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Food Waste Co-Digestion at City of Stevens Point Public Utilities Department (WI)

Business Case Analysis Case Study

Glossary

AD	Anaerobic digestion
BOD, COD	Biological oxygen demand, chemical oxygen demand
CHP	Combined heat and power
Cogen	Cogeneration
Cu ft	Cubic feet
FOG	Fats, oils, and grease
FPR	Food processing residuals
HSOW	High strength organic waste
kW, kWh	Kilowatt, kilowatt-hour
mgd	Million gallons per day
O&M	Operations and maintenance
ROI	Return on investment
Scfd	Standard cubic feet per day
SPWTP	Stevens Point Waste Treatment Plant
TS/TSS/TVS	Total Solids/ Total Suspended Solids/Total Volatile Solids
WEF, WERF	Water Environment Federation/Water Environment & Reuse Foundation
WTP	Wastewater treatment plant

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Cover photo is an aerial view of the City of Stevens Point Waste Treatment Plant, courtesy of the City of Stevens Point. Cover design by Evan Odoms.

Stevens Point Wastewater Treatment Plant
City of Stevens Point Public Utilities Department, Wisconsin

About the Utility

- Service Area: City of Stevens Point and Village of Park Ridge
- Operating since: 1940
- Wastewater customers served: 27,500 including UW students
- Employees: 6
- Governance: City of Stevens Point Board of Water and Sewerage Commissioners

About the WTP

- Location: Stevens Point, WI
- Size: 2.4 mgd average flow; 4.5 mgd permitted flow
- Anaerobic digesters (AD): three 735,000-gallon mesophilic digesters, plus a 1.5-million-gallon mesophilic digester (converted in 2018 from a wastewater solid storage tank)
- Food waste feedstocks: Brewery wastes, food processing residuals
- Food waste as share of total AD feedstocks: 54.7% by volume (57.4% by TVS)
- Feedstock preprocessing: onsite 1-inch bar screen, rock trap, large grit sump at bottom of mixing tank, chopper pump; slurry is metered into digester.
- Electricity provider and costs: Wisconsin Public Service (WPS) sells to Stevens Point Waste Treatment Plant at $0.13/kWh peak, $0.04/kWh off-peak; WPS purchases back at: $.10/ kWh peak, $.05/ kWh off-peak under the WPS Renewable Energy Tariff
- Biogas end use: 180-kW combined heat and power (CHP) generator, boilers to heat digesters, biosolids dryer, and waste treatment plant buildings
- % energy neutral: 50%
- Biosolids management: Class A biosolids distributed as agricultural fertilizer

Drivers and Goals

- Drivers: Avoid need for major investments to treat dramatically expanding brewery wastes; Wisconsin Focus on Energy (energy efficiency and renewable energy grant program); increasing restrictions on land applications for industrial processing wastes, biosolids
- Goals: increase energy efficiency; produce as much biogas as possible to offset natural gas usage; keep operating costs (and rates) low; provide reliable outlet for brewery and other food processing wastes

Summary

The City of Stevens Point, Wisconsin has transformed its wastewater treatment facility into a “Utility of the Future” that recovers clean water, energy and nutrient resources while carrying out the utility’s primary mission to treat wastewater effectively and efficiently. The utility began its journey toward energy efficiency in the early 2000s, as an early participant in Wisconsin Focus on Energy, the state’s energy efficiency and renewable energy program. Over time, plant staff realized that, if the plant increased

energy efficiency, it could produce enough energy to move toward energy neutrality by building a co-digestion program for high strength organic wastes (HSOW) and optimizing utilization of the resulting biogas. Indeed, the utility was one of the first in the nation to produce sufficient electric power and heat to be nearly self-sustaining.

Over the past decade, the utility, led by Joel Lemke, Public Utilities Director, Jeremy Cramer, the former Wastewater Superintendent, and Chris Lefebvre, current Wastewater Superintendent, has put in great effort to build a co-digestion program for high strength organic wastes (HSOW) and optimize utilization of the resulting biogas. One important external driver was the rapidly expanding production wastes from the Stevens Point Brewery, which threatened to overwhelm the treatment capacity of the plant. Further, because the wastes are highly energy-intensive to aerate, their treatment through the headworks was an impediment to achieving the plant's energy efficiency goals.

To address this challenge, Stevens Point created a public-private partnership with the nearby Stevens Point Brewery to pipe brewery processing residuals to the WTP, which enables increased production of renewable energy and reduces onsite energy costs. Following a successful pilot project co-digesting brewery wastes, the utility's board approved a $1.9 million investment in a biogas-driven, 180-kW CHP engine, biogas conditioning equipment and AD upgrades to increase energy efficiency. The utility and the brewing company subsequently split the $1.3-million cost (net of grant monies) of constructing a pipeline connecting the properties and a high strength organic waste (HSOW) receiving station at the wastewater plant, which was completed in 2014.

In addition to the brewery waste, the utility developed sources for hauled food waste for co-digestion feedstocks. The plant initially accepted FOG; however, over time there was more demand for digester capacity than it could fulfill. As a result, in 2016, the utility decided to accept only hauled food processing residuals, which are more consistent in quality and quantity than the FOG deliveries were. All of the hauled liquid organic wastes enter the plant at the HSOW receiving station built in 2014 as part of the brewery partnership.

In 2019, the plant completed a $17-million project to further expand resource recovery by converting a wastewater sludge storage tank into a 1.5-million-gallon digester, installing a biogas storage cover, and constructing a new biosolids drying facility with a thermal oil heated paddle dryer. A primary goal of the project was to support a shift in biosolids strategy to address regulatory and market challenges with land application of the Class B biosolids they were producing. The expanded AD capacity has enabled the plant to accept more HSOW and thereby produce more biogas to support the dryer facility. And the new drying facility has enabled the plant to shift from producing Class B biosolids to producing Class A biosolids that can be distributed as agricultural fertilizer.

The utility also is considering investments in nutrient harvesting technologies to remove side stream phosphorus in order to comply with Wisconsin's new effluent regulations covering phosphorus (P) as well as the new plant limit on P in its revised water permit, which has a 7-year compliance period (WERF 2015).

Joel Lemke and Chris Lefebvre cite a small, tight-knit staff as crucial to building staff buy-in to the plant's energy efficiency and resource recovery projects. In addition, a long-standing trust relationship with their board helps to overcome political obstacles that may impede new projects at the Stevens Point Waste Treatment Plant.

Project 1: Co-Digestion Enables Increased Resource Recovery

The goal of this award-winning project was to move toward energy neutrality while keeping customer rates low. The strategy was to shift rapidly-expanding brewery wastes from wastewater pretreatment to anaerobic digestion, which would enable the utility to avoid high investment costs to expand treatment capacity and increase energy efficiency. This first project had three components: a public-private partnership with Stevens Point Brewery to pipe brewery wastes directly to the utility's digesters and build the necessary infrastructure; investment in energy generation equipment to create value from the additional biogas and in digester upgrades to improve energy efficiency; and acceptance of other high-strength wastes from outside its service area.

"Brewing a Better Future Together": Public-Private Partnership with Stevens Point Brewery

The Stevens Point Brewery has manufactured Point Beer since 1857, and the liquid wastes from beer production have entered the headworks of Stevens Point Waste Treatment Plant (SPWTP) - as part of the wastewater utility's pretreatment program - since the construction of the WTP. The brewery expanded dramatically during the decade of the 2000s (and beyond). A continuing high growth rate threatened to overwhelm the treatment capacity of the plant and the potential for the town to accept new "wet" industries that would require treatment of their wastes. Further, the high Biological Oxygen Demand (BOD) in brewery wastes resulted in operational upsets, as well as high energy costs for aeration in the WTP's treatment train.

In 2010, SPWTP and the brewery implemented a pilot project to reduce energy costs by hauling brewery wastes to the plant and feeding them directly into the digesters. The purpose of the pilot was to evaluate whether sufficient biogas could be produced to warrant the addition of a cogeneration system, and whether brewery wastes would cause any major operational issues. After the pilot showed that the brewery wastes provided a significant amount of biogas with minor effects on operations, SPWTP received Board approval to continue accepting high-strength organic waste (HSOW) feedstocks and to invest in a cogeneration and biogas conditioning system.

As a result, in 2014 SPWTP established a public-private partnership with the Stevens Point Brewery to send the brewery wastes to the plant digester by dedicated pipeline. The two parties agreed to share equally in the costs of a new high strength organic waste (HSOW) receiving station and pipeline. SPWTP paid the costs upfront, and the parties currently have a contract specifying that the Stevens Point Brewery will pay its share over 10 years, in equal annual assessments. The pipeline is a 4", 3,000' long force main from the brewery to the plant. The HSOW receiving station includes a 40,000-gallon receiving tank, with a Vaughan mixing system and chopping system, and a bar screen and rock trap, which is used to preprocess the hauled HSOW the plant receives (Lefebvre and Lemke, interview with authors, March 18, 2019).

Brewery wastes are separated and stabilized at the brewery before being sent through the pipeline to the WTP. Because they are pumped twice before getting to the receiving tank, they are not contaminated with solids and the WTP does not pretreat them (Lefebvre and Lemke, interview with authors, March 18, 2019). The brewery wastes have a pH of 4.2, but are exempt from the Industrial Pretreatment Program pH limit (> 5) on wastewater solid discharges because they are transmitted on a dedicated pipeline. In the contract, the WTP specified they would take whatever quantity of wastes the brewery generated, so long as they were within specific ranges for BOD (minimum BOD of 25,000 mg/L) and Total Solids (TS) content.

These conditions were designed to prevent the brewery from sending excessive amounts of water down the pipeline.

As a condition of the partnership, the utility does not charge a tipping fee for the piped-in waste.

Energy Strategy to Increase Efficiency and Self-Sufficiency

The goal of the plant's energy strategy was to move substantially toward energy self-sufficiency by generating heat and electricity for the plant with the additional biogas from co-digestion. With the board's approval following the successful brewery pilot, in 2012 SPWTP added a biogas-driven, 180-kW CHP engine and biogas conditioning equipment. At the same time, they added a low-energy digester mixing system and a low-energy pumping system. These AD upgrades enabled the plant to further increase energy efficiency.

Chris Lefebvre explained that they chose an internal combustion engine rather than microturbines because the latter require higher pressure and therefore additional infrastructure to operate.

Figure 1. 180-KW Cogeneration engine and hydrogen sulfide removal tanks. Source: City of Stevens Point.

Incorporating Other HSOW Feedstocks

Due to tightening restrictions on land application, haulers of other food wastes started contacting SPWTP in their search for waste disposal sites. The WTP began accepting truck deliveries of fats, oils, and greases (FOG) in 2010, and deliveries of high-quality food processing residuals (FPR) from nearby plants shortly thereafter. Located on Interstate 39 in an area with various food processing plants, the plant is well-situated for access to extensive feedstocks. The demand for FPR disposal is so great in the Stevens Point area that, as of 2016, the WTP digester was operating at capacity and regularly turned away calls from nearby industries. They were coordinating feedstock supplies with the only other treatment plant co-digesting in the area, Wisconsin Rapids Wastewater Treatment Plant, which is 20 miles away. In 2018, approximately 1/3 of offsite organic wastes the plant received were from the Stevens Point Brewery and 2/3 were from nearby food processing industries.

The plant accepted FOG between 2010 and 2016. However, WTP staff decided to stop accepting FOG when sufficient quantities of less contaminated, more consistent feedstocks became available to fill the digester. Deliveries of FOG were often inconsistent in terms of quality and generally occurred only once a month when the grease traps were emptied. Chris Lefebvre and Joel Lemke noted that when they did accept FOG, total solids ranged from 0.5% to over 15% and the FOG was frequently contaminated with an assortment of debris, including spoons, steel wool, aprons, t-shirts, even cell phones.

Though SPWTP has no contracts with feedstock suppliers other than the brewery, the plant receives regular deliveries of FPR from a set of haulers who have been delivering to them over an extended time period. When haulers' schedules or the content of their loads will diverge from the usual, they notify the plant. The FPR supplies are normally liquids (4-7% total solids) and can include substances such as marinade from chicken nuggets, batter from frozen appetizers or dissolved air flotation wastewater solids from food production facilities (Lefebvre, interview with authors, July 20, 2018). Haulers pump the manufacturers' waste into their tanker trucks, and then unload the tanks at the SPWTP receiving station. At the WTP, the trucked-in waste goes through a 1-inch bar screen. The wastes are mixed together and treated using a rock trap grinder, large grit sump, and a chopper pump before being metered into the digesters.

The plant has specified quality parameters that the feedstocks must meet. Before they are accepted, the wastes must be tested by a third-party lab for the several constituents that would influence biosolid quality including metals, N, P, BOD, and COD. The WTP prefers high Chemical Oxygen Demand (COD) and low Total Suspended Solids (TSS) feedstocks to improve biogas production. Because they have been anticipating tighter phosphorus discharge limits, they have turned away feedstocks with low COD and high P contents, such as dairy waste.

Project Impacts and Risk Management

Operational Impacts

Operational Impacts on Digester Operations

During the initial stages of FOG acceptance, SPWTP staff found that overfeeding and inconsistent feeding caused digester upsets. By watching what feed-in rates caused upsets, the staff were able to determine that if biogas production goes above a certain level, too much feedstock is being added. Using historic ratios of volatile acids to total alkalinity (VA:TA) and monitoring the corresponding gas production, the WTP staff has been able to pace digester feed-in and avoid digester upsets .

Some odors were experienced, notably from overfeeding the digesters and from the malodorous nature of FOG. This problem was addressed by dropping FOG as a feedstock, and by mixing the feedstocks before feeding them to the digester.

Operational Impacts on Biogas Production and Energy Use

As of the beginning of 2014, SPWTP was producing 100,000 scfd, which represented a doubling of the biogas produced before co-digestion. The biogas powers the 180-kW CHP engine, which generated enough electricity to supply 90% of the WTP's electricity needs. In addition, the plant was regularly able to push excess power to the grid. The plant has an agreement with Wisconsin Public Service to purchase electricity back from the utility under a Renewable Energy Tariff ($.10/kWh peak, $.05/kWh off-peak, which is effective though April 2022. The greater share of sales is off-peak (3am-6am) and in the warmer months of the year. The utility retains the renewable energy credits (RECs) associated with the purchases. On average 5% of the WTP's annual electricity production has been sold to Wisconsin Public Service, a local investor-owned utility.

In addition, about 85% of the waste heat from the CHP (engine coolant and exhaust gases) is captured and used to heat the digester and plant buildings, supplying 90% of the heat the facilities need.

Approximately one-third of the biogas was flared because the WTP did not have the capacity to use it.

Operational Impacts on Biosolids

The volume of the Class B biosolids increased by roughly 12% with the addition of co-digestion. The quality of the biosolids did not change.

The biosolids (5% TS) were distributed for land application by utility contractors on nearby farmlands. However, the utility was running into obstacles, including the lack availability of land (which can trigger requirements to acquire additional storage) and public opposition to land application of Class B biosolids. Wisconsin prohibits land application during winter months, and consequently requires facilities to have 180 days of onsite biosolids storage. SPWTP has two biosolid tanks with mixing capacity, which are covered to keep out precipitation. With a capacity of 1.6-million gallons each, the tanks represent 180 days of storage under normal weather conditions. However, in the winter of 2018/2019, the plant needed to find additional storage because weather challenges limited their access to farmers' fields to apply the biosolids.

These obstacles were part of the motivation for a new biosolids strategy and a subsequent co-digestion project to implement it, as described below.

Regulatory Impacts

No adjustments were required to the plant's NPDES, air or solids permits.

Financial Impacts

Investment Costs

One way to gain approval from the City of Stevens Point Board of Water and Sewerage Commissioners for projects is to demonstrate that the project is needed to meet a regulatory requirement, and will do so cost-effectively. Other projects must meet a Return on Investment (ROI) hurdle rate and have a reasonable payback period. Chris Lefebvre and Joel Lemke present each project to the board with projected purchase and installation costs, and operating revenues and costs over a life cycle of 20 years. Including operational costs in project analyses allows the plant to give due consideration to investments in equipment with a higher capital cost but lower long-term operating costs.

In the case of the receiving station and pipeline, the investment was evaluated relative to the avoided costs of anticipated future wastewater treatment investments (new aeration basins, which are expensive given the underground rock formations, and new selector tanks) as the brewery wastes continued to grow with the rapidly expanding brewery. The net cost of the receiving station and pipeline was $1.293 million, after taking into account a Wisconsin Focus on Energy grant of $114,000. The utility and the brewery split the cost of the receiving station, and the utility paid for its share from its operating budget. The board approved the expenditures because the avoided costs of wastewater investments to treat the growing brewery wastes would be multiple times the costs associated with the co-digestion infrastructure.

The net cost of the cogen engine and biogas treatment system to the utility, after a Focus on Energy program grant of $225,000, was $1.048 million. The digester upgrades cost an additional $800,000. The utility financed the net project cost with a combination of internal operating funds and Build America Bonds -- taxable municipal bonds that provided tax credits or federal subsidies for local governments at a very favorable rate. (The Build America Bond Program expired in 2010.) The projected payback of the cogeneration and biogas conditioning project was estimated to be 12 years. Due to unanticipated gas conditioning expenses, however, the current payback period estimate is 13-14 years.

Net Operating Revenues and Costs

By removing brewery wastes from the headworks, SPWTP saved $150,000 per year in wastewater treatment costs. The pipeline also saved the brewery $150,000 in annual wastewater surcharges.

After the co-digestion break-in period, the plant did not incur additional O&M costs for running the anaerobic digesters. The additional costs for operating the receiving station were minimal, primarily for increased billing and paperwork.

Through October 2018, tipping fees were set based on the desirability of the waste for co-digestion. Hauled wastes with high gas production value were charged $6.06 per 1000 gallons; wastes with less desirable impacts on the digester, such as dairy wastes, were charged $39.88 per 1000 gallons. On average, the utility received $110,000 per year in tipping fees for food waste feedstocks 2014-2018.

The cogen engine periodically has required extensive maintenance, which results in episodic downtime. On average, operating costs for the energy system increased $30,000 per year, primarily due to engine O&M costs. The WTP saved $90,000 per year in electricity costs and $9000 in heating costs. SPWTP sold electricity produced from the cogeneration system to their electricity provider, Wisconsin Public Service, at a cost of $0.10/kWh on peak and $0.05/kWh off peak. In 5 years, the WTP generated a total of $29,284 in electricity sales revenue.

With the additional biosolids and the difficulties with land application due to weather and decreasing farmer acceptance, biosolids O&M and hauling costs increased by 66% or approximately $60,000 per year on average 2016-2018.

Project 2: Expanding Co-Digestion and AD and Energy Investments

Project Strategy

A major goal of this second co-digestion project was to reorient the utility's biosolids strategy to address challenges with land application. The addition of a new biosolids drying facility with a thermal oil paddle dryer has enabled the plant to shift from producing Class B biosolids, for which the WTP paid the costs of hauling to farmlands, to producing Class A biosolids that are picked up from the site free of charge as agricultural fertilizer. To expand AD capacity and biogas storage, a wastewater solid storage tank was converted to a 1.5-million-gallon digester and a 52,000-cu-ft biogas storage cover was installed. The AD

conversion and gas storage projects were completed in August 2018. The installation of the biosolids drying facility was completed in September 2019.

These AD and biogas storage investments have enabled the utility to increase feedstocks (and tipping fees), produce additional biogas to support the dryer, and manage biogas utilization to reduce flaring.

Figure 2. Andritz 10W-310 Biosolids Paddle Dryer. Source: City of Stevens Point.

In the face of increasing popularity of producing renewable natural gas (RNG) from biogas, SPWTP explicitly chose to pursue energy self-sufficiency, as opposed to increasing revenue by producing RNG for pipeline injection or direct sales as vehicle fuel. According to Lefebvre, the equipment for upgrading biogas into liquefied natural gas for pipeline injection is quite expensive due to the high quality of renewable natural gas required by utilities for pipeline injection. As a result, the economics of producing compressed natural gas for vehicle fuel are not favorable unless 1) grant funding essentially buys the processing equipment and 2) the WTP has no capital costs other than the conversion of their vehicle fleet to natural gas.

In addition, Lemke and Lefebvre are considering investments in nutrient harvesting technologies to remove sidestream phosphorus, to comply with the new Wisconsin effluent regulations covering phosphorus (P) and the new plant limits on P in its revised water permit, which have a 7-year compliance period.

Project Impacts

Operational Impacts

With the expansion in digester capacity, the plant began accepting additional HSOW feedstocks in 2019, primarily from the food processing sector. Brewery feedstocks have remained relatively constant, even through COVID-19. Total HSOW volume has increased by 54% relative to 2018. The plant has not experienced any major operational issues with the old and new digesters as a result of increased feedstocks.

With the additional feedstocks, biogas production has increased from 100,000 scfd to 150,000 scfd, which is triple the pre-codigestion level. With the new equipment, the energy uses for the biogas have expanded sufficiently that flaring has dropped from 30% to 18%, but energy neutrality also has declined from 90% to 50% and the utility is no longer selling any of its annual electricity production to Wisconsin Public Service.

Biosolids have also increased. Whereas project 1 led to a 12% increase relative to the pre-co-digestion baseline, with the additional feedstocks following implementation of project 2, they have increased 53% relative to the pre-co-digestion baseline.

Financial Impacts

With the increased costs associated with the new biosolids project, SPWTP changed its tipping fee structure effective November 2018. The fees now depend on whether the feedstock is generated within its service area or not, independent of feedstock quality: $6.06 per 1000 gallons for within its service area, and $39.88 per 1000 gallons for outside its service area. Since currently only the brewery waste originates from inside its service area, this represented an increase in price for most haulers. Total HSOW tipping fees have increased from an annual average of $110,000 in 2014-2018 to $140,000 in 2020.

Operating costs for the new elements of the energy system (new dryer, biogas storage tank) are $400,000 per year. Despite increased production of biogas and improved biogas utilization with storage capacity, energy purchases have increased because of the additional equipment that is drawing power. Following project 2 investments, electricity costs increased from a 2014-2019 average of $105,100 to $133,000 in 2020, heating costs have increased from a 2014-2019 average of $7200 to $39,700 in 2020, and average annual revenues from electricity sales declined to nothing, from about $5900.

With the shift to production of Class A biosolids, associated O&M costs have increased 10.3% from $366,600 to $404,300. Though hauling costs have been eliminated, energy and polymer costs have increased.

SPWTP spent about $17 million for the digester conversion, biogas storage cover, and biosolids drying facility. Because a primary goal is to address regulatory and market challenges with land application of biosolids, the utility Board did not require the project to pass a formal return on investment (ROI) or payback period test.

The Wisconsin Clean Water Fund Program is providing the financing in a 20-year bond at an interest rate of 1.892%, along with a principal forgiveness grant of $650,000. The plant also has received $105,499 in grant funding from the Wisconsin Focus on Energy program to offset more of the costs.

Figure 3. New 1.5-million-gallon anaerobic digester, converted from a wastewater solids storage tank in 2018. Source: City of Stevens Point.

Lessons Learned

Create Value and Manage Risks

Led today by two sustainability champions, Joel Lemke, Public Utilities Director, and Chris Lefebvre, Wastewater Supervisor (and previously by Jeremy Cramer, former Wastewater Superintendent), the utility has been focusing throughout the last two decades on creating value and increasing efficiency by recovering resources in service of the utility's mission to treat wastewater effectively and efficiently.

As early participants in Wisconsin Focus on Energy, the state's energy efficiency and renewable energy program, they realized that co-digestion, in tandem with energy efficiency investments, would allow them to move toward becoming energy self-sustaining by enabling onsite production of renewable energy. The resulting energy cost savings benefit their customers by keeping their customer rates down.

The small utility was able to address political/stakeholder, operational and financial risks by making incremental changes, and by then evaluating and fine-tuning strategy based on performance. Chris Lefebvre cites the availability of a willing brewery partner, as well as a small, dedicated staff and a close working relationship with their Commission, as factors essential to the success of their co-digestion projects.

The presence of a committed provider of feedstock of consistent quality and quantity reduced the risk of feedstock loss in what can be a highly volatile feedstock market.

Operations and maintenance personnel initially resisted the change in operations to achieve increased energy efficiencies because the plant had historically met its discharge requirements without any issues,

and energy efficiency is not required for funding or for permit conditions. By starting out with a pilot project with the local brewery to test the co-digestion strategy, managers were able to foster staff buy-in by including staff members in the decision-making process for each operational change. With the results of the pilot project, the SPWTP also was able to demonstrate the efficacy of the plan to the utility Board.

Finally, SPWTP's approach of incremental improvements, relying to a great extent on internal operational funds, supplemented by a few state grants, is a conservative way to finance co-digestion.

This project has been recognized by Water and Waste Digest (2015), WEF/WERF Utility of the Future Today (2016), and American Council of Engineering Companies of Wisconsin.

Replicability

Stevens Point demonstrates that small facilities with project champions, a strong relationship with their Board, state support for renewable energy markets, and an ample and reliable supply of feedstock can successfully implement co-digestion. The long-term feedstock commitment of the Stevens Point Brewery – a special element in this case – was an important driver for co-digestion. Further, the plant is in a good location for a robust supply of other feedstocks, which allows it to be selective in what it accepts. Project champions Chris Lefebvre and Joel Lemke cite a "Do the Right Thing" attitude among utility leaders and staff as the motivation for many of the sustainability related projects they have implemented.

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