list-style-type: none"> • Limited hands-on support • Primarily information resources listed on the website about local contractors, case studies, rebates, incentives, financing, and EE rating systems 	Rebates or Financing: <ul style="list-style-type: none"> • Detailed list of utility and local, state, and federal government incentives and rebate options • Limited information on commercial project financing 	Contacts: Ann Livingston, Interim Executive Director ann@coloradogreenbuildingguild.org info@gbg.org Useful Links: <ul style="list-style-type: none"> • Colorado Green Building Guild • Incentives & Rebates

3.2.2. Colorado Industrial Energy Challenge (CIEC)

The Colorado Industrial Energy Efficiency Challenge (CIEC) is a voluntary program that challenges industrial companies in Colorado to set a five-year energy efficiency goal and to implement energy related best practices at their facilities. CIEC provides some technical expertise and has built networking opportunities, energy audits, specialized trainings, and participant recognition into the program to help participating firms achieve their goals. The Southwest Energy Efficiency Project (SWEET) leads the CIEC program, which is funded by the U.S. DOE Advanced Manufacturing Office. The Colorado Energy Office leads and facilitates CIEC’s annual recognition events.

30 industrial firms participated in the initial CIEC program that ran from 2010 to 2013. The participating firms reported an average of 9.7% reduction in energy usage (about 2 TBtu annually) from the program. 23 industrial firms are currently involved in CIEC 2.0, which began in October 2014. To join the program industrial firms must only sign a simple commitment letter and agree to: 1) Set a 5-year goal for reducing total energy use or energy intensity at their facility, measured from a recent base year; 2) Report total energy consumption or energy intensity for the base year and each subsequent year; 3) Describe and report savings from implemented energy efficiency projects. Table 3-6 provides additional information on CIEC.

Table 3-6. Colorado Industrial Energy Challenge (CIEC)

Colorado Industrial Energy Challenge (CIEC)			
Accessibility: <ul style="list-style-type: none"> • CO statewide • Industrial EE focus Useful Links: <ul style="list-style-type: none"> • CIEC - SWEET • CIEC - US DOE 	Technical Support: <ul style="list-style-type: none"> • Specialized EE trainings • Networking opportunities • Energy related best practices and technology recommendations • EE case studies available • Recognition for EE achievements 	Rebates or Financing: <ul style="list-style-type: none"> • Some support through technical support staff • Program focuses on setting and measuring progress to an EE goal, getting there is mostly left to the participating firm to figure out 	Contacts: Christian Williss, Colorado Energy Office Director of Programs & Initiatives (303) 866-2386 christian.williss@state.co.us Neil Kolwey, Southwest Energy Efficiency Project Senior Associate, Industrial Program (303) 499-0213 nkolwey@swenergy.org

3.2.3. Southwest Industrial Energy Efficiency Project (SWEEP)

SWEEP is a non-profit organization serving Colorado, Arizona, Wyoming, New Mexico and Nevada. The organization is both an advocacy organization which focuses on energy policy, as well as a service organization that works with industrial firms to help implement energy efficiency and energy cost saving measures. As mentioned in Section 3.2.2, SWEEP leads CIEC, an initiative aimed at reducing greenhouse gases by increasing energy efficient practices throughout Colorado’s industrial sector. In addition to administering CIEC, SWEEP promotes energy efficiency programs provided by utilities, works to improve building and transportation efficiency, and advocates for the adoption of CHP technologies. Table 3-7 provides additional information on SWEEP.

Table 3-7. Southwest Industrial Energy Efficiency Project (SWEEP)

Southwest Industrial Energy Efficiency Project (SWEEP)			
Accessibility: <ul style="list-style-type: none"> CO, AZ, WY, NM, and NV Advocacy and service organization that includes industrial programs 	Technical Support: <ul style="list-style-type: none"> Administers CIEC Limited other direct support to industrial firms Advocates for EE policy and program implementation 	Rebates or Financing: <ul style="list-style-type: none"> Knowledgeable of available opportunities Limited support through technical support staff 	Contacts: Neil Kolwey, Senior Associate, Industrial Program (303) 499-0213 nkolwey@swenergy.org info@swenergy.org SWEEP

3.3. Federal Programs

3.3.1. US DOE Southwest CHP Technical Assistance Partnership

The US DOE, Southwest Combined Heat and Power (CHP) Technical Assistance Partnership (CHP TAP) encourages the use of CHP technologies in the Southwestern US. CHP TAP offers project support for three on-site generation technologies that are applicable to industrial firms: 1) Co-generation: a technology that captures lost energy from power generating activities, and re-uses it for heating/cooling; 2) Waste to heat power: a technology that captures waste heat from industrial processes and converts it to electricity; and 3) District energy: a technology which centralizes energy generation so that firms in a ‘generation network’ do not have to invest in capital equipment such as boilers. CHP TAP provides direct technical assistance to industrial firms to help assess the technical feasibility and economic viability of implementing the aforementioned technologies. Table 3-8 provides additional information on CHP TAP.

Table 3-8. US DOE Southwest CHP Technical Assistance Partnership

US DOE Southwest CHP Technical Assistance Partnership			
Accessibility: <ul style="list-style-type: none"> Firms located in CO, AZ, NM, OK, TX, UT, and WY CHP only 	Technical Support: <ul style="list-style-type: none"> Free basic screening and site qualification Feasibility analysis at either 25% cost share or conducted internally using free software and checklist Investment-grade analysis by professional engineering design firm (no cost share) Other technical and regulatory assistance 	Rebates or Financing: <ul style="list-style-type: none"> Information resources available on project financing Directed to other websites and databases for incentive information 	Contacts: Gavin Dillingham, PhD SW CHP TAP Director (281) 216-7147 gdillingham@harcresearch.org Useful Links: <ul style="list-style-type: none"> CHP TAP Project Support CHP TAP in Colorado EPA CHP Incentives Database

3.3.2. US DOE Better Plants Challenge

The US DOE Better Plants Challenge, part of the Better Plants Program, is a voluntary initiative where industrial firms commit to EE best practices in the form of “showcase projects”, which are near-term demonstrations of significant energy savings at an individual facility, and “implementation models”, which document corporate-level best practices that overcome specific barriers to EE. The approximately 170 industrial companies that participate in the Better Plants program typically strive to reduce energy intensity by 25% over 10 years. All Challenge participants share data and success

stories with the US DOE to quantify impacts and help share best practices. Table 3-9 provides additional information on the US DOE Better Plants Challenge.

Table 3-9. US DOE Better Plants Challenge

US DOE Better Plants Challenge			
Accessibility: <ul style="list-style-type: none"> Open to all industrial sectors including utilities 	Technical Support: <ul style="list-style-type: none"> Offers extensive web-based informational resources and examples of “implementation models” and “showcase projects” Information on opportunities for in-plant trainings, measurement and verification, energy management tools Detailed information on participants 	Rebates or Financing: <ul style="list-style-type: none"> DOE Better Buildings Financing Navigator helps firms evaluate options and financing partners Program focuses on setting and measuring progress to an EE goal, getting there is mostly left to the participating firm to figure out 	Useful Links: <ul style="list-style-type: none"> Better Plants Program Better Plants Challenge Better Buildings 2016 Progress Report Contact US DOE Better Buildings

3.3.3. US DOE State and Local Energy Efficiency Action Network (SEE Action)

The State and Local Energy Efficiency Action Network (SEE Action) is a network of leaders and experts in the field of energy efficiency to encourage the widespread adoption of energy efficiency technologies. The Network has eight working groups, including a group dedicated to industrial energy efficiency. Through this group, the network identifies best practices and policies that encourage EE projects in the industrial sector. The network then shares its findings with local and national policy makers to encourage policies which make it easier to introduce energy efficiency measures into industrial and manufacturing firms across the US. Table 3-10 provides additional information on the SEE Action Network.

Table 3-10. US DOE State and Local Energy Efficiency Action Network (SEE Action)

US DOE State and Local Energy Efficiency Action Network (SEE Action)			
Accessibility: <ul style="list-style-type: none"> Industrial EE, EE financing, CHP, and other relevant programs 	Technical Support: <ul style="list-style-type: none"> Information resources only SEE Action does not provide technical assistance at the project level 	Rebates or Financing: <ul style="list-style-type: none"> Information resources only SEE Action does not provide financial assistance at the project level 	Contacts: Johanna Zetterberg SEE Action Network Coordinator johanna.zetterberg@ee.doe.gov Useful Links: <ul style="list-style-type: none"> SEE Action Network

3.3.4. US DOE Industrial Assessment Centers (IACS)

US DOE Industrial Assessment Centers (IACS) are located at 28 universities around the country. The IACS conduct free energy audits for manufacturers with fewer than 500 employees at the plant site, annual energy bills between \$100 thousand and \$2.5 million, and no professional in-house staff to perform the assessment. Colorado currently does not have an active IAC for the 2017 to 2021 program, however Colorado State University has participated in the past. As of May 15, 2017, the IAC database contains 17,838 assessments and 135,303 recommendations related to industrial energy and top-ten lists of assessments and recommendations are available for specific criteria. Table 3-11 provides additional information on the US DOE IACS.

Table 3-11. US DOE Industrial Assessment Centers

US DOE Industrial Assessment Centers			
Accessibility: <ul style="list-style-type: none"> SIC Codes 20-39 Not currently available in Colorado 	Technical Support: <ul style="list-style-type: none"> Free IAC energy audit if within 150 miles of participating university (currently none active in CO) Detailed database of technology recommendations and results 	Rebates or Financing: <ul style="list-style-type: none"> Recommendations only, implementation is left to the industrial firm 	Contacts: John Smegal, IAC Coordinator (202) 287-6225 john.smegal@ee.doe.gov Useful Links: <ul style="list-style-type: none"> US DOE - IACS IAC Locations IAC Project Database IAC Top Tens

3.3.5. US DOE Superior Energy Performance Program (SEP)

SEP provides guidance, tools, and protocols to drive deeper, more sustained savings from the ISO 50001 energy management standard. ISO 50001 principles help organizations integrate energy management into their overall efforts to improve quality and environmental management. It provides a framework for organizations to develop policies for efficient energy use, set targets and objectives, use data to measure results and make decisions, and continually improve energy management.

To become SEP certified, facilities must implement an energy management system that meets the ISO 50001 standard and demonstrate improved energy performance. An independent third party audits each facility to verify achievements and qualify it at the Silver, Gold, or Platinum level, based on energy performance improvement. While the requirements for certification are even more stringent than the ISO 50001, the resulting cost savings are typically worth the extra investment in terms of time and upgrades. DOE cost-benefit assessments of SEP find that becoming certified has impressive results for large energy users including: annual savings of \$36,000 to \$938,000 using no-cost or low-cost operational measures; 12% reduction in energy costs within 15 months of SEP implementation (on average); 5.6% to 30.6% improvement in energy performance over three years; and paybacks of less than 1.5 years (in facilities with energy costs > \$2 million annually). Table 3-12 provides additional information on the US DOE SEP program.

Table 3-12. US DOE Superior Energy Performance Program

US DOE Superior Energy Performance Program			
<p>Accessibility:</p> <ul style="list-style-type: none"> Industrial firms that have or are interested in implementing ISO 50001 	<p>Technical Support:</p> <ul style="list-style-type: none"> Extensive information resources and tools to help facilities with EE Typically requires the equivalent of 80% of a full-time employee’s time during the implementation period (avg 36 months) Three accredited SEP Verification Bodies to verify SEP certification SEP recognition for achievements 	<p>Rebates or Financing:</p> <ul style="list-style-type: none"> Recommendations only, implementation is left to the firm SEP verification paid for by the firm 	<p>Contacts:</p> <p>Paul Scheihing (202) 586-7234 paul.scheihing@ee.doe.gov superiorenergyperformance@ee.doe.gov</p> <p>Useful Links:</p> <ul style="list-style-type: none"> SEP Program SEP Business Case Verification Bodies 2017 Standards & Protocols ISO 50001

4. UTILITY PROGRAMS, REBATES, AND PERFORMANCE BASED INCENTIVES

Utilities present another opportunity for industry firms to access EE and DG cost savings. Most utilities in Colorado offer free or low-cost energy audits to help firms assess how much energy they are using and to identify ways in which energy usage can be reduced. Many utilities also offer rebates to encourage firms to buy energy efficient products, or to introduce energy efficient practices at their facilities.

In Colorado, utilities can be broken down into two broad categories:

- 1) Utilities that produce and supply power to customers, and
- 2) Utilities that sell wholesale power to other utilities, who then distribute this power to retail customers.

The first category includes the investor owned utilities (IOU) of Xcel Energy and Black Hills Energy, while the second includes Tri-State Generation and Transmission, the Arkansas River Power Authority, the Municipal Energy Association of Nebraska, the Platte River Power Authority and the Western Area Power Authority. Tri-State Generation and Transmission supplies power to Colorado’s 22 Rural Electric Coops, while the other power authorities supply power to 29 municipal utilities across the state of Colorado.

Colorado Electric Utilities, General Resources

Investor Owned Utilities

- [Xcel Energy](#)
- [Black Hills Energy](#)

Cooperative Utilities

- [Colorado Rural Electric Association](#)
- [Tri-State Generation and Transmission](#)

Public Power and Municipal Utilities

- [Colorado Association of Municipal Utilities](#)
- [Western Area Power Authority](#)
- [Arkansas River Power Authority](#)
- [Platte River Power Authority](#)
- [Municipal Energy Association of Nebraska](#)

Other Useful Links

- [CEO, Electric Utilities](#)
- [Colorado Utilities Report \(2010\)](#)

Figure 4-1 shows a map of Colorado’s electric utilities and their service territories. Industrial firms should become familiar with their electricity provider to understand what incentives and rebate options are available in their service territory. Additionally, the cost of electricity may vary from territory to territory, which may impact the return on investment for EE and DG projects at facilities in those areas.

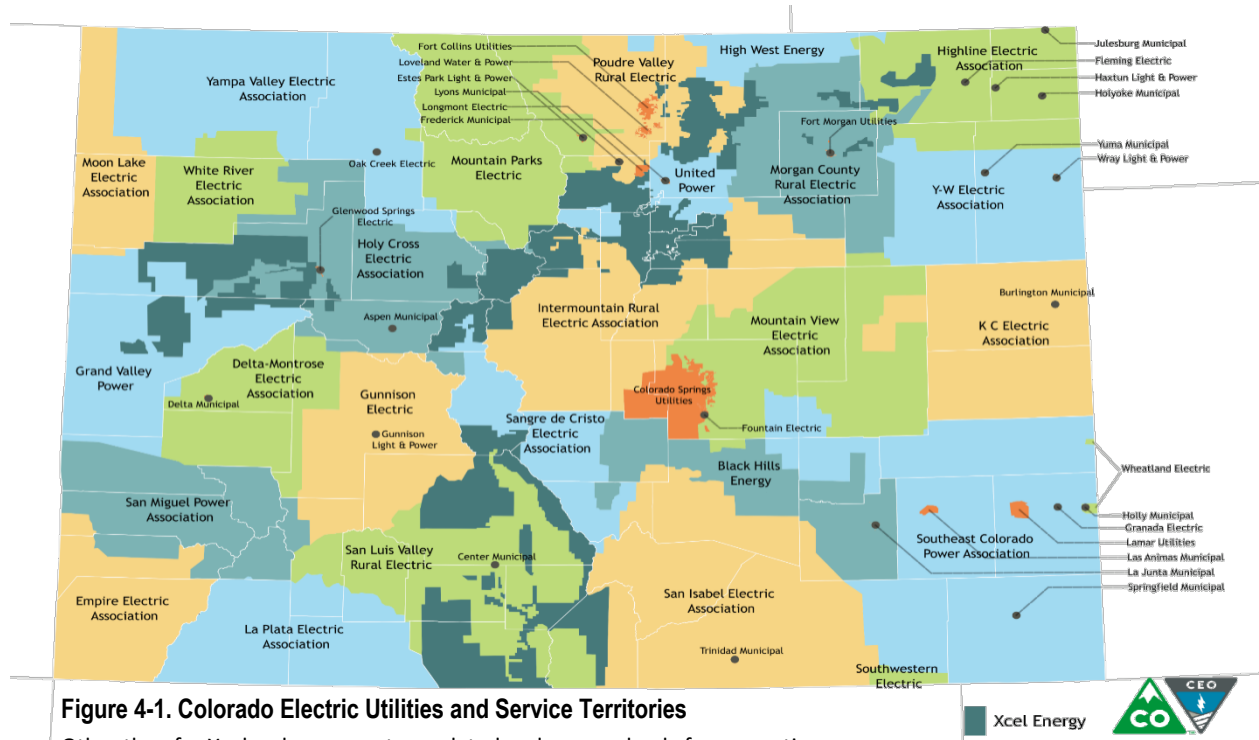


Figure 4-1. Colorado Electric Utilities and Service Territories
Other than for Xcel, colors are not correlated and are used only for separation

4.1. Xcel Energy

Xcel Energy is the largest utility provider in the state of Colorado. Xcel offers a host of rebate and energy audit programs and also help connect customers to third-party financing programs for EE and DG investments.

4.1.1. Xcel Audits and Studies

Xcel offers a variety of resources to help facility managers and industrial firms gain the advice, data, and documentation they need to make the case for sustainable, long-term energy and cost savings. The Xcel Energy Analysis program offers three audit options that provide information about EE/DD options and the associated costs and paybacks. Table 4-1 provides additional information on the three audit options.

Table 4-1. Xcel Energy Analysis Program, Audit Options

Online Energy Assessments		
<p>Overview:</p> <ul style="list-style-type: none"> Quickly uncovers potential energy savings for a facility Asks questions about equipment and operating conditions to uncover potential energy and cost savings opportunities Utilizes industry trends, regional data, and customer knowledge of the facility 	<p>Incentive Details:</p> <ul style="list-style-type: none"> Free 30-minute online assessment 	<p>Useful Links:</p> <ul style="list-style-type: none"> Online Assessment Assessment Info Sheet Assessment FAQ Xcel Energy Analysis
On-Site Energy Audits		
<p>Overview:</p> <ul style="list-style-type: none"> More detailed cost and payback information prior to starting EE upgrades Xcel sends an energy advisor out to conduct an audit of the facility and its energy use. Customer receives a detailed report including energy conservation opportunities with the associated cost, savings, payback, and available Xcel Energy rebates 	<p>Incentive Details:</p> <ul style="list-style-type: none"> Audit valued at \$2,700 (small fee per audit) Final report within 3 months of audit Preapproval required 	<p>Useful Links:</p> <ul style="list-style-type: none"> Application Form Sample Assessment Report Xcel Energy Analysis
Engineering Assistance Studies		
<p>Overview:</p> <ul style="list-style-type: none"> In-depth engineering assistance study focuses on a major energy conservation improvement and helps build the project's business case Provides guidance for major process or system replacement or upgrade Designed for customers who are focused on analyzing their refrigeration, cooling, or heating systems Customer hires a study provider of their choice to analyze the facility and develop recommendations for the most energy efficient equipment options 	<p>Incentive Details:</p> <ul style="list-style-type: none"> Xcel pays up to 75% of the study cost, up to \$25,000 depending on projected savings Studies take 3 months Preapproval required 	<p>Useful Links:</p> <ul style="list-style-type: none"> Preapproval Application Form Study Rebate Form Assessment FAQ Xcel Energy Analysis

4.1.2. Xcel Commercial Energy Efficiency Rebates

Xcel Energy offers a variety of rebates on EE technologies for commercial and industrial customers. Table 4-2 provides additional information and links to resources regarding Xcel commercial EE rebates.

Table 4-2. Xcel Commercial Energy Efficiency Rebates

Xcel Commercial Energy Efficiency Rebates		
<p>Overview:</p> <ul style="list-style-type: none"> Xcel Energy offers rebate programs for Colorado commercial and industrial customers for a wide range of EE technologies including but not limited to heating and cooling, motors, lighting, and refrigeration Xcel will cover at least part of the cost of an energy assessment in addition to the equipment and installation rebates Xcel can also connect business customers to third-party lenders if desired 	<p>Incentive Details:</p> <ul style="list-style-type: none"> Varies by technology 75% of recommissioning cost covered, up to \$25,000 Whole building/custom rebates available at \$400/kW +\$0.04/kWh 	<p>Useful Links:</p> <ul style="list-style-type: none"> Equipment Rebates DSIRE Overview <p style="text-align: right;">(800) 481-4700 Inquire@xcelenergy.com</p>

4.1.3. Xcel Commercial Energy Efficiency Loan Financing

Xcel Energy offers a lending referral program through HBC Energy Capital to support energy-efficiency upgrades. HBC Energy Capital works with Xcel approved lending partners to provide customers access to appropriate financing that best suits their needs. Table 4-3 provides additional information and resources regarding Xcel commercial EE loan financing.

Table 4-3. Xcel Commercial Energy Efficiency Loan Financing

Xcel Commercial Energy Efficiency Loan Financing		
Process:	Rates and Terms:	Useful Links:
<ul style="list-style-type: none"> Match – Fill out HBC finance request form to get matched with the right approved lender for a project Offer – HBC will craft a cash flow analysis to help the customer understand their project Support – HBC Energy Capital will offer support from start to finish of the project 	<ul style="list-style-type: none"> Rates between 4.25% to 7% Projects between \$150 thousand to \$1.5 million Contract terms, 1 to 10yrs No audit required 	<ul style="list-style-type: none"> Xcel Commercial EE Financing HBC EE Finance Request Form DSIRE Overview <p>(720) 629-2288 info@hbcenergycapital.com</p>

4.1.4. Xcel Solar Rewards Program

Through Xcel’s Solar Rewards for Businesses program industrial firms can install solar panels on-site. Any extra generated energy is added to the grid and the customer can either receive a credit on their bill or carry over the excess to the next month. Xcel provides information on solar developers and installers and offers tips to help industrial firms find a suitable partner. Xcel offers both small (less than 25 kW) and medium (25-500 kW) capacity options. Each year 24 MW of capacity is periodically added to each branch of the Solar Rewards Program. Larger systems do not qualify under the standard program, however larger renewable generators may still approach Xcel via competitive bidding process. Table 4-4 provides additional information and links to resources regarding the Xcel Solar Rewards Program.

Table 4-4. Xcel Solar Rewards Program

Xcel Solar Rewards Program			
Overview:	Small Program (<25 kW):	Medium Program (25-500 kW):	Useful Links:
<ul style="list-style-type: none"> Third party solar installer information available Xcel will purchase excess energy Capacity limited to 120% of average annual consumption on-site 	<ul style="list-style-type: none"> 2 MW capacity added monthly 25 kW or less per system Xcel excess energy purchase price, \$0.005 per kWh 	<ul style="list-style-type: none"> 6 MW capacity added quarterly 25-500 kW per system Xcel excess energy purchase price, \$0.00475 per kWh 	<ul style="list-style-type: none"> Solar Rewards for Business Solar Rewards Application Portal Solar Providers

4.1.5. Xcel Recycled Energy Incentive

Xcel has a new recycled energy incentive of \$500/kW of recycled energy system capacity installed. Recycled energy projects are most applicable to industrial operations with high temperature processes, such as glass or aluminum furnaces, steel mills, cement kilns, or refineries. The Xcel incentive will be paid monthly, over 10 years at a rate of approximately \$0.012/kWh. Projects must be preapproved and can be up to 10 MW capacity and be used on-site or sold. Table 4-5 provides additional information and links to resources regarding the Xcel Recycled Energy Incentive.

Table 4-5. Xcel Recycled Energy Incentive

Xcel Recycled Energy Incentive		
Overview:	Incentive Details:	Useful Links:
<ul style="list-style-type: none"> Program offered for industrial customers who own and operate a qualifying facility Does not include any process whose primary purpose is electricity generation Industries with a steady source of waste heat of 300 °F should consider this opportunity 	<ul style="list-style-type: none"> \$500/kW capacity 10 MW max capacity Paid monthly over 10 years at \$0.012/kWh Program capped at 20 MW/year Electricity can be used on-site or sold Internal or 3rd party financing required 	<ul style="list-style-type: none"> Xcel Recycled Energy Xcel Recycled Energy Fact Sheet CEO - Recycled Energy <p>Contact an account manager or Renewables@xcelenergy.com</p>

4.2. Black Hills Energy

Black Hills Energy is the second largest utility provider in Colorado, serving Pueblo, Fremont, Custer, Otero, and Crowley. Black Hills has several incentive and rebate programs including those for solar power, commercial energy efficiency, and natural gas technologies.

4.2.1. Black Hills Energy – Solar Power Program

Black Hills Energy offers a performance based incentive for solar PV systems up to 100 kW in capacity. Table 4-6 provides additional information regarding the Black Hills Solar Power Program.



Figure 4-2. Black Hills Energy Service Territory

Table 4-6. Black Hills Solar Power Program

Black Hills Solar Power Program		
Overview:	Incentive Details:	Useful Links:
<ul style="list-style-type: none"> Incentive payments are subject to the availability of funds and a pre-installation site inspection System must be sized to no more than 120% of the building's most recent 12 month demand PV modules must be warranted for a minimum period of 20 years 	<ul style="list-style-type: none"> 100 kW max capacity \$0.05/kWh for systems under 30 kW \$0.075/kWh for systems over 30 kW 10 yr term 	<ul style="list-style-type: none"> Black Hills - Solar DSIRE Overview

4.2.2. Black Hills Energy – Commercial Energy Efficiency Rebate Program

The commercial EE rebate program both prescribed and custom rebates to commercial customers that install or upgrade to energy efficient equipment recommended by an energy evaluation. Table 4-7 provides additional information regarding the Black Hills Commercial Energy Efficiency Rebate Program.

Table 4-7. Black Hills Commercial Energy Efficiency Rebate Program

Black Hills Commercial Energy Efficiency Rebate Program		
Overview:	Incentive Details:	Useful Links:
<ul style="list-style-type: none"> Prescriptive and custom rebate options are available Prescriptive technologies include lighting, lighting controls/sensors, chillers, heat pumps, air conditioners, programmable thermostats, energy management systems, duct/air sealing, motors, motor VFDs, comprehensive and whole building measures, and geothermal heat pumps 	<ul style="list-style-type: none"> Varies by technology Black Hills covers 50% of equipment and labor cost up to \$40,000 per facility per year Black Hills either buys down upgrades to a two-year payback or pays 50% of incremental equipment costs for custom projects 	<ul style="list-style-type: none"> Black Hills - EE Rebates DSIRE Overview

4.2.3. Excess is Out Rebate Program (now Black Hills Energy operating as Colorado Natural Gas)

The Excess is Out Program offers various natural gas related energy efficient equipment rebates for residential, commercial, and industrial customers in Colorado. The program offers prescriptive incentives for energy efficient furnaces, boilers, hot water heaters, programmable thermostats, and insulation. Table 4-8 provides additional information regarding the Black Hills Commercial Energy Efficiency Rebate Program.

Table 4-8. Excess is Out Rebate Program

Excess is Out Rebate Program		
Overview:	Incentive Details:	Useful Links:
<ul style="list-style-type: none"> Technologies include furnaces, boilers, hot water heaters, programmable thermostats, and insulation 	<ul style="list-style-type: none"> Max of \$300 each for air sealing and basement, floor, wall, and attic insulation Up to \$7,500 for custom projects Up to \$50,000 for all available technologies 	<ul style="list-style-type: none"> Excess is Out DSIRE Overview <p>(866) 971-7347 excessisout@egja.org</p>

4.3. Rural Electric Coops

There are currently 23 coops serving the state of Colorado with a combined service territory that covers over two thirds of the state’s land. Tri-State Energy Generation generates electricity for 18 of these entities while the remaining coops receive their energy from Xcel. Coops are mission driven, nonprofit organizations that are often highly committed to energy efficiency and distributed generation efforts. Many of the coops in Colorado have rebate programs, energy savings tips, and other incentives for on-site energy generation. Table 4-9 provides a very brief summarization of the offerings at each coop.

Colorado Rural Electric Coops and Wholesale Power Supplier

Association of Rural Electric Coops

[Colorado Rural Electric Association](#)

Rural Coop Wholesale Power Supplier

[Tri-State Generation and Transmission](#)

Table 4-9. Rural Electric Coops – Rebates, Programs, and Incentives Summary

Rural Electric Coop	Counties Served / Service Area	Rebates, Programs, Incentives
Delta-Montrose Electric Assn.	Montrose and Delta	Rebates for lighting, heat pumps, motors and more
Empire Electric Association, Inc.	Cortez, Dolores, Mancos, Dove Creek, Towaoc, and Monticello	Rebates and incentives for lighting, electric motors, and more
Grand Valley Rural Power Lines	Mesa, Delta and Garfield Counties	Solar farm, on-site generation options, energy help desk
Gunnison County Electric Assn.	Gunnison, Hinsdale and Saguache	Energy audits. Rebates on lighting and other technologies
Highline Electric Association	Seven counties in Northeastern Colorado	Energy audits. Rebates on lighting, heating, motors, and more
Holy Cross Energy	Eagle, Pitkin, Garfield, Mesa, and Gunnison	Rebates for lighting, refrigeration, cooling system; energy audits
Intermountain Rural Electric Association	Colorado’s Front Range: Sedalia, Conifer, Strasburg, Woodland Park	Energy audits
K.C. Electric Association	Cheyenne, Kit Carson and part of Lincoln	Rebates on electric motors, water & heat pumps, Energy STAR
La Plata Electric Association	La Plata; Archuleta	Rebates for Water Heaters, ETS Heaters, motors
Morgan County Rural Electric Association	Morgan, Logan, Weld, Adams, Arapahoe, and Washington	Free energy audits. Rebates on heat pumps.
Mountain Parks Electric Inc.	Grand, Jackson, Routt, Summit and Larimer	Rebates on lighting and net metering
Mountain View Electric Association, Inc.	Arapahoe, Crowley, Douglas, Elbert, El Paso, Lincoln, Pueblo and Washington	Rebates for geothermal heat pumps, refrigerators/freezers, LED bulbs, and more
Poudre Valley Rural Electric Association, Inc.	Poudre Valley	Rebates for lighting, motors, heat pumps
San Isabel Electric Association	Fremont, Custer, Pueblo, Las Animas, Huerfano Counties	Rebates on heat pumps and A/C
San Luis Valley Rural Electric Cooperative, Inc.	Rio Grande, Costilla, Saguache, Alamosa, Conejos, Mineral and Hinsdale	Rebates for various technologies. Energy Star air conditioners and advanced metering options.
San Miguel Power Association	Ouray, San Juan, San Miguel, Montrose, Mesa, Hinsdale and Dolores	Rebates for LED lighting and weatherization
Sangre De Cristo Electric Association	Wet Mountain Valleys in central Colorado	Business energy advisor website. Rebates on heat pumps, water heaters, and Energy STAR.
Southeast Colorado Power Association	Baca, Bent, Cheyenne, Crowley, El Paso, Kiowa, Las Animas, Lincoln, Otero, Pueblo, Prowers	Renewable Energy Credit (REC) Contract; Net Metering
United Power, Inc.	Coal Creek and Golden Gate Canyon to Brighton, Hudson and Keenesburg	Rebates for water heaters and heat pumps
White River Electric Association	Rio Blanco County	Net metering, hydro, solar
Yampa Valley Electric Association	Craig, Hayden, Steamboat Springs, and Yampa; does not include Oak Creek	Rebates on lighting and appliances; energy audits; community solar and other solar initiatives
Y-W Electric Association, Inc.	Yuma and Washington	Energy Rebates

4.4. Municipal Utilities

Colorado is home to 29 municipal utilities that serve nearly half a million people across the state. These utilities typically operate as self-supporting city divisions or authorities. Rebate and incentive opportunities differ between the utilities.

Some utilities provide informational resources on their website and/or have technical support staff available as part of EE programs as in the Efficiency Works program (see Section 3.1.4). In another example, the Colorado Springs Utilities offers free basic and advanced energy audits to customers and provides various EE rebates. Regardless of the publicized opportunities, or lack thereof, industrial firms should contact their utility to better understand the opportunities are or can be made available to them. Table 4-10 provides a very brief summarization of the offerings at each utility.

Colorado Municipal Utilities and Wholesale Power Suppliers

Association of Municipal Utilities

[Colorado Association of Municipal Utilities](#)

Wholesale Power Suppliers

[Arkansas River Power Authority](#)

[Municipal Energy Association of Nebraska](#)

[Platte River Power Authority](#)

[Western Area Power Authority](#)

Table 4-10. Municipal Utilities – Rebates, Programs, and Incentives Summary

Municipal Utilities	Municipality Served	Rebates, Programs, Incentives
Aspen Municipal Electric System	City of Aspen	Rebates on EE purchases up to 50% of project costs; Rebates issued in partnership with Energy Smart Colorado at the Community Office for Resource Efficiency (CORE)
Burlington Municipal Light & Power	City of Burlington	None identified, contact utility directly
Center Municipal Gas Light & Power	Town of Center	None identified, contact utility directly
City of Fountain Utilities	City of Fountain	None identified, contact utility directly
Colorado Springs Utilities	Colorado Springs	Free Commercial and Industrial Energy Audit; Rebates Available
Delta Municipal Light & Power	City of Delta	None identified, contact utility directly
Estes Park Light & Power	Town of Estes Park	Efficiency Works Program (see Section 3.1.4)
Fleming Electric Light Department (no website)	Town of Fleming	None identified, contact utility directly
Fort Collins Utilities	City of Ft. Collins	Efficiency Works Program (see Section 3.1.4)
Fort Morgan Electric Light	Fort Morgan	Energy Smart Lighting Program
Frederick Municipal Light System	Frederick	None identified, contact utility directly
Glenwood Springs Electric System	City of Glenwood Springs	Appliance Rebates
Granada Utilities	Town of Granada	None identified, contact utility directly
Gunnison Light & Water Department	Gunnison County	None identified, contact utility directly
Haxtun Municipal Light & Power (no website)	Town of Haxtun	None identified, contact utility directly
Holly Light & Power	Town of Holly	None identified, contact utility directly
Holyoke Municipal Light & Power (no website)	Holyoke	None identified, contact utility directly
Julesburg Municipal Light & Power	Town of Julesburg	None identified, contact utility directly
La Junta Municipal Utilities	City of La Junta	None identified, contact utility directly
Lamar Light & Power	Greater Lamar area	Business Energy Partners Program
Las Animas Municipal Light & Power	City of Las Animas	None identified, contact utility directly
Longmont Power & Communication	City of Longmont	Efficiency Works Program (see Section 3.1.4)
Loveland Water & Power	City of Loveland	Efficiency Works Program (see Section 3.1.4)
Lyons Municipal Light & Power	Lyons	None identified, contact utility directly
Oak Creek Municipal Utilities	Town of Oak Creek	None identified, contact utility directly
Springfield Municipal	Springfield	None identified, contact utility directly
Trinidad Municipal Power & Light	City of Trinidad	None identified, contact utility directly
Wray Light & Power	City of Wray	None identified, contact utility directly
Yuma Municipal Light & Power	City of Yuma	Energy calculator

5. TAX INCENTIVES

Tax incentives offer another way for industrial firms a way to offset costs related to EE and DG projects. There are several local, state, and federal tax incentive programs specifically designed for EE and DG projects that can provide substantial savings for investments. In general, tax incentive programs seek to reduce three different types of taxes: 1) corporate income tax, 2) property tax, and 3) sales tax. The incentives may be applied as credits against a firm’s tax liability, exemptions that reduce a firm’s taxable income, or as refunds. Additionally, there are incentives for how equipment listed as an asset on an industrial firm’s balance sheet is treated and depreciated. Tax codes are often fairly complex and qualified certified public accountants (CPA) with expertise in the application of energy incentives may help to maximize a client’s savings. The following sections detail the incentives available to industrial firms in Colorado.

Relevant Tax Terminology

Credits	Money that can be subtracted from owed taxes
Exemptions	Monetary exemptions that reduce taxable income
Assessments	The valuation of taxable personal property
Depreciation	Income tax deduction for the wear and tear, deterioration, or obsolescence of property

5.1. State and Federal Investment Tax Credits

Investment tax credits (ITC) can help reduce the effective up-front costs for energy efficient equipment by reducing a firm’s tax liability. The ITC is calculated as a percentage of the purchase price of energy efficient equipment. Also, it is a credit, as opposed to a deduction, so it is used directly to reduce the tax liability, and not to reduce the taxable income upon which the liability is based. Some ITCs offer carry over provisions that allow the credit to be applied in subsequent years or are refundable and pay out cash payments to firms over time.

Colorado industrial firms can access both a Federal ITC as well as a State ITC. These credits affect the Federal and State tax liabilities of a firm respectively and can be combined to obtain substantial tax-cost reductions on equipment purchases.

5.1.1. Business Energy Investment Tax Credit (BEITC) – Federal

The federally administered Business Energy Investment Tax Credit (BEITC) may be applied to various EE and DG equipment purchases including solar, geothermal, wind, waste-to-energy, CHP, fuel cells, tidal power, microturbines, and more. In general, the original use of the equipment must begin with the taxpayer, or the system must be constructed by the taxpayer. The equipment must also meet any performance and quality standards in effect at the time the equipment is acquired. The energy property must be operational in the year in which the credit is first taken.

The BEITC ranges from 10% of the equipment purchase price for geothermal, microturbine, and CHP projects to 30% for solar, wind, and fuel cell projects. The expiration date varies by technology and the BEITC gradually declines through 2022 before being eliminated or plateauing at 10%. The expiration date for solar technologies and wind is based on when construction begins. For all other technologies, the expiration date is based on when the system is placed in service (fully installed and being used for its intended purpose). Table 5-1 provides additional information on the Federal BEITC.

Table 5-1. Business Energy Investment Tax Credit (BEITC) – Federal

Business Energy Investment Tax Credit (BEITC) – Federal			
Overview:	Incentive Details:	Eligibility:	Useful Links:
<ul style="list-style-type: none"> Federal Corporate Tax Credit Broad technology applicability Incentive and restrictions vary by technology 	<ul style="list-style-type: none"> 30% credit for solar, fuel cells, and small wind turbines 10% credit for geothermal, microturbines, and CHP Fuel Cells: \$1,500 per 0.5kW max Microturbines: \$200 per kW max No limit for other technologies 	<ul style="list-style-type: none"> Small wind turbines: 100 kW or less Fuel cells: 0.5 kW or greater Microturbines: 2 MW or less CHP: 50 MW or less No other size restrictions Equipment must meet efficiency criteria 	<ul style="list-style-type: none"> Federal ITC Federal Tax Form DSIRE Overview

5.1.2. Enterprise Zone Investment Tax Credit – State

Colorado’s Enterprise Zone (EZ) Investment Tax Credit is designed to encourage businesses to locate and expand in designated economically stressed areas of the state, or EZs, shown in Figure 5-1. An EZ ITC, equal to 3% of the investment, may be applied to qualified investments located in an EZ including those for geothermal electric, solar thermal electric, solar PV, wind, biomass, hydroelectric, landfill gas, anaerobic digestion, and recycled energy. A taxpayer can claim up to \$750,000 during any tax year for eligible renewable energy. Alternatively, a taxpayer making a DG investment may elect to receive 80% of the amount of the EZ investment tax credit as a refund.

In addition to the renewable energy ITC, EZ tax credits are available to support activities such as job training, employee hiring, research and development, and other activities. Industrial firms should review all available options to maximize their benefits if operating in an EZ. Table 5-2 provides additional information on the Colorado EZ ITC.

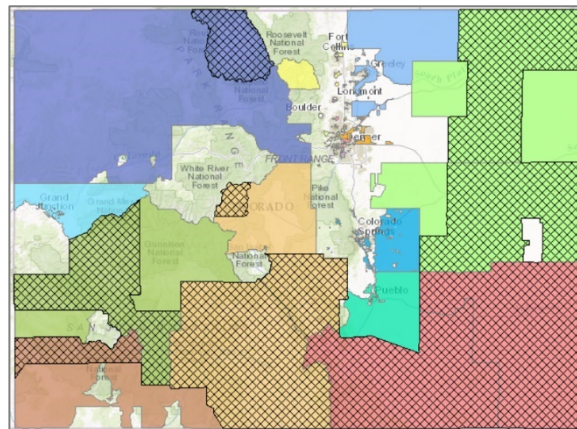


Figure 5-1. Colorado Enterprise Zone Territory

Areas in color represent EZ territory
The cross-hatch pattern designates Enhanced Rural EZ status

Full size image available from, choosecolorado.com/doing-business/incentives-financing/ez/

Table 5-2. EZ Investment Tax Credit – State

EZ Investment Tax Credit – State			
Overview:	Incentive Details:	Eligibility:	Useful Links:
<ul style="list-style-type: none"> State Corporate Tax Credit CO Office of Economic Development and International Trade (OEDIC) CO Department of Revenue 	<ul style="list-style-type: none"> 3% of qualified investments as ITC Can elect 80% of ITC as a refund \$750,000 per tax year 22-year carryover allowed 	<ul style="list-style-type: none"> Investments must be located in an EZ Recycled energy 15 MW or less New hydropower 10 MW or less No other size restrictions 	<ul style="list-style-type: none"> CO - EZ ITC CO - DOR DSIRE Overview

5.2. Modified Accelerated Cost-Recovery System (MACRS) Depreciation

Under the federal Modified Accelerated Cost-Recovery System (MACRS), businesses may recover investments in certain property through depreciation deductions. The MACRS establishes a set of class lives for various types of property, ranging from three to 50 years, over which the property may be depreciated. Many of the renewable energy technologies described in the federal Energy ITC (Section 5.1.1) are classified as five-year property and biomass and hydrokinetic technologies are classified as seven-year property. In addition to the short tax durations for qualifying EE and DG equipment, there is a 50% first-year bonus depreciation provision for equipment placed in service before January 1, 2018. MACRS depreciation encourages businesses to purchase new assets and helps to reduce a firm’s taxable income. Table 5-3 provides additional information on MACRS depreciation.

Table 5-3. Modified Accelerated Cost-Recovery System (MACRS) Depreciation

Modified Accelerated Cost-Recovery System (MACRS) Depreciation			
Overview:	Incentive Details:	Eligibility:	Useful Links:
<ul style="list-style-type: none"> Corporate depreciation incentive IRS administered 	<ul style="list-style-type: none"> 50% first year bonus depreciation if equipment in service by Jan. 1, 2018 Bonus depreciation decreases to 40% if placed in service during 2018 Bonus depreciation decreases to 30% if placed in service during 2019 	<ul style="list-style-type: none"> Federal ITC technologies eligible Solar, geothermal, and wind classified as 5-year property Biomass and hydrokinetic classified as 7-year property 	<ul style="list-style-type: none"> MACRS - IRS Bulletin DSIRE Overview

5.3. Federal Renewable Energy Production Tax Credit

The Federal Renewable Energy Production Tax Credit (PTC) is an inflation-adjusted per-kWh tax credit for electricity generated from qualified sources and sold to an unrelated person during the taxable year. Industrial firms interested in consuming the electricity they generate on-site may be more interested in the Federal energy ITC (Section 5.1.1). The PTC is available for a broad array of renewable energy technologies including geothermal, solar, wind, biomass, and hydroelectric systems. However, only wind projects are eligible for projects commencing construction after December 31, 2016. Projects using one of the other technologies are eligible for the PTC so long as construction commenced before January 1, 2017. Wind projects can receive a maximum PTC of \$0.023/kWh over ten years for facilities that commenced construction prior to 2017. This PTC is reduced by 20% for construction commencing in 2017 and is reduced further for projects starting in 2018 and 2019 before it expires. Unused credits may be carried forward for up to 20 years following the year they were generated. PTC legislation has been amended multiple times and may require specialized accounting expertise to properly access this credit. Table 5-4 provides additional information on the Federal PTC.

Table 5-4. Renewable Energy Production Tax Credit – Federal

Renewable Energy Production Tax Credit – Federal			
Overview:	Incentive Details:	Eligibility:	Useful Links:
<ul style="list-style-type: none"> • Corporate tax credit • IRS administered • Expires 12/31/19 	<ul style="list-style-type: none"> • \$0.023/kWh for wind facilities commencing construction prior to 2017 • 20% reduction if started in 2017 • 40% reduction if started in 2018 • 60% reduction if started in 2019 • PTC applies to first 10 yrs of operation 	<ul style="list-style-type: none"> • Wind facilities commencing construction by 12/31/19 • Cannot also claim the ITC • Electricity must be sold to an unrelated entity 	<ul style="list-style-type: none"> • IRS PTC Tax Form • IRS PTC Details • DSIRE Overview

5.4. State Sales Tax Exemption for Renewable Energy Equipment

Colorado exempts up to 100% of the sales tax on eligible EE and DG technologies including geothermal electric, solar (heating and electric), wind, biomass, and anaerobic digestion. While these purchases are exempted from CO States sales and use taxes, counties and cities have their own local sales and use taxes. The state has encouraged localities to issue similar exemptions for renewable energy equipment, however it is up to the locality to decide. Industrial firms should contact the city or county where they are considering an investment to see if a tax exemption has been established in their community. This exemption expires on July 1, 2017. Table 5-5 provides additional information on CO sales tax exemptions.

Table 5-5. State Sales Tax Exemption for Renewable Energy Equipment

Renewable Energy Production Tax Credit – Federal			
Overview:	Incentive Details:	Eligibility:	Useful Links:
<ul style="list-style-type: none"> • State sales tax exemption • Local governments • CO Department of Revenue 	<ul style="list-style-type: none"> • Up to 100% exemption • Incentive varies by locality • Expires 7/1/17 	<ul style="list-style-type: none"> • Geothermal electric, solar (thermal and PV), wind, biomass, and anaerobic digestion technologies 	<ul style="list-style-type: none"> • CO Sales Tax Exemptions • County Government Directory • Colorado Municipal League • DSIRE Overview

5.5. State Property Tax Exemption for Renewable Energy Systems

The state of CO has authorized counties and municipalities to offer property tax rebates or credits to property owners that install renewable energy systems on their property. These technologies are similar to those covered by the CO sales tax exemption and including geothermal electric, solar (heating and electric), wind, and biomass. In another similarity to the CO sales tax exemption rules, CO counties and cities must choose to offer any exemptions. Industrial firms should contact the city or county where they are considering an investment to see if a tax exemption has been established in their community. This exemption expires on July 1, 2017. Table 5-6 provides additional information on CO property tax exemptions.

Table 5-6. State Sales Tax Exemption for Renewable Energy Equipment

Renewable Energy Production Tax Credit – Federal			
Overview:	Incentive Details:	Eligibility:	Useful Links:
<ul style="list-style-type: none"> State property tax exemption CO Department of Local Affairs, Property Taxation 	<ul style="list-style-type: none"> Incentive varies by locality Expires 7/1/17 	<ul style="list-style-type: none"> Geothermal electric, solar (thermal and PV), wind, and biomass technologies 	<ul style="list-style-type: none"> DSIRE Overview County Government Directory Colorado Municipal League

5.6. State Renewable Energy Property Tax Assessment

Properties are either assessed locally for property taxes or by the State Assessed Properties Section of the Division of Property Taxation depending on the size and type of technology on a given property. Projects with less than 2 MW of capacity are typically assessed locally and those greater than 2 MW are assessed by the state. Assessors apply capital cost threshold rates for generation, based on the nameplate capacity of a project. DG projects that went into service on or after January 1, 2012 are subject to additional valuation component to be considered for associated transmission lines.

Relevant technologies include geothermal electric, solar (heating and electric), wind, and biomass. Investments these technologies will typically increase a property's assessed value. The Renewable Energy Property Tax Assessment methodology attempts to minimize the amount of increase that is passed on to property tax bills. Table 5-7 provides additional information on CO property tax assessments.

Table 5-7. Renewable Energy Property Tax Assessment

Renewable Energy Production Tax Credit – Federal			
Overview:	Incentive Details:	Eligibility:	Useful Links:
<ul style="list-style-type: none"> Property tax exemption CO Department of Local Affairs, Property Taxation 	Capital cost threshold rates <ul style="list-style-type: none"> 0-2 MW (\$1098/ kW) 2-5 MW (\$845/ kW) 5-10 MW (\$740/ kW) 10-50 MW (\$553/ kW) 50-100 MW (\$436/ kW) >100 MW (\$376/ kW) 	<ul style="list-style-type: none"> Geothermal electric, solar (thermal and PV), wind, and biomass technologies 	<ul style="list-style-type: none"> CO, DOLA - RE Property Assessment DSIRE Overview

6. STRATEGIES TO ENCOURAGE ENERGY EFFICIENCY AND DISTRIBUTED GENERATION INVESTMENT

A March 2017 report by the SEE Action Network discusses case studies of industrial energy efficiency programs at large U.S. industrial corporations and the role of ratepayer-funded support programs.¹⁴ The SEE Action Report identifies three key requirements for successful EE programs at industrial firms: 1) Corporate Commitment; 2) “Boots on the Ground”; and 3) Efficient Project Processing Systems. These requirements align with findings from the various tasks of the Colorado Industrial Research Report, in particular with those identified in Colorado Industrial Survey and Interviews conducted in Task 3. Our findings from Task 3 would also suggest the addition of “Access to Information Resources” as a fourth requirement that enhances the three identified in the SEE Action Report. Section 0 also discusses the nuances of choosing a financing approach (Section 6.1), considerations based on industrial firm size (Section 6.2), the importance of active engagement by technical support programs and company staff (Section 6.3), and other recommendations for industrial engagement programs (Section 6.4).

The four requirements are briefly discussed here and throughout this section. For additional analyses and explanation please refer to the SEE Action Report and to the accompanying CO Industrial Research Reports from Tasks 1, 3, and 4.^{14,15}

Requirement 1: Corporate Commitment

“Senior management needs to signal clearly to staff that improving EE is a corporate goal that both plant managers and their staff should care about. This is best achieved by establishing clear EE-improvement targets and making plant management and staff accountable for achieving them.” – SEE Action Report

This requirement is reinforced by findings from the Task 3 Industrial Surveys and Interviews. Large corporations are most likely to participate in public commitment programs such as CIEC or those run by DOE, establish corporate energy and/or sustainability goals, and hold staff accountable for energy and sustainability related initiatives. Small and mid-sized companies reported a much more passive attitude towards energy use and consumption. It is also less likely for small and mid-sized firms to have an individual or group that is expected to consider energy use as part of their normal job responsibilities, let alone the dedicated personnel or budgets found at larger firms. Without commitment and direction from senior management, energy projects are often ignored altogether or considered secondary to other priorities.

Requirement 2: “Boots on the Ground”

“Competent staff or outsourced or borrowed experts must work at the facility-level to continually identify site specific, profitable EE measures and to follow through with implementation. Although a maintenance manager may have interest in energy efficiency, it naturally ranks below other priorities of multi-tasked staff, such as keeping production lines moving. Unless someone is available who has the necessary time and competence to put EE projects together, they are not likely to be undertaken.” – SEE Action Report

Once senior management has established a strong corporate commitment to improving EE and DG there must be staff to execute on those commitments. Depending on a firm’s available resources they may or may not be able to commit a full-time employee or team of engineers to identify EE and DG improvements, even in cases where the cost-savings of the improvements more than cover those staff’s salaries. The SEE Action Report identifies several approaches industrial firms can take to ensure that have the necessary “boots on the ground” for energy initiatives including: dedicated energy

¹⁴ Glatt, S. Dutrow, E. “Saving Energy in Industrial Companies: Case Studies of Energy Efficiency Programs in Large U.S. Industrial Corporations and the Role of Ratepayer-Funded Support.” SEE Action Network: Industrial Energy Efficiency and Combined Heat and Power Working Group. Published March 2017. Available from, eere.energy.gov/seeaction/system/files/documents/saving_energy_industrials_0.pdf

¹⁵ CEO PO 12-7107: Task 1, Industrial Trends and Overview; Task 3, Industrial Surveys and Interviews; Task 4, Final Report. Energetics Incorporated. June 2, 2017.

engineers; outsourced experts from local utilities placed at key facilities; and a mix of roving EE engineering staff with part-time, on-site energy champions, interns, and experts supported by technical assistance programs. Additionally, third party auditors or technical assessment personnel may be available as part of a specialty financing process, as is the case with the PACE, EPC, and ESA mechanisms.

For any energy management professional, familiarity with the equipment/process potential, and actively measuring process performance is essential to identifying savings opportunities. While not always plausible for an organization, the SEE Action Report found that a staff member with full-time responsibility for EE work can be more productive than two engineers charged with overseeing EE work part-time. Regardless of how potential EE and DG improvements are identified, at a minimum an energy champion is needed to help push projects through the myriad stages before, during, and after implementation (discussed in Section 6.3). This champion is unlikely to emerge without the clear corporate commitment and accountability described in Requirement 1.

Requirement 3: Efficient Project Processing Systems

“Effective internal systems need to be in place and smoothly operate to allocate financing for portfolios of EE measures deemed to be most attractive to the company. Project development and implementation slows when an inordinate amount of time is needed for internal processing of good EE projects, when basic energy cost saving project rationale needs to be explained over and over, and when even the best projects have uncertain outcomes.” – SEE Action Report

Once a clear corporate commitment and personnel responsibility/accountability have been established, an organization needs efficient processes to ensure that EE and DG projects do not get entangled in internal bureaucracy or indecisiveness. The Task 3 surveys and interviews found that larger firms are able to dedicate annual budgets to EE and DG projects and have approval processes established for their energy managers to follow. Although these dedicated budgets offer greater autonomy, even energy managers with these resources cited difficulty getting some projects approved and suggested focusing on low/no cost improvement measures, such as process optimization, to avoid the need for large capital expenditure approvals when possible.

Collaboration between internal groups at larger organizations, such as between finance and engineering, may strengthen the transparency and understanding of EE/DG cost-savings benefits and increase enthusiasm for investments. At smaller organizations where fewer individuals several responsibilities, a clear set of investment criteria can help to establish guidelines for new projects. For all firms, energy criteria should be established as a factor for new construction projects and equipment purchases. Developing processes and best practices to account for energy consumption from the start of a project can lead to significant lifetime energy cost savings and fewer retroactive investments.

Requirement 4: Access to Information Resources

There is a vast array of incentives, rebates, technical support programs, financing mechanisms, and case studies available to industrial firms. The Task 3 surveys and interviews showed that firms have difficulty accessing external resources even in cases where there is strong corporate commitment, dedicated staff, and internal processes for identifying and investing in EE and DG projects. Many companies expressed great interest in CEO or another trustworthy entity to maintain an up-to-date website where one can access information on the various resources and partners that can help to finance, implement, and support EE/DG improvements. The companies expressed particular interest in clearly articulated eligibility requirements and benefit levels for tax incentives and rebate programs.

While simply publishing a list of available resources may not increase EE/DG investment on its own, committed industrial firms need up-to-date and accurate information available to support their personnel, accelerate their processing systems, and inform their decision-making. As discussed in Section 6.3, active engagement between company staff and technical support programs (including CEO) is needed to increase awareness and use of the available resources.

6.1. Choosing a Financing Option

As made clear in this report, there are numerous financing options along with incentives, rebates, and other resources that industrial firms must consider when deciding how to finance and implement a project. This is often a difficult process to navigate due to the nuances of each approach and the attributes that may make one option more favorable than another. Metrus Energy has visualized this decision process in the simplified infographic shown in Figure 6-1.

There is an important caveat to the infographic regarding self-funding that is particularly applicable to the industrial sector. It is true that self-funding a project will allow an organization to obtain the highest return on investment (ROI) for an energy project because the firm will not owe interest on any equipment or have to share savings with an ESA or EPC provider. However, industrial companies often have competing priorities for internal capital and may be able to achieve a higher ROI from another investment (e.g., expanding production capacity, developing new products, etc.). In these situations, third party financing presents a valuable opportunity to derive some cost savings and value from energy savings initiatives without limiting the ability spend internal capital on other high value initiatives. Although the energy cost savings will be less than that of a fully-funded project, they will still provide a positive return on investment that could be cash flow positive from day one. Figure 6-2 provides a simplified approach that may help industrial firms to increase funding energy initiatives when they are faced with competing investment priorities.



Figure 6-1. Road to Energy Efficiency (Metrus Energy)

Complete infographic available from, metrusenergy.com/wp-content/uploads/2013/04/metrusinfographicfinal.pdf

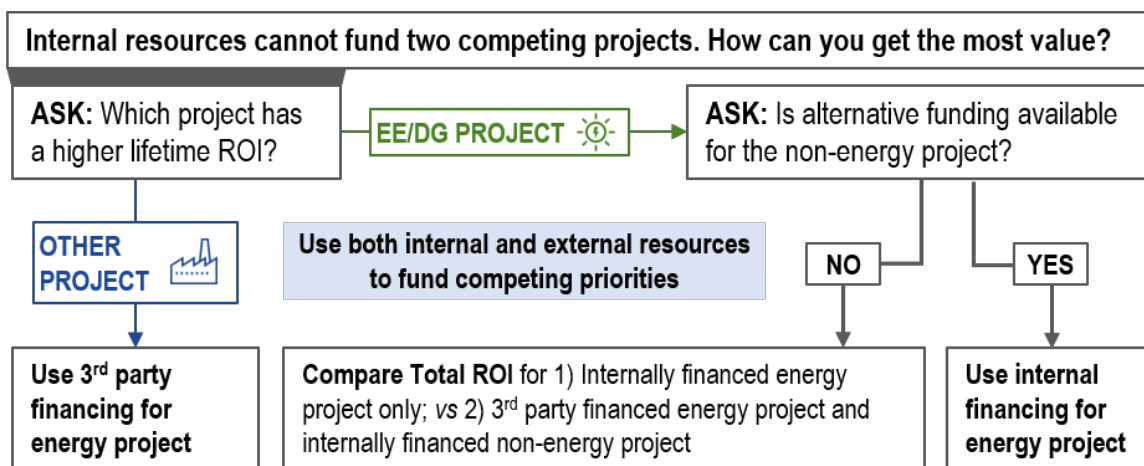


Figure 6-2. Simplified approach to use internal and external resources to fund competing priorities

Third-party financing can a very attractive, but confusing, way to pursue an energy related project if a firm does not have sufficient internal resources or there are competing investment opportunities that warrant external support. Table 6-1 provides a high-level comparison of the third-party financing mechanisms described in Section 2.

Table 6-1. Third-party financing comparison

	Leases/Loans	On-bill (OBF)	PACE	EPC	ESA
Access to Capital	● Fast, but requires down-payment	● Up to 100%	● Up to 100%	▲ Requires financing	● Up to 100%
Cash flow positive	▲ Depends on contract terms	● Day 1. Depends on contract terms	● Day 1. Savings exceed payments	▲ Depends on contract terms	● Day 1. No up-front costs
Project size limitations	● Any, depends on lender	▲ Smaller projects (\$5k - \$350k)	● No	▲ Large projects (\$1M or \$5M+)	▲ Large projects (\$1M+)
Balance-sheet treatment	● Both options available	● Paid via utility bill	● Paid via annual property tax	▲ Asset, on-balance-sheet	● Off-balance-sheet
Interest rates & repayment	▲ Market rates	● Low-to-zero	▲ Higher than commercial rates	▲ Cost savings go to EPC provider	▲ Cost savings go to ESA provider
Contract duration	● Flexible (3-5 yrs common)	● Flexible, 2-15 years	▲ Up to 20 years	▲ 10-20 years	▲ 5-15 years
Transferability	▲ No, tied to customer	● Yes, tied to utility meter	● Yes, tied to property	▲ Cannot exceed lease duration	▲ Cannot exceed lease duration
3rd party technical involvement	▲ No	▲ Utility administrated	● Initial assessment and M&V	● Audits & project management	● Audits & project management
M&V of energy savings	▲ No	▲ Not provided	● Not required, but M&V provided	▲ Required, savings shared	▲ Required, savings shared
Performance guarantees	▲ No	▲ No	▲ No, but high confidence	● Yes	● Yes
Other	● Simple/familiar contracts	▲ Utility specific Not required in CO	▲ Geographically limited	▲ Contractually complex	▲ Contractually complex
Legend: ▲ Partly or not addressed by mechanism ● Favorably addressed by mechanism					

All of the mechanisms enhance a firm’s access to capital, but with different conditions or strings-attached. A firm’s decision to use a certain financing mechanism may be influenced by factors including: reducing or eliminating up-front costs; being cash-flow positive from day one; shifting performance risk to a third party; obtaining low or no-cost 3rd party technical support via audits, recommendations, and support; contract complexity and duration; repayment terms; transferability; and potential geographic or utility specific restrictions. These attributes may greatly influence internal decision making and approvals at industrial organizations and must be considered when deciding how to approach a project.

OBF, PACE, and ESA are of particular interest because they can provide up to 100% of funding for a project and can be cash flow positive from day 1. These three mechanisms each offer different options regarding typical project size, balance-sheet treatment, contract duration, transferability, and repayment. Additionally, industrially processes can be highly complex with multiple factors that influence energy consumption that may make it very difficult to negotiate and agree upon a methodology to calculate energy savings. Although PACE and OBF do not guarantee energy savings, they also do not require the firm to share a fixed portion of those savings with the provider and may be more suitable for complex, difficult-to-measure, projects than an ESA. Alternatively, the performance guarantees and third party project management of an ESA may be preferable for common building upgrades or equipment improvements that are easily measurable and of a sufficient scale. As noted in Section 2.3.2 however, OBF is not wide-spread in Colorado and is not required by legislation. Industrial firms should talk to their utility to determine whether an OBF offering can be made available if it is a financing option of interest. Due to the nuances of each funding approach all available options should be reviewed to determine the best fit for a given project.

6.2. EE/DG Investment Considerations Based on Firm Size and Resources

The size, and more specifically the amount of resources, available to an industrial firm present yet another factor that can influence EE and DG investments. Understanding how the characteristics of different sized firms impact the ability to effectively identify savings opportunities, access support resources, and finance investments can be useful to both industrial firms and to the organizations that work with them. Industrial firms must recognize their abilities and limitations so that they can take appropriate actions to operate as efficiently as possible, while support organizations must understand the firms they are attempting to work with so that they can offer prudent and actionable advice. Table 6-2 compares large (501+ employees) and small to mid-sized firms (0-500 employees) across their available resources, interest, and activity in EE/DG investments including for the four requirements described at the start of Section 0.q

Table 6-2. Large vs small firm resource, interest, and activity comparison for EE/DG investments

	Larger firms (501+ employees)	Small to mid-sized firms (0-500 employees)
Primary Requirements for Successful EE Programs		
Corporate Commitment	High (common to have energy/sustainability goals)	Moderate-low (uncommon to have energy goals)
“Boots on the Ground”	High (dedicated energy managers and efficiency engineers)	Low (staff stretched thin with multiple responsibilities)
Efficient Project Processing Systems	Moderate-High (common to have established approval processes)	Low (no established processes)
Access to Information Resources	Moderate (scattered information, but dedicated personnel)	Low (scattered information and no responsible personnel)
Other Notable Attributes, Behaviors, and Resources		
Available resources	High (dedicated EE budgets and personnel)	Low (little to no dedicated funds or personnel)
EE/DG investment activity	High (annual budgets, but competition for capital)	Low (no budgets and competition for capital)
Typical financing approach	Internal funding (avoid long-paybacks and 3 rd party commitments)	Internal funding (as available, mostly opportunistic)
Attitude towards specialty financing products	Skeptical (particularly of M&V of savings, but would consider)	Interested (need active engagement and support to access)
Participation in technical support programs	Case by case (those that engage seek all possible opportunities)	Case by case (high interest but require active/direct engagement)
Use of rebates	Moderate (will access when readily available)	Low (will access when brought to them)
Use of tax incentives	Low (change frequently and often do not qualify)	Low (no dedicated staff to pursue)

As shown in Table 6-2, the larger firms that responded to the survey and interviews in Task 3 have more alignment with the four primary requirements for successful EE programs than do small and mid-sized firms. Having resources, both funding and personnel, makes a significant difference in this regard. Firms with more resources can pursue corporate commitments using dedicated staff and investments from dedicated budgets. The larger firms typically have energy managers who are devote their time and effort to EE improvements in their plants. Additionally, large businesses are more likely not to focus just on absolute dollars, but recognize other justifiable attributes of EE/DG investments, such as meeting energy and/or sustainability goals. Conversely, small to mid-sized firms instead rely on engineers and/or plant managers who have a host of competing duties. These firms may have informal staff structures with no clear responsibility for energy management nor encouragement to pursue EE. The small to mid-sized firms tend to focus on cash flow and meeting their day-to-day obligations and without support may only implement EE/DG projects opportunistically in efforts to cut costs, improve production, and comply with regulatory requirements.

Industrial firms have not yet seriously pursued specialty financing products because they are unfamiliar with the contracts and associated complexities have appeared to be more trouble than they are worth. As mentioned in Section 2.3.4, a 2014 Colorado Energy Office research report on EPC’s found that large industrial firms would take advantage of the EPC process to obtain a reduced-price investment quality audit from a pre-qualified ESCO and then move forward with self-implementation of the facility improvement measures. This reluctance to engage in EPC structures has a great deal to do with the fact that the process of quantifying savings results in a lot of potential pitfalls that can lead to opposing viewpoints and conflict. Manufacturing companies, understandably, do not trust an EPC or ESA provider to estimate how equipment changes will affect the energy profile of their processes. As a result, process alterations and technology upgrades may be better suited towards PACE or OBF financing to avoid complex M&V negotiations and energy cost-savings sharing agreements. Specialty financing options with performance guarantees (i.e., EPC and ESA) should be targeted towards common technologies with easily measurable energy savings and consistent energy baselines, such as building technologies. By working together on easy to measure projects industrial firms and specialty financing providers may develop a positive and trusting relationship that could be expanded to more complicated investments later on.

Another limiting factor for investments is that firms could have competing priorities for capital that may enable greater returns if spent elsewhere in the organization. Industrial firms also traditionally seek payback periods of 2-years or less and do not normally engage in long-term contracts. Specialty financing options could potentially address both of the issues. Companies can invest in competing priorities by leveraging both internal and external (specialty finance) capital to maximize their ROI (see Section 6.1), structuring contracts off the balance sheet and requiring no up-front costs.

Lastly, firms of all sizes indicated that they desire easier access to information on the various resources and partners that can help to finance, implement, and support EE/DG improvements. Even larger firms who have dedicated energy management staff underutilize rebates and tax incentives because the information is often scattered and considered not worth it to spend the time digging up to access. Industrial firms most commonly take advantage of rebate or incentive programs when approached by an organization that will help walk them through the opportunity. Table 6-3 provides high-level recommendations for EE/DG financing at industrial firms based on the discussion throughout Section 0.

Table 6-3. Summarized EE/DG Financing Recommendations for Industrial Firms

EE/DG Financing Recommendations for Industrial Firms	
Larger firms (501+ employees)	Small to mid-sized firms (0-500 employees)
<ul style="list-style-type: none"> Leverage internal and external financing to support both energy and non-energy projects Compare the total ROI of energy and non-energy projects. 3rd party financed energy projects can still provide a cash flow positive ROI and while freeing internal funds for other investments. Consider ESA for simple, large scale projects The performance guarantees and third party project management of an ESA may be preferable for common building upgrades or easily measurable equipment improvements over \$1M Consider PACE and OBF for complex projects Although PACE and OBF do not guarantee energy savings, they also do not require the firm to share a fixed portion of those savings with the provider and, if available, may be more suitable for complex, difficult-to-measure, projects than an ESA. Avoid operational interruptions Target low/no cost process optimization, plan improvements into maintenance cycles, replace equipment with high efficiency technology, plan energy into new facility constructions, and pilot efficiency strategies before expanding company-wide. 	<ul style="list-style-type: none"> Consider PACE financing if in a supported county PACE does not require the same large scale as ESAs, but offer similar 3rd party technical resources to help identify opportunities and M&V savings. The energy savings from these agreements typically pay for themselves with no cost to the customer. Access technical support programs where available If available, local programs (e.g., Denver, Boulder, Ft. Collins, etc.) as well as some utility programs (e.g., Xcel, Black Hills, etc.) will help organizations identify opportunities and access EE/DG rebates. Plan EE and DG into equipment and facility decisions Every operational advantage matters and prioritizing efficient, state-of-the-art equipment and facilities can help to optimize production, realize significant lifetime energy cost savings, and minimize the need to identify and implement retroactive investments. Establish energy use and consumption as a priority There will not be any projects to worry about financing if there is not a strong corporate commitment and staff recognition that energy is a priority. An energy champion is needed to identify, assess, manage, implement, monitor, and document EE/DG projects.

6.3. Passive vs Active Engagement by Technical Support Programs and Company Staff

Sections 6.3 and 6.1 primarily focused on EE/DG investment strategies from the perspective of the industrial firm. Sections 6.3 and 6.4 more specifically incorporate recommendations for the organizations that engage with industrial firms. The SEE Action Report found that active engagement on the part of technical support programs leads to more participation by industrial organizations.¹⁴ While having information on potential opportunities resources is necessary, the programs that simply published a list of basic incentives for EE measures, waited for companies to approach them, and then processed incentive requests slowly were assessed as the least effective. The Colorado Industrial Survey and Interviews conducted in Task 3 also found that participation in relatively passive EE programs can be expected to be poor for companies that may lack interest in EE, lack staff to find EE projects eligible for incentives, or lack a clear path to internal co-financing of projects.

Additionally, the Task 3 research aligned with the SEE Action report findings that the people and resources dedicated to managing energy at a given company play a crucial role for any successful EE initiative. There is a continuum of responsibility to identify potential projects, summarize the technical and financial feasibility of the project, present the opportunity to financial and management teams for approval, manage and implement the project, and then monitor project operations and make adjustments to maximize energy savings. While outside auditors may be valuable to identifying low-hanging fruit and simple projects that are common across industries and buildings, these outsiders are unlikely to be effective for more complicated projects. Dedicated staff and internal resources are most effective at championing projects forward through each stage of responsibility. Without personnel tasked to specifically work on energy efficiency, such tasks are often neglected as was found in the Task 3 assessment of small and medium sized companies without dedicated energy efficiency resources. Technical support programs or EE initiatives that take a more active role in partnering with their industrial customers, and require at least some form of active commitment in return, can be effective in helping obtain benefits from EE.¹⁶

Active Engagement Helps to Identify and Access All Possible Assistance

Incentives

- Utility Rebates
- Tax Incentives/ deductions
- Grants/ dedicated funding

Financing Support

- No up-front costs
- Cash flow-positive contract structure
- Reduced interest rates
- Balance-sheet flexibility

Performance/Technical Support

- Performance Guarantees
- Energy Savings Insurance
- Free Energy Assessments
- Technology Recommendations

Cooperation between technical support programs, technical professionals will relevant experience to the opportunity, and industrial company personal can help to increase access to the various forms of assistance available for energy related projects. Each of the identified opportunities takes time and resources to obtain and industrial firms are unlikely to fully access the available benefits without adequate commitment, encouragement, and support through the process. Each opportunity may also require specific knowledge or a trained professional to access, such as an experienced CPA to access tax incentives. Simply providing a list of available opportunities may help organizations with adequate resources to investigate each opportunity, but remain underutilized by firms that have fewer resources or do not recognize the value of energy-related investments. Firms will only become more familiar with the available offerings and how to access them if they build relationships with the professionals that administer the opportunities or have experience navigating the process. Ultimately, energy incentives and financing energy-related projects could become an invaluable part of operations for firms of all-sizes as organizations pursue more projects and realize actual savings to their bottom-line’s.

¹⁶ Glatt, S. Dutrow, E. “Saving Energy in Industrial Companies: Case Studies of Energy Efficiency Programs in Large U.S. Industrial Corporations and the Role of Ratepayer-Funded Support.” SEE Action Network: Industrial Energy Efficiency and Combined Heat and Power Working Group. Published March 2017. Available from, eere.energy.gov/seeaction/system/files/documents/saving_energy_industrials_0.pdf

6.4. Other Recommendations for Industrial Energy Engagement Programs

The industrial sector has significantly more variety between firms and industrial processes and therefore has different needs than other sectors. In addition to the recommendations already discussed in Section 0, there are several other factors that have been identified by case-studies and analyses of ratepayer-funded energy efficiency programs and industrial strategic energy management initiatives. These reports include:

- SEE Action Network, Case Studies of EE Programs in Large U.S. Industrial Firms and Ratepayer-Funded Support;¹⁶
- SEE Action Network, Designing Effective State Programs for the Industrial Sector;¹⁷
- SEE Action Network, Sustained Energy Savings through Industrial Customer Interaction with Ratepayer Programs;¹⁸
- Consortium for Energy Efficiency, Industrial Strategic Energy Management Initiative;¹⁹

The aforementioned reports identify four universal recommendations for industrial energy engagement programs to achieve the best partnership results with firms of all sizes. Additionally, one of the SEE Action Network report’s compiles seven recommendations for the various sources specifically targeted to larger industrial firms (although many of the recommendations are applicable to firms of all sizes).¹⁶**Error! Bookmark not defined.** The potential scale of savings from the plants and facilities of large industrial firms may be worth the additional time and effort to engage and develop relationships with them and can lead to strong multi-year portfolios of projects. Table 6-4 summarizes the recommendations from the various reports.

Table 6-4. Summarized Recommendations for Industrial Energy Engagement Programs

Recommendations for Industrial Energy Engagement Programs	
Universal Recommendations	Specific Recommendations for Engaging Larger Firms
<ul style="list-style-type: none"> • Multi-year relationships Develop relationships between program administrators and industrial company staff in a steadily evolving program of support to identify and implement multiple projects over time. • Dedicated, Competent Support Staff Assign dedicated, technically competent program staff or trusted contractors to work as account managers with key clients, maintaining medium-term staff continuity as much as possible. • Flexible Program Offerings Include both custom project incentives and prescriptive incentives, with flexibility to best accommodate the budgeting, processing, and implementation needs of industrial customers. • Active outreach and engagement Programs should make it easy to participate in the program and save energy. Work with industrial customers to tailor solutions to specific needs rather than offering a catalog of incentives. 	<ul style="list-style-type: none"> • Partner participation and recognition programs (can provide companies with reputational and service benefits) • Understand specific technical assistance needs (be flexible to support the needs of different firms) • Consider pilot and rollout programs for locating or financing support staff or EE engineers at facility sites (attempts to address requirement 2, “boots on the ground”) • Understand project development, approval, and implementation procedures within key industrial clients (cater assistance to match and support these procedures) • Strive for maximum flexibility when structuring incentives (overcome corporate hurdles, such as simple payback periods) • Consider facility SEM and/or behavioral energy savings program support where clients wish to pilot such efforts (cohort initiatives with meetings for training, peer exchange, and experience sharing can be successful for large and small firms) • Consider incremental financial incentives for new equipment purchases with above business-as-usual EE performance (must not delay project time lines or procurement activities)

¹⁷ A. Goldberg, R.P. Taylor, and B. Hedman, Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector, State and Local Energy Efficiency Actions Network, Industrial Energy Efficiency and Combined Heat and Power Working Group. 2014. Available from, energy.gov/sites/prod/files/2014/03/f13/industrial_energy_efficiency.pdf

¹⁸ Glatt, S. Dutrow, E. “Sustained Energy Savings Achieved through Successful Industrial Customer Interaction with Ratepayer Programs: Case Studies.” SEE Action Network: Industrial Energy Efficiency and Combined Heat and Power Working Group. Published October 2015. Available from, eere.energy.gov/seeaction/system/files/documents/IEE%20Case%20Studies_1002.pdf

¹⁹ Burgess, J. “CEE Industrial Strategic Energy Management Initiative.” Consortium for Energy Efficiency. Published January 17, 2014. Available from, library.cee1.org/system/files/library/11282/Industrial_SEM_Initiative.pdf