



6. Evaluating and Working with Project Partners

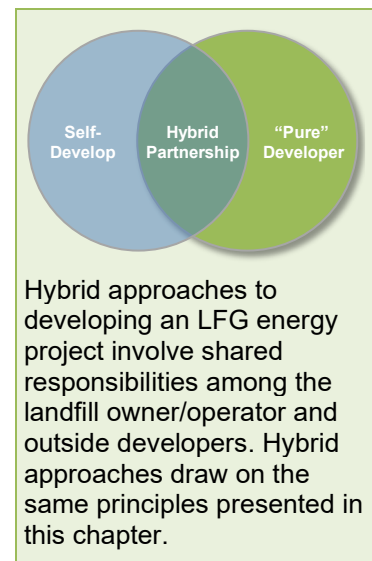
Successful landfill gas (LFG) energy projects involve the contributions of landfill owners, project developers, energy end users and other project partners. This chapter outlines how landfill owners can find and evaluate project partners and discusses the roles of each partner during project development. This discussion covers projects that are “self-developed” by the landfill owner and “pure developer” projects that use an outside energy project developer. The chapter also discusses LFG energy project partnering from an end user’s perspective, focusing on considerations and evaluation techniques that end users may wish to consider before selecting partners and entering into agreements.

6.1 Approaches to Project Development

Once the decision is made to initiate an LFG energy project, the next step is to decide who develops, manages and operates the project. One of two primary models is typically followed in structuring the development, ownership and operation of an LFG energy project:

- **Use an Outside (“Pure”) Project Developer:** An outside project developer can finance, construct, own and/or operate the LFG energy project.
- **Self-Develop:** A landfill owner or operator can self-develop the project and operate the LFG energy project with landfill personnel. The landfill owner directly hires individual consultants and contractors to fulfill each role that the landfill personnel cannot perform themselves.

As shown in Figure 6-1, there are several key questions that should be considered when making the determination to self-develop or to secure an outside “pure” project developer. Before the decision is made, landfill owners should carefully assess their willingness and expertise to undertake each of the steps to self-develop an LFG energy project and evaluate their tolerance for risk.



In all cases, the landfill owner, energy end user and LFG energy project owner will need assistance from outside partners, which typically include consulting engineers, lawyers, contractors, regulatory and planning agencies, community members and financial professionals. The involvement of multiple partners helps to ensure timely development of an LFG energy project that is financially feasible and benefits the environment and the local community.



For a full list of Landfill Methane Outreach Program (LMOP) Partners, see the [LMOP website](#). Contact information for and descriptions of these organizations are provided, including services offered by Partners in the industry sector.

Figure 6-1. Considerations for Selecting the Project Development Approach



Decision Factors

In deciding whether to seek a project developer, the landfill owner should consider economics, technical expertise available to the landfill and the level of risk the landfill is willing to accept.

Economics. Significant capital (upfront) costs are required to design, build and operate an LFG energy project. An economic feasibility study is prepared to determine whether the landfill owner has enough capital available. Results of this study are evaluated for capital needs, internal rate of return (IRR) and other financial needs. The landfill owner considers available capital and financing options (such as private financing or municipal bonds) to determine whether sufficient funding is available or can be obtained. If the landfill chooses to hire a developer, the developer would obtain the funding.



For more information about economic feasibility studies and financing, see [Chapter 4](#).

Expertise. To develop an LFG energy project, landfill owners will need to interact with partners who have a variety of specialized technical, financial or legal expertise. One way to improve this interaction is to use a qualified project manager. A qualified project manager knows the landfill owner's operating and financial constraints, has the expertise and authority to direct work on the project and must be able to make a significant time commitment to managing the project for a long period (often up to 2 years). If a landfill owner does not have a project manager on staff, then they should consider contracting for an outside project manager or hiring a project developer to perform this task.

Landfill owners might need to seek the expertise of consultants and contractors to design, build and operate LFG energy projects, especially if they plan to self-develop. A consultant can give landfill owners technical assistance on the design and technical recommendations regarding state and federal regulations and operation of the wellfield and energy project. Contractors can provide advice on how to build the LFG energy project, but their main responsibility is construction of the facility. After construction, a contractor, operation and maintenance (O&M) vendor or consultant can operate the LFG energy project if the landfill owner decides not to operate the project using landfill personnel.

Risk Level. The amount of risk that the landfill owner is willing to accept is an important factor in deciding whether to self-develop the LFG energy project or seek a project developer who will assume much of the risk. Table 6-1 lists types of risks involved in LFG energy projects.

Table 6-1. Types of Risks for LFG Energy Projects

Construction	<ul style="list-style-type: none"> ▪ Cost over-run ▪ Project delays ▪ Failure of plant to meet performance criteria ▪ Weather and seasonal implications ▪ Work warranties
Equipment	<ul style="list-style-type: none"> ▪ Mechanical failures ▪ Not meeting specifications ▪ Not meeting emission requirements ▪ Not configured for the corrosiveness of LFG
O&M	<ul style="list-style-type: none"> ▪ LFG quantity/quality issues from improper long-term wellfield maintenance
Permitting	<ul style="list-style-type: none"> ▪ Excessive permit conditions or right-of-way issues ▪ Public comments on draft permits ▪ Non-approval of interconnection for electricity or pipeline projects
Financial Performance	<ul style="list-style-type: none"> ▪ Not having enough LFG ▪ Maintenance downtime ▪ Operation cost over-run ▪ Project financing ▪ Labor and material costs ▪ Regulatory exposures ▪ Credit value or offtake agreement uncertainty ▪ Low pricing for energy commodities

Advantages of the Pure Developer or Hybrid Approach. Selecting a developer to manage, own, finance and operate the LFG energy project reduces risks for a landfill owner. The developer also incurs the cost associated with an LFG energy project, so there is no net cost to the landfill owner. Other reasons for selecting a project developer are:

- The project developer’s skills and experience may bring a project online faster.
- The developer may have numerous other LFG energy projects, which may reduce capital and O&M costs through economies of scale.
- The developer may invest equity or have access to financing.
- The developer might possess a power sales agreement (PSA) that was previously negotiated with a nearby electric utility.
- Bringing on a developer can simplify the project development process for the landfill owner, requiring less landfill staff time and expertise.
- In return for accepting project risks, the project developer retains ownership and control of the energy project and receives a relatively large share of the project profits. Note that developers may make decisions that tend to favor factors that increase energy revenues but not necessarily the landfill owner’s priorities, such as managing LFG migration and emissions.

A turnkey project allows for a hybrid approach. With turnkey projects, the landfill owner retains energy project ownership, but the project developer assumes the responsibility for construction risk, finances and building the facility. Once the LFG energy project is built and operating to project specifications, the

developer then transfers operation of the LFG energy project to the landfill owner. In return, the landfill owner gives the project developer a smaller portion of the project proceeds, gas rights or a long-term O&M contract. The turnkey approach can be a “win-win” approach for both the project developer and the landfill owner because the developer retains responsibility of construction, development and performance risk and the landfill owner assumes the financial performance risk.

Advantages of the Self-Development Approach. There are advantages to self-developing a project in spite of the increased risks to the landfill owner. For example, the landfill retains control and holds a larger share of the profits. In addition, developing a project may be a rewarding challenge and opportunity for landfill staff, and these projects can foster good relationships with end users, other partners and the community.

Examples

[Perdido Landfill and Gulf Power Company Electricity Project, Florida](#). In 2010, Escambia County, Florida, brought its new LFG energy project online. With \$950,000 in federal block grant funding and a large team of consultants, contractors and equipment suppliers, the County developed an expandable reciprocating engine project to sell green power to Gulf Power Company. The facility was also designed to provide educational areas for visiting school groups.

[Sioux Falls Landfill and POET Ethanol Direct-Use Project](#). In response to its growing landfill and increasing LFG flow and following a 2006 feasibility study, the city decided to pipe this valuable resource to an ethanol plant about 11 miles away for co-firing in a wood waste-fuel boiler. Since 2009, the LFG has offset about 10 percent of the plant’s natural gas usage and the city grosses approximately \$2 million in revenue annually from the sale of LFG and carbon credits. In 2019, the City and POET signed a 10-year contract extension.

The “pure” project developer, self-development and hybrid approaches have all yielded successful LFG energy projects. The key is finding the approach that is best suited to the specific landfill and other participants involved in the project.

6.2 Selecting a Project Developer (Pure Development Approach)

Finding Qualified LFG Energy Project Developers

Landfill owners who decide to employ a developer should investigate individual developers to determine which one meets their particular needs. Criteria to consider when evaluating developers’ qualifications and capabilities include:

- Previous LFG energy project experience
- A successful project track record
- Financial offer to the landfill owner
- Financial strength
- In-house resources (engineering, finance, operation), including experience with environmental compliance and community issues

Landfill owners can obtain background information on developers from annual reports, brochures, project descriptions and discussions with references such as other landfill owners and engineers. Typically, project developers and other partners provide a Statement of Qualifications (SOQ), which describes their

experience, staff qualifications and other important factors that may influence the landfill owner’s final decision.

Another method of evaluating developers for a landfill owner is issuing a Request for Proposals (RFP). Although private landfill owners do not normally issue RFPs to developers, RFPs provide a competitive and fair basis of evaluation. All the landfill owner’s requirements should be identified in the RFP, as well as information about the LFG resource. Landfill owners sometimes hire consultants to help them develop and evaluate responses to an RFP. LMOP can provide landfill owners with example RFPs and can distribute RFPs via LMOP’s email listserv.



Evaluating Developers

After the landfill owner receives proposals from various developers, the next step is to evaluate the proposals, sometimes with the assistance of a consultant. In reviewing the proposals, landfill owners typically compare SOQs, proposals or RFP responses to evaluate the developer’s expertise, technical approach, financial advantages to the landfill owner, business experience and schedule for implementation. After the proposals have been evaluated, the landfill owner selects the developer who adds the most value and begins negotiations. Various methods are available to evaluate proposals, ranging from a checklist to a ranking matrix that lists the evaluation criteria with a scoring system.

Checklist. The simplest method is a checklist that lists the RFP requirements and evaluation criteria so the landfill owner can simply check if each requirement is met. The checklist method may be sufficient for a landfill owner who considers all RFP requirements to have equal importance.

Ranking Matrix. A ranking matrix would be a better tool for completing the evaluations for a landfill owner who considers RFP requirements to vary in importance. For example, if a landfill owner has been unsuccessful in developing an LFG energy project at their facility, making sure that the developer’s approach is technically sound might be the most important factor in selecting a developer. However, the royalty paid by the developer might be the more important requirement for another landfill owner who considers an addition to the landfill’s net income to be most important. Table 6-2 presents potential evaluation criteria that landfill owners might use to evaluate an LFG energy project developer.

Table 6-2. Example Evaluation Criteria for Selecting an LFG Energy Project Developer

Project Cost	Project Experience	Project Approach
<ul style="list-style-type: none"> ▪ Capital costs ▪ O&M costs 	<ul style="list-style-type: none"> ▪ Plant design and construction experience ▪ Experience with state regulations ▪ LFG energy experience ▪ References and track record 	<ul style="list-style-type: none"> ▪ Technical approach ▪ Project feasibility (likelihood of success) ▪ Odor control and other environmental advantages or impacts

Financial Advantages	Business Considerations	Time to Implement
<ul style="list-style-type: none"> ▪ Price per MMBtu for the gas ▪ Up-front payments ▪ Revenue sharing ▪ Greenhouse gas, renewable energy or other credits ▪ Planned expenditures by the developer on the wellfield 	<ul style="list-style-type: none"> ▪ Developer or parent net worth ▪ Developer or parent annual revenue ▪ Developer-assumed LFG quality and availability risk 	<ul style="list-style-type: none"> ▪ Scheduled startup date ▪ Penalties or termination issues for missing startup date

MMBtu: Million British thermal units

O&M: operation and maintenance

6.3 Identifying Project Partners (Self-Development Approach)

Landfill owners who decide to self-develop typically partner with persons or institutions that provide assistance during the development and operation stages of the LFG energy project. These partners typically include financial partners, such as bankers and accountants; professional consultants, such as consulting engineers and lawyers; and contactors, such as equipment manufacturers and construction contractors. Under this approach, the landfill owner manages, owns and operates the LFG energy project.

The process for contracting with a partner under the self-development approach is the same as contracting with a developer for the pure developer approach. Landfill owners often issue RFPs to prospective partners. Each RFP is tailored to the type of partners and role to be performed in developing the energy project. The RFP includes the equipment the partner must supply and the services and activities each partner is required to perform. The landfill owner evaluates the proposals by reviewing the submitter's project experience, project approach and proposed cost. The specific evaluation criteria are typically customized depending on the type of partner and the specific statement of work in the RFP, but general criteria include:

- Project cost
- Project experience
- Staff qualifications
- Project approach
- Risk management
- Time frame to implement

Finally, the landfill owner uses the same methods described in "Evaluating Developers" (in Section 6.2) to review proposals and award projects to prospective partners.

6.4 Interacting with Project Partners

LFG energy project owners will contract with some or all the following types of partners during the evaluation process and during development of the LFG energy project:

- Financial
- Professional
- End users
- Contractors
- Government
- Community

Each of these partners provides financial, professional, regulatory and contracting services to make the project successful.

Financial Partners

Financial partners are persons or institutions that assist the LFG energy project owner (either the developer or the landfill owner who self-develops a project) by loaning or providing adequate finances, preparing tax credits and tracking finances associated with the LFG energy project. Typical financial partners are tax creditors, bankers and accountants. Table 6-3 describes how each one of these partners is involved in the LFG energy project.

Table 6-3. Financial Partners for LFG Energy Projects

Partner	Purpose
Tax creditor	Assists LFG energy project owners in identifying and applying for available federal, state and local tax credits.
Banker/ financier	Helps developers/landfill owners fund the LFG energy project.
Accountant	Assists LFG energy project owners by tracking the finances involved in project development. Tracks revenues for both the landfill owner and developer.
Broker/Marketer	Assists LFG energy project owners with offering environmental credits (e.g., greenhouse gas [GHG] credits, renewable energy certificates [RECs], transportation fuel credits) on the market for additional project revenue. Ensures credits comply with program requirements and provides transparency for transactions.

Even if a landfill owner uses a developer, they will still need to interact with financial partners. For example, the landfill owners might provide information on the quantity of LFG generated so that tax creditors can perform calculations needed to determine tax credits and bankers can determine whether they will make a loan.

Professional Partners

Professional partners are persons or institutions that provide legal, marketing or technical services to the LFG energy project owner. Typical professional partners for an LFG energy project are listed below and described in Table 6-4. Depending on the LFG energy project owner's in-house capabilities, professional partners may provide some or all these services:

- Engineering consultants
- Legal assistance
- Communication and public relations services

Landfills owners who use a developer will still need to interact with the professionals listed in Table 6-4. For example, landfill owners will probably need to give the consulting engineer information on landfill design and gas collection system (GCS) design, site maps and surveys and permit requirements to be sure that this information is taken into account in designing, constructing and operating the LFG energy project. Landfill owners will also interact with lawyers to be sure their interests are protected during negotiations and contract development. Landfill personnel who operate the wellfield will need to work closely with partners who operate the LFG energy project to ensure that the required amount and quality of gas are provided to the project and that applicable air regulatory requirements are met.

Table 6-4. Professional Partners for LFG Energy Projects

Partner	Purpose
Consulting engineers	<ul style="list-style-type: none"> ▪ Provide technical services to the developer or landfill owner. ▪ Can help developers prepare the proposal to the landfill owner. ▪ May assist the developer or the landfill owner in designing and constructing the LFG energy project. ▪ Can help ensure that the project is in regulatory compliance.
Lawyers	<ul style="list-style-type: none"> ▪ Draft and review a wide range of contracts (e.g., contracts protecting the LFG energy project owner from liability, contracts between a developer and the landfill owner, contracts between the LFG energy project owner and the energy end user and contracts with other consultants or contractors). ▪ Review legal aspects of tax credits, project structures and other legal aspects of the work.
Communication specialists/ public relations firms	<ul style="list-style-type: none"> ▪ Can help foster interaction with community partners. ▪ Publicize the environmental benefits of the LFG energy project. ▪ Prepare educational materials about the project.

End Users

The end user is the entity that purchases the generated energy or product from the LFG energy project owner. End users may purchase: LFG (that has undergone appropriate treatment) for direct use in boilers, heaters, kilns or furnaces; treated LFG to produce electricity or as a feedstock for a chemical process; electricity that the LFG energy project owner generates from the LFG; or renewable natural gas (RNG) that is injected into a pipeline or compressed for use in vehicles.

When the end user will consume LFG or an LFG product directly, they provide the LFG energy project owner with their fuel requirements (e.g., LFG quantity, energy content, pressure and temperature), electricity requirements or RNG specifications, so that the project owner can design and operate the LFG energy project to meet the end user's needs. The end user will enter into a contract to purchase the LFG, electricity or RNG. Alternatively, an end user may enter a supply contract for a set amount of electricity or RNG but is not necessarily directly using any LFG. A close working relationship between the landfill owner, developer (if there is one) and end user should continue after the project becomes operational to ensure the success of the project. Section 6.5 provides further information on end-user perspectives.

Contractors

Contractors are partners whom the LFG energy project owner employs to implement specific activities such as constructing the facility, providing the equipment or conducting regulatory compliance testing. Table 6-5 describes the responsibilities of contractors.

Table 6-5. Contractor Partners for LFG Energy Projects

Partner	Purpose
Generator manufacturers	A developer or landfill owner approaches several manufacturers to determine which type of energy generation equipment best fits the design and operating requirements of the LFG energy project. Specifications of interest to the developer include low air emissions, low cost, operation efficiency, fuel requirements, O&M requirements and output production. As a result, generator manufacturers provide the project owner with data that show whether the equipment meets the project requirements. Based on this information, the developer selects the generator which is provided by the manufacturer.
Energy generation plant operators	Developers typically employ operators who operate and maintain the LFG energy plant. As a result, they interact with both the landfill owner and the developer. The plant operator usually records and provides the energy output data, air emission data, testing data and maintenance information to the project owner.
LFG treatment system manufacturers	Developers or landfill owners often need LFG treatment systems to filter, remove moisture or contaminants from, and compress the LFG. They approach manufacturers for design and product specification assistance. These manufacturers work with the developer, the consultant, the end user and the landfill owner to design, supply and assemble the proper equipment to treat the LFG.
Construction contractors	The developer or the landfill owner who self-develops an energy project employs the construction contractor. The contractor builds the facility. Interactions between the parties include project bidding, awarding a contract, construction activities and initial project performance evaluation (the time when the system is tested to determine if it meets project performance requirements).
Testing laboratories	Developers or landfill owners employ testing laboratories to perform any emissions testing required by regulations or permits to ensure that the energy generation equipment does not emit more than the allowable levels.
Wellfield operators	Landfill owners and developers often employ a wellfield operator to ensure that the landfill is in compliance with any air permit requirements. The wellfield operator operates and maintains the gas extraction wellfield and makes tuning adjustments necessary to efficiently collect the LFG and maintain LFG quality. After each wellfield tuning event, the wellfield operator communicates the results to both the landfill owner and developer, who need this information to meet LFG energy project operation requirements and to comply with air permits.

The landfill owner will be closely involved with contractors even if a developer constructs, owns and operates the energy project. For example, the construction contractor works on the landfill owner's property. Therefore, the contractor follows the landfill owner's rules and operational requirements. During construction, the contractor may need to interrupt daily waste placement or LFG management operations at the site; therefore, the landfill owner and contractor will be in constant communication. After project startup, the landfill owner must provide the required amount of gas to the LFG energy project, and the LFG must meet quality specifications. The landfill owner is typically responsible for air permit requirements related to LFG surface emissions. Therefore, the landfill owner must work with the wellfield operator to maintain both air permit requirements and LFG energy production needs. If there is temporarily not enough LFG, the landfill owner notifies the energy recovery project operator so that the project operator can make the proper adjustments. The project operator will also notify the landfill owner if there is a malfunction or similar issue at the facility, since this circumstance usually requires the landfill owner to use a different method to control LFG emissions (with a backup flare).

Government Partners

Regardless of whether the landfill owner chooses to hire a developer or to self-develop a project, the LFG energy project owners will need to work with various governmental partners, including regulatory and planning agencies.

Regulatory and Planning Agencies. Regulatory partners are involved to ensure that the project complies with local, state and federal regulations. They are often the partners that “make or break” a project. As a result, the LFG energy project owners and operators need to work closely with these partners to ensure success.

Regulatory and planning agencies provide regulatory guidance and the required permits to landfill and LFG energy project owners. When applications are prepared for zoning or land use permits, air permits and conditional use permits, LFG energy landfill owners or developers engage with regulatory and planning agency partners, such as:

- State environmental regulatory agencies
- State energy agencies, public utility commissions
- State or local air quality agencies or departments
- County board members
- Local solid waste planning boards
- Local economic development agencies
- Local zoning and planning departments

These partners are involved primarily during the process of siting and permitting the facility. Discussions between the LFG energy project owner and the regulatory agencies should begin early in the process to ensure that LFG energy project owners understand all the environmental and land use requirements and restrictions that will apply to the project and that the regulators’ concerns are satisfied. The project owner will need to provide information showing that the project will meet emission limits and other requirements and will need to demonstrate compliance once the project becomes operational. Each state may have different regulations and procedures for these activities. Some of these regulations and procedures can be found at the following websites:

- [LMOP’s State Agencies page](#)
- [Database of State Incentives for Renewables and Efficiency \(DSIRE\)](#)

State and local agencies can also play an active role in encouraging environmentally and economically beneficial energy projects. LFG energy projects make use of a renewable energy resource, offset fossil fuel combustion and may reduce odors and help improve local air quality. Projects can also create jobs and other economic benefits for the community; in some cases, new businesses have located near a landfill to use the gas, providing further economic benefits. In recognition of these benefits, many states have created incentives for LFG energy and other renewable energy projects. Many state energy, environmental protection and economic development agencies have partnered with LMOP to encourage LFG energy projects in their states. These [LMOP State Partners](#) can assist landfills and end users who want to develop projects.

Community Partners

Community partners are typically neighbors to the landfill, members of the public, local businesses and environmental and community organizations. It is important for LFG energy project owners to provide information to the community so that community partners understand how the LFG energy project might affect them and to help the LFG energy project owner understand and address any community concerns.

Unless there is significant opposition to the LFG energy project, community partners are mainly involved during the permitting process. LFG energy project designs should adhere to all local ordinances and zoning, and the anticipated environmental and economic benefits to the surrounding community should be clearly identified and communicated. When LFG energy project owners apply for the required permits (air and zoning permits), community members provide comments during a public comment period. During this public comment period, the community provides the LFG energy project owner or regulators with questions, concerns or opposition to (or support for) the proposed facility. Depending on the results of the public comment period, the permits are issued, modified or rejected.

LFG energy project owners can work with community organizations and the media to help the public understand the benefits of an LFG energy project and to answer environmental, cost and other questions that the community raises. Involving community groups in the planning of an LFG energy project can help ensure that the type of LFG energy project chosen is a good fit for the community and provides environmental and economic benefits to the community.

6.5 Evaluating Projects from an End User's Perspective

LFG energy end users who make contractual agreements with the project owners or project developers also have issues to consider before they enter into negotiations. End users should perform due diligence on the prospective LFG energy project owner and evaluate several aspects of the proposed project, including technical, financial and regulatory implications. End users may conduct their own research or obtain professional services from consultants who specialize in performing due diligence. Potentially, some end users may be working through a broker or fuel supplier, not directly with the project owner or developer. In any of these scenarios, end users or their representatives typically consider the following topics:

- Quality and quantity of fuel
- Reliability of fuel
- Public perception
- Time to develop the LFG energy project
- Retrofits of combustion and other equipment necessary at the end user's facility
- Effect of LFG energy project on the end user's air permit
- Equipment maintenance (such as boilers, internal combustion engines and gas turbines)
- Landfill owner and developer financial assurances
- Contractual terms

Evaluating and Negotiating with Landfill Owners and Developers. Evaluation begins with comparing the results of due diligence studies with the end user's requirements (financial goals, business objectives and project schedule). If the proposed project meets the end user's requirements, the end user begins negotiating with the landfill owner or the LFG energy project owner, as appropriate, for purchasing the LFG energy product. These negotiations may also involve lawyers, bankers, accountants and consultants. If the end user finds a discrepancy with the project requirements, the end user discusses each discrepancy with the landfill owner or developer. Depending on the degree of these discrepancies, the end user negotiates a different price, requires the discrepancy to be addressed or proposes an alternative.

Evaluating Potential Partners. End users engage in partnerships with consultants, financial professionals and lawyers. Consultants provide technical recommendations to the end user about a range of project issues, including environmental and regulatory compliance, economic *pro forma* analysis, LFG quantity and quality, energy production and equipment operation and maintenance. Financial professionals can

include bankers, tax advisors and financial planners. They may provide finances necessary to purchase the LFG, provide advice on obtaining tax credits or assist with financial planning. In addition, they help end users obtain and receive grants, loans and credits. Lawyers provide legal advice to the end user about LFG rights, contract agreements and site leases. Before entering into any contracts with project partners, end users should assess potential partners by examining their past experience with LFG energy projects, their project approaches, financial proposals and schedules. By working closely together throughout the project development process, end users and their partners will help to ensure that the LFG energy project produces environmental and economic benefits for the end user, the landfill owner and the community.