

Combined Heat and Power

Utah Governor's Office of Energy Development (OED) Fact Sheet

Definition

Cogeneration or combined heat and power (CHP) involves the use of a heat engine or power station to generate electricity and useful heat at the same time. Trigeneration or combined cooling, heat and power (CCHP) refers to the simultaneous generation of electricity and useful heating and cooling from the combustion of a fuel or a solar heat collector.

Cogeneration is generally a more thermally-efficient use of fuel than electricity generation alone. In separate production of electricity some energy is rejected as waste heat, but in cogeneration the goal is to put this thermal energy to good use. Conventional methods of producing usable heat and power separately have a typical combined efficiency of 45 percent. CHP systems can operate at levels as high as 80 percent.

OED's CHP Development Support

- Formed a Combined Heat and Power Working Group
- Commented on CHP in the State's response to the Clean Power Plan
- Helped organize a CHP technical training workshop
- Involved in Federal level programs such as the US DOE CHP for Resiliency Accelerator.

CHP Energy Resource Development Issues

Incentives

Federal: A 10% investment tax credit for CHP property, applicable to the first 15MW of CHP property. Eligible for 5 year depreciation. Not eligible for production tax credits. This makes it less attractive for developers.

State of Utah: The Alternative Energy Development Incentive calls out Waste Heat Recovery but not CHP specifically. It also is directed at larger systems – 2MW or larger.

Is it Distributed Generation (DG) or Energy Efficiency (EE)?

The answer is BOTH, but this has tended to create confusion and, as a result, CHP is often overlooked in programs that support either DG or EE.

Additional Barriers

- The business and regulatory structures of most electric utilities tend to discourage them from pursuing CHP.
- Perceived project complexity when compared to other distributed generation options.

Advantages

- Over the past few years an increased focus on sustainability has made industrial CHP more attractive within the industrial space as the technology can be used to reduce carbon footprint compared to generating steam or burning fuel on-site and importing power from the grid.
- For structures, cogeneration has its greatest benefits when scaled to fit buildings or complexes of buildings where electricity, heating and cooling are perpetually needed. Such installations include but are not limited to: data centers, manufacturing facilities, universities, hospitals, military complexes, and schools.
- Localized trigeneration has additional benefits because of its ability to meet heating and cooling needs.
- Air quality emissions improvement potential.

CHP and Utah State Policy

- **54-12-1. Legislative policy.**

- (1) The Legislature declares that in order to promote the more rapid development of new sources of electrical energy, to maintain the economic vitality of the state through the continuing production of goods and the employment of its people, and to promote the efficient utilization and distribution of energy, it is desirable and necessary to encourage independent energy producers to competitively develop sources of electric energy not otherwise available to Utah businesses, residences, and industries served by electrical corporations, and to remove unnecessary barriers to energy transactions involving independent energy producers and electrical corporations.
- (2) It is the policy of this state to encourage the development of independent and qualifying power production and cogeneration facilities, to promote a diverse array of economical and permanently sustainable energy resources in an environmentally acceptable manner, and to conserve our finite and expensive energy resources and provide for their most efficient and economic utilization.

Amended by Chapter 374, 2008 General Session

54-12-2. Purchase of power from qualifying power producers.

- (1) Purchasing utilities shall offer to purchase power from qualifying power producers.
- (2) The commission shall establish reasonable rates, terms, and conditions for the purchase or sale of electricity or electrical generating capacity, or both, between a purchasing utility and a qualifying power producer. In establishing these rates, terms, and conditions, the commission shall either establish a procedure under which qualifying power producers offer competitive bids for the sale of power to purchasing utilities or devise an alternative method which considers the purchasing utility's avoided costs. The capacity component of avoided costs

shall reflect the purchasing utility's long-term deferral or cancellation of generating units which may result from the purchase of power from qualifying power producers.

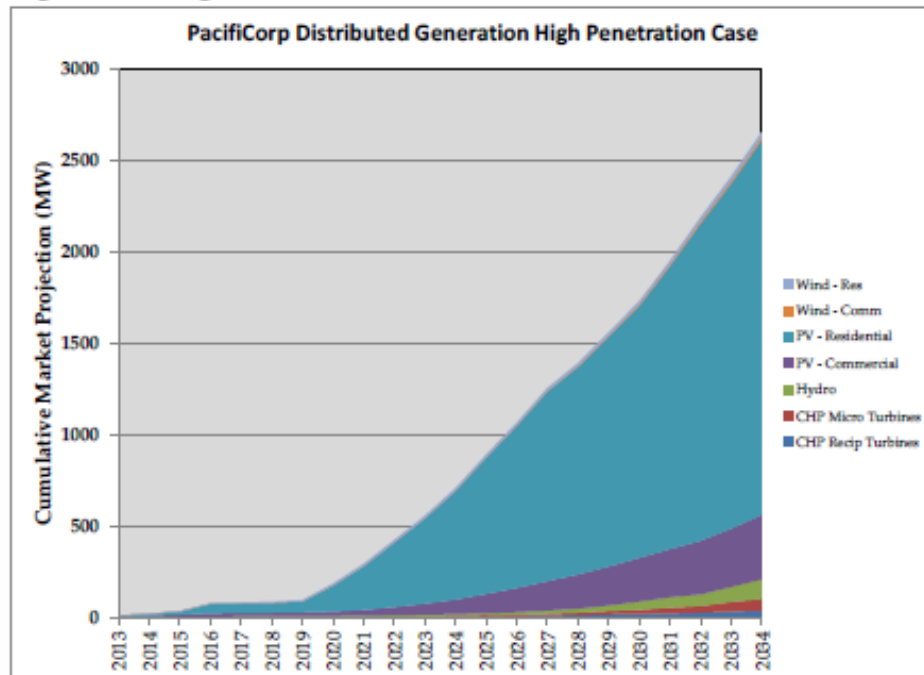
- (3) Purchasing utilities and qualifying power producers may agree to rates, terms, or conditions for the sale of electricity or electrical capacity which differ from the rates, terms, and conditions adopted by the commission under Subsection (2).
- (4) The commission may adopt further rules which encourage the development of small power production and cogeneration facilities.

Rocky Mountain Power /PacifiCorp and CHP

PacifiCorp’s 2017 IRP states that its purpose is to identify the best mix of resources to serve customers in the future. The best mix of resources is identified through analysis that measures cost and risk. The least-cost, least-risk resource portfolio—defined as the “preferred portfolio”—is the portfolio that can be delivered through specific action items at a reasonable cost and with manageable risks, while considering customer demand for clean energy and ensuring compliance with state and federal regulatory obligations.

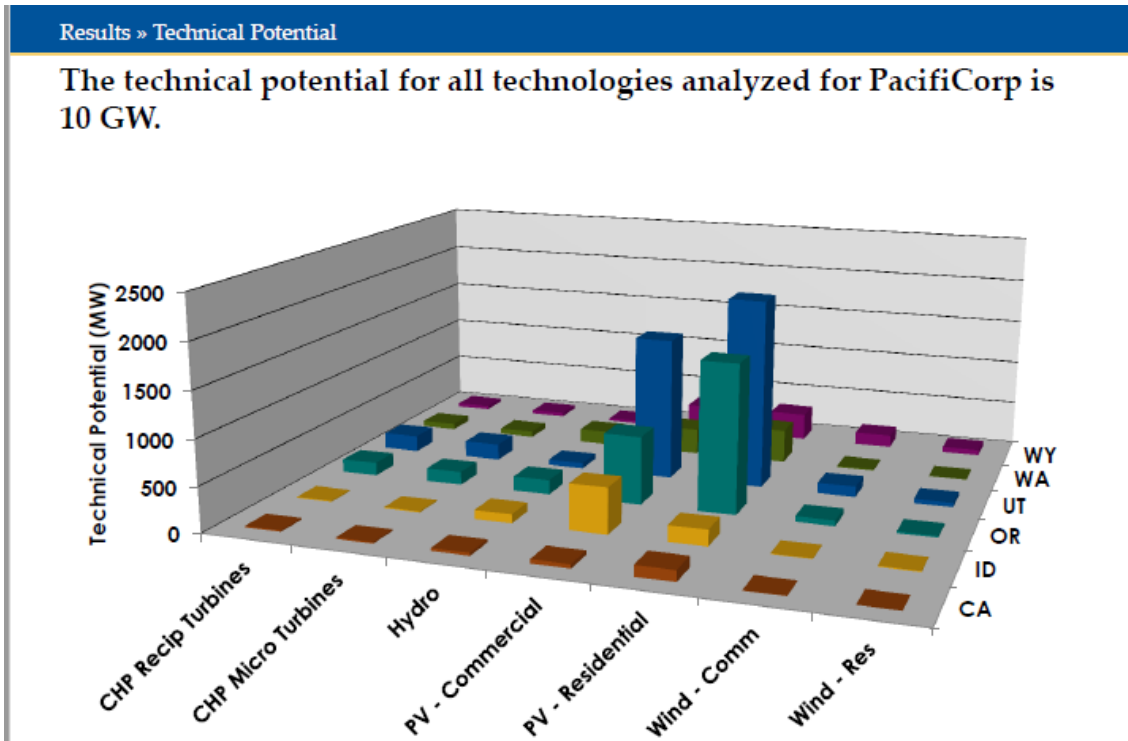
In the 2015 IRP, as shown in Figure 5.3 from that report, CHP is shown as having potential growth under the high case for distributed generation within the PacifiCorp region of operation.

Figure 5.3 – High Case Distributed Generation



A 2015 IRP Supply Curve Study conducted by Navigant for PacifiCorp presented that the potential for all distributed generation (which is how CHP is classified by the utility) is 10 GW.

As seen in the figure below, this analysis indicates that CHP potential within the State of Utah should exceed that of new hydro or additional wind generation.



The 2017 IRP preferred portfolio states that it reflects a cost-conscious transition to a cleaner energy future and shows how PacifiCorp’s resource needs will be met with new renewable resources, demand side management resources, and short-term firm market purchases through 2028. Over the 20-year planning horizon, the preferred portfolio includes 1,959 MW of new wind resources, 905 MW of upgraded (“repowered”) wind resources, 1,040 MW of new solar resources, 2,077 MW of incremental energy efficiency resources, and 365 MW of new direct load control capacity. However, the Utah plan does not appear to include CHP in any significant measure.