

NAWTEC16-1913

OPTIONS AND STRATEGIES FOR WASTE TO ENERGY FACILITY ENERGY SALES IN DEREGULATED MARKETS

Noel P. Chesser

South River Consulting, LLC
Baltimore, MD 21030, USA

ABSTRACT

Many US Municipal Waste to Energy (WTE) plants entered into long term electric sales contracts with their local utilities for the electricity generated. These legacy contracts will be expiring over the next few years. With the advent of electric deregulation, the energy markets are vastly different and WTEs now have many more options to optimize the value of the energy generated from their facilities. There are even some options available for WTE's located in regulated markets. A well developed energy sales strategy and execution can make a significant difference in the value realized from the WTE energy generated.

To understand the options available to WTE's it is first helpful to have a basic understanding of the power markets. In markets that are deregulated, there exists two primary markets, the hourly market where prices are set by the regional independent system operator (ISO) such as PJM or NYISO and the forward markets which offer fix rates for energy delivered some time in the future. The hourly market prices are highly transparent (posted on ISO's web site) and are based on the marginal cost of fuel used to meet the last increment of demand during that hour. In the Mid-Atlantic, New York and New England prices are typically driven by the price of natural gas and to a lesser extent fuel oil and coal. The forward markets are driven by counterparties who are willing to offer fixed prices in return for risk premiums added to the price to cover their price risk. Forward market pricing is not as transparent and requires knowledge of the market, knowledge and experience with the major buyers and sellers and multiple price bids.

Options for WTEs facilities now include sales directly to the ISO, sales to wholesale

buyers (generally 1-5 years), sales to local utilities and power authorities, sales directly to the local municipality and sales to large local commercial/industrial users of energy. The option selected should be consistent with a well defined energy sales strategy. The strategy should incorporate a price risk profile, budget and funding requirements/objectives, facility operating risk profile, credit risk, local considerations, and risk management timeframe. The mechanisms required to execute the above options vary and involve different approaches, contract structures, licenses, memberships, risks and rewards.

There are qualified independent energy consultants that can assist WTEs in understanding the markets, developing energy sales strategies and execution thereof to help ensure the value of the energy generated is optimized.

HISTORY

WTE's were constructed and began operations under regulated electricity markets. Under the Public Utility Regulatory Policies Act (PURPA) passed by the United States Congress in 1978, electric utilities were forced to purchase electricity from non utility power producers at their "avoided cost". As such WTE's negotiated long-term power sale agreements with the local electric utility.

During the 1990's the federal government began encouraging states to deregulate their electric markets just as they had for the airline and telecommunications industries. States in the Mid-Atlantic, Northeast, Mid west, Texas and California began implementing deregulated markets on a staggered basis.

Many of the long term contracts that WTE's entered into under regulation are expiring

over the next few years. As deregulated markets develop, WTE's may now find more sale options for their power including numbers and types of buyers and different pricing structures. As a result, it becomes incumbent on WTEs to understand how deregulation works, what their options are and what strategies they need to deploy.

DEREGULATED MARKET SALE OPTIONS

To explore the power sales options under deregulation, it is helpful to have an understanding of them. In deregulated markets, WTE power sale options may include selling directly to the regional independent system operator (ISO), bilateral contracts with wholesale buyers (generally wholesale affiliates of energy suppliers), sales to local utilities and power authorities, sales to large end users of power such as industrial/commercial facilities and sales to the local municipality and or its residents.

ISOs are established to manage the generation and transmission system for the particular region (e.g. PJM for the Mid-Atlantic, NYISO for New York State etc.) Their objectives include ensuring the reliability and safety of the system, ensuring adequate supply and delivery capability, dispatching generation on a marginal basis and setting the hourly prices based on marginal prices. Marginal or economical generation means that the next low cost generator of electricity is dispatched to meet the next increment of system demand. The last generation unit dispatched to meet the last increment of demand for that hour sets the market price for that hour. Sales to the ISO are priced at the hourly or marginal price each hour.

There are numerous wholesale buyers of power. They can be energy suppliers who look to resell the power to end users, market makers, and financial institutions. These parties are generally willing to pay a fixed price or some combination of a fixed and variable price established today for a delivery of power during some future time period. Credit risk becomes important here as default by the purchaser may expose the seller to replacing an existing contract price with a current market price (which could be higher or lower). Arrangements can be made to establish collateral accounts, with periodic adjustments made to reflect mark to market changes.

Depending on location, some local electric utilities may be permitted to enter into long-term contracts for power. This option will vary as some states do not permit utilities to enter into long term power purchase agreements.

Power authorities (such as the New York Power Authority), usually established by state

statue can in certain regions be another sale alternative. Power authorities may have commitments to sell power and therefore may need to purchase additional power beyond their own owned generation.

Large commercial/industrial facilities located near a WTE plant can be another sale option. The WTE proximity and other localized issues (such as economic development) can warrant consideration for this option.

Perhaps the most economical alternative is for WTE's to sell directly to their local governments (townships) and public school systems. This can be accomplished by having the WTE become an ISO member and the local government buyers establish an account with the ISO through a licensed local service provider (retail energy suppliers). This structure eliminates the energy supplier buyer/seller fees (middleman costs) involved which can be up to \$.01 kwh or higher. Another option is to sell power to the local residents, however, this would involve the WTE assuming residential credit and migration risk which it may not want to assume.

PRICE STRUCTURES

Our experience has been that many WTE's look for price certainty over time. This helps establish the tipping fees required to cover operating and financing costs not covered by electricity sales. Given this reality, sales to qualified credit worthy wholesalers are a desired option. Prices can be fixed by time of day (peak vs. off peak) and season (summer/non summer or by month) for the desired term length (1 - 5 years). Capacity and any applicable renewable attributes can be sold along with the energy component or sold separately.

Power purchase and sale agreements can be made on a firm or unit contingent basis. Firm means that all power scheduled to be generated (contract quantities) is purchased at the agreed upon price. If WTE generation falls below contracted quantities, the WTE must purchase the quantity shortfall in the market (generally at the then market hourly price) to make up the difference. Under the firm pricing structure, the seller (WTE) assumes the production shortfall price risk. Unit contingent means that the buyer agrees to pay the agreed upon price for what ever quantity the WTE produces. Under this pricing structure the buyer assumes the risk of production shortfalls. Firm pricing commands a higher price than unit contingent pricing as the seller is rewarded for assuming the production shortfall price risk. Pricing can also reflect a hybrid of firm and unit contingent whereby a baseline production quantity is priced on a firm

basis and any excess is priced on a unit contingent basis.

manage changing markets. Waiting until the expiration of the current power sales contract can limit options, prices and opportunities.

REGULATORY CHANGES

Power purchase and sale agreements should address regulatory changes that impact the prices of energy, capacity and renewables. Contracts can be structured to pass through any regulatory change that impacts out of pocket costs or revenue opportunities. Alternatively the buyer or seller can assume or share the cost and revenue opportunity risk associated with regulatory changes.

Capacity markets in particular are changing and the value of capacity in some markets are increasing dramatically. Many of these changes are regulatory driven. Sale contracts should account for potential changes in capacity brought about by regulatory changes.

IMPORTANCE OF OPERATIONAL RELIABILITY

Operational reliability has a significant impact on the value and price of power sold. Those WTE's that operate consistently and experience limited unplanned outages will command higher prices in both the energy and capacity price components. Operational and production consistency also better position WTEs to sell on a firm or hybrid basis which command higher prices relative to unit contingent prices. When soliciting price offers it's important to provide detailed historical kwh production (preferably by hour) and planned and unplanned outage information (dates and lengths). This information will help buyers establish and value expected production consistency. The more uncertainty that can be removed from electric production, the more valuable that power becomes. Markets discount uncertainty.

BENEFIT OF ISO MEMBERSHIP

To ensure maximum flexibility it is usually advantageous for WTE's to become ISO members. If a counter party buyer defaults, the defaulting buyer can be quickly replaced by a new buyer and the ISO stands ready to purchase any power during the interim. In addition, ISOs offer revenue opportunity programs for generators under the category of ancillary services. The programs vary by ISO and are dependent in part on individual WTE capabilities.

ONGOING DISCIPLINE

Power sale contracts are not a one and done event. WTE's need to be strategizing and planning their next sales contracts on an ongoing basis. Markets can change dramatically (witness the energy markets right after hurricane Katrina) and its helpful to have strategies in place to