

THE LAW OF LAVA
—Penciling Out:
Project Finance for Geothermal Power Projects—

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Since the vast majority of geothermal energy projects are larger than 25 MW in size, successfully financing one of these projects generally requires raising a substantial amount of capital. While debt usually is the source for a large part of the required capital (commonly 60 to 70 percent of the total project cost), lenders usually require that a significant amount of equity be invested in the project as well. Since all these types of investment are structured differently, come from separate sources, and often are at odds with each other, understanding both components of the financial picture (as well as their interaction) is a critical aspect of getting the projects launched.

In general, debt is lower risk and is the most highly structured component of the financing—deals are usually structured so that the lenders get priority on returns from cash flows and on disposition of assets and the equity investors are generally entitled only to what is left after the debt holders have been paid off. There is a natural tension between the allocation of the relative risks and rewards between the two groups of investors, so striking a reasonable balance that makes the overall financing work requires understanding the expectations and motivations of each group.

Debt Financing. The essence of debt financing for electric generation projects is fashioning a loan package that provides adequate assurance (creditworthiness) that the loan will be repaid in a timely manner. Alternatively stated, it is the fashioning of a loan/credit package such that the risk of default (nonpayment) is minimized—reduced or mitigated to bring the risk within levels acceptable to the lender. Creditworthiness and risk are thus two sides of the same coin: the greater the risk, the lower the creditworthiness, and vice versa.

The lender's collateral security for repayment of the loan is usually accomplished by various legal undertakings, including mortgages and security interests granted in the project assets, revenues, and key project agreements; warranties and contractual requirements for the equipment and the work performed in making it operational; requirements for various types of insurance to cover certain adverse events; and guarantees of the project participant's obligations from creditworthy entities. The negotiation and documentation of these risk-shifting devices is the focus of activity in project debt financing, resulting in loan documentation of substantial heft and complexity. In broad terms, there are two basic approaches to addressing the credit/risk allocation issues in a manner that can be made to work (more or less) for all the participants involved: full-recourse (or balance sheet) financing, and limited-recourse (or project) financing.

I. Full-Recourse (Balance Sheet) Financing.

A. Defined. With balance sheet financing, the payment of the debt is backed by the legal obligation of an entity with sufficient financial resources (that is, its balance sheet) to underwrite the risk that the project will be successful and the debt will be repaid. It is “full” recourse in that the lender can enforce payment of the debt out of any and all unencumbered assets of the entity providing the balance sheet support, rather than being limited to the project assets or other specific collateral. On the other hand, balance sheet financing is usually unsecured, with the lender taking no lien on or security interest in any tangible or intangible assets of the borrower.

The balance sheet backing rarely comes from the entity that will serve as the project owner, as these tend to be a “single” or “special” purpose entity (“SPE”) with no substantial assets other than the project. Rather, it most typically is provided by an affiliate of the project owner—an upstream parent or other affiliate with the requisite financial profile.

B. Who Can Access Balance Sheet Financing? Balance sheet financing is generally available only to the more substantial players in the electric industry—investor-owned utilities, power marketers,

equipment manufacturers, and others whose long-term unsecured debt is rated at least investment grade by one of the national rating agencies. In a very real way, the reason balance sheet financing works is highlighted by the old joke:

Question: What does it take to get a \$100 million loan from a bank?

Answer: \$1 billion in cash collateral!

Indeed, backing a loan with the balance sheet of an entity that has substantial liquid and tangible assets, acceptable levels of debt, and a proven track record of earnings can result in a risk posture to the lender that, in many respects, is the functional equivalent of overcollateralizing a loan with cash collateral.

C. Focus Shifted Away from Project. With balance sheet financing, the focus is on the financial position and prospects of the entity providing the balance sheet, rather than on the legal, economic, and technical viability of the geothermal energy project. The reason is simple: when a lender is primarily relying on the overall credit strength of the balance sheet provider and has recourse to all of its unencumbered assets and revenues to enforce payment of the debt, the viability of the project to be financed is only one small piece of the credit picture, and thus should not be the primary focus in evaluating the credit. Whether the particular project will be successful is less of a concern than it would be if the success of the project were the only route to repayment of the debt.

In many cases balance sheet financing simply is not an option for geothermal energy projects. There is often an unwillingness by the project developer to use the balance sheet to support the debt. It is a question of opportunity cost: the more the balance sheet is used to support project debt, the less it will be available for other corporate purposes (such as the acquisition of other companies or the maintenance of a balance sheet debt posture that will not adversely affect the company's stock price). Thus, even for the more financially well-heeled players in the geothermal industry, balance sheet financing may not be an attractive course to pursue. The alternative is limited-recourse financing (often called "project financing").

II. Limited-Recourse (Project) Financing.

A. Defined. With limited-recourse, or "project," financing, the debt is backed only by the project assets and the revenues they are able to generate. If the project fails to produce the revenues needed to pay expenses and service the debt, the lender cannot pursue the nonproject assets or revenues of those who own the equity interests in the project owner. Recourse is limited to the project owner and the project assets and revenues.

This limited-recourse nature is generally reinforced by the ownership structures for geothermal energy projects, which tend to utilize an SPE to own the project. An SPE is set up to have no assets other than its interest in the geothermal energy project. Furthermore, the SPE is typically a legal form of entity (for example, a corporation, limited liability company, or a limited partnership with a general partner which is a separate special purpose corporation or limited liability company) that, in most instances, prevents the creditors from going after the nonproject assets of the ultimate owner(s) of the SPE to satisfy payment of the debt. Thus, by both the contractual provisions of the lending documents and the type of ownership structure employed for the SPE, the goal is to limit the lender's recourse to enforce payment of the debt to the project assets and revenue-generating capability.

B. Betting on the Project. Assuming that the debt is properly structured to eliminate or acceptably mitigate the lender's risk, the lender antes up on this "bet" on the project by making the loan. The

exercise in structuring a limited-recourse financing is focused on those features that serve to eliminate or mitigate the risk to the lender. This, in turn, leads directly to an exhaustive examination of all aspects of the project—the conditions at the site, the nature and adequacy of the land rights and permitting for the site, the reliability of the equipment used, the legal obligations and creditworthiness of the key project participants, the availability of transmission, and so on. Indeed, if the lender is to be limited to project assets and revenues to secure repayment of the debt, it is essential that all aspects of the project be thoroughly vetted to ensure that it will operate successfully (that is, pay its bills) even in a “worst-case” scenario.

C. Project Viability Versus Collateral Value of Project Assets. It should be noted that while the lender will generally insist on—and get—a first-priority lien on all project assets, the tangible collateral securing the loan is, in reality, of secondary importance to the lender. The reason is simple: as a general rule, in a foreclosure situation, tangible collateral can usually be sold only at a price that produces a relatively small fraction of the debt it secures. A lender is far more likely to get repaid if the project operates successfully and produces the needed revenues than it is by liquidating the project assets in foreclosure. Therefore, the detailed examination of the project for purposes of limited-recourse financing is aimed primarily at determining the likelihood that the project will operate as planned, and then putting in place those security arrangements with the project participants that, in the judgment of the lender, are best calculated to ensure that the project will in fact perform up to expectations even in the face of a worst-case occurrence. In many cases, the limited-recourse nature of the debt financing does not truly come into play until the project has achieved full commercial operation, as the project owner is often required to guarantee the debt on a full-recourse basis during the construction period.

D. Security Arrangements—Creating a Sealed System. Thus far we have focused on those aspects of project finance that are aimed at vetting the risk associated with the ability of the project to perform up to expectations. We now turn to the security arrangements for project debt. In the context of a limited-recourse financing, the security arrangements are the core foundation on which the financing rests, as the lender has recourse only to the project assets and revenues to enforce payment. The lender therefore seeks control (by means of security interests, mortgages, and contract assignments) of all project assets (including all key project agreements) and all project revenues (also by means of security interests, but coupled with lockbox arrangements as described below). One way of looking at it is that the lender seeks to create a sealed system whereby all project assets and revenues are, to the fullest extent possible, sealed off from other creditors or investors by means of the security arrangements, with the lender exercising control over the assets and revenues to ensure that they do not escape the system and jeopardize the repayment of the debt. This is the essence of the project finance bargain: the lender is willing to limit its recourse to the project assets and revenues, in exchange for a financing structure that effectively preserves all project assets and revenues for the sole benefit of the lender.

In financing for PTC-dependent renewable energy projects, we have seen this essential bargain preserved even in the context of an “A-B” type of project finance debt structure—that is, when there are two project loans, the primary (or “A”) loan is payable out of power sales revenues, and the secondary (or “B”) loan is payable out of the production tax credits available to the project. In such transactions, each loan corrals (by means of the security arrangements) its own source of repayment, taking paramount rights in the sealed system so created to the exclusion of the other loan. For geothermal facilities that qualify for the PTC (presently, those placed in service before January 1, 2014), this credit can constitute a crucial feature of the financing portfolio.

1. Power Purchase Agreements. One key aspect of the security arrangements that create the requisite sealed system is the power purchase agreement (the “PPA”). The PPA is the core of the credit picture in a project financing, as it is the source of all revenues that will be needed to make the project successful. As such, the assignment to the lender of the project owner’s rights under the PPA forms the centerpiece of the

security arrangements. In addition to a price for power that will support the project operating expenses and debt service based on the expected production, lenders generally look for a PPA with the following features:

a. **Term.** The term of the PPA (exclusive of renewal options) should generally be several years longer than the term of the financing. For example, if the term of the financing is 20 years (fully amortizing), the lender is likely to require a PPA term of 22 to 25 years. The additional years of the PPA term provide the lender with “work-out” room if the project encounters difficulties during the term of the financing.

b. **Purchaser’s Creditworthiness and Credit Maintenance Provisions.** The output purchaser under the PPA must be a creditworthy entity or have its obligations guaranteed by a creditworthy entity. Generally speaking, lenders will look for at least an investment grade rating on the long-term, senior unsecured debt of the purchaser or its guarantor. Because of their dependence on PPA revenues for repayment of the project debt, lenders often seek credit maintenance provisions whereby if the power purchaser’s credit rating falls below a certain level, the power purchaser is required to post collateral to better secure its obligation to pay for the power delivered. However, there is as yet no universal willingness of power purchasers to agree to provide such credit assurances in the context of renewables when the purchaser is acquiring the resource in order to comply with a renewable portfolio standard imposed. Under current market conditions, it is generally not possible to obtain limited-recourse financing for a geothermal energy project without a long-term PPA for the purchase of the output of the project. Merchant geothermal energy projects may someday and under some market conditions be capable of securing limited-recourse financing, but for now, balance sheet financing is the only workable option for merchant geothermal energy projects—that is, those that will sell the electricity into the market rather than pursuant to a long-term PPA. In lieu of using a credit rating as the trigger, other triggers, such as maintenance of a specified level of tangible net worth, are sometimes employed, either alone or in combination with a credit rating requirement by the local public utility commission. But when the purchaser is pursuing resources on its own motion (as many distributing utilities are doing these days for a variety of reasons that go beyond renewal portfolio standards), one sees a greater willingness to include credit maintenance provisions in the PPA.

c. **Reciprocal Credit Maintenance Provisions.** While reciprocal credit maintenance requirements (in which both the seller and the purchaser agree to maintain a certain credit posture and to post collateral if the posture is not maintained) are common in PPAs for gas- and coal-fired resources, they have been less common in PPAs for other types of power. Historically many geothermal energy project developers were independent companies without the substantial financial resources to support a credit maintenance requirement. However, as more financially substantial players (such as the unregulated development arms of investor-owned utilities) have entered the development arena in recent years, this is proving less a stumbling block.

d. **Provisions Recognizing Lender’s Rights.** The PPA must contain provisions pursuant to which the output purchaser authorizes the project owner to assign the owner’s rights under the PPA to the lender as security for the project debt and recognizes the right of the lender to cure defaults and perform the owner’s obligations under the PPA. Any PPA signed without such provisions will certainly be revisited before project financing can be put in place.

e. **Transmission Curtailment Risk.** While not universally required, a PPA will provide better security for the lender (and better revenues for the project owner) if it shifts the risk of transmission curtailment to the output purchaser. This is done by providing that during periods of transmission curtailment,

the output purchaser will be obligated to pay for the power that would have been produced and delivered had the curtailment not prevented the plant from operating.

2. **Assignments of Key Contracts and Permits.** As a second feature of the sealed system, the lender will also require first-priority assignments of all key project contracts and permits. This ensures that it has control (via the security arrangements) over the entire project as a going concern. On the contract side, this includes the equipment supply agreement, the construction contracts, the interconnection agreement, the parts supply agreement, the equity contribution agreement between the owners of the project owner, the operation and maintenance (“O&M”) agreement (if the geothermal energy project is to be operated by a third-party operator), the leases or rights-of-way for the project site, and, of course, the PPA. In addition to taking assignments of the contracts from the project owner, the lender will also insist on having each counterparty to the assigned contracts consent in writing to the assignment in a manner in which the counterparty acknowledges the lender’s rights, agrees to give the lender notice of any default by the project owner, and agrees to grant the lender certain cure rights. The consents may also include a so-called “bankruptcy replacement clause” whereby the counterparty agrees to enter into a replacement agreement with the lender if the project owner is the subject of a bankruptcy proceeding. Finally, when payments are or may be owing by the counterparty to the project owner under the contract (for example, the PPA), the consent also makes provisions for those payments to go directly into an account controlled by the lender, as part of the lockbox arrangement discussed below. On the permit side, it can be more problematic to obtain a valid and enforceable assignment of a needed project permit. This is because under applicable law, the permit is often granted to a particular entity, such as the project owner, and either no provision is made for assignment of the permit to a third party or the nature of the permit is such that it may no longer be valid in the hands of anyone other than the original permittee.

To solve such problems, the lender may sidestep the issue by taking a first-priority security interest in the equity ownership interests of the project owner—the stock of the project owner if it is a corporation, or the membership or partnership interests in the project owner if it is a limited liability company or partnership. In this way, in a foreclosure situation, the lender forecloses upon the equity ownership interests, thus taking over ownership of the project owner and therefore the permits that are held by the project owner, but the permits themselves are never transferred from one entity to another. This may still require some action on the part of the lender to effectively complete the foreclosure. For example, in certain situations, foreclosing on the equity interests of the project owner may require authorization from the Federal Energy Regulatory Commission (“FERC”) under Section 203 of the Federal Power Act (if taking over the project owner results in a transfer of FERC jurisdictional assets that cannot be lawfully done without an approving order from FERC). But it nevertheless provides a path forward for the lender that may not otherwise be available (or be subject to significant legal doubt) were it to attempt to foreclose directly on a security interest in a permit. As one can imagine, this does not tend to be very popular with potential equity investors.

3. **Flow of Funds, Reserves and Lockbox Arrangements.** The final piece of the puzzle needed to create a sealed system to protect the lender is the creation under the credit agreement of a flow of funds (often called a “waterfall”) and an accompanying lockbox arrangement. Again, the key purposes of these provisions are to ensure that the project revenues are applied in a manner that will ensure the timely repayment of the project debt, and to place the lender in the position of controlling the revenues to see that they are, in fact, so applied. The lockbox arrangement requires all persons making payments to the project owner under the project agreements to pay those amounts into an account controlled by the lender. Thus all PPA payments flow directly into this account, as do warranty or liquidated damage payments under the turbine supply agreement and

balance-of-plant contract. Typically, the account in question is an account established with the lender itself, if the lender is the type of financial institution capable of handling such an account. Alternatively, the account may be established with a third-party financial institution, in which case the lender's rights with respect to the account will be memorialized pursuant to a custodian agreement among the lender, the project owner, and the custodian financial institution. It is the flow-of-funds, or waterfall, provisions in the credit agreement that govern the lender's (and, by negation, the project owner's) rights with respect to the project revenues captured by the lockbox arrangement. Given that under limited-recourse financing the project debt will be repaid only if the project operates more or less according to projections, the flow-of-funds provisions generally specify a priority of application of project revenues that has as its primary goal maintaining project operations so that power is produced and needed revenues from power sales are earned. It does this in part by directing the project revenues first to those expenses that are needed to keep the project operational, and in part by requiring the funding of various subaccounts in a manner that creates a variety of reserves to protect against, among other things, foreseen future expenses, the possibility of a mismatch of revenues and expenses during operation and adverse events that could interrupt the flow of project revenues. Moneys get paid out of the lockbox in accordance with the priorities or "waterfall" established under the credit agreement. Disbursement of lockbox moneys is made against a requisition presented by the appropriate party (the project owner or the O&M operator), accompanied by the relevant invoices documenting the expenditures for which disbursement is sought. It is not unusual for the lender to remit lockbox moneys directly to the party to whom they are owed, in order to avoid misapplication by the project owner or O&M operator. A typical flow of funds will provide that project revenues will be applied for the following purposes in the order of priority set forth below:

a. **O&M Expenses.** First, project revenues are applied to the payment of the ongoing O&M expenses of the project. For this purpose, O&M expenses are generally defined to capture the cash outlays the project will need to make to stay operational, and to exclude noncash items such as depreciation expense. A typical flow-of-funds provision will, over time, trap project revenues in the O&M subaccount commonly named the "operating reserve" until an amount (or reserve) equal to a set period of projected O&M expenses (commonly, six months) is on hand and maintained. It is not unusual for an operating reserve and other reserves to be initially funded, in whole or in part, from funds available from the loan.

b. **Debt Service.** Second, project revenues are applied to the payment of debt service on the project debt. Again, typical flow-of-funds provisions will, over time, capture project revenues at this level of the waterfall until the debt service subaccount has on hand and maintains an adequate debt service reserve amount (typically six months' debt service on the project debt, but sometimes as long as one year).

c. **Major Maintenance Reserve.** Third, project revenues are deposited into a major maintenance reserve account. This reserve is required to be funded over time in an amount such that sufficient funds will be on hand to pay for anticipated items of major maintenance on the project assets and to provide a source of funding to cover the cost of major unanticipated equipment failures.

d. **Distributions to the Project Owner.** Fourth, any remaining project revenues are deposited in a subaccount that is variously called a "sweep account," a "distribution account," or a "surplus cash account." Subject to restrictions imposed under the credit agreement, the project revenues that end up at this level of the waterfall are available for distribution to the project owner. Generally such distributions are permitted on a periodic basis (quarterly, or for longer periods), and then only to the extent the subaccounts higher up in the waterfall are fully funded at the time of the proposed distribution and there is no default under the credit agreement. Typically, the credit agreement will use a debt service coverage ratio (the "DSCR") as one of the tests for determining how cash in the distribution account is to be applied. The DSCR is the ratio of net

project revenues to annual debt service, expressed as a number. For example, a DSCR of “1.20” means net revenues for the fiscal year must be at least equal to 120 percent of annual debt service. To the extent the project fails to produce revenues sufficient to meet the DSCR, it generally means that the project has not been able to make the required payments into one or more of the subaccounts higher up in the waterfall. In such a situation, moneys in the distribution subaccount are not permitted to be distributed to the project owner, but instead are swept into the higher waterfall subaccounts until they are fully funded.

III. Equity Financing. The other critical portion of the financing picture for geothermal and other renewable energy projects is equity. As a residual stakeholder with rights to profits that generally take a back seat to those of secured lenders, the equity component of these types of projects often tends to be the most difficult to raise because a high level of return is expected in order to justify the risk. Matters tend to be further complicated by the fact that the pool of investors is limited and that there generally is a lack of understanding of the sometimes confusing private equity financial landscape by developers, owners, and operators.

A. What Is Private Equity? Private equity is one of the terms that tends to be least understood by people outside of the financial community. Private equity refers to the sale and purchase of securities that are not publicly traded—in other words, securities in private companies that have not yet been registered under federal and state securities laws and, therefore, are not freely transferable on stock exchanges such as the New York Stock Exchange or NASDAQ. The information reporting requirements for entities without publicly traded stock under the Securities Exchange Act of 1934 are substantially less than those for entities whose stock is publicly traded. As a result, the world of private equity investing tends to be somewhat secretive and have an aura of mystique. The concept of private equity is a broad one, with a large number of very different types of investment groups being classified under the general definition. Since most geothermal energy projects are privately owned, becoming familiar with the private equity landscape is a critical step toward successful fundraising.

There are fundamentally two types of private equity investors: individual private equity investors and institutional private equity investors.

1. Individual Private Equity. As the name suggests, individual private equity is simply investment by individuals who have the appropriate net worth to make investments for their own personal portfolios. Since they are just individuals, the amounts of money that they are able to invest tend to be smaller (in the tens of thousands or hundreds of thousands of dollars, rather than the millions). They can be classified primarily by their relationship to the companies in which they invest rather than by the source of their money or structure of their investment vehicle.

The most common types of individual private equity investor categories are:

Self financiers—the developer or original owner of the project puts up the capital him or herself.

Friends and family—people known to the individual owner/developer who invest based on their personal relationship to the owner/developer rather than necessarily on the merits of the project itself.

Angels—arm’s-length individual investors who are willing to invest and are often interested in becoming actively involved with the project, because of experience with the industry or passion about it or both.

Individual investors are generally best suited for the early stages of project exploration and development. In fact, the first million dollars or so of high-risk equity will probably have to come from these types of sources because

such small investments simply are not large enough to attract the attention and justify the involvement of funds managing money for large financial institutions.

As a side note, while government grants are a common funding source for early-stage projects, grants are not technically considered equity. Unlike an equity investment, grants are not made with the expectation of profit or of being ultimately repaid. In this sense, they are more akin to gifts and, as such, can be one of the best and least expensive sources of financing for an early-stage company or project.

2. **Institutional Private Equity.** In contrast to the small scale and informality of individual investors, the bulk of all dollars available for investment in the United States comes directly or indirectly from large financial institutions such as pension funds, insurance companies, university endowments, and large corporations. These institutions have trillions of dollars under management and act as formal mechanisms for pooling money for very large numbers of individuals who wish to have their savings professionally managed and placed in diversified asset portfolios.

In fact, in the United States today, there is so much money under management with these funds that the managers directly responsible for the investment decisions can only go to a certain level of depth in their analysis of, and day-to-day involvement with, investments. Specifically, they view the money as a resource of their portfolio that needs to be deployed and focus their efforts on asset allocation, meaning designating in which broad asset categories to place their money. Instead of trying to invest the money directly in companies themselves (although occasionally they do), they prefer to invest in a diversified portfolio of smaller, specialized investment funds managed by professional managers that have particular areas of expertise.

The exact categories for the funds in which they invest varies from institution to institution, but generally the institutional equity investment taxonomy is as follows:

- Public Equity
 - Mutual Funds
 - Publicly Traded Stocks
- Private Equity
 - Venture Capital
 - Mezzanine Funds
 - Hedge Funds
 - Buyouts
 - Work-outs/Turnarounds
- Real Estate/Development Project Investing

3. **General Diversified Private Equity Groups.** When making their investment allocations, it is not uncommon for the institutions simply to put a substantial portion of their funds in generic “private equity” funds. In these funds, then, the fund managers have the freedom to opportunistically make investments in many or all of the above-listed subcategories. Many of these diversified private equity funds, therefore, have the latitude and interest (in the name of portfolio diversity) to invest in renewable energy projects such as a geothermal development project. On the other hand, because they are generalists, they may not have any exceptional level of understanding or expertise in how those projects are put together and operated, so it may take some education before they are actually comfortable enough to invest.

The investing activities of diversified private equity groups are distinguished by the following key characteristics:

- They have very large pools of capital (often billions of dollars) that need to be deployed in a prudent manner.
- Like their institutional parents, they take a fairly high-level, general view of investing and focus very closely on diversification and portfolio theory.
- They view their investment capital as needing to be perpetually deployed and, as a result, view exiting an investment as a negative event (rather than a successful ultimate payoff) because it just means that they have to turn around and find another asset in which to put the same money.
- They very closely assess the risk/reward trade-off—total return is assessed with respect to the risk involved. Only investments with the lowest risk/reward ratio tend to get done.
- They are large enough to spend the time and money to deal with complex legal structures or tax issues because of the large amount of money that they have to deploy and the economies of scale.
- They can often actually benefit from tax incentives because they have taxable income across their portfolio to offset.

In short, these types of funds, if their managers understand or are willing to learn about the geothermal sector, can be good candidates for providing project equity.

4. Focused Private Equity: The Venture Capital Fund Example. While venture capital has gotten a lot of publicity in the past few years because a lot of people made a lot of money (and subsequently lost a lot of money) during the Internet bubble, the reality is that venture capital is a very narrowly focused type of investment activity and a very small subset of the entire private equity world.

In contrast to the diversified investment approach of private equity funds described above, venture capital is designed to be very tightly focused on only the highest risk and highest reward investment opportunities and, as such, is viewed by the financial institutions as the highest risk component of the whole equity portfolio. In essence, this is a small amount of “play money” out of the whole portfolio that is set aside to “swing for the fences,” knowing full well that that some or much of it may be lost and never recovered. The hope is that by investing in enough of these funds, the overall return will still be higher than other asset categories or diversified funds.

The primary mission for venture investors, and the only way that they can generate the level of returns that they target, is to invest in growth companies with new technology. With that mission, they usually stay away from (and often are explicitly precluded by their organizational documents from) investing in any sort of one-time real estate, construction, or energy project.

Venture capitalists’ goals are to invest in ongoing businesses with high-quality management teams that capitalize on new technologies and opportunities arising from fundamental market shifts. Because of the uncertainty and lack of structure involved with the early-stage companies, they expect extremely high levels of return. Expectations of returns on the order of 10 times the original investment in 5 years or 45 to 55 percent

compounded annual return per year are not unusual in this segment. Additionally, venture capitalists demand hands-on control of the companies with which they work.

5. **Corporate Investors.** While people initially tend to think of stand-alone investment funds as the primary source of equity investment for energy projects, another source of capital that is particularly applicable to the geothermal and renewable energy sector are corporate investors. Like institutions, large corporations often have large pools of capital to invest and can often be convinced to invest for either tax-motivated or strategic reasons.

B. A Framework for Finding Equity Sources. With this full spectrum of private equity investors, the best way to attract investors is by doing your homework and making sure that you understand who you are talking to and what motivates them. Below is a list of items that should be considered when trying to determine how to focus your private equity fundraising efforts.

1. **Stage of Company's Development.** In the energy world, there are two primary stages: the development/exploration phase (which is roughly equivalent to seed stage in the venture world) and the project stage. The early stages of the project will probably have to be financed through some combination of self, friends and family, and angel funding, and government grants. There are some very small scale, institutionally backed "seed funds" or renewable energy funds that are beginning to emerge that can complement these more traditional sources, but they are generally few and far between. Institutional capital tends not to be available until the much later stages in the project's development.

2. **Investment Philosophy.** The key distinction here is the difference between investment in development projects and investment in growth companies built to exploit new technologies or fundamental market shifts. Venture capitalists tend to invest in new technologies and rapidly growing businesses and, therefore, are not a good source for any sort of project financing.

3. **Geographical Focus.** Some investors are national or global in focus and some tend to be more locally focused. As a general rule, the earlier stage the project, the more likely it will be that the investor is nearby. This is because working with unproven, incomplete, high-risk projects requires much closer attention and more regular interaction than later-stage opportunities, and this level of involvement is far easier if the investor is actually located in the same state or city. Investors who are not necessarily local tend to be more comfortable with later-stage investment opportunities in which the financial structure, rather than the day-to-day operational concerns, is the driving force.

4. **Deal Size.** The amount of money that a project is looking to raise also greatly effects which equity source is sought. If the equity amount sought is under \$1 million, angels, friends and family, and self funding tend to be the best alternative because institutional funds do not make such small investments. If the investment amount is in the \$2 million to \$5 million range, then venture capital is probably well suited, but the investment philosophy requirements of the investor still must be met. Since venture capitalists tend not to like project investing, corporate investors are probably better suited for this midlevel range of financing. If the project is seeking more than \$10 million in equity, then the diversified private equity funds or strategic investors are probably the best source.

5. **Risk/Return Profile.** Venture capitalists' money is the highest-risk capital, so naturally they expect the highest rewards (45 to 55 percent per year compounded return). This expectation generally precludes their involvement in development projects.

Institutions, on the other hand, are usually satisfied with significantly smaller returns on investment (maybe 15 to 20 percent per year compounded). Since their upside is limited, however, they expect the risk that they are asked to bear to be far lower. This means that institutional investors often want many of the same types of assurances that lenders require, even if the lenders are expected to have a preferential financial position.

6. **Liquidity Horizon.** It is important to take a look at when investors expect to get their money back. Individuals and seed and start-up stage investors need to understand that they may get their money back only over the full life of the project (which may be up to 30 years!). Venture capitalists generally look for a five- to seven-year horizon and then expect to be fully cashed out at the end of that period. Corporate investors who are motivated by tax savings tend only to remain interested in the project for the period of time during which they can receive the tax benefits (often 10 years). Institutional equity investors want to have as long of a horizon as they can get, provided they can maintain the appropriate level of returns, because redeploying capital is seen as a problem to be dealt with rather than an opportunity.

7. **Industry Expertise.** Remember that an additional reason for bringing in investors is for the value they add beyond just their capital contributions. It is wise to consider noneconomic benefits, such as industry expertise and connections, when targeting investors.

IV. **Conclusion.** Raising millions of dollars of financing for geothermal energy projects can be complex and present a wide range of challenges, especially since it will require significant debt and equity financing. But by understanding the underlying structures and motivations of both lenders and private equity investors, as well as the best ways to address their respective needs in terms of the deal and the legal documentation, one can create well-balanced, fully financed deals that are ultimately rewarding for all of the participants.