ABSTRACT

Many countries overseas, for the first time, are beginning to explore the use of waste-to-energy plants as part of their integrated solid waste management plans. They are doing this for a number of reasons, which include geopolitical and economic pressures, as well as environmental. Overseas markets are actively seeking out, and wanting to apply the advancements made by U.S. waste-to-energy companies in the last three decades. U.S. companies have made U.S. waste-to-energy plants the least costly and most efficient plants in the world. U.S. waste-to-energy companies may be poised for new business opportunity for their systems in overseas markets. However, there are many obstacles to overcome in marketing technology and waste disposal services overseas. Where are those markets of opportunity? There are three criteria which can be used to screen for potential waste-to-energy markets: 1. Living standards; 2. Limitation on land use; and, 3. Rule of law. What are the cultural, geographic and competitive obstacles in marketing overseas? Can obstacles such as language, development costs, time zone differences, institutional experience with privatization, local and foreign competitive advantages be managed or medicated? An understanding of how a global economy impacts the marketing of U.S. waste-to-energy services is essential to formulating an overseas marketing plan.

Introduction

As U.S.-based waste-to-energy companies are grappling with the continued outlook of little to no domestic growth, other countries are beginning to use waste-to-energy disposal technology for the first time. U.S. waste-to-energy companies are peppered with calls from overseas developers and government officials requesting plant information and plant tours. Requests come in from all over the world for cost information and solicitations to become equity partners in new projects. Does this signal, for U.S. waste-to-energy companies, a new opportunity to offer waste disposal services overseas? Where are the viable waste-to-energy markets, and what are the obstacles to marketing waste-to-energy services overseas? My remarks in this paper will address these and other similar questions.

Changing Global Landscape

For many, the fall of the Berlin wall signaled the beginning of a new era of global peace and a more open and dynamic world economy. While these changes have been embraced by most of the countries, governments and their domestic businesses must now be more innovative and more competitive than ever before. Ever expanding domestic budgets for infrastructure services burden a country’s businesses with new taxes, and reduce their competitiveness in the global economy. In addition, domestic pressures and international treaties have increased the liability for countries to turn a blind eye to pollution within their borders. With respect to the waste management industry, the EU Packaging Directive and EU Landfill Directive require diversion of packaging and organics, respectively from landfill by increasing amounts over the next 20 years. Failure to comply with these directives could lead to severe economic sanctions. These directives will likely revitalize the waste-to-energy industry in Europe.

In summary, geopolitical and global economic pressures have caused governments to reevaluate how infrastructure services can be more effectively and economically procured, without degradation of quality of service and the environment. Some countries, for the first time, are passing laws enabling privatization of many historically owned...
and operated, infrastructure services, such as electricity generation, drinking water and waste water services, and waste-to-energy plant ownership and operation. This is being done in an effort to gain state-of-the-art technology while lowering the cost of infrastructure services. The political events of the past ten years, and the continued emergence of a global economy, has shown the need to procure infrastructure services in a less costly way.

**Traditional Waste-to-Energy Projects**

The most common way to procure waste-to-energy plant disposal services overseas is the two-step, turnkey procurement approach. A government entity, charged with the responsibility for operation and ownership of the waste-to-energy project, would prepare a detailed plant design and performance specification for tender. The tender would be advertised, resulting in an award to a turnkey contractor. The turnkey contractor would provide the combustion technology, construction, and startup services. The procuring entity would provide the plant site, capital, landfill, waste supply, energy contract (if any), and operation personnel.

It is fair to say government waste-to-energy projects were viewed as one of many government infrastructure services, and not a business. Their goal was to provide reliable and predictable waste disposal services under any circumstances. While cost-of-service is always a factor, in the case of government owned and operated waste-to-energy plants, it often was not the deciding factor in specifying the design and performance criteria in a waste-to-energy procurement. The government’s need for reliable and predictable performance was often achieved through equipment redundancy, large operating staffs and budgets.

This procurement approach worked well for the government procuring entity and the technology/EPC contractor, resulting in reliable, effective waste-to-energy disposal services. It also resulted in the domination of the waste-to-energy market by technology suppliers, equipment manufacturers, and EPC (engineering, procurement, and construction) contractors. Unfortunately, the hidden consequence was that it did not foster lower capital and operating costs, technology innovations, or operation cost efficiencies.

**U.S. Waste-to-Energy Projects**

It is important to remember, without the ground breaking efforts of the many highly experienced European engineers, the U.S. waste-to-energy business would not have emerged or evolved as an industry. Their contributions enabled U.S. companies to move the waste-to-energy industry to a higher plateau.

The U.S. waste-to-energy market began with the two-step, turnkey procurement, and evolved into the single-step procurement process, where a single contractor is selected to design, build, own, and operate (DBOO) a waste-to-energy plant. DBOO waste-to-energy service contractors are compelled by the competitive bidding process and the allocation of risks (i.e., plant ownership) to develop the most cost competitive and efficient waste-to-energy plants, and still meet operational performance and environmental criteria profitably.

The benefits of a U.S. derived waste-to-energy plant design is just now being discovered by countries having to find more cost effective ways of employing waste-to-energy plants in their integrated solid waste management plans. Even though U.S. companies don’t have a unique waste-to-energy technology per se, they do have something more valuable: --- cost efficient plant designs, efficient operation protocols, and long-term maintenance know-how from the perspective of a business enterprise.

Compared to traditional European and Asian waste-to-energy plants, U.S. waste-to-energy industry advancements include:

- Lower plant construction costs. Less equipment redundancy is used, and a conscious effort to minimize unproductive architectural and ancillary enhancements.
- Less parasitic plant loads because less equipment is used (12% in the U.S. vs. 20% for foreign plants). This means more electricity for sale.
- Lower operation and maintenance costs per ton processed. Less equipment, less employees, and proven long-term, highly structured preventive maintenance programs are used to achieve lower repairs and maintenance costs.
• Higher equipment availability resulting in more project revenues. Plants are designed and maintained to maximize their return on investment. DBOO and DBO (design, build, and operate) contractors value-engineer every aspect of the plant, as would any cost competitive business.
• Higher temperature and pressure boilers are often used to maximize the electric output per ton of trash burned.

In summary, the method used in the U.S. to procure waste-to-energy services, and the shift of plant ownership from government to the private sector has stimulated significant waste-to-energy plant advancements. Consequently, these advancements have resulted in increased global interest for U.S. waste-to-energy technology and service.

Market Screening
The demand for U.S. style waste-to-energy plants will grow as countries transition to privatization of infrastructure services. The shift to private ownership of waste-to-energy plants with the commensurate risks and rewards will make U.S. waste-to-energy know-how valuable in the competitive market place. However, the first challenge for U.S. companies is to identify markets that are potentially viable for waste-to-energy services.

While there is intense interest overseas for advanced technologies and new business opportunities, there are few areas of the world that can realistically implement waste-to-energy technology. Waste-to-energy technology is expensive, and there are numerous institutional and business factors that have to be in place before hundreds of millions of dollars can be invested in a business venture half way across the globe. With this as a premise, there are a few basic criteria that can be used to screen markets opportunities. Potential waste-to-energy markets should meet the following criteria:

1. **Country/market must have a high standard of living.** In general, the country must have successfully addressed other high priority infrastructure services such as energy, water, food, housing, health care, education, etc. If these basic services are not adequate it is not likely there is money or the political will to pay for expensive waste-to-energy disposal services at the expense of food, water, energy and similar basic needs.

2. A simple review of the current budget for waste disposal usually tells the story. For example, if the total collection and disposal costs are $10 to $15 per ton (which is not unusual in many countries overseas) there is little money in their budget for significantly more expensive waste-to-energy disposal alternatives.

3. **The country/market has little land for land disposal.** This is a common circumstance for island governments (Singapore, Hong Kong, and Bermuda). Land constraints also occur along heavy populated coastlines — ocean on one side, people on the other, and no room for landfills. This was one of the criteria exhibited by cities along the eastern seaboard of the U.S., most of which now have waste-to-energy plants.

4. **The country/market must be founded in the “rules of law”.** Due to the long-term nature of the capital investment, the risks of ownership and operation, a country with a reputation of having a fair and unbiased court system is essential. This also applies to the enforcement of internationally recognized standards of contract law, as well as the fairness of the tendering procedures used. Without this, the risks of investment are unacceptable, and the availability of capital for the project may never materialize.

Only a handful of markets in the world meet these criteria. It is certainly possible waste-to-energy plants can and will be built in countries that do not meet these criteria. Government policy decisions can override market constraints. However, enforcement of rules and regulations causing customers to use the waste-to-energy plant are critical to the success of these projects.

It is no surprise that markets that meet all these criteria spend the largest sums of money on environmental technologies. The table below shows the amount of money spent in various global environmental markets. The U.S. is the leading market followed by Western Europe, Japan, and the
Asia deserves some further evaluation. It is a complex mix of cultures and economies. Japan has extensively employed incineration and waste-to-energy technologies as a major part of its solid waste management system. A year ago, Japan passed enabling legislation, which permits private ownership and operation of waste-to-energy plants. Clearly, Japan can be categorized as being in the first tier of environmental spending. The second tier of countries in Asia, are Singapore and Hong Kong, South Korea, and Taiwan. The third tier of countries in Asia is China, India, and Southeast Asia (e.g., Thailand, Malaysia, and Indonesia).

Overseas Market Obstacles

There are significant challenges in marketing any product or services overseas. There is the initial spadework required to develop waste-to-energy opportunities sufficiently before it warrants a yes or no decision from senior management. If senior management elects to proceed, the price tag for market entry is hundreds of millions of dollars. The obstacles are many. However, they can be categorized into two groups. First, there are the cultural and geographic challenges, such as language, local customs, and travel time. These are the obstacles we most often believe makes overseas work challenging. The second group of business obstacles is more amorphous. This group encompasses the competitive business challenges associated with overseas work and working in a global economy. This group is often not recognized or under-appreciated as significant impediments to doing business overseas.

Cultural and Geographic Obstacles: Cultural, geopolitical and social obstacles can be disruptive, but are manageable. In fact, they add to the interest, color, and challenge to working overseas.

- Language: This is the most readily identifiable challenge. The good news is English is the unofficial business language of the global economy. This makes it possible level of business anywhere in the world. The complexity occurs when even though you appear to be communicating with someone in the English language, they may have a very different understanding as to the context and content of the conversation. This sometimes comes as a painful realization during contract negotiations. It is not unusual to hear this comment: “We all agreed to it at the meeting, but when I read their draft, it was clear they agreed to something else.”
- Translations: Languages are not as precise as we would want them to be for crafting agreements. Many common English words and technical terms can not be translated one-for-one into other languages. It is not surprising to have two translations of the same document be significantly different.
- Travel Expense: There is no way to underestimate the impact this has to development budgets. Business-class airfare from the U.S. East Coast to Singapore is $6,000 or $8,000 depending on the direction. It is more expensive going through Europe; however, it takes four hours less travel time. Depending on the length of stay and degree of business entertainment, it is not unusual to spend $1,500 over a period of a week. Therefore, a one-week trip and back can cost $7,000 to $10,000.

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**THE GLOBAL ENVIRONMENT MARKET**

<table>
<thead>
<tr>
<th>Revenue ($billions)</th>
<th>2000</th>
<th>2002</th>
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<tbody>
<tr>
<td><strong>By Region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>195.7</td>
<td>201.8</td>
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<tr>
<td>Western Europe</td>
<td>148.7</td>
<td>155.0</td>
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<tr>
<td>Japan</td>
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<td>Rest of Asia</td>
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<tr>
<td>Latin America</td>
<td>11.0</td>
<td>13.7</td>
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<tr>
<td>Canada</td>
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<td>14.2</td>
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<tr>
<td>Australia/NZ</td>
<td>8.2</td>
<td>9.1</td>
</tr>
<tr>
<td>Central &amp; Eastern Europe</td>
<td>8.6</td>
<td>12.2</td>
</tr>
<tr>
<td>Middle East</td>
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</tr>
<tr>
<td>Africa</td>
<td>3.1</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>506.7</td>
<td>536.2</td>
</tr>
</tbody>
</table>

Source: Environmental Business International, Inc., San Diego, CA
• Time Zone and Jet Lag: Time zone differences can play havoc with coordination efforts with the U.S. home office, and the impact to body and mind caused by jet lag. Fatigue resulting from jet lag or from staying up late to call the home office will impact overseas business productivity.

• Local Office Support: Opening a business office can be complicated. Each country has legal requirements that must be met, depending on the nature of the business or the type of office (sales office or a registered company office). In addition, for the local office staff to be most productive they have to be familiar with both local and U.S. business practices. People with these skills can be difficult to find. A small office with a part-time secretary may cost $100,000 annually. Add a U.S. citizen (x-pat.), you can add another $200,000 a year to the office budget.

• Business Protocols: There is no shortage of reference materials available explaining the “do’s and don’ts” of the overseas business culture. The trick is to remember them all, and to incorporate them routinely during the business day.

Competitive Business Obstacles: There is nothing you can do to eliminate these obstacles. However, recognizing their impact on marketing waste-to-energy services is important in crafting a business strategy for overseas work.

• The country’s (market’s) experience with privatization: Ownership and operation of infrastructure services is usually the purview of a government agency. Overseas, governments go even further. It is not uncommon for governments to own, operate, or otherwise subsidize competitive businesses. Privatization of infrastructure services is essentially unique to the U.S. It is then understandable that when countries say they are privatizing their waste-to-energy plants, they may have a completely different view of what it means to privatize. With so little experience with private companies taking the ownership and operation risks associated with large public works projects, governments don’t have a full appreciation of what fair and reasonable commercial terms are for the service. Because the ownership and operation of infrastructure services has been historically managed by a government agency, if a problem occurred with the operation of service, or a new law was passed affecting the service, matters were worked internally. Service contract issues were not a concern. There were no service contracts. If there was a cost impact due to a change in law, for example, the government paid for it with tax dollars, or the cost impact of the change in law was passed on to users of the service.

The commercial terms of the service are, by far, the most difficult issue to address when working overseas. Few governments fully appreciate the commercial risks of a DBOO or DBO waste-to-energy project. For most governments, privatization is a new concept and they do not understand that the commercial terms of the service contract is a critical element of attracting private investment. Waste-to-energy projects are, by their nature, complex, often requiring multiple, interrelated agreements.

Making matters worse, government procurement agencies are often powerless to change evaluation procedures or accept any exceptions, or recommended changes to the documents issued in the tender. The concept of a negotiated procurement process is unheard of in most markets overseas.

• Local companies have a contracting advantage: Local companies are usually best positioned to deal with the quirks of local procurement procedures, permitting, and regulatory agencies. This is a singularly good reason to partner with a strong local partner. Unfortunately, the local partner’s willingness to accept certain business risks may be based upon relationships, rather than ability. It is not unusual to hear the local partner say, “Don’t worry, if that happens, we will work out the problem with people I know in the ministry. They will lose face if our business venture is not successful after they have selected us.” How do you take this to your Board of Directors as a reason for accepting the risk, for example, for all changes of law without the ability to raise your service price?
Business collusion as an art form: Unlike the U.S., in many countries it is not always illegal to join forces with a competitor to force another competitor out of the market. In addition, it is not folly to believe government procurement agencies have a vested interest in ensuring local companies are successful in their home country. Don't be surprised if there is a preference for selecting local firms. If you look at it from the local official's point of view, how can local companies grow to be competitive outside of their countries if they can't win work in their local economy?

Finally, U.S. firms are required to abide by the Foreign Corrupt Practices Act, and foreign competitors are not. Consequently, for U.S. firms the competitive playing field is not level.

Foreign governments actively market their country's companies overseas: Many foreign governments take an active role in promoting and funding products and services of their companies overseas. Financial support can come in the form of direct subsidies to the company or government backing of low interest loans to purchase technology or equipment from the competitor's country of origin. On capital intensive DBBO waste-to-energy projects, the financing package can determine the winner.

In addition to financial support, competitors' foreign embassies are not shy about using their local contacts to promote their domestic companies and aggressively work to diminish the standing of other companies competing for work in the market. U.S. government programs and agencies have stepped up their efforts to help U.S.-based companies by paying for feasibility studies in foreign markets. The commercial department of an embassy is usually helpful in making contacts and showing a U.S. company around the pitfalls of the local market. Nonetheless, the support system for U.S. companies can't compare with what is available for foreign competitors.

Work overseas is not foreign to foreign companies: U.S. companies have had the luxury of growing in the largest market in the world, the United States. Foreign competitors have long ago outgrown markets in their own country, and have been working overseas for hundreds of years. In general, foreign companies have the corporate support procedures, and seasoned internationally experienced and multi-lingual people to effectively pursue work outside of their countries. They are used to long-distance pursuit and management of overseas businesses.

Impatience stifles new initiatives: Patience is a virtue. It is not an attribute of U.S. companies. U.S. companies are oriented to seek out business opportunities that return investments quickly. U.S. corporate culture is focused on quarterly and yearly goals. Stockholders require it, and market analysts track it. Overseas work requires a significant development budget and time to penetrate. Few U.S. companies have the patience, budgets or corporate fortitude to make long-term commitments to markets that are high-risk and take years to show a return on investment. U.S. companies often conclude it is more prudent to stay with the largest market in the world, the United States, the market they know best.

This is not the case for foreign companies. Disclosure of business results (wins and losses) are much more closely held. As discussed above, global marketing is the norm for foreign competitors. If the foreign company is to grow, it must go beyond its borders. There is no choice.

Closer review of the list of obstacles shows that the cultural and geographical obstacles are manageable. These obstacles can be thorny, but in no way should they be viewed as a deterrent to the pursuit of business overseas. However, the list of competitive business obstacles requires more consideration and time, and needs to be factored into the overseas marketing plan for waste-to-energy. Can these obstacles be changed or neutralized with an innovative waste-to-energy marketing strategy? Can a U.S. company learn to operate and compete more like a foreign company? Or are these obstacles market risks that have to be lived with, and can not be changed or effectively managed?
Marketing U.S. Waste-to-Energy Services Overseas

If recent actions by prominent companies in the waste management and disposal industry are any indication of whether or not U.S. companies can compete overseas, the answer is no. Divestitures of international assets by BFI, and Waste Management, Inc. (WMI) shows a total pull-back from overseas business ventures.

It can be argued as to the reasons for their withdrawal, but it was not solely due to competitive obstacles overseas. Both these companies had the advantage of falling back to the United States, the largest environmental market in the world. This pull-back has left French firms such as Vivendi and Sita in a strong position overseas for DBOO and DBO (design, build, operate) waste-to-energy services. Traditional waste-to-energy grate and equipment suppliers are probing the possibility of competing in single-step waste-to-energy procurements.

Unlike the large collection and landfill companies, U.S waste-to-energy companies have no fall back option. The current U.S. waste-to-energy market will remain flat for the foreseeable future. The only growth opportunities are overseas. However, the candidate markets are few and the obstacles to business are many. Many of these obstacles cannot be changed or mitigated. Therefore, how does the industry approach the overseas markets, knowing that major waste management companies have not been successful overseas, and competitive market obstacles cannot be neutralized?

Market Strengths: It's helpful to recall how the waste-to-energy business grew in the U.S. and what U.S. waste-to-energy companies have contributed to the industry's advancement. This brief analysis is helpful when contemplating an overseas marketing approach for waste-to-energy.

European grate and boiler equipment suppliers seeded the U.S. with years of municipal waste combustion experience. U.S. companies eagerly purchased European waste-to-energy technology in the form of grates and boilers. U.S. companies then modified the technology to meet private industry's business models. U.S. companies did not import the privatized waste-to-energy business; they imported technology and equipment. The U.S. companies created the privately owned and operated waste-to-energy services as a business. The DBOO and DBO waste-to-energy services business model was home-grown in the U.S.

U.S. companies have demonstrated they know how to operate waste-to-energy plants as stand alone businesses. Cost efficiencies and superior plant performance make U.S. waste-to-energy plants the envy of overseas markets. For the most part, U. S. companies don't have equipment to sell. We do have waste-to-energy design, operation and maintenance "know-how" to transfer to new customers.

Conclusion

Our U.S. experience has shown how technology know-how can be readily transferred from one country to another. A strong argument can be made that third parties acquiring that know-how are in the best position to modify it as necessary to meet the market conditions of their respective country/market. Indigenous companies don't have to overcome the same obstacles foreign companies have to when entering into a new market. This was certainly the case in the United States when European waste-to-energy companies sold their technology in the U.S.

The number of obstacles for U.S. companies to overcome show that it is difficult to develop, win, operate and control DBO and DBOO waste-to-energy businesses overseas. Those obstacles have been described in this paper. Development costs will be high and patience is required. There is, however, a concrete opportunity to be part of the overseas waste-to-energy market. The overseas market will eventually have to do what the U.S. waste-to-energy industry has already done; learn to build and operate less costly and more efficient plants.