



ICF Quick Take

Unlocking Your CHP Potential

How to Find Sites that will Grow Revenue and Benefit Customers

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Gas Utilities are in a Competitive Market – CHP Can Help

Attracting new gas customers and building load with existing customers is a challenging business. Combined heat and power (CHP) presents an ideal solution, as it offers a win-win for local distribution companies (LDCs) and their customers: LDCs receive additional revenue from increased natural gas throughput, and customers benefit from lower net energy costs through on-site electricity production. In addition, there are societal benefits from reduced CO₂ and NO_x emissions from a CHP system compared to the production of central station grid electricity. The value of reduced emissions is expected to increase as new environmental regulations and policies are adopted by federal, regional, and state agencies.

Natural gas is a common fuel used for CHP. In recent years, the U.S. oil and gas industry has had exceptional success in developing new gas fields. As a result, natural gas supply conditions are robust, North American natural gas prices are relatively low, and forecasts call for stable long term prices. These dynamics are driving a surge of interest in CHP.

While the benefits of CHP are significant, finding customers that have the right characteristics to capture these benefits can be complicated. That is why Southern California Gas (SoCalGas) partnered with ICF to pinpoint the best prospects and optimize CHP targeting.

A Case Study – How ICF Helped SoCalGas Identify CHP Sites

ICF has been collaborating with SoCalGas since 2012 to identify CHP opportunities. Initially, ICF completed a market study that examined CHP technical potential at over 10,000 sites within the SoCalGas service territory.

The scale of the potential identified in the 2012 market study was robust, and SoCalGas therefore subsequently developed an innovative business strategy to be more closely engaged with customers interested in CHP. As part of this strategy, SoCalGas intends to offer enhanced CHP services to customers, including the option of having SoCalGas build, own, and operate CHP equipment on a customer's site (i.e., "behind the meter"). To support this business approach, SoCalGas received a proposed decision from the California Public Utility Commission approving a new gas tariff – the Distributed Energy Resources Services Tariff (GO-DERS).¹ SoCalGas expects to begin offering the GO-DERS tariff in 2016.

In 2015, SoCalGas asked ICF to build on the earlier study by conducting a site level assessment to identify specific

ICF's CHPower Model

The CHPower model identifies the most viable candidates for CHP projects. The model is supported by the DOE/ICF CHP Installation Database, which contains information on more than 4,300 CHP installations in the United States with a collective capacity exceeding 82,000 MW. * The model is also supported by ICF's CHP Technical Potential Database – the only comprehensive data source for CHP technical potential available in the US – which includes information on specific sites throughout the country that have concurrent electric and thermal loads conducive to CHP.

* [DOE/ICF CHP Installation Database](#).
Maintained by ICF International for Oak

¹ Information on the GO-DERS tariff can be viewed on the SoCalGas [web site](#).

commercial and industrial (C&I) customers that might be most interested in taking advantage of a CHP system. In this site level evaluation, ICF used the CHPower model to update and expand the 2012 study, generating detailed results on the economic viability of over 1,000 C&I sites with an expected minimum electric load of 500 kW. SoCalGas is using the results of the ICF site level assessment to prioritize customers that may be the best candidates for CHP adoption, and to focus marketing resources and messages to these top-tier locations.

Benefits

To illustrate how SoCalGas is using the study results to target their resources, consider a natural gas-fired CHP system sized at 1,100 kW, which would be appropriate for a commercial building such as a hospital or small to medium sized industrial plant. The accompanying table shows the expected benefits of this CHP system compared to grid electricity and an on-site boiler. Based on national average energy and emission rates, the CHP system in this example

Description	Value
CHP System Size (kW)	1,100
Capacity Factor (%)	85%
Electricity Production (MWh / yr)	8,191
Useful Thermal Energy (MWh / yr)	9,076
Capital Cost (\$ / kW)	\$2,400
Capital Cost (\$)	\$2,640,000
Energy Cost Savings (\$/yr and %)	\$403,419 (33%)
Payback (yrs)	6.5
Energy Savings (MMBtu/yr and %)	46,796 (38%)
CO2 Savings (short tons and %)	5,451 (55%)

reduces site energy costs by 33%, reduces overall energy consumption by 38%, and reduces CO₂ emissions by 55%. The payback for the CHP system is 6.5 years without including tax credits or incentives. A 10% federal investment tax credit – which CHP systems are eligible to receive – and any applicable state or regional incentives would reduce the length of time to payback. While actual results are dependent on site-specific conditions and prevailing energy rates, this example illustrates the benefits that can be achieved from CHP. SoCalGas now has the type of site level economic information illustrated in this example for over 1,000 C&I sites.

Studies like this show how utilities can — and should — develop actionable information on specific sites that have the most to gain from CHP, and therefore the highest likelihood of installing a CHP system. As SoCalGas is now doing, utilities can use these insights to make strategic decisions on how to most effectively stimulate CHP adoption, which can help them expand their customer base and offer new services. Gas utilities can ultimately benefit from increased natural gas throughput, or with the proper regulatory engagement, from the added potential to participate in CHP ownership. In the case of gas utility ownership, customers receive the added assurance that a reputable LDC is standing behind the CHP installation, and will ensure that the CHP system delivers the expected reliability, efficiency, and financial benefits. These kinds of financial win-wins are uncommon in energy — indeed, in most sectors — and present a source of real opportunity.



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