

THE LAW OF BIOMASS
—Setting Up Shop: Design, Engineering, and
Construction of Biomass Projects—

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This chapter provides an overview of the contractual structures that are typically applied to the design and construction of a biomass energy generation facility. While each project is different, there are common issues that must be addressed to promote project success, including the allocation of expected project risks, the scheduling and coordination of work by multiple designers and contractors, and arrangements for financing and insurance. This chapter provides guidance about how to address those key issues. This overview is written from the perspective of a biomass project developer, but it should interest design and engineering, construction, and procurement contractors as well. As with any complex negotiated transaction, there is potential value to be gained or lost by all parties, and often the potential exists for using creative legal strategies to increase value for those on both sides of the table.

I. Components of Project Agreements. Certain component agreements are critical to the construction and development of a biomass project, including agreements for:

- design and engineering;
- procurement of receiving and storage equipment; processing equipment (*e.g.*, chippers for woody biomass); boilers and controls; pumps, piping, and related components; and materials to construct “balance-of-plant” facilities, storage tanks, foundations, roads, and maintenance facilities;
- performance guarantees, warranties, and insurance arrangements; and
- operation and maintenance of the completed facility.

Engineering, procurement, and construction tasks are frequently combined in a single agreement referred to as an “EPC agreement.” The EPC agreement may provide for, or anticipate the provision of, other services such as warranty services or operations and maintenance services for the completed facility. Sometimes all the design and engineering, procurement, and construction services are addressed in a single agreement (a “full-wrap agreement”) under which a single general contractor is responsible for the whole project, but it is more common to have separate agreements for different areas of the work, with a specialty firm engaged to provide proprietary process equipment and another contractor engaged for the balance-of-plant construction work. Warranties, insurance, and other matters may also be addressed in a single agreement or in separate agreements, depending on contractual structure.

II. Preliminary Design and Engineering Services. Biomass facilities require design and engineering expertise in heat generation in general and in the properties of specific biomass resources in particular. Relatively few firms design, engineer, and manufacture specialty process equipment for biomass projects, as this technology is still being developed. While most biomass facilities burn the biomass directly, other processes (gasification, pyrolysis, and anaerobic digestion) can be used to generate combustible materials from the biomass stock. The designer must consider the properties of the biomass materials to be used and the best way to extract the maximum useful energy. The designer will determine the types of equipment and facilities that will be needed. Thoughtful design becomes even more critical if the project site contains existing facilities that are to be incorporated into the new plant, or if the biomass facility will be linked to another industrial process that has specific requirements for heat or power input.

III. EPC Contractual Structure. No single contractual structure will apply to all projects. In many cases, the project developer retains one contractor to design and provide the specialized biomass processing and

combustion equipment and a second contractor to undertake the design and engineering of the balance of plant, including electrical generation equipment or industrial process equipment. The balance-of-plant contractor may be given responsibility for the commissioning, start-up, and performance testing of the entire facility and may provide warranty services. In this arrangement, the work of the two contractors needs to be closely coordinated both in space and in time, clearly setting forth the division of responsibilities. This becomes particularly important should disputes arise relative to performance guarantees and warranty obligations. The balance-of-plant contractor will need information about the specialty contractor's process equipment to design, construct, and lay out the entire plant in a way that economically connects the various parts to power, controls and data systems, and other facilities. The balance-of-plant contractor will also need a delivery schedule for the process equipment to formulate a schedule for preparing foundations and erecting plant components.

The project developer and the specialty contractor may enter into a supply agreement where the contractor agrees to engineer, procure, and construct biomass process equipment components and deliver them to the site on a definite schedule and to provide expert assistance in commissioning and testing that equipment after it is set in place and connected to the balance-of-plant facilities. The specialty contractor also typically provides a performance guarantee that must be carefully negotiated and measured in terms of inputs (biomass material characteristics) and outputs.

The project developer then enters into a balance-of-plant agreement with a general contractor who agrees to design and construct the other necessary facilities for the project, including foundations, roads, loading and storage facilities, and electrical and control systems for the entire biomass facility.

Both sets of agreements will attempt to coordinate the work of the two contractors while avoiding interference, duplication, or omission between the scopes of work of the specialty contractor and the balance-of-plant contractor. Collectively, the agreements should result in a fully constructed, integrated, and operational project.

In drafting contracts for process equipment and the balance-of-plant construction, the developer must focus on the scope of work, measures of completion, respective warranty obligations, limitations of liability, and related insurance issues. These issues are discussed in the sections that follow.

IV. Scope of Work. The parties should place great emphasis on the description of the scope of work set forth in the agreements. Generally, whatever is not included in the contractors' scopes of work remains the project developer's responsibility. The scopes of work should describe, in detail, the design, engineering, and construction obligations of the contractors, and any obligations relating to the commissioning, start-up, and performance testing of the biomass facility. The contractors' scopes of work should address design, procurement, delivery, installation, control systems, completion, and warranty work. As with other aspects of such an agreement, the scope-of-work provisions will probably be heavily negotiated.

V. Completion and Start-Up Obligations. Details of how, when, and by whom the plant is to be commissioned are usually set forth in the scope-of-work provisions of the relevant agreements. Because of the specialty contractor's in-depth knowledge of the work and its role in plant design, that contractor is typically responsible for commissioning the equipment that it supplies. However, this work may be undertaken by the project developer (with assistance from the specialty contractor) or by the balance-of-plant contractor. Attention must be given in the agreements to defining the stages of completion, such as the actual delivery of equipment to the project site, the installation of the equipment, and the commissioning, start-up, and performance testing of the plant. Each of these stages plays an important role in the coordinated development of the project. As these progress milestones are established, completion is generally documented by the contractors' certifications of, for

example, interim completion, substantial mechanical completion, final mechanical completion, and final sign-off. Each such certification is considered an incremental measure that the project must satisfy to progress to the next measure. As with other supply- and construction-related agreements, progress payments by the project developer to the contractors (as set forth in the relevant agreements) are normally based, in part, on the milestones described above. To the extent there is a financing party involved, a third-party, independent engineer will likely be a part of this process, providing input and oversight on behalf of the financing party.

VI. Performance Guarantees and Warranty Obligations. Performance guarantees and warranty-related obligations are likely to be an issue of substantial negotiation between parties to these types of agreements. The nature and scope of a contractor's obligations will, however, depend on what services, materials, and equipment the contractor is contracted to provide. A contractor's obligations generally include such things as a general parts warranty (the definition of a defect can be important when determining what is included or excluded as a defective or nonconforming part or component), utilities consumption rate and output guarantees, and related matters.

Key issues to consider with respect to warranties include (1) the period or term of a particular warranty and whether the term can be extended, (2) the definition of a defect, (3) limitations on a warranty due to third-party services (such as operation and maintenance services), (4) the remedial measures a contractor must or may take to cure any defect, and (5) measures the facility operator must take to trigger the warranty obligation (such as notice and providing opportunities for inspection and repair). Additionally, a project developer may want third-party contractor or subcontractor warranties applicable to parts or components used in the plant to be "passed through" the contractor for the project developer's direct benefit.

VII. Limitation of Liability. As with other construction and procurement agreements, contractors will seek to limit their liability to the project developer and may request a waiver of consequential, indirect, incidental, and special damages. Those clauses must be negotiated carefully to result in a reasonable allocation of risk to those parties best able to avoid risk and to ensure that excluded categories of damages are clearly defined (they may not be clearly established in the law). A contractor will often seek to have its liability for damages limited to a stated percentage of the value of the relevant agreement. The parties may carve out particular issues for different treatment and may specify the contractor's maximum aggregate liability. Liability risk needs to be coordinated with liability insurance resources.

VIII. Project Financing. The high capital costs of a biomass project mean that the project likely will require some form of substantial debt financing or joint venture financing to support the design, engineering, procurement, construction, and initial operations. Before committing funds to a project, financial institutions and potential investors will expect to review and comment on a project's design and engineering, procurement, process engineering, licenses, construction agreements, operations and maintenance agreements, and warranties. In particular, lenders and investors will expect to be able to step into the shoes of the project developer in the event the project developer (as the borrower) is in default under its financing arrangements, and are focused on provisions specifying the extent and nature of available damages in the event of a contractor's subpar performance.

Because of the involvement of investors and lenders, and to avoid issues arising from any potential inconsistencies, the project developer should be prepared to present a consistent and complete set of project agreements to lenders and investors and should be prepared for the possibility that lenders and investors may require substantial changes in the negotiated documents, particularly as they relate to warranty obligations, performance guarantees, and limitations on liabilities. These issues become even more significant when a project is utilizing a new technology or the facility is scaling up to a plant size not previously constructed.

IX. Performance and Payment Guarantee Issues. A project developer may want its contractors to ensure, for the project developer's benefit, (1) procurement of performance and payment guarantees or bonds to ensure timely performance of contractors under the relevant agreements and (2) that no liens or undesired security interests are lodged against the project in relation to unpaid subcontractors. These guarantees and bonds are described below.

A. Performance Guarantee or Bond. A performance guarantee or bond is usually issued by a parent company or other creditworthy entity, such as a bonding company, selected or approved by the project developer. Under the guarantee or bond, an agreed-on sum is available to satisfy the project developer's damages arising out of the contractor's failure to perform as specified in the relevant agreement. The bonding company charges a fee and retains the right to seek reimbursement from the contractor or contractor's guarantor. If the contractor defaults or cannot complete the project, the project developer may call on the guarantor or bonding company to perform the contractor's obligation (for example, the surety may pay another contractor to complete the project). The project developer will want to reserve all rights against the defaulting contractor if the performance guarantee or bond does not fully cover the project developer's costs of completing the project or any damages the project developer must pay to a third party (such as penalties for failure to provide power from the delayed plant).

B. Payment Guarantee or Bond. A payment guarantee or bond provides assurance that upon the contractor's default, employees and subcontractors will be paid for work performed so that no liens or other security interests will attach to the project developer's property or to the project. A lien claim, normally filed against the project developer's property, may be bonded over so that the lien attaches to the bond rather than to the property. Lenders, upon their review of the agreements, may demand or require such payment guarantees or bonds to enhance the lenders' security interests in the project, particularly if the commencement of work (which may give rise to lien rights) predates the lenders' recorded interests in the property.

The project developer or the lenders may require other security from contractors such as standby letters of credit and an insurance policy listing the developer and lenders as additional insureds. The contractors will demand ample opportunity to cure any default or delay and will seek to limit the project developer's ability to call on its performance or payment bonds or other security. Contractors may demand some form of reciprocal security issued by the project developer or its parent company, such as a parent guarantee, particularly if the project developer's only substantial asset is the project itself.

X. Liens and Releases Issues. When the project developer makes periodic payments to contractors, the developer should obtain a lien release from each contractor and major subcontractor. A lien release will help protect the project developer from liens being filed on the project by subcontractors who have not been paid. Liens are undesirable because (among other reasons), once filed, they can delay or interfere with the project's financing or sale. Worse still, if a lien claimant is successful, a lien could be used to force a foreclosure sale of the project property. The language of the lien release is important, and often release forms are included in the contract documents.

XI. Insurance and Indemnity Issues. A project developer should obtain appropriate indemnities against and insurance coverage from the various parties with whom it contracts and should require those parties to obtain similar protections from their subcontractors and material suppliers for the benefit of the project developer. Relevant indemnities include indemnities against personal injury, death, and property damage claims; contractor and subcontractor lien indemnities; an indemnity for taxes (other than those attributable to the developer); an indemnity for violation of applicable laws (including environmental laws); and an indemnity for intellectual

property infringement claims. Appropriate insurance policies include commercial general liability; workers' compensation and employer's liability; automobile; errors and omissions (liability insurance relating to design and engineering services); and builder's all-risk (property insurance for the project under construction). Policies should name the developer and its financing party (if any) as additional insureds and contain appropriate waivers of subrogation. Appropriate policy limits will vary with respect to the nature of the work being performed by the insured and the scope of the project. It is advisable for project developers to consult with an insurance or a risk management specialist to ensure that appropriate types and levels of coverage are obtained.