CHAPTER 1

What Is Project Financing?

Project financing can be arranged when a particular facility or a related set of assets is capable of functioning profitably as an independent economic unit. The sponsor(s) of such a unit may find it advantageous to form a new legal entity to construct, own, and operate the project. If sufficient profit is predicted, the project company can finance construction of the project on a *project basis,* which involves the issuance of equity securities (generally to the sponsors of the project) and of debt securities that are designed to be self-liquidating from the revenues derived from project operations.

Although project financings have certain common features, financing on a project basis necessarily involves tailoring the financing package to the circumstances of a particular project. Expert financial engineering is often just as critical to the success of a large project as are the traditional forms of engineering.

Project financing is a well-established financing technique. Thomson Financial's Project Finance International database lists 4,360 projects that have been undertaken since 2002. About 10 percent of these are large projects costing $1 billion or more. Looking forward, the United States and many other countries face enormous infrastructure financing requirements. Project financing is a technique that could be applied to many of these projects.

WHAT IS PROJECT FINANCING?

Project financing may be defined as the raising of funds on a limited-recourse or nonrecourse basis to finance an economically separable capital investment project in which the providers of the funds look primarily to the cash flow from the project as the source of funds to service their loans and provide the return of and a return on their equity invested in the project.[1] The terms of the debt and equity securities are tailored to the cash flow characteristics of the project. For their security, the project debt securities depend mainly on the

profitability of the project and on the collateral value of the project's assets. Assets that have been financed on a project basis include pipelines, refineries, electric generating facilities, hydroelectric projects, dock facilities, mines, toll roads, and mineral processing facilities.

Project financings typically include the following basic features:

1. An agreement by financially responsible parties to complete the project and, toward that end, to make available to the project the funds necessary to achieve completion.
2. An agreement by financially responsible parties (typically taking the form of a contract for the purchase of project output) that, when project completion occurs and operations commence, the project will generate sufficient cash flow to enable it to meet all its operating expenses and debt service requirements under all reasonably foreseeable circumstances.
3. Assurances by financially responsible parties that, in the event a disruption in operation occurs and funds are required to restore the project to operating condition, the necessary funds will be made available through insurance recoveries, advances against future deliveries, or some other means.

Project financing should be distinguished from conventional direct financing, or what may be termed financing on a firm's general credit. In connection with a conventional direct financing, lenders to the firm look to the firm's entire asset portfolio to generate the cash flow to service their loans. The assets and their financing are integrated into the firm's asset and liability portfolios. Often, such loans are not secured by any pledge of collateral. The critical distinguishing feature of a project financing is that the project is a distinct legal entity; project assets, project-related contracts, and project cash flow are segregated to a substantial degree from the sponsoring entity. The financing structure is designed to allocate financial returns and risks more efficiently than a conventional financing structure. In a project financing, the sponsors provide, at most, limited recourse to cash flows from their other assets that are not part of the project. Also, they typically pledge the project assets, but none of their other assets, to secure the project loans.

The term *project financing* is widely misused and perhaps even more widely misunderstood. To clarify the definition, it is important to appreciate what the term does *not* mean. Project financing is *not* a means of raising funds to finance a project that is so weak economically that it may not be able to service its debt or provide an acceptable rate of return to equity investors. In other words, it is *not* a means of financing a project that cannot be financed on a conventional basis. A project financing requires careful financial engineering to allocate the risks and rewards among the involved parties in a manner

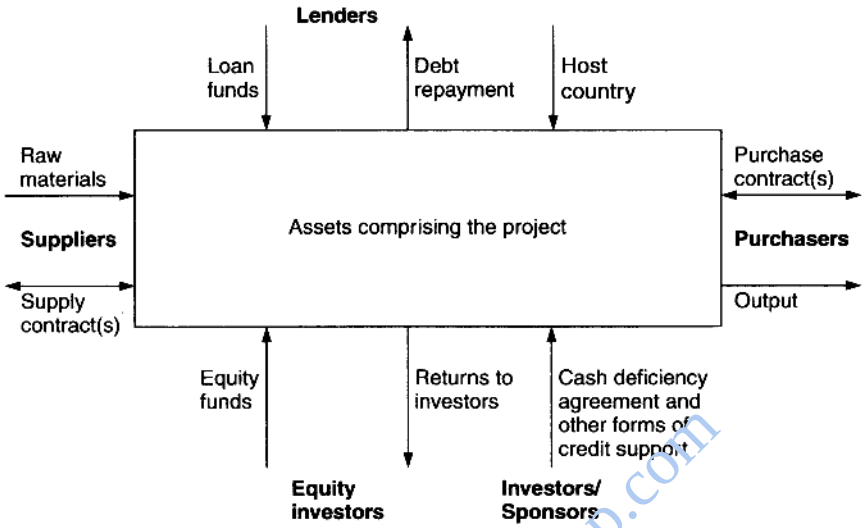

FIGURE 1.1 The Basic Elements of a Project Financing

that is mutually acceptable. Figure 1.1 illustrates the basic elements in a capital investment that is financed on a project basis.

At the center is a discrete asset, a separate facility, or a related set of assets that has a specific purpose. Often, this purpose is related to raw materials acquisition, production, processing, or delivery. More recently, this asset is a power-generating station, toll road, or some other item of infrastructure. Many projects involve the modernization or upgrade of an existing facility, or a brownfield project, rather than the construction of a brand new facility, or greenfield project.

As already noted, this facility or group of assets must be capable of standing alone as an independent economic unit. The operations, supported by a variety of contractual arrangements, must be organized so that the project has the unquestioned ability to generate sufficient cash flow to repay its debts.

A project must include all the facilities that are necessary to constitute an economically independent, viable operating entity. For example, a project cannot be an integral part of another facility. If the project will rely on any assets owned by others for any stage in its operating cycle, the project's unconditional access to these facilities must be contractually assured at all times, regardless of events.

Project financing can be beneficial to a company with a proposed project when (1) the project's output would be in such strong demand that purchasers

would be willing to enter into long-term purchase contracts and (2) the contracts would have strong enough provisions that banks would be willing to advance funds to finance construction on the basis of the contracts. Project financing can be beneficial to lenders when it reduces the risk of project failure, leads to tighter covenant packages, or facilitates a lower cost of resolving financial distress.

For example, project financing can be advantageous to a developing country when it has a valuable resource deposit, other responsible parties would like to develop the deposit, and the host country lacks the financial resources to proceed with the project on its own.

A HISTORICAL PERSPECTIVE

Project financing is not a new financing technique. Venture-by-venture financing of finite-life projects has a long history; it was, in fact, the rule in commerce until the seventeenth century. For example, in 1299—more than 700 years ago—the English Crown negotiated a loan from the Frescobaldi (a leading Italian merchant bank of that period) to develop the Devon silver mines.[2] The loan contract provided that the lender would be entitled to control the operation of the mines for one year. The lender could take as much unrefined ore as it could extract during that year, but it had to pay all costs of operating the mines. There was no provision for interest.[3] The English Crown did not provide any guarantees (nor did anyone else) concerning the quantity or quality of silver that could be extracted during that period. Such a loan arrangement was a forebearer of what is known today as a *production payment loan*.[4]

Recent Uses of Project Financing

Project financing has long been used to fund large-scale natural resource projects. (Appendix B provides thumbnail sketches of several noteworthy project financings, including a variety of natural resource projects.) One of the more notable of these projects is the Trans-Alaska Pipeline System (TAPS) Project, which was developed between 1969 and 1977. TAPS was a joint venture of eight of the world's largest oil companies. It involved the construction of an 800-mile pipeline, at a cost of $7.7 billion, to transport crude oil and natural gas liquids from the North Slope of Alaska to the port of Valdez in southern Alaska. TAPS involved a greater capital commitment than all the other pipelines previously built in the continental United States combined. Phillips, Groth, and Richards (1979) describe Sohio's experience in arranging financing to cover its share of the capital cost of TAPS.

More recently, in 1988, five major oil and gas companies formed Hibernia Oil Field Partners to develop a major oil field off the coast of Newfoundland. The projected capital cost was originally $4.1 billion. Production of 110,000 barrels of oil per day was initially projected to start in 1995. Production commenced in 1997 and increased to 220,000 barrels per day in 2003. Production is expected to last between 16 and 20 years. The Hibernia Oil Field Project is a good example of public sector–private sector cooperation to finance a large project. (Public–private partnerships are discussed in Chapter 16.)

The Impact of PURPA

Project financing in the United States was given a boost in 1978 with passage of the Public Utility Regulatory Policy Act (PURPA). Under PURPA, local electric utility companies are required to purchase all the electric output of qualified independent power producers under long-term contracts. The purchase price for the electricity must equal the electric utility's "avoided cost"—that is, its marginal cost—of generating electricity. This provision of PURPA established a foundation for long-term contractual obligations sufficiently strong to support nonrecourse project financing to fund construction costs. The growth of the independent power industry in the United States can be attributed directly to passage of PURPA. For example, roughly half of all power production that came into commercial operation during 1990 came from projects developed under the PURPA regulations.

Innovations in Project Financing

Project financing for manufacturing facilities is another area in which project financing has recently begun to develop. In 1988, General Electric Capital Corporation (GECC) announced that it would expand its project finance group to specialize in financing the construction and operation of industrial facilities. It initiated this effort by providing $105 million of limited-recourse project financing for Bev-Pak Inc. to build a beverage container plant in Monticello, Indiana.[5] The plant was owned independently; no beverage producers held ownership stakes. Upon completion, the plant had two state-of-the-art production lines with a combined capacity of 3,200 steel beverage cans per minute. A third production line, added in October 1989, expanded Bev-Pak's capacity to 2 billion cans per year. This output represented about 40 percent of the total steel beverage can output in the United States. Bev-Pak arranged contracts with Coca-Cola and PepsiCo to supply as much as 20 percent of their can requirements. It also arranged a contract with Miller Brewing Company. Bev-Pak enjoyed a competitive advantage: Its

state-of-the-art automation enabled it to sell its tin-plated steel cans at a lower price than aluminum cans.[6] Moreover, to reduce its economic risk, Bev-Pak retained the flexibility to switch to aluminum can production if the price of aluminum cans were to drop.

Financing a large, highly automated plant involves uncertainty about whether the plant will be able to operate at full capacity. Independent ownership enables the plant to enter into arm's-length agreements to supply competing beverage makers. It thus diversifies its operating risk; it is not dependent on any single brand's success. Moreover, because of economies of scale, entering into a long-term purchase agreement for a portion of the output from a large-scale plant is more cost effective than building a smaller plant in house. Finally, long-term contracts with creditworthy entities furnish the credit strength that supports project financing.

Infrastructure is another area ripe for innovation. Chapter 16 discusses the formation of public–private partnerships to finance generating stations, transportation facilities, and other infrastructure projects. Governments and multilateral agencies have recognized the need to attract private financing for such projects (see Chrisney, 1995; Ferreira, 1995). Chapter 18 describes how private financing was arranged for two toll roads in Mexico. In the past, projects of this type have been financed by the public sector.

REQUIREMENTS FOR PROJECT FINANCING

A project has no operating history at the time of the initial debt financing. Consequently, its creditworthiness depends on the project's anticipated profitability and on the indirect credit support provided by third parties through various contractual arrangements. As a result, lenders require assurances that (1) the project will be placed into service, and (2) once operations begin, the project will constitute an economically viable undertaking. The availability of funds to a project will depend on the sponsor's ability to convince providers of funds that the project is technically feasible and economically viable.

Technical Feasibility

Lenders must be satisfied that the technological processes to be used in the project are feasible for commercial application on the scale contemplated. In brief, providers of funds need assurance that the project will generate output at its design capacity. The technical feasibility of conventional facilities, such as pipelines and electric power generating plants, is generally accepted. But technical feasibility has been a significant concern in such projects as Arctic

pipelines, large-scale natural gas liquefaction and transportation facilities, and coal gasification plants. Lenders generally require verifying opinions from independent engineering consultants, particularly if the project will involve unproven technology, unusual environmental conditions, or very large scale.

Economic Viability

The ability of a project to operate successfully and generate adequate cash flow is of paramount concern to prospective lenders. These providers of funds must be satisfied that the project will generate sufficient cash flow to service project debt *and* pay an acceptable rate of return to equity investors. There must be a clear, long-term need for the project's output, and the project must be able to deliver its products (or services) to the marketplace profitably. Therefore, the project must be able to produce at a cost-to-market price that will generate funds sufficient to cover all operating costs and debt service while still providing an acceptable return on the equity invested in the project. Project economics must be sufficiently robust to keep the project profitable in the face of adverse developments, such as escalation in construction cost; delays in construction or in the start-up of operations; increases in interest rates; or fluctuations in production levels, prices, and operating costs.

Availability of Raw Materials and Capable Management

Natural resources, raw materials, and the other factors of production that are required for successful operation must be available in the quantities needed for the project to operate at its design capacity over its entire life. To satisfy lenders, (1) the quantities of raw materials dedicated to the project must enable it to produce and sell an amount of output that ensures servicing of the project debt in a timely manner; (2) unless the project entity directly owns its raw materials supply, adequate supplies of these inputs must be dedicated to the project under long-term contracts; and (3) the term of the contracts with suppliers cannot be shorter than the term of the project debt. The useful economic life of a project is often constrained by the quantity of natural resources available to it. For example, the economic life of a pipeline serving a single oil field cannot exceed the economic life of the field, regardless of the physical life of the pipeline.

The project entity must have capable and experienced management. Many project sponsors enter into management contracts with engineering firms to ensure that skilled operating personnel are available. The sponsors of the Indiantown Cogeneration Project, discussed in Chapter 17, negotiated a

management services agreement with an experienced operator of electric power generating plants.

APPROPRIATENESS OF PROJECT FINANCING

The ideal candidates for project financing are capital investment projects that (1) are capable of functioning as independent economic units, (2) can be completed without undue uncertainty, and (3) when completed, will be worth demonstrably more than they cost to complete.

In determining whether project financing might be an appropriate method of raising funds for a particular project, at least five factors should be considered:

1. The credit requirements of the lenders in light of both the expected profitability of the project and the indirect credit support to be provided by third parties.
2. The tax implications of the proposed allocation of the project tax benefits among the parties involved.
3. The impact of the project on the covenants contained in the agreements governing the sponsors' existing debt obligations.
4. The legal or regulatory requirements the project must satisfy.
5. The accounting treatment of project liabilities and contractual agreements.

These factors are discussed later in the book.

Risk Sharing

Often, the risks associated with a project are so great that it would not be prudent for a single party to bear them alone. Project financing permits the sharing of operating and financial risks among the various interested parties, and it does so in a more flexible manner than financing on the sponsors' general credit. Risk sharing is advantageous when economic, technical, environmental, or regulatory risks are of such magnitude that it would be impractical or imprudent for a single party to undertake them. A financing structure that facilitates multiple ownership and risk sharing is particularly attractive for projects such as electric power generating plants, where significant economies of scale are possible and the project will provide benefits to several parties.

Chapter 5 discusses the various risks involved in a project financing. Chapter 7 explains how contractual arrangements can be designed to allocate those risks among the parties involved with the project.

Expansion of the Sponsors' Debt Capacity

Financing on a project basis can expand the debt capacity of the project sponsors. First, it is usually possible to structure a project so that the project debt is not a direct obligation of the sponsors and does not appear on the face of the sponsors' balance sheets. (Footnote disclosure may be required if a sponsor's project-related debt obligations are material in relation to its overall financial position.) In addition, the sponsors' contractual obligations with respect to the project may not come within the definition of indebtedness for the purpose of debt limitations contained in the sponsors' bond indentures or note agreements.

Second, because of the contractual arrangements that provide credit support for project borrowings, the project company can usually achieve significantly higher financial leverage than the sponsor would feel comfortable with if it financed the project entirely on its own balance sheet. Data concerning project leverage provided in Chapter 3 indicates that the initial leverage ratio is substantially greater than the typical corporate leverage ratio. The amount of leverage a project can achieve depends on the project's profitability, the nature and magnitude of project risks, the strength of the project's security arrangements, and the creditworthiness of the parties committed under those security arrangements.

AN EXAMPLE

A hypothetical cogeneration project (hereafter referred to as the Cogeneration Project) can be used to illustrate the basic elements of a project financing. In recent years, project financing has been used to finance many power generation facilities. Data provided in Chapter 3 indicates that the power sector accounts for the largest number of projects of any industry sector and is second only to the oil and gas sector for the largest total dollar value of projects since 2002. Such leading companies as Boise Cascade, DuPont, Exxon Mobil, and Southern California Edison have been involved in cogeneration projects.

Cogeneration involves the production of steam, which is used sequentially to generate electricity and to provide heat. In this sense, the two forms of energy, electricity and heat, are *cogenerated*. The owners of the cogeneration facility may use some of the electricity themselves; they can sell the rest to the local electric utility company. The leftover heat from the steam has a number of possible commercial uses, such as process steam for a chemical plant, for enhanced oil recovery, or for heating buildings. The Indiantown Cogeneration Project, discussed in Chapter 17, sells its leftover steam to a wholesale citrus juice processor.

As noted earlier, passage of PURPA gave cogeneration a boost. PURPA requires regulated electric utility companies to purchase the electric power produced by qualified independent power producers, which include cogeneration facilities. It also requires the electric utility companies to supply backup electricity to the cogeneration facilities (e.g., during periods when the cogeneration facilities are closed for maintenance) at nondiscriminatory prices (see Chen, Kensinger, and Martin, 1989). PURPA also exempts a qualified cogeneration project from rate-of-return regulation as a "public utility,"[7] thereby enabling sponsors of cogeneration facilities to benefit from the cost savings that cogeneration achieves. The profitability of these projects and the valuable credit support provided by the contractual arrangements with local electric utility companies have made it possible to finance many of these cogeneration projects independently, regardless of their sponsors' creditworthiness.

The Project

Engineering Firm has proposed to Chemical Company that it design and build a Cogeneration Project at Chemical Company's plant in New Jersey.

The Project Sponsor

Engineering Firm has considerable experience in designing and managing the construction of energy facilities. The market for engineering services is very competitive. Engineering Firm has found that its willingness to make an equity investment, to assist in arranging the balance of the financing, and to assume some of the responsibility for operating the project following completion of construction, can enhance its chances of winning the mandate to design and oversee construction of a cogeneration project. Nevertheless, Engineering Firm's basic business is engineering, and its capital resources are limited. Accordingly, it is anxious to keep its investments small, and it is unwilling to accept any credit exposure. However, it is willing to commit to construction of the facility under a fixed-price turnkey contract, which would be backed up by a performance bond to ensure completion according to specifications.

The Industrial User

Chemical Company's plant began commercial operation in 1954. Two aged, gas-fired steam boilers produce the process steam used in the chemical manufacturing process at the plant. Local Utility currently supplies the plant's electricity.

Engineering Firm has suggested building a Cogeneration Project to replace the two boilers. The new facility would consist of new gas-fired boilers and turbine-generator equipment to produce electricity. The Cogeneration Project would use the steam produced by the gas-fired boilers to generate electricity. It would sell to Local Utility whatever electricity the plant did not need. It would sell all the waste steam to Chemical Company for use as process steam and would charge a price significantly below Chemical Company's current cost of producing process steam at the plant.

Chemical Company is willing to enter into a steam purchase agreement. But it will not agree to a term exceeding 15 years, nor will it invest any of its own funds or take any responsibility for arranging financing for the facility. Chemical Company is insistent that the steam purchase contract must obligate it to purchase only the steam that is actually supplied to its plant.[8]

The Local Utility

Local Utility is an investor-owned utility company. It provides both gas and electricity to its customers, including Chemical Company. Local Utility has stated publicly that it is willing to enter into long-term electric power purchase agreements and long-term gas supply agreements with qualified cogenerators. It has also formed an unregulated subsidiary for the express purpose of making equity investments in PURPA-qualified independent power projects. Its regulators have authorized it to make such investments, provided Local Utility owns no more than 50 percent of any single project.

Local Utility has informed Engineering Firm that it is in support of the Cogeneration Project. It is willing to enter into a 15-year electric power purchase agreement and a 15-year gas supply agreement. Local Utility has committed to accept a provision in the gas supply agreement that would tie the price of gas to the price of electricity: The price of gas will escalate (or de-escalate) annually at the same rate as the price Local Utility pays for electricity from the Cogeneration Project. Local Utility is willing to invest up to 50 percent of the project entity's equity and to serve as the operator of the facility. However, it is not willing to bear any direct responsibility for repaying project debt. Local Utility would include the facility's electricity output in its base load-generating capability. A 15-year inflation-indexed (but otherwise fixed-price) operating contract is acceptable to Local Utility. The contract would specify the operating charges for the first full year of operations. The operating charges would increase thereafter to match changes in the producer price index (PPI). These charges would represent only a relatively small percentage of the Cogeneration Project's total operating costs. Because such facilities are simple to operate, the completed Cogeneration Project will require only a dozen full-time personnel to operate and maintain it.

Outside Financing Sources

The balance of the equity and all of the long-term debt for the project will have to be arranged from passive sources, principally institutional equity investors and institutional lenders. The equity funds will have to be invested before the long-term lenders will fund their loans. The passive equity investors will undoubtedly expect Local Utility to invest its equity before they invest their funds. The strength of the electric power purchase and gas supply agreements will determine how much debt the Cogeneration Project will be capable of supporting. The availability of the tax benefits of ownership, as well as the anticipated profitability of the project, will determine how much outside equity can be raised for the project.

Use of the Example

In subsequent chapters, I will develop the basic concepts that pertain to project financing. I will then apply them to the Cogeneration Project, which will serve as an ongoing illustration.

CONCLUSION

Project financing involves raising funds on a limited-recourse or nonrecourse basis to finance an economically separable capital investment project by issuing securities (or incurring bank borrowings) designed to be serviced and redeemed exclusively out of project cash flow. The terms of the debt and equity securities are tailored to the characteristics of the project. For their security, the project debt securities depend mainly on the profitability of the project and on the collateral value of the project's assets. Depending on the project's profitability and on the proportion of debt financing desired, additional sources of credit support may be required (as described later in this book). A project financing requires careful financial engineering to achieve a mutually acceptable allocation of the risks and rewards among the various parties involved in a project.