

Is My Facility a Good Candidate for CHP?



Why CHP?

CHP is a proven way to reduce energy costs, but often this beneficial project is internally terminated when upper management deems CHP to be outside the organizations “core competencies” or “business.” For example, a college is in the business of education, not generating power.

Recent events in the energy sector are causing this notion to be re-evaluated. Over the last seven years, energy prices have fluctuated widely, causing energy budgeting to be hit or miss. Storms have left facilities without power for days, or even weeks, causing many to be highly concerned about the long-term reliability of grid provided services. Historical policy changes (including deregulation & environmental mandates) have had the unforeseen backlash of decades of dramatically reduced re-investment, by the utilities, into the generation and transmission infrastructure (power plants, gas lines, electrical transmission lines). This means the long-term outlook for power pricing and reliability may only intensify.

As your organization is determining whether on-site power is an important part of your business strategy, you may ask yourself the following questions:

What is CHP?

CHP stands for combined heat and power. Through the process of generating electricity through an engine, and then efficiently re-using that engine’s waste heat, CHP can become a great method for providing both electrical and thermal energy for any facility.

What are the benefits of CHP?

- Lower energy costs
- Redundancy & Reliability
- Reduced carbon footprint
- Support sustainability initiatives

- What would happen if my energy prices fluctuated 30% or more annually?
- What is the impact to my business if there was no grid provided electricity for seven days or more?

Many facilities are answering the above questions and coming to the conclusion that CHP and on-site power are important to their overall business strategy. Even if on-site power is not core business, the minimization of risk, cost control and need for reliable power are certainly core requirements. If your organization fits this example, then the next step would be exploring the technical and financial side of CHP.

Is CHP a Good Fit For My Facility?

The process of evaluating the “fit” for CHP often starts with a feasibility study. This study will look at all your energy usage (electrical, thermal) and compare to your 24/7/365 usage. For example, an office building has high usage Monday through Friday during working hours, whereas a manufacturing facility may have 24/7 usage. This cost and usage evaluation will be used to determine the type of engine (prime mover) as well as the size of the engine. In general, if your facility has high thermal requirements (steam, hot water, chilled water) you may be a good fit for a gas turbine. If your thermal energy usage is lower, you may be a better candidate for a reciprocating engine.

The study will then weigh the cost of the project versus the payback. Each facility has different ways of determining the cost of capital (ROI, IRR, NPV) this will need to be influenced by your finance department. This study is your first internal hurdle to determine fitness for use. The cost benefit will be heavily influenced by other factors including your location, state incentives, tax status, daily operational schedule, real estate availability, and more.

If the feasibility study proves the value of the project, next would be design and procurement process. This phase often includes capital approvals and financing, environmental and permitting, grant applications, equipment selection and pre-design. Lead times for major components (prime mover, HRSG, chillers) can be anywhere from 3-12 months depending on size of system.

There are numerous options on how to finance and construct the project. The span runs from an internal project with your own staff, financing, engineering to full “turn key” options. These turn key options include ESCO’s, Power Purchase Agreements via 3rd party developers, and all flavors in between. Ultimately your development and installation process will be selected to align with your organizations staffing, financial structure, and experience with similar projects.

NOTE: Often the CHP process is started by the Facilities or Engineering Department. Please bear in mind that a CHP project will eventually involve all departments as well as senior management. It is recommended to engage them in the process early and often.

Factors Favoring CHP

The short and mid-term outlook for small scale CHP is favorable. A combination of several factors has revitalized the development of CHP in the United States. The improving economy, cheap natural gas, Federal/State incentives and client site’s desire for resilient on-site power have all been influential in the uptick of CHP development.

The most active markets are in the Northeast, California, Texas and Mid-West. There are many factors influencing this uptick in CHP development. Geographies of highest interest are those with both high electrical costs and state level incentive programs promoting CHP. Verticals of highest interest typically have high thermal requirements combined with high electrical consumption. Some common examples include hospitals, universities and manufacturing. Opportunities for CHP are strongly influenced by several factors. Some of the top influencers include:

Spark Spread Specific parts of the US currently have favorable “spark spreads” that support CHP and on-site generation. Spark spread is the difference in price between the costs of retail electricity (buying from the grid) versus cost of self-generation.

Fracking The advent of fracking technology has been a game changer. There are a myriad of shale gas reserves already identified. Natural gas is now abundant, inexpensive and the long-term outlook for natural gas reserves is estimated anywhere between 50 to 150+ years.

Cheap Gas

Natural gas pricing in the five years prior to the recession averaged approximately \$7.50/MMBtu. Since 2008, gas prices have averaged approximately \$4/MMBtu. Henry Hub gas price projections remain in the \$4 to \$7 range through 2030 (based on wide consensus of outward projections).

Aging Infrastructure

The installed base of utility-scale generation is aging. This will continue to place upward pricing pressure on retail electric pricing. There have been very few new utility-scale generation plants built within the last decade. The historical utility approach is being challenged by environmental and safety concerns. MACT laws are causing several coal plants to be de-commissioned ahead of schedule. An overall more restrictive environmental and permitting view by many states has hindered investment/construction by traditional utility companies into new generation facilities. De-regulation of electrical power initially promoted new generation, but subsequently has severely limited new construction of utility scale fossil-fueled and nuclear generation.

Federal Programs

President Obama signed an Executive Order in August 2012 (non-binding) to promote CHP and increase the installed base of CHP by 50% over the next several years. There are also ITC's (investment tax credits) that run thru 2016 to support infrastructure investment in CHP and on-site generation. General consensus is the ITC's will be extended for the foreseeable future to promote renewable and CHP power.

State Programs

States have a couple ways to promote CHP and on-site generation. One is via inclusion of CHP as part of their RPS (Renewable Portfolio Standard). This creates a financial mechanism to support these types of energy producing projects. Also several states have direct incentive programs to provide direct financing assistance (i.e. - MA, CT, NY, MD & NJ).

Conclusion

There is a growing trend of facilities that feel CHP and on-site power is a necessary step for their long-term viability. Grid outage and pricing swings over the last few years, coupled with the mid and long-term outlook for the overall utility infrastructure cause many to see CHP as hedging their risk and taking control of their energy future. The lower cost and increased variety of CHP engines (variety of technologies and sizes of units) means most facilities are now viable candidates for on-site power. The CHP process is well vetted, the ROI is often very attractive, and there are several options in project implementation to fit your specific facility profile.



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The Kinsley Group was founded in 1964 by Kenneth N. Kinsley in Springfield, Massachusetts. Over the years, the company has grown into an energy solutions provider for customers throughout the northeast, and has developed a reputation for integrity and professionalism. Our mission is to set the standard for energy systems performance and service.

Central to that mission is providing quality products and employing the best people in the business. Kinsley has been a distributor of KOHLER® Power Systems - one of the most respected names in power generation - for over 45 years. We also can furnish prime movers for co-generation, biomass and landfill applications. More than anything, Kinsley is proud of the expert team of energy professionals we employ. Our people exceed customer expectations, exemplify pride and ownership, and display uncompromising excellence.