

Turning Waste to Cash in Wisconsin Combined Heat and Power (CHP) Summary White Paper

Overview

The Wisconsin State Energy Office (SEO) received funding from the U.S. Department of Energy (U.S DOE) to conduct the “Turning Waste to Cash in Wisconsin” project. A primary goal of this project was to identify, and reduce or remove regulatory, market and utility barriers to Combined Heat and Power (CHP) project development. The project also sought to build on the past successes that led to Wisconsin’s leadership in development of anaerobic digestion systems. This paper summarizes the project activities and insights and sets the stage for a Wisconsin Action Plan (WAP) to promote use of CHP in the state.

Project Objectives

The first objective of this project was to **increase awareness** of cost-effective CHP opportunities in the state. To this end, the SEO convened four stakeholder group meetings to look at issues with development of projects using CHP systems. The stakeholder meetings occurred between July 1, 2014 and December 8, 2015, and involved representatives from manufacturing, health care, state government, universities, non-governmental organizations, technology providers, law firms, research institutes, city government, public benefit programs, trade organizations and electric cooperatives.

In addition, the SEO conducted two seminars dedicated to CHP using biogas from anaerobic digesters at agricultural and industrial facilities. These included an industry stakeholder seminar and a publicly attended seminar. Finally, the SEO conducted outreach that included press releases, the seminars themselves, and posting of resources on the SEO website to make useful information from this process available to the public.

The second objective was to **assist in implementation** of sustainable CHP projects in Wisconsin. The information produced from stakeholder group meetings provided direction for addressing barriers to CHP project development. The project convened a meeting of utility representatives through the Wisconsin Public Utility Institute to discuss options to diminish utility barriers.

The project period included the uncertainty of a pending unprecedented federal regulation of carbon emissions which promised to influence how CHP projects were viewed. It was also a period in Wisconsin in which the combination of utility rates and public policies amounted to an unfavorable environment for development of CHP systems. Therefore, this project was unable to directly contribute to specific CHP projects over the project period.

The most prominent barriers to CHP development and options for minimizing them that were brought up in the course of this project are discussed in the following section.

Barriers and Options

The stakeholder group agreed that the largest and most addressable barriers to expanded use of CHP systems in Wisconsin were utility related. These were identified as:

1. Standby rates including demand charges, and
2. Interconnection costs.

Standby Rates

Standby rates are charges utilities require of customers who own generation systems. These charges are meant to cover the utility costs of supplying power when the customer's system goes down. They typically include a volumetric rate, based on the amount of electricity the customer uses, and a demand charge that is set by the highest-demand period the customer has in a given billing period. CHP system downtimes can cause an unusual spike in customer demand for power from the grid, and cause this charge to kick in, dramatically increasing the customer bill for that month or longer.¹ Demand charges typically worsen the economics of owning CHP systems.

The stakeholder groups suggested it might be appropriate to divide CHP owners into different categories for use of standby rates.

Large Industrial Customers. One category would be large industrial customers with generation capacity between one and five megawatts. Because of the size of the generation, demand charges make sense in that failure of that generation is more likely to affect local reliability as the customer suddenly needs to draw large amounts of power from the grid. One option to reduce the effect of demand charges on this group is the rate applied could take into account the pooling effect of multiple generators with the knowledge that they will not all fail at the same time.

Small Sustainable Generators. A second group would be smaller generators who have sustainable, renewable systems such as waste-to-energy systems, wastewater treatment plants, distributed solar and wind systems, efficient CHP systems, and farm and food waste anaerobic digester systems. The stakeholders believed that, for these types of generators, standby rates should be zero because their failure is unlikely to cause reliability issues, and they are of societal value.

Special Economic Development. A third group of customers could be those to whom special concessions or incentives are offered because of other benefits their residence provides. For example, a community may want reduced or eliminated standby rates for CHP systems owned by occupants of industrial parks to improve the profitability and efficiency of companies located in the park and attract additional tenants. Generation located close to industrial end users brings more options for CHP in local use of steam or heat. Local economic benefits from such offerings might well exceed the costs. In addition, this may open the door for use of additional technologies or arrangements that could help with reliability such as energy storage and demand response agreements.

¹ For more information on standby rates see ACEEE, <http://aceee.org/topics/standby-rates>.

Value to Distribution System. A final strategy identified by the stakeholders is to offer standby rate agreements to CHP systems based on their value to the distribution system due to their location. This would require sharing of information by utilities on where generation would benefit their distribution system and where it would cause problems. The designations could be as described below.

High value – The local distribution system is in need of upgrade in the next five to ten years and would benefit substantially from adding generation in that the upgrade could be postponed or avoided. Incentives such as a more favorable standby rate or even socializing of interconnection costs would be offered.

Medium value – The local distribution system does not need an upgrade in the next five to ten years, but incentives for development of CHP systems in the form of standby rate reductions and socialized interconnection costs could be offered, but at a lower rate than the high value locations.

Low Value – The local distribution system has been upgraded in the past five to ten years. Incentives for siting distributed generation systems would not be provided.

Interconnection Costs

Like standby rates, the costs of interconnecting a CHP project to the grid can be high enough that they discourage development, especially with smaller systems where these costs can be a large part of the overall project cost. Alternative treatment of interconnection costs can be similar to those for standby rates discussed in the previous section, including similar criteria as to when some or all costs should be socialized.

Utility Perspective

Utility representatives found common ground in wanting to be involved in development of interconnection standards. They see importance in having a transparent interconnection process, developing best practices, reducing conflicts through better understanding of contributing factors, and reviewing how engineering studies are done. Primary issues stated by utilities are avoiding negative effects on customer rates, safety of systems, and their legal obligation to choose the most cost-effective solutions for ratepayers.

Utilities generally viewed changes to standby rates unfavorably. However, specific options for changes were not discussed at the utility meeting.

Environmental Protection Agency Clean Power Plan 111(d)

The participating utilities and stakeholders alike recognized that once the Environmental Protection Agency Clean Power Plan 111(d) (CPP) rule came into effect, it would change the economics of many of these issues. Late in this project, the final rule was published² and therefore positions are likely to change. At the time of publication, the SEO is not at liberty to discuss this issue any further.

² US Federal Register, October 23, 2015, <https://www.gpo.gov/fdsys/pkg/FR-2015-10-23/pdf/2015-22842.pdf>.