CALCULATED DECISIONS

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An engineer's feasibility report can help communities and financiers assess the risk of a waste conversion project.

A waste-to-energy (WTE) or waste conversion (WC) project can be one of the most complex public works projects considered by a community. Such projects should undergo a methodical feasibility assessment that seeks answers to key questions upfront. This approach provides assurance to the public and to the decision-makers that relevant issues have been explored and a resolution reached before significant resources are expended on such projects.

Those directly involved in providing an assessment of the questions noted are given a mandate by the implementing agency and the project financiers to conduct a due diligence review of all the project documents.

For example, an analysis should be undertaken of the community's existing and projected waste stream to establish the ultimate size of a single- or multiple-unit facility. Markets should be examined to confirm whether the energy and/or materials produced by this system can generate adequate revenues to offset the construction, operating and financing costs for the facility.

Feasible sites should be investigated along with an analysis of the technical, environmental and institutional requirements for permitting a facility. In addition, a risk assessment should be undertaken to help assess the associated risks facing the community with regards to technology, project ownership, operation, and financing.

A formal engineer's feasibility report, which is presented to the implementing entity and the financing entity, usually documents these activities in this phase. This initial phase ends with a go/no-go decision on the part of the community to either proceed with implementation of the project or to terminate activities for the foreseeable future.

KEY FEASIBILITY QUESTIONS

In a nutshell, decision-makers and the ultimate financing agency need to get clear answers on the following 10 major questions:

1 **Does the technology work?** Assess annual operating experience; scale-up issues; need for preprocessing of the waste stream; and reliability of disposal.

2 **What is the strength of the company providing the technology?** Assess its business strength to secure capital; its intellectual property and patent rights for the technology; patent guarantee.

3 **Does the project fit with the community's current solid-waste program?** Assess if the new system meshes with the current waste collection, recycling and disposal program; if a transfer system is needed; and if modification of the solid waste plan is necessary.

4 **Can the community provide waste supply or feedstock for the project?** Assess legal or economic flow control; whether enough waste can be provided by the community; and if waste imports are needed.

5 **What are the project's siting needs?** Assess if land is available with the proper zoning and setbacks; if needed utilities are available at a reasonable cost; and if there is public buy-in for the project.

6 **What kind of permits will be needed?** Assess air permits, local and state zoning and plan amendments.

7 **Are markets available for the products and energy?** Assess whether there is sufficient information to predict plant outputs from the technology selected; if markets exist for products (i.e., syngas, slag, compost, etc.).

8 **What are the costs?** Calculate the project's short-term and long-term economic impacts through pro forma modeling to develop accurate capital and operating costs for the project, to determine if funds are available to cover operating costs; and to determine if tipping fees are required.

9 **Will there be financing risks?** Assess the role of government agencies in the process; whether taxpayers could be on the hook for risks of loan.

10 **What happens if the facility fails?** Assess which local agency would control the solid-waste system; where waste would go if the plant had to be shut down; and who would be responsible for extra costs incurred in a system failure or extended shutdown.

DUE DILIGENCE REVIEW

Those directly involved in providing an assessment of the 10 questions noted are given a mandate by the implementing agency and the project financiers to conduct a due diligence review of all the project documents.

The mandate includes a thorough review of the design and specifications for the project, construction, and long-term operations, feedstock supply, energy or biogas production and lease agreements, among others. This may require face-to-face interviews with the project participants and review of financial projections of performance.

All work needs to be thoroughly documented in case questions come up during the review of the report by project participants and potential investors/bond holders.

THE FINANCIAL MODELING

A pro forma model should be developed based on an understanding

of the dynamics of the market influencing the life cycle of the project. While software programs can be great tools, the programs are only as good as the assumptions that go into these programs.

Another common problem with most pro forma models is the one-size-fits-all syndrome. Every project is unique and the design of the pro forma financial model should reflect these differences.

To accommodate the various types of business models needed to analyze the feasibility of recycling projects, the author has developed a variety of different types of pro forma models that allow him to tailor the financial statements to specific projects.

This has provided clients with models with maximum flexibility to model multiple scenarios of facility size, biogas production/cogeneration and site locations.

Using cost assumptions and critical project assumptions, a multiyear (typically 20-year) projection of projected revenues, operating expenses and debt service will be developed using spread-sheet programs such as Microsoft Excel.

Assumptions are usually based on working knowledge of the solid waste industry, recently reported case history, and actual ranges in capital and operating costs for similarly sized facilities.

THE OPINION

The end game of the feasibility study report is to prepare an estimate of the cash flows of the project over its useful life and determine if the revenues generated by the project (e.g., electricity, biogas and steam revenues, tipping fees, and the sale of marketable products) can enable the project to pay debt service.

Typically, many lenders require special reserve funds (debt service reserve, renewal and replacement reserve) be set-aside by the implementing agency or developer.

Thus, the project also must meet operational and debt service but also these additional coverage requirements. Only then can the engineer's feasibility report deliver an unambiguous opinion that the project is financially feasible over the long term to pay its investors. e

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