Chapter 5 Securing an Energy Contract

Contents:

Chapter 5 Securing an Energy Contract

This chapter provides a guide to the issues involved in negotiating a contract to operate a small biogas fired generator in parallel with a utility. When electrical production is the desired mode of operation, the utility contract is the most important issue affecting the profitability of a project.

While utilities are legally required to work with farm biogas electrical generators, there are no set industry rules or procedures that govern the process for small power producers (<250 kW), as most rules were developed for very large independent power producers (>1 MW). In general, utility rules apply to interconnection requirements, capacity guarantees, and energy payment/purchase rates. In the best of cases, some utilities have developed handbooks of procedures, specifications, options and draft contracts in an effort to provide small power producers with a standard contractual process. In these cases, the process is orderly and straightforward. In other cases, some utilities have dispersed responsibilities across a number of different groups within their organizational structure. These groups may include metering, rates, engineering, agricultural services, and others. In these cases, the process can become confusing, time consuming, and may present impediments to project development. Negotiation is an appropriate method to develop successful small power contracts, given the many approaches utilities may take toward these types of projects. Since contract negotiation is often a complex process, farm owner/operators and developers may want to consult an expert for information and guidance in this area.

Since the first edition of this handbook was written, deregulation has resulted in a major restructuring of electric utilities. Many utilities have sold their generating capacity to independent power producers and now purchase all the electricity delivered to their customers charging a fee for distribution. Theoretically, each customer has or will have choice as to the source of the electricity that they purchase. However, the progress toward total deregulation has varied among states and in some states there is only one choice, especially for residential customers. Conversely, customers in other states may have several options including a supplier that generates "green power" from a renewable resource such as biogas. As a source of green power, farms selling electricity produced using biogas may be able to receive a premium price for the electricity that they sell to their local utility due to a higher rate structure for electricity generated from a renewable resource.

In Chapter 3, considerations of the types of generation arrangements were discussed. This chapter applies to farm biogas generators operating in parallel with a utility. Operating modes are described, utility contracts are discussed, and the utility contract process is presented.

5-1. Operational Modes

The key issue in developing a biogas recovery system is the value of the energy to the owner. A careful review of utility rates and interconnection requirements are necessary prior to selecting the operating mode. In addition, the owner or developer must realistically estimate the potential to generate electricity and analyze the farm's monthly energy use and history. The analysis may show that the farm will make some surplus electricity or require more than it can produce. Once the potential surplus/shortfall situation is known, the following options may be considered. Not all utilities offer these options under these names.

5-1.1 Sale of Electricity to the Utility

In 1978, the Public Utilities Regulatory Policy Act (PURPA) required an electric utility to buy electricity from a power project, that is granted Qualifying Facility (QF) status by the Federal Energy Regulatory Commission (FERC). The electricity would be bought at the utilities' current avoided cost rate. A power project is granted QF status as either a "small power producer" or a "qualifying cogenerator." PURPA prohibits utilities or utility holding companies from having more than 50 percent ownership in QF projects, and it stipulates size and fuel requirements as follows:

> "**Small Power Producer.** Small power producers must be no more than 80 MW in size and must use a primary energy source of biomass, waste, renewable resources, or geothermal resources."

Biogas fueled electricity generation qualifies by definition. However, because the avoided cost offered by utilities for purchasing power from QF's,

under PURPA, is much lower today, energy may be more profitably utilized in other operational modes. One option that warrants immediate investigation is the direct sale of energy to a neighboring facility that can use the power.

Currently, the electricity market is undergoing rapid change, including electric utility re-structuring. Re-structuring may provide opportunities as well as challenges that may affect small power production contracts. State actions may impact technology options and the system economics.

The following are typical operating modes for parallel farm digester generators.

Buy All - Sell All

Some utilities offer an agreement where they will continue to sell the farm all electricity requirements and then buy all the generator output. There are very few advantages to this type of arrangement in today's market. In general, utilities offer to pay an avoided cost rate which is 1/4 to 1/3 of what they charge for a retail kilowatt-hour. In rare circumstances a utility will pay an amount close to the value per kilowatt-hour that they charge. However, there also is another version of a Buy All – Sell All agreement that may be available in which the electric utility purchases and uses the biogas produced to generate electricity on the farm. Under this type of agreement, the utility owns the generator set and the interconnection equipment and the electricity generated, which is delivered to the utility's distribution grid. Although all of the electricity used on the farm must be purchased from the utility, the capital and operating costs of the biogas production system are reduced.

Surplus Sale

In a "surplus sale" agreement a farm produces electricity in parallel for use on farm. Excess production is sold at avoided cost and excess consumption is purchased at the retail rate. The surplus sale allows the farm to realize the retail value of a kilowatt-hour by keeping it on farm and using it. In recent years, some utilities have begun charging "standby" rates on these types of projects. The purpose of the standby charge is to pay for the availability of electricity to the farm when the generator is not running. Typically the standby charge is adequate to recover all utility profits on kilowatt-hours not sold.

Net Metering

In net metering, the generator output is offset on a monthly or yearly basis against the farm consumption with surplus production purchased by the utility or shortages purchased by the farm. The farm is, in effect, trading electricity with the utility (Exhibit 5-1). Many states (AK, CA, CT, DE, HI, ID, IL, IA, LA, MA, ME, MI, MN, NV, NH, NM, ND, NY, OH, OK, PA, RI, TX, VT, WI, WY) allow a net metering arrangement for small generators, but the upper limit for generator size varies from state to state. Net metering may be available from individual utilities in other states, so check with your utility.

5-2. Interconnection Requirements

An integral part of the contract negotiation involves the interconnection requirements. Each utility has interconnection requirements for protective relays to disconnect the generator automatically if the power line near the farm is accidentally broken or there is a problem with the generator. These relays are necessary for protection of farm and utility personnel. It is recommended that a professional familiar with interconnection equipment negotiate with the utility and supply the appropriate gear. Negotiation is necessary because of the potential cost of the interconnection. Solid state relays and electromechanical relays perform the same generator (disconnect) function. However, electromechanical relays may cost 10 times more. A utility may need high cost relays for very large power producers but lower cost relays are appropriate for smaller farm scale power production.

Chapter 5 Securing an Energy Contract

5-3. Whom to Contact

The utility may have a representative who will be able to start you on the path to an energy agreement. The responsible person is usually found in the marketing department. Some utilities have assembled a handbook of procedures, options, and draft contracts. In these cases, the procedure is orderly and straightforward, but will take time. Other utilities have dispersed the responsibilities. In such cases it will take a lot of time to determine what you have to do to interconnect with the utility. The best advice is to ask questions, and if you do not get answers, to ask to talk to someone more senior. In some cases, contacting the state Public Utility Commission (PUC) may be helpful. In all cases, contacting the utility early on in the project development process is essential because of the long lead times often encountered in completing small power contracts. It is suggested that the sample utility letter in Appendix G be used as a tool to initiate this process.

5-4. What to Ask For

To begin the contract process the information you need includes but is not limited to:

1. Avoided cost rate schedules
2. Contract Options - for renewable energy projects
   - A. Buy-sell agreement
   - B. Surplus sale agreement
   - C. No sale parallel agreement
   - D. Net sale agreement, if available
   - E. Any other currently available agreements
3. Interconnection requirements
4. Any charges, riders, rate schedules that may be applied to the project (e.g., standby charges)

Examples of some of these documents can be found in Appendix H.

Exhibit 5-1 The Advantage of Net Metering

This example shows the costs under net metering for a 550 cow, scrape freestall dairy farm with a plug flow digester. The farm generates an average of 70 kW with an average on-farm demand of 50 kW. The example uses a typical utility rate schedule (Service Class 2-D) for the State of New York (Appendix H-5). The generator operates 95 percent of the time.

Delivery rate, $/kWh	$0.0265
Supply rate, $/kWh	$0.0500
Monthly energy use, kWh	34,200
Monthly excess to grid, kWh	13,680
Net $ credit at $.0765/kWh	$909
Total demand/fixed costs	-$645
Net monthly credit	$264
Energy credit at $.0765/kWh, kWh	3,449
Monthly $ credit at $.050/kWh	$172
Net metering annual credit	$2,069

After deducting demand charges, the farm's monthly electricity bill includes a 3,449 kWh credit to be carried forward for netting against future month's electricity bills (i.e., whenever farm demand for electricity exceeds the biogas system generation rate). After 12 months, any unused energy credit would be converted to a dollar credit at the utility's avoided energy cost (i.e., supply rate). If on-farm energy demand were fully met each month, the value of the 12-month credit would be $2,069. Including the value of energy generated for on-farm use, the annual value of the biogas is $33,465.

5-5. Elements of an Agreement

A long-term contract is usually favored to ensure revenues for projects, and is usually required to obtain financing. However, review short and medium term options to be sure to choose the most beneficial options to the project. Many utilities have a standard offer contract for qualifying facilities such as farm-scale anaerobic digesters.

The entire contract offered by a utility should be carefully reviewed by the project developer and legal counsel to ensure that each of the terms is acceptable. If they are not, a more acceptable, revised version of the contract should be presented to the utility for negotiation. The details of the agreements are crucial to limiting issues that may adversely impact the system in the future.

Primary contract considerations include:

- **Term.** The contract term should be sufficient to support financing and/or the life of the project. A satisfactory term is usually 15 years or more.
- **Termination.** Grounds for contract termination should be very limited in order to protect the long-term interests of all parties.
- **Assignment.** The contract should consider assignment for purposes such as financing. For example, allowing for contract assignment to heirs or to partners may be advisable to avoid ownership arrangement difficulties.
- **Force Majeure.** Situations that constitute force majeure (e.g., storms, acts of war) should be agreed upon, otherwise this clause could be used to interrupt operations or payment.
- **Schedule.** There should be some flexibility allowed for meeting milestone dates and extensions (e.g., in penalty provisions such as nonperformance). This is necessary in case unforeseen circumstances cause delays.
- **Price.** The contract price should ensure the long-term viability of the project, which means that accounting for potential cost escalation through the contract term will be very important.

5-6. Why Negotiate and What to Watch Out For

Negotiating is a difficult task and only experience can help. Patience and common sense are virtues. If a contract clause request seems unreasonable, it might be negotiable. However, remember that power contract agreements are binding with the utility, and therefore any changes or agreements need to be in writing.

Utility contracts or standard offers tend to have one or more unique clauses that must be recognized as potentially costly to the project. Some standard offers are developed for certain QF's and then applied to all projects. This is fine if the contract was developed for a small cogenerator, but can be fatal to a small project if the standard clauses were developed for a 2 MW steam turbine project. Some unfavorable clauses from some utility standard offers are summarized below as examples. The owner/developer should be aware that these and other clauses might exist. At a minimum, the financial impact of these clauses on the project, must be fully assessed. Where clauses appear to be unreasonable, they should be renegotiated.

5-6.1 Examples of Contract Elements that May Be Included and Must Be Identified and Renegotiated

These include:

- **Change in the farm retail rate.** The utility may mandate a new retail rate for a farm with biogas cogeneration. A change in rate affects project financial performance, and must be accounted for in the project's financial analysis.
- **Standby charges.** Standby charges may be applied to the project by the utility. Standby or "backstand" charges typically are rate schedules or riders that add additional charges to the project. Utilities levy these charges on customers that purchase power on an intermittent or 'as needed' basis, such as those using a farm-scale biogas system. These charges need to be carefully evaluated in terms of their financial im-

pacts on the project, in relation to the expected engine generator performance.

- **Interconnection requirements.** The Federal Energy Regulatory Commission (FERC) proposed expedited grid-connection procedures for smaller generators, such as digester electricity projects to help standardize the interconnection process and make it less of a burden. Appendix H contains the proposed rules. It is recommended that project developers contact their local utility early in the process to discuss interconnection requirements.

- **Insurance Requirements.** Liability insurance is a requirement for any project. Most farms have adequate insurance for the operation that will also cover the digester with minimal additional premium. Some utilities have asked farms to add the utility to the policy and to increase the limits of the insurance to levels higher than any farm insurance carrier normally writes.

- **Monitoring and Reporting.** Some utility companies have clauses requiring such things as hourly reporting of generator output and thermal heat use. They are designed to ensure that natural gas cogenerators meet PURPA thresholds. Such requirements are generally not necessary for a farm digester, and should be renegotiated.

- **Telemetry.** Some contracts can mandate direct control of the farm generator from the utility power management center, via a leased phone line. This is excessive for small power contracts and is an example of applying large power production specifications to small power producers.

- **Construction of the Interconnection.** Some utilities prohibit cogenerators from supplying their own equipment. This action can add costs to the project that can affect financial performance. This is another example of applying large power production specifications to small power producers.

The farm has to be careful in rate analysis because "high" demand charges can negate half the value of the electricity produced. "Demand" is usually the highest rate of electricity consumption for 15 minutes during the month. To offset demand charges, a generator must achieve 99.6% operation. Some utilities offer a "backup" or "standby" charge that is usually a lower fee than a demand charge. FarmWare can be used to evaluate these financial impacts.

5-6.2 Benefits to the Utility from Farm Biogas Systems

When working with a utility, it is important to remember that these projects can also meet their needs and to emphasize how successful implementation of the project will benefit both parties. For example, there are several non-monetary benefits to a utility from a farm anaerobic digester generator that utilities should consider in project negotiations, including:

1. **Customer Retention.** A digester may allow a farm to continue in business and continue purchasing some of its electricity needs, when a methane recovery system eliminates odor problems with neighbors.

2. **Demand Reduction.** Most utilities try to manage the peak demand by demand side management programs that reward customers for not using electricity during peak demand times. A digester generator reduces farm demand for utility power meeting the management goal.

3. **Voltage Support.** Where farms are near the end of utility transmission laterals, the generator supports the line voltage, keeping it from fluctuating. This saves the utility the cost of providing voltage support or paying for burned out motors.

4. **Deferred Capital Expenditures.** In rural areas, a digester generator (distributed generation) provides a remote generation source. It can delay the need for increasing system capacity and defer expenditures for conductors and substations, by supplying electricity at the point of use.

5. **Greenhouse Gas Reductions.** Several utilities have joined the Climate Leaders Program to reduce emissions of greenhouse gases. Methane recovery from animal wastes and combustion reduces its atmospheric effects. The recovery of

one pound of methane is the same as reducing carbon dioxide emissions by 21 pounds. By encouraging biogas production and its use to generate electricity, the utility objectives to reduce greenhouse gas emissions are advanced without capital expenditures.

6. **Renewable Portfolio Standards**. A Renewable Portfolio Standard (RPS) requires that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a particular area. Utility purchases of electricity from biogas projects may help meet these RPS requirements.

5-7. Transmission (Wheeling) Arrangements

Another option for producing revenue from biogas generated electricity is the direct sale to a third party using the local utility transmission lines. This strategy may be possible if the local utility is required to enter into a long-term contract to deliver or "wheel" electricity from other generators at a reasonable price. Also, farms with more than one site may be able to wheel surplus electricity via the local utility lines to their other locations. Wheeling could produce more revenue than the sale of surplus electricity to the local electric utility or may be an option if an acceptable long-term purchase agreement cannot be negotiated with the local utility. Before considering wheeling, contact the Public Utility Commission to determine if electric utilities in the state are required to wheel electricity generated by small power producers.