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Work Session I: Energy Waste to Energy and Other Energy Options for Cities

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This paper has three sections. The first, by Paul Gosselink, discusses the concept of converting municipal solid waste (MSW) to electricity or fuel. The second, by Geoffrey Gay, lays out a framework for power purchase agreements. The third section, also by Geoffrey Gay, discusses various energy options for municipalities beyond the possibility of converting MSW to energy.

Section One

Waste to Energy

by Paul Gosselink

WASTE TO ENERGY

Introduction

What is a Waste-to-Energy Facility and Why is it a Timely Topic?

This lawyer's very simplified explanation is that waste-to-energy ("WTE") is a technology or process that takes waste (for the purposes of this paper, municipal solid waste or "MSW") and converts it to electricity or fuel. There are many different waste-to-energy and waste-to-fuel ("WTF") technologies. This paper will focus on the following technologies, each of which are able to convert all or most of the MSW stream into electricity or fuel; not just a small portion of it:

- Mass-burn combustion (including refuse derived fuel) (WTE)
- Pyrolysis (WTF)
- Gasification (WTF)
- Plasma arc gasification (WTF)

Currently, there are eighty-six operating WTE facilities in the United States. Seventy-five of them utilize mass-burn combustion. Eleven utilize refuse derived fuel ("RDF"), a process to pretreat the MSW to improve combustion and recover materials for recycling. Pyrolysis is utilized commercially to a limited degree in Europe, but not for processing of MSW. Gasification is utilized commercially for MSW on a small scale in both Japan and Europe. A Plasma arc gasification plant is operating in Japan, commercially treating MSW.

While mass-burn and RDF technologies have been shown to be economically feasible in the United States, at least in those areas where either disposal costs are high, or land is at a premium, interest has been turning lately to the WTF technologies. There are two basic reasons for this increased interest. The first is the recent emphasis on sustainability, including reducing greenhouse gas emissions. The Environmental Protection Agency (EPA) estimates that, for each ton of MSW handled by a WTE/WTF facility, approximately one ton of CO_2 equivalent emissions are avoided. The second reason is the trend to reduce the amount of MSW sent to landfills (often called "zero waste" initiatives). Landfills are the least desirable method of disposal according to the EPA. Further, landfills are expensive and difficult to site and/or expand as available real estate becomes more scarce, transportation costs increase, and tipping fees rise. WTE/WTF facilities can be co-located on or near existing landfills, making siting and transportation less of a problem.

While the economics in many parts of the United States may not yet support WTE/WTF facilities, the basic technology has existed for more than twenty years. Most analysts agree more WTE/WTF projects are coming. The issue is when, not whether.

It is not surprising that entrepreneurs have sensed this resurgence. Indeed, WTF entrepreneurs in particular have approached multiple cities in Texas to persuade them to host these facilities on their landfills. This paper will identify some of the issues that must be considered before committing to a WTE/WTF project, and if the decision is reached to move forward, some of the contractual and permitting issues that are unique to these projects.

DISCUSSION

Decision Point

Imagine you work for a landfill owner, and a WTE/WTF vendor approaches your city council or management (depending on whether the owner is a public or a private entity), seeking to site a facility at or near your landfill and capture all or part of the waste stream. You are tasked with evaluating the proposal. The enticement of the offer[1] to your council or management (where this offer is invariably made initially) is clear: you can keep all or a significant portion of your tipping fee, without consuming valuable landfill capacity. All you will have to do is direct some (or all) of your waste stream to the WTE/WTF facility. The vendor will build the facility and be responsible for operating it. The vendor proposes to keep all or most of the revenue from the sale of the electricity or the fuel. The landfill may get a royalty on the electric or fuel sales or perhaps a reduced cost of fuel. In addition, if the facility is to be located on the landfill, the vendor may pay you rent.

There are several threshold issues and questions that you will need to evaluate:

- Does the technology being proposed work?
- Is the proposed technology being used commercially?
- Where can the technology be seen?
- Who else is using this technology?
- What is the operating history of the proposed technology?

Let me give you a recent example here in Texas. Several cities have been approached by a gasification vendor making a proposal similar to the one described above. The cities asked the question: where can they see the vendor's gasification technology work? The answer was South Korea. We advised them: road trip. Although this may not have sounded like serious advice, a site visit to a working plant is a necessary part of one's due diligence on a $100 million to $500 million facility.

You will next need to investigate the economics of WTE/WTF plants, which are highly site specific and primarily depend upon:

- Existing / competing disposal costs (tipping fees)
- The comparative cost of electric generation using the existing traditional source compared to the WTE/WTF
- Price of electricity/proximity of a dedicated buyer
- The cost of environmental compliance
- Disposal costs for byproducts
- Composition of the available waste stream
- Transportation costs
- Tax incentives and other incentives
- The value of environmental attributes

[1] This is only one of many possible business arrangements discussed in the Contract Issues section below, but is generally the business arrangement the vendors use to generate interest from the owner.

As part of the economic evaluation, you will need to think through the following basic issues. The first issue is where to locate the facility. If the facility will be located within the landfill's footprint in whole or in part, you will need to subtract the value of the air space lost from the value of the project. However, you will need to add in a value for the increase in the life of the landfill due to the reduction in waste flow, delaying the need for a future expansion or new landfill. You may also want to add in a value for the sale of government incentives and environmental attributes (such as renewable energy certificates ("REC") and carbon credits) for which the project may qualify, but subtract out the value of the reduction in landfill gas-to-energy sales that will result from removing a significant portion of the organic waste stream from the facility.

One important consideration will be to what extent you factor "uncertainties" into your economic analysis. Many of the economic benefits are difficult to value. Federal subsidies are often renewed only a few years at a time, and could be discontinued at any time. Tax incentives are particularly difficult to value, especially if your entity is public and does not pay taxes. The only way you, as a public entity, can benefit is by including them in the contract negotiations with the vendor. The value of RECs and carbon credits may be particularly susceptible to the ebb and flow of the political currents. Even energy and fuel prices may vary wildly from today's predictions. A project that looks extremely valuable under one set of assumptions may look very different under another.

San Antonio recently hired a consulting firm (SAIC) to evaluate the economics of a potential WTE project for the City. These and other factors led SAIC to advise San Antonio that the time is not yet right for WTE in San Antonio; San Antonio's landfill tipping fees and the costs of electricity, according to SAIC, are too low to support WTE in San Antonio. It is no surprise that more than half of the eighty-six WTE facilities in the United States are located along the densely populated East Coast.

One additional issue you will need to consider is that this technology is changing rapidly. Whatever technology you select now may not be able to be upgraded until the end of a twenty- or forty-year contract.

Contract Issues

There are three basic business arrangements commonly used in the WTE field: (1) a private enterprise owns and operates the facility; (2) a public entity owns and operates the facility; (3) a public entity owns the facility but a private entity operates it.

This portion of the paper will focus on the third option since there are fewer significant contract issues when the same entity owns and operates the facility. That is not to say there are no other contracts required in all three categories. These other contracts include, but are not limited to:

- Real estate contracts
- Engineering contracts
- Architectural contracts

- Construction contracts
- Bond issuance contracts
- Insurance contracts
- Contracts with electricity purchasers, wire companies, and transmission Certificate of Convenience and Necessity (CCN) owners
- Contracts for environmental attributes

There are many contractual provisions that are standard for any large construction or utility contract. This portion of the paper will highlight a few of the more unique issues in WTE/WTF contracts.

Contract Form:

Contracts can either be bifurcated (a lease and a service agreement) or combined. Generally, contracts should be combined. This practice avoids discrepancies between the two agreements. Such discrepancies can be particularly problematic when the termination provisions are not carefully compared or tied together, creating the potential for one of the agreements to be terminated while the other continues in force and effect.

Term and termination:

Because of the high cost of a WTE project, third-party financing (whether from public bonds, private equity, or a lender) is almost always required. Such financing will be difficult, if not impossible, to obtain unless the term of the contract is sufficiently long to ensure repayment of the capital costs. Further, if the contract can be terminated easily by either party, the project will be difficult to finance. Thus, the remedy for a breach of most contractual provisions will likely have to be limited to damages, not termination of the contract. Contracts typically run between twenty and forty years.

Allocation of revenue and costs:

Revenue allocations can be as simple or as complicated as the parties care to make them. Revenues can come from many sources, including sale of electricity or fuel, sale of recyclables (either removed from the waste stream prior to conversion, or removed from the slag or ash following the conversion process), sale of slag (if the market is "real" and the slag meets regulatory requirements), sale of environmental attributes, federal incentives (such as tax credits and/or grants), and tipping and/or processing fees. Costs can come from capital expenses, pretreatment of waste, treatment of resulting fuel and/or slag to meet a buyer's specifications, debt service, operation and maintenance, permitting, insurance, and regulatory compliance (and future changes in regulations). Not only must the revenues and costs be allocated between the parties, but the risks associated with unforeseen changes (both positive and negative) in each must be allocated. Note that public entities are typically more risk averse than are private entities, and the revenue allocations should reflect that reality.

Included in this analysis is whether the landfill wants to be a part owner of the WTE/WTF facility and share in the risks and profits based on the market forces or whether it

would prefer to lease its land and sell its waste stream in exchange for a set rent or some royalty, or some hybrid between these two alternatives. The outcome of that risk management decision will depend primarily upon the risk taking appetite of the landfill owner. Cities are invariably more conservative and, in many states, are legally constrained from entering into certain types of corporate arrangements with private parties. Private landfill owners, on the other hand, often hate to be left out of the action.

Environmental Attributes:

Environmental attributes merit some additional discussion; specifically RECs and carbon credits (CO_2e) credits).

RECs are a statutory creation. Thirty states have renewable portfolio standards which provide that RECs can be bought and sold. Only nineteen of those states explicitly recognize WTE as an eligible technology for generating RECs. Several of the remaining states, Texas included, allow only biogenic waste to be eligible for RECs. In those states, in the absence of a change in laws or more explicit regulatory guidance, only the portion of the waste stream that is biogenic would potentially be eligible for RECs.

CO_2e credits are sold both on the voluntary market, and in some areas with mandatory cap-and-trade programs, on a regulated market. I am only aware of one WTE facility in the United States that, to date, has been awarded CO_2e credits.

The revenue streams from environmental attributes are likely not significant at this time, and are not likely to be embraced at a federal level by this Congress. Nonetheless, we strongly recommend that you reserve the right to some percentage of these environmental attributes because in the next twenty to forty years they may grow significantly in value.

We offer one last caveat about environmental attributes. Keep in mind that your landfill will have the same opportunity to generate some amount of RECs and CO_2e credits from landfill-gas-to-energy/greenhouse gas (LFGTE/GHG) emission reductions and would not have to share them with the WTE facility. This fact should be taken into account in your calculus and in your negotiations, although, the reduction in CO_2e from WTE facilities is multiples of the reduction from LFGTE facilities.

End of Term:

Rights of the parties at the end of the contract and any extensions will also need to be addressed. In situations where the facility is located on a landfill, the issue of who will own the facility at the end of the contract arises. If the facility is no longer usable, who will be responsible for the removal of the facility and who will be entitled to any salvage value? What if the site needs to be remediated for contamination? The obvious point is that the landfill needs to be sure that it has some type of financial assurance mechanism in place, including guarantees by an appropriate guarantor or by bonds or by insurance. A general indemnification clause to require remediation due to the operation of the WTE is also worthwhile.

Waste Stream Requirements

WTE/WTF vendors approach landfills because landfills have access to existing, reliable waste streams. This is particularly important because WTE/WTF facilities typically run 24 hours per day, 7 days per week. A WTE/WTF vendor will be interested in the extent to which the landfill can continue to guarantee a waste stream that will support its project. A vendor may request a "flow control ordinance." A flow control ordinance is a local law that requires all waste within a local jurisdiction be directed to a specific facility. If the facility is owned by a City, this can potentially be handled through franchise agreements instead of an ordinance.

The enforceability of such ordinances has been the topic of much recent debate. Until a 2007 U.S. Supreme Court Decision known as *United Haulers*, the conventional wisdom and established case law generally held that flow control ordinances were unconstitutional under the "dormant" commerce clause of the U.S. Constitution. However, following *United Haulers*, it appears that, if the facility receiving the waste is owned and operated by a public entity, the ordinance may be constitutional. Another case, *Rockland County vs. Carbone*, in which the owner is a public entity but the operator is a private entity, is working its way through the courts, and may stretch the law so as to allow a private entity to be the operator of a publicly-owned facility. In yet another case, the City of Dallas passed a flow control ordinance, but the federal district court granted an injunction prohibiting Dallas from enforcing its ordinance until the final case is decided. Dallas has appealed.

If a flow control ordinance is deemed necessary for a particular project to be viable, the parties should carefully review this still developing area of the law, carefully craft the ordinance, and support any such law with analyses and studies.

Permitting Requirements

Each state's permitting requirements are different, but generally, the facility will require the same permits that any facility that handles waste requires (*i.e.*, stormwater and wastewater discharge permits, zoning and site plan approvals, etc.). While all permits can have their own set of nuances, for a WTE/WTF facility, the solid waste permit (to handle, store, and/or process waste), and a permit for air emissions merit some particular discussion.

Solid waste permitting:

The state may treat a proposed WTE/WTF facility in any number of ways. In Texas, WTE facilities have historically been treated as processing facilities, similar to transfer stations, and are required to show how they will process waste, and include limits on the storage times and amounts for the incoming waste and the residuals at the end of the process. In short, it is the waste handling that is regulated, not the process for converting the waste. One interesting nuance in Texas, is that processing facilities that beneficially recover greater than 10% of the waste stream, as would any WTE/WTF facility, can obtain a registration without the risk of undergoing a contested case hearing for the solid waste authorization.

Depending on the novelty of the technology that is proposed, a state may choose to treat the facility as an innovative technology, and require pilot testing and possibly even third-party oversight before granting a full-scale permit.

States often have relaxed permitting requirements for facilities that are located inside the permit boundary of a landfill. This is because landfills are tightly regulated and the landfill would also be required to modify its permit to account for the addition of the WTE/WTF facility.

Not every state follows the Texas model. State-level permitting and siting requirements for WTE/WTF facilities can vary from easy to very difficult. In addition, some states have delegated authority to political subdivisions of the state to impose separate and more stringent siting restrictions than the state-level requirements. It is important to thoroughly consider the host state's regulatory environment.

Air Permitting:

An air permit is generally the key permit that must be secured for a facility, and the requirements are highly project specific. The type of permit needed will depend on the emission rates and whether the area is an "attainment" or "non-attainment" area. Emissions, in turn, will depend not only on the process and technology chosen, but also on the characteristics of the waste stream and the volume of the throughput processed. Most air permits, except those for relatively small emission sources, provide an opportunity for public notice and, in Texas, a contested case hearing.

One of the attractions of WTF facilities over WTE facilities is the vendors' claim that the process has no air emissions. Regulators may view such a claim skeptically. Although the claim is theoretically true, regulators are likely to ask the applicant to prove that there are no fugitive emissions at levels that require a separate permit. Further, while the claim may be true of the process to convert the waste into fuel, the resulting fuel will likely require some cleaning or treatment to be saleable, and that treatment process will likely have regulated emissions. If instead, the fuel is converted to electricity, in either a boiler or turbine, the combustion process will have regulated emissions. Finally, once the waste or fuel is converted to energy, emissions from the boiler or turbine will be regulated.

If a WTE facility includes combustion on site, the facility will be considered a "major source" if it emits or has the potential to emit listed pollutants over certain quantities. Those thresholds, and the stringency and complexity of the associated permit, may depend on many factors, including the throughput of the proposed facility, the percentage of fuel that is derived from MSW, and whether the facility is proposed to be located in an attainment or non-attainment area.

SUMMARY

WTE/WTF technologies are generally considered technologically viable methods of disposing of MSW. Mass-burn and RDF facilities are profitably operating commercially today, at least in areas where disposal costs and land costs are high. Before embarking on such a project, the city or private enterprise has a considerable amount of due diligence to undertake, including: evaluating the technology, evaluating the operation of that technology somewhere in the world, working with regulators in the state to understand the permitting issues associated with that technology, and evaluating the business components that will need to be addressed in the contracts between itself and the primary vendor and various contractors, and finally permitting the facility. While not easy, this due diligence is essential to prevent a very costly mistake.

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Section Two

Power Purchase Agreements

by Geoffrey Gay

POWER PURCHASE AGREEMENTS FOR ENERGY

A Power Purchase Agreement ("PPA") secures the payment stream for an independent power plant. It is between the purchaser, often a state-owned electric utility, and a privately-owned power provider. PPAs may have special issues when the power is being sold in a deregulated market, such as Texas. A PPA will determine the obligations related to the sale and purchase of the power generated, as well as the output, operation, and maintenance specifications for the power plant. The producer will agree to make available to the purchaser the contracted capacity of energy and deliver the energy in accordance with the PPA. PPAs are long-term agreements, typically for 20 years, but anything from 15 years through the life of a generation asset could be appropriate.

In typical markets, the charging mechanism in the PPA is a pass-through arrangement. The price consists of an availability charge to cover the producer's fixed costs and return on equity, as well as a variable charge to cover variable costs. The availability charge relates to the availability of the power plant, and the variable charge is calculated according to the quantity of power supplied. In deregulated, competitive markets, project developers, owners and purchasers are using the price of natural gas, which is at a historically aberrant low and relatively stable level to establish the economic viability of generation projects.

The following discussion will address key terms of renewable PPAs in general, as well as those specifically relating to waste-to-energy projects. For this discussion, assume that the buyer is a municipality, and the seller is an independent power producer.

Tension between buyer and seller[1]

As parties approach the negotiation process, both should engage in the identification of risks and seek contract language that will mitigate risk. Assuming that due diligence has already assured that the technology on which the generation is based has a proven track record and that counter-parties are credit worthy, a municipality should desire contract language that includes: development and construction milestones; delay damages for failure to meet specific milestones; guaranteed commercial operation date ("COD") based on subjective standards; guaranteed capacity factor; liquidated damages if the project achieves its COD with less capacity than promised; and delivery of energy to a specific point. This is not an exhaustive list as will be clear from the discussion that follows.

A purchasing municipality should anticipate that the seller will, at a minimum, seek terms that: provide force majeure protections; limit damages for delay; contain a dispute resolution process; include take or pay provisions; include specific terms and damages for early termination or breach of contract; and establish conditions precedent to seller's fulfillment of obligations, such as: execution of leases and rights-of-way, receipt of permits, and receipt of financing.

Performance Guarantees[1]

A seller will usually seek very broad force majeure provisions and generally argue for an "as available" product, with no liquidated damages. The purchasing municipality needs delivery of the agreed upon portion of the energy output. Failure of delivery will likely precipitate the buyer having to make spot market purchases and should desire contract language that requires liquidated damages to cover the cost of replacement energy. There are two types of performance guarantees frequently used in PPAs. The first is based on a mechanical definition. For example, the parties can contract for a specific capacity factor expressed as a percentage. If mechanical availability falls below the guaranteed percentage, the seller will pay the buyer liquidated damages based on the shortfall in megawatt hours ("MWhs"). A mechanical guarantee can include any number of plant operational characteristics.

The second form of guarantee is expressed via minimum output standards which may vary with seasons or time-of-day. Generally speaking, an output guarantee is expressed as total MWhs to be provided on an annual basis. If there is a shortage in the output, the seller may be liable to make the buyer whole for the cost of replacement power or the shortage could be considered an event of default.

The seller may want a "test period" prior to the COD to define output for purposes of a guarantee. The municipal buyer will want to carefully define objective criteria for the test period and may want to condition acceptance on certification by an independent consultant.[2]

Also, the seller may want the PPA to define offsets to a particular output commitment that includes energy lost through force majeure, energy curtailed by governmental action, and energy that cannot be delivered because of buyer's breach.

Terms for Supply[3]

The PPA should contain terms that define which party is responsible for fuel procurement. The responsibility for feedstock is usually the seller's responsibility, but a municipality that owns its own landfill and garbage delivery vehicles may want to assume some portion of the responsibility for fuel supply. The terms, particularly with waste-to-energy projects, should specify allowed types, quantities, and size of fuel. A municipality may want to require seller to hire an independent consultant to keep the project in compliance with regard to fuel issues.

Terms for Delivery and Metering[3]

The PPA should identify when title to the energy passes, if ever, and when the risk of energy loss passes from the seller to buyer. The risk of line losses is associated with the designated point of delivery. The seller will likely prefer delivery to the transmission grid. The buyer will likely prefer delivery to the nearest substation.

Termination[4]

Most PPAs will contain terms that allow early termination of the agreement. Termination by either party prior to COD if certain conditions precedent are not met (*i.e.*, financing is denied, regulatory approval cannot be obtained, the intended site becomes unavailable or falls into a non-attainment zone, or transmission access becomes too remote) should be addressed. The agreement needs to define notice requirements and specify what happens in the event of termination. Are the assets to be transferred? To whom and how will the price be calculated?[2]

NOTE: Damages for early termination (or default) of a PPA are guided by an Edison Electric Institute Model agreement that calls for the injured party to be made whole. Both parties are expected to mitigate damages. Generally speaking, if a buyer terminates the agreement, the seller may liquidate the energy obligation remaining under the contract in the current market and the terminating buyer will be liable for the difference between the price in the terminated agreement and the market price the seller obtains for the energy the buyer was obligated to take, plus administrative and legal costs.

Project Operation Terms[2]

Most PPAs will include project operation terms, including scheduled outages and maintenance outages, operation and maintenance, emergencies, and accounting and records.

Financial Assurance[1]

Most PPAs have a term requiring the seller to provide credit support. This could be a guaranty, letter of credit, cash, or a second lien on project assets.

Renewable Energy Credits ("RECs") And Other Environmental Benefits[1]

RECs are sometimes referred to as tradable renewable certificates. One MWh of renewable energy equals one MWh of RECs. Which party has the right to sell the REC or be entitled to future environmental benefits (*i.e.,* carbon offset credits)? RECs are frequently bundled with the sale of energy. The PPA should address whether the municipal purchaser of renewable energy is entitled to the associated REC (which can be sold to offset the price of the renewable power). The seller is usually obligated by the PPA to obtain the necessary permits associated with RECs.[3]

Choice of Law[1]

PPA terms should specify venue and address mandatory arbitration and other dispute resolution avenues. The parties may want clauses that allow requests for immediate injunctive relief to preserve the status quo and avoid irreparable harm. With regard to potential technical disputes (*i.e.,* has the project achieved COD, is the accounting proper and reasonable, is the project achieving maximum operational efficiency), the PPA may include a process for selection of an independent subject matter expert to resolve the dispute.

Restrictions on Assignment[1]

PPAs often will have terms for restrictions on assignments of collateral or assignment of the PPA to another buyer. If consent is required for assignment, terms should clearly state the standards for approval. Seller is often not allowed to sell the facility, or is required to give the right of first offer to the purchaser.

Option for Purchaser to Purchase Facility[3]

Some PPAs will have terms allowing the government entity purchaser to purchase the facility at the end of the term. This is usually based on the fair market value as defined in the PPA.

Potential Ancillary Agreements[7]

A PPA may reference or attach several ancillary agreements, particularly in situations that cover construction of the facility that will generate the electricity to be supplied to the purchaser. These may include: security agreements; facility lease and construction agreements; warranties, maintenance and service agreements; transmission and operating agreements; and REC sale and purchase agreements.

Project Financing[6]

For projects to be constructed, the PPA may include (possibly in an ancillary agreement) details on the sources of finances (*i.e.*, debt, equity, tax equity, federal incentives or public/private partnerships) which may create a basis for termination if not fulfilled.

Options for Allocating the Risk of Curtailment[1]

Curtailment or undeliverability of contract energy could occur because of a transmission line loss or because an ISO has to solve transmission congestion by ordering certain generation plants to curtail production. The seller will want to shift the risk of curtailment to the buyer and treat the curtailed energy as if actually generated. The negotiated PPA may split the risk and associated cost between the parties or allow the curtailed energy to count toward output or capacity factor guarantees.

Default and Cure[1]

The PPA needs to specify what constitutes an event of default and the time period in which a default can be cured. The non-defaulting party may terminate the agreement and seek damages which are usually limited to direct damages and exclude punitive, consequential, and incidental damages. The agreement should clarify whether lost tax credits and other environmental benefits are included in direct damages. A damage formula should be clearly defined. Terms may specify that lenders or other third parties can cure a seller's default.

Attached as Exhibit A is a model that illustrates how a PPA would flow, and how the items addressed herein would be dealt with in a contract.

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CONTENTS OF A MODEL POWER PURCHASE AGREEMENT

Recitals

Definitions Be thorough and specific. May include: Acceptance test, Actual Output, Allowed Capacity, Ancillary Services, Annual Adjusted Energy, Annual Contract Energy, As-Available Energy, Average Annual Energy, Balancing Energy, Bankruptcy Proceeding, Business Day, Capacity, Commercial Operations, Change-in-Law, Confidential Information, Construction Milestones, Construction Start Date, Contract Price, Default, Delay Damages, Effective Date, Energy, Energy Payment, Energy Cost Adjustment Clause, Environmental Credits, Event of Default, Evergreen Period, Excess Energy, Facility, Facility Debt, Facility Lender, Financing Documents, Force Majeure, Forced Outage, Gains, Good Engineering Practices, Governmental Authority, Guaranty, Indemnified Losses, Independent Evaluation, Initial In-Service Date, Interconnection Facilities, Late Payment, Law, Local Congestion Management, Losses, Monthly Payment Amount, Non-appealable Order, Performance Standards, Permit Application Filing Date, Permits, Point of Interconnection, Points of Delivery, Prime Rate, Power Curve, Public Utility Commission (PUC), Purchased Energy, Receiving Party, Regulated Delivery Service Charges, Renewable Portfolio Standards (RPS), Security Funds, Settlement Interval Site, Tariff, Term, Termination Date, Termination Notice, Termination Payment, Transfer Date, Transmission Losses, Transmission Service, Unaccounted for Energy, Waiver Agreement

Also, include Principles of Interpretation: Does reference to a document include all schedules, exhibits and attachments as may be amended? Does use of the singular include the plural?

Term Define Basic Term. May want to include a provision for survival of terms and conditions after termination until final settlement.

Exhibits This section should incorporate Exhibits and Ancillary Agreements into this PPA by reference.

Facility Description Seller shall construct, operate, and maintain the facility, more completely described, including equipment and components in Exhibit A. Include a paragraph that locates and describes the site. Include provisions that obligate the seller to design and construct the facility in a professional manner according to Good Utility Industry Practices.

Construction Milestones and Guarantees	If the supply agreement depends upon construction of a generation facility, construction and operational milestones should be identified and guaranteed by liquidated damages.
Credit Assurance & Financial Guaranty	Bonds or letters of credit may be required as part of a guarantee of certain events or milestones. Sometimes there will be a mutual guarantee of credit worthiness. A failure to provide credit assurance may become a condition of default.
Interconnection & Metering	Provisions in this section should obligate the seller to enter into an Interconnection Facilities Agreement with grid and transmission operators, as may be appropriate, and require installation of reliable metering devices.
Obligation to Sell & Purchase Energy Output	Provisions should include conditional purchases tied to achieving completion by a date certain subject to Force Majeure or Buyer delay. The amount of energy to be purchased (any or all or a fixed value) should be specified along with the point(s) of delivery. The party entitled to RECs or environmental benefits should be specified.
Pricing	Separate components for capacity, energy, and ancillary services may be specified.
Billing and Payments	Provisions should cover the timing and form of invoices based on metered data available to buyer. Payment dates, late payments, disputed charges, offsets, and audit rights should be addressed.
Operations and Maintenance	Provisions may identify conditions precedent to the facility completion date and obligate seller to maintain the facility in a manner consistent with interconnection agreements, Good Utility Industry Practice, and all applicable laws and rules. Maintenance schedules, outage expectations, and capacity factors should be defined. Provisions should require seller to maintain an operations log that is available to buyer and a requirement that seller provides buyer with regular reports.
Default and Termination	Provisions should define events of default of seller, events of default by buyer, and termination for cause. There should also be a provision excluding consideration of consequential damages.
Early Termination (for convenience)	This section should prescribe notice necessary for early termination and how damages are to be calculated between the contract price over the remaining term and the market price. Parties should be mutually obligated to mitigate damages. Consequential and punitive damages should be precluded.

Damages	The industry standard is defined in a model Edison Electric Institute ("EEI") Agreement that calls for the injured party to be made whole by recovering the differential between the contract price for energy and the market price at the time of default or termination. The Agreement may specify specific price per kW values for termination prior to commercial operation and post-commercial operation.
Indemnification	The seller should indemnify the purchaser against any and all liabilities, etc. arising out of or attributable to location, construction, interconnection, or operation of seller's facilities.
Insurance	Seller may be required to maintain general liability insurance with respect to seller's facilities, operations, etc. Purchaser may demand to be listed as an additional insured.
Assignment	May want to preclude assignment without prior written consent and possibly allow seller to assign benefits and rights, but not its obligations to buyer.
Force Majeure	Define events that constitute *force majeure* and possibly define what it does not include.
Warranties and Representations	If the PPA involves construction of a generation facility, the PPA or an attached ancillary agreement should cover warranties and representations related to plant equipment and operations. Generally, each party will represent and warrant that they have the right, power and authority to execute, deliver and perform the contract obligations.
Dispute Resolution	This section should obligate the parties to good faith negotiations, and then set out dispute resolution procedures that will hopefully avoid litigation.
Notices	The PPA will identify specific individuals for each party to receive notices required by the Agreement.
Miscellaneous	The Miscellaneous section may address matters of contract interpretation, future amendments, governing law, severability, environmental credits and other matters.

Geoffrey M. Gay

Partner and head of the Firm's Energy and Utility Practice Group, Geoffrey Gay focuses on representation of municipalities. He is General Counsel to Texas Coalition for Affordable Power and several coalitions of cities that participate in administrative, court, and legislative proceedings involving natural gas and electric rates. He served as Assistant Attorney General for the State of Texas and Director of the Office of Public Utility Counsel, a state agency charged with representing residential and small commercial ratepayers. He has been recognized as a Texas Super Lawyer and listed by Chambers USA as a Leading Individual for Energy State Regulatory & Litigation, for both Electricity and Oil and Gas. He has been included in Best Lawyers in America for twenty years. He received a B.A. from Emory University, an M.A. from Rice University, and a J.D. from University of Houston.

Section Three

Other Energy Options for Municipalities

Understanding Rate Structure

Electric accounts of municipalities are served under multiple tariffs which may include: small and large commercial, water pumping, outdoor lighting or security lighting, street lighting and perhaps emergency services. Since different tariffs for different customer classes have different rates, it is important to occasionally perform audits to ensure that each municipal account is served under the correct and least costly tariff.

Many commercial accounts include demand ratchets which impose a consistent monthly charge based upon the highest usage month in a twelve-month period. Demand ratchets can be particularly onerous for water pumps and emergency sirens which may be used only sporadically. For water pumps that are only used during peak or emergency needs, this means that there will be a significant monthly charge despite the fact that during the majority of the year there is little or no electricity consumed at a particular meter. It may be prudent for municipalities to participate in administrative and legislative efforts to limit or eliminate the application of demand ratchets to electric accounts that are necessary for public purposes.

Many distribution electric utilities now assess penalties for electric motor inefficiencies through power factor provisions in tariffs. An electric account with a low power factor motor requires more current than a motor with a high power factor for the same amount of useful power. The higher currents associated with low power factor motors increase losses of energy on the distribution system in comparison to more efficient high load factor machines. Many machines can be retrofitted to increase load factor and eliminate load factor penalties. In most situations, it will be more cost effective for municipalities to retrofit municipal machines than to continue to pay load factor penalties.

Energy Conservation

Between April 16, 2008 and late May of that year, the City of Juneau, Alaska cut its consumption of electricity by 40%. Of course this drastic drop was precipitated by a dramatic increase in the price per kWh from about 11 cents to 52.5 cents caused by a transmission line loss that necessitated a shift from inexpensive hydro generation to expensive diesel generation. However, it does illustrate that when prices skyrocket most of us discover that we can get by with much less electricity. For municipalities facing difficulties in budgeting, it might be prudent to reduce consumption of electricity prior to a commodity price emergency. That may present a call to investigate whether the distribution utility serving the city offers financial reward for voluntary load reductions during peak usage periods. It may also suggest that there is wisdom in replacing inefficient lighting throughout city-owned buildings and transitioning to light emitting diode (“LED”) street lighting.

Aggregation

Aggregation involves the joining of two or more electric customers into a single purchasing unit. By pooling their electric load, the aggregation members can purchase a greater quantity of electricity under a common contract, hopefully, under better terms and at a lower price than could be achieved by any individual member acting alone. In states that have

deregulated their electric market, cities should be allowed to aggregate their load. In Texas, 162 political subdivisions (mostly cities) have become members of a political subdivision corporation, Texas Coalition for Affordable Power ("TCAP"), that aggregates approximately 16,000 electric accounts with consumption of around 1.3 billion kWh annually under a common contract. As a large non-profit corporation with economic and political clout, TCAP can monitor, participate in and influence regulatory and legislative activities that impact regulated and deregulated electric markets in Texas.

Light Emitting Diode (LED) Street Lights

How significant is the consumption of electricity associated with street lighting? National Geographic reported in January 2011 that the Clinton Climate Initiative states that worldwide usage accounts for 159 terawatt hours, enough to require the annual output of thirty-six 500 MW power plants.[2] The experience of TCAP indicates that as much as 50% of the annual budget for electricity is associated with street light usage. However, National Geographic says that in some cities, "street lights command upwards of 60 percent of municipal electric spending."[3]

If LED lighting could cut electric consumption of street lighting fixtures in half, it should logically follow that cities could realize significant savings in annual expenditures for electricity. Recent studies suggest that reduced consumption of around 50% with LED street lighting is possible. In June 2012, it was reported that a global trial of LED street lights (in 12 cities, including New York, London, Hong Kong, Toronto, and Sydney) led to the conclusion that such fixtures can deliver electricity savings up to 85% over incumbent technologies. Twenty of 27 products tested yielded savings of 50% or more.[4]

The Bureau of Street Lighting for the City of Los Angeles - Department of Public Works indicates on its website (www.ci.la.ca.us/bsl/) that it has started to replace existing modern street light fixtures with LED units. The Bureau predicts that the "program will save energy by 40%, approximately 40,500 tons of carbon emissions per year and reduce maintenance of the City's street lighting system."

The City of Seattle posted on its website on June 18, 2012 that the U.S. Conference of Mayors at its annual meeting in Orlando adopted Seattle Mayor Mike McGinn's resolution endorsing the nationwide use of LED street lights. Seattle was apparently selected by the U.S. Department of Energy in April 2010 to lead a national effort to promote the installation of LED street lights.

While there seems to be strong evidence that LED lighting will save energy, it is less clear that the technology will save cities money in the near term. The immediate significant problem for cities contemplating a transition to LED street lighting is that many, if not most, street lighting accounts are not metered. Significantly reduced street lighting consumption may

[2] "Tough Road to Getting LED Lights on the Street," National Geographic Daily News, January 20, 2011.
[3] *Ibid*.
[4] *See* LightSavers Report, "Lighting the Clean Revolution: The Rise of LED Street Lighting and What it Means for Cities," at www.TheCleanRevolution.org.

not save a penny, unless and until the local distribution electric utility serving cities interested in transitioning to LED lighting begins to meter street lighting accounts or adopts revised rate tariffs that lowers the rate from what has historically been charged to mercury or sodium vapor fixtures.

The Department of Energy sponsors a Municipal Solid-State Street Lighting Consortium with the objective of sharing technical information, product evaluations, and experiences related to LED street and area lighting. Any city considering transitioning to LED street lighting would be wise to join.

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