THE LAW OF WIND
—Project Finance for Wind Power Projects—

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I.

II. Introduction.

A. The Search for Credit. The essence of wind farm debt financing—as with other electric generation projects—is the search for credit: the fashioning of 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.

B. Risk Shifting. To the extent there is drama involved in putting together wind farm debt financing, much of it derives from the efforts of each participant to shift the various risks to others, while retaining the benefits from the transaction that the participant seeks. The project owner seeks to shift the technology risks to the turbine manufacturer and the construction contractor, while preserving for itself as much of the cash flow and appreciation in project value as possible. The lender seeks to shift the risks to the project owner by taking paramount positions in the project revenues and assets, and to third parties such as the turbine manufacturer and construction contractor by getting the benefit of the warranties and contractual obligations of these participants, all to enhance the prospects of the loan being repaid on schedule.

This risk shifting is accomplished by various legal undertakings by the participants: 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 requirements to cover certain adverse events; and guarantees of each 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.

III. 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 (*i.e.,* 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 single-purpose entities ("SPEs") 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, turbine manufacturers, and others whose long-term unsecured debt is rated at least investment grade by one of the national rating agencies.[1] 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.[2]

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 wind farm. 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 if the success of the project were the only route to repayment of the debt.

D. Limiting Factors. However, in many cases balance sheet financing simply is not an option for wind farms. Many developers of wind farms are smaller, independent companies that do not have the type of balance sheet lenders require. This has changed somewhat in recent years as more substantial companies (*e.g.,* unregulated affiliates of investor-owned utilities) enter the field as wind farm developers.

But even in those situations, there is often an unwillingness 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 wind industry, balance sheet financing may not be an attractive course to pursue. The alternative is limited recourse financing (often called "project financing").

IV. 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.[3] 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.

Indeed, this limited recourse nature is generally reinforced by the ownership structures for wind farms, which tend to use SPEs to own the project. An SPE is set up to have no assets other than its interest in the wind farm.

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[1] The minimum investment grade ratings from Moody's Investors Service and Standard & Poor's Corporation are "Baa3" and "BBB-," respectively.

[2] Though, as any lender will be quick to point out, cash collateral in the hands of the lender is better security than any balance sheet—the difference between a bird in the hand (the cash collateral) and one in the bush (the earnings value of the balance sheet).

[3] 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. However, due to the technology employed, the construction and start-up risks associated with wind farms are generally significantly less than with respect to gas- or coal-fired plants.

Furthermore, the SPE is typically a legal form of entity (*e.g.,* corporations, limited liability companies, and limited partnerships that have as their ultimate general partners corporations or limited liability companies) that, in most instances, prevents the creditors from going after the nonproject assets of SPE owner(s) 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 lender's recourse to enforce payment of the debt is limited to the project assets and revenue-generating capability.

B. Betting the Farm. The project owner literally "bets the farm." Assuming that the debt is properly structured to eliminate or acceptably mitigate the lender's risk, the lender antes up on this "bet" by making the loan. The exercise in structuring a limited recourse project 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 wind 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 (such as the output purchaser and turbine manufacturer), the availability of transmission, how the transmission system handles imbalance penalties for variable resources such as wind, etc. 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 (*i.e.,* pay its bills) even in a worst case scenario.

C. Project Viability vs. Collateral Value of Project Assets. It should be noted that although 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.

D. Capacity Factor—The Answer Is Blowing in the Wind. Unlike gas- or coal-fired electric generation facilities, at this stage of development the technology employed in wind farms is subject to relatively little risk. This is largely due to the fact that, in comparison to gas- or coal-fired plants, wind turbine technology is relatively simple—there are far fewer things that can go wrong with a wind plant. This simplicity, in turn, derives from the fuel source: with no combustible fuel to control and contain, a windmill avoids many of the stresses and strains that cause gas and coal plants to be comparatively temperamental.

Rather, it is the fuel source itself that presents one of the most fundamental risks associated with wind farms: that is, the risk as to how often and how fast the wind will blow. No wind means no electricity, and no electricity means no revenues to pay project operating expenses and debt and to provide a return to the owner. But simple lack of wind is not the only problem. Excessive wind speeds can be equally problematic, as wind turbines cannot generally be operated when wind speeds exceed a certain level (generally around 60 to 65 miles per hour). Furthermore, in many prime wind-site areas, the wind tends to blow most consistently at night during off-peak hours, rather than during daytime periods of peak usage.

Wind risk is quantified by reference to the "capacity factor" of the wind farm site. This is a convention developed for expressing (as a percentage of the project's installed capacity) the amount of electric energy a wind farm can be expected to produce over an extended period of time (usually one year). Thus a wind farm with an installed capacity of 100 MW (*e.g.,* 100 one-MW turbines) that has a capacity factor of 30 percent can be expected to produce, over the course of a year, 30 MW of electricity on average. It is for this reason that sales of wind power are often stated in terms of "average MW" (or "aMW"). Of course, this means that at certain times the wind farm will be producing 100 MW, while at others it will be producing 0 MW.

E. Meteorological Studies. The capacity factor for a wind farm is based on meteorological (or "met") studies done at the site over an extended period of time. Thus the met study is a key piece of information that will be given special scrutiny in the financing process, as it is one of the foundations on which an evaluation of the economic viability of the project must be based.

The longer the met study is conducted, the greater confidence the parties can have that the capacity factor will be accurate going forward. Generally speaking, a met study will not be relied on unless it was conducted for at least one year. And many participants in the wind industry naturally have a bias toward met studies conducted over several years (after all, "one swallow does not a summer make").

The met study can also provide valuable information as to how the turbines should be configured on the site to optimize production. The trick here is to put as many turbines on the site as can effectively use the available wind resource, but to do so without creating counterproductive inefficiencies (such as one turbine being located in the "wind shadow" of another turbine, thereby reducing the efficiency—or output—of the former).

Because it takes awhile to do a usable met study on a site, lenders rarely commission their own independent study. Rather, it is more typical for the lender to retain its own independent meteorologist to review the wind study previously done by the project developer's meteorologist. As with any study of this nature, reasonable experts can have different views as to proper method for conducting the study and the conclusions to be drawn. Thus it is not unusual for the lender's and the developer's meteorologists to have extended discussions over the methodology employed and the conclusions to be drawn from the data collected. And one can expect the lender's advisor to argue for a more conservative interpretation (*i.e.,* lower capacity factor), while the developer's meteorologist is more naturally inclined toward a more generous interpretation (*i.e.,* higher capacity factor).

F. No Free Fuel. In considering wind farms in comparison to other electric generation facilities, one may be tempted to think that the fuel is free. This is only superficially the case. It is true that there is no line item in the wind farm pro forma for fuel costs, as there would be with a gas- or coal-fired plant. However, the cost of fuel for wind farms is embedded in the capital costs of the project when viewed in relation to the project's productivity. And rather than being free, careful consideration demonstrates that, at present, the out-of-pocket costs involved in using wind as the fuel source are significantly higher than the out-of-pocket costs of traditional fuels such as gas or coal.[4]

The current cost of putting up a wind farm is approximately $2.3 million for each MW of installed capacity. Thus a 100 MW wind farm (installed capacity) will generally cost about $230 million to build and put into operation. By way of contrast, the cost of constructing a gas-fired plant is around $900,000 to $1.2 million per

[4] I stress here out-of-pocket costs, meaning the portion of project revenues that must be devoted to deferring the fuel costs. This is not to say that the real economic and social benefits that come from using nonemitting resources such as wind power have no value, for indeed, such benefits seem indisputable though perhaps more difficult to quantify. But, for better or worse, the out-of-pocket costs tend to be the key driving force behind most economic decisions of this sort. The societal/environmental benefits of wind power are beginning to hold greater sway in the marketplace, driven by the PR value to utilities of being able to tout their "green prowess" and the move by many public utility commissions to implement renewable portfolio standards.

MW of installed capacity. Thus, out of the box, wind farms are significantly more expensive to construct than gas-fired plants. However, the fact that a gas-fired plant must also bear the ongoing operating expense of fuel costs largely eliminates the superficial cost advantage that gas-fired plants have in this regard.

But when one considers the impact of the capacity factor on wind farm economics, the competitive advantage once again tilts strongly in favor of gas-fired plants. If one builds a 100 MW gas-fired plant, it will generate 100 MWs of electricity day in, day out, 24/7 for the life of the plant (scheduled maintenance and the occasional forced outage excepted). But a 100 MW wind farm with a capacity factor of 30 percent (which is about average these days) will generate only 30 aMWs—a full 70 percent less in power production over the life of the farm as compared to the gas-fired plant. Because production equals revenues, one can readily see that if the price for wind power and gas-fired power were the same in the marketplace, the dollars invested in a wind farm would produce a dramatically smaller return than they would if invested in a gas-fired plant.

Fortunately for the future of wind, the current market price for wind power (including the "green tags" or environmental attributes that are sold along with the power, though perhaps to a different buyer than the buyer of the power) is generally higher than the price for power generated via fossil fuels. Wind power and associated green tags often bring about $12 to $15 more per MW than power generated by fossil fuels. In fact, this differential is a fair proxy for the value of the green tags and can be viewed as the marketplace's acknowledgement that the environmental benefits of green power have real economic value. It is this differential, along with subsidies like the production tax credit, that enables wind farms to be a viable alternative.

Although it is good that the marketplace currently places such a premium on wind power and green tags, the foregoing nevertheless amply shows that the choice of wind as fuel source has very real costs. Far from being free, using wind as a fuel source results in direct, tangible, out-of-pocket costs that are currently far in excess of the costs associated with other fuel sources. Indeed, wind will not be an economically free fuel unless the industry evolves to the point where the all-in, out-of-pocket costs of producing wind power are equal to or less than the all-in, out-of-pocket costs of producing fossil fuel-generated power minus the fossil fuel costs.

G. Performance Guarantees. Evaluation of the met study is aimed at addressing one of the key risks associated with wind farms—namely, how often, at what times of the day, and how fast will the wind blow. Moving beyond that, there is the risk associated with the equipment employed. Because wind farms are variable resources that produce revenue only when the wind is blowing, it is essential that the project produce the maximum amount of electricity from the available wind resource in order to produce the maximum amount of revenue. The performance risks are addressed in the various guarantees provided by the turbine manufacturer.

The types of performance guarantees that are usually sought from the turbine manufacturer are as follows:

Mechanical Availability: The mechanical-availability guarantee is aimed at ensuring the reliability of the turbines—that, from a mechanical standpoint, they will be ready to produce electricity whenever the wind blows. In recent years as the technology has improved, typical mechanical-availability guarantees provide for a guarantee of a mechanical-availability percentage in each contract year of 95 percent. The mechanical-availability percentage is a fraction, the numerator of which is the actual number of hours in the contract year during which the turbines were mechanically available for operation, and the denominator of which is the theoretical number of hours during the contract year in which the turbines could have been mechanically available to produce electricity.[5] To the extent the project falls below the guaranteed mechanical-availability percentage in a given contract year, the turbine manufacturer is liable for liquidated damages, which are usually calculated by reference to the cost of replacement power (or cost to cover) in an amount equal to the forgone production due to failure to meet the guarantee.

Guaranteed Output: Although the mechanical-availability guarantee is aimed at providing assurance that the turbines will be mechanically available to produce electricity, the output guarantee is aimed at ensuring that a certain level of total output (electricity production) will be achieved over time. The output guarantee starts by reference to the project's mean annual output. Mean annual output, in turn, is a negotiated figure usually expressed in terms of a certain number of megawatt hours ("MWh") in each contract year. The output guarantee is typically 75 percent of the mean annual output. The guarantee takes the form of guaranteeing that the average annual output for the calculation period in question (*i.e.,* the actual amount of MWh produced during such period) will be not less than the output guarantee.

It should be noted that the period over which the output guarantee is tested is usually a rolling two-year period, rather than an annual period. By taking the average of two years, one avoids a situation in which a bad wind year results in a breach of the guarantee. Rather, the guarantee is not breached so long as the average annual output in each rolling two-year test period is equal to or greater than the guaranteed output.

As with the mechanical-availability guarantee, breach of the output guarantee results in the turbine manufacturer being liable for liquidated damages calculated by reference to the cost of replacement power (or cost to cover) in an amount equal to the forgone production due to failure to meet the guarantee.

Power Curve Warranty: The power curve warranty is aimed at ensuring the efficiency of the turbines. A turbine may meet the mechanical-availability and output guarantees and yet not be producing as much electricity as it could under the same wind conditions due to inefficiencies resulting from poor design, manufacture, or installation. To determine compliance with the power curve warranty, one or two turbines in the wind farm are usually selected for testing upon completion of construction of the wind farm. These turbines are then tested to determine their actual power curve (basically, how much power the turbine produces at various wind speeds and ambient temperature conditions). As with the other performance guarantees, to the extent the actual power curve of the tested turbines is less than the guaranteed power curve, the turbine manufacturer is liable for liquidated damages calculated by reference to the cost of replacement power (or cost to cover) in an amount equal to the forgone production due to failure to meet the guarantee. With the power curve warranty, if the actual power curve of the tested turbines is less than the guaranteed curve, the turbine manufacturer usually has the right to attempt to fix the turbines and retest.

Parent Guarantee: It is, of course, one thing to secure performance guarantees from the turbine manufacturer; it is quite another to collect on them should the guarantee be breached. Because many turbine manufacturers are subsidiaries of larger enterprises, the financial strength of the consolidated group often resides not in the manufacturing subsidiary, but in the parent or another affiliate. As a consequence, the performance guarantees often require backing (in the form of a guarantee of payment) from the manufacturer's parent or affiliate in order to give them substance over the long term.

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[5] The denominator is essentially the total number of hours in the contract year, less the hours during which the project suffers transmission curtailment, is down for scheduled maintenance, or is down due to a force majeure event other than a purely mechanical event related solely to the turbines.

H. 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 part of 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 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 so as to 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.

This essential bargain is 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.

Key aspects of the security arrangements that create the requisite sealed system are:

The Power Purchase Agreement: The power purchase agreement ("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.[6] 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:

- *Term:* The term of the PPA (exclusive of renewal options) should generally be several years longer than the term of the financing. Thus, 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 in the event the project encounters difficulties during the term of the financing.

- *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

[6] Under current market conditions, it is generally not possible to obtain limited recourse financing for a wind farm without a long-term PPA for the purchase of the output of the project. Merchant wind farms 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 wind farms (*i.e.,* those that will sell the electricity into the market rather than pursuant to a long-term PPA).

falls below a certain level,[7] 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 wind power, especially when the purchaser is acquiring the wind resource in order to comply with a renewable portfolio standard imposed by the local public utility commission.[8] But when the purchaser is pursuing wind 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.

- *Reciprocal Credit Maintenance Provisions:* Although reciprocal credit maintenance requirements (*i.e.,* 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 wind power, for several reasons. First, historically many wind farm 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 wind development arena in recent years, this is proving less of a stumbling block. Second, wind farm owners have argued that because wind is a variable resource from which one cannot count on having a given amount of power available for delivery at any given time, the purchaser is not harmed by a failure to deliver in the way it would be, for example, with a gas-fired base load resource that can be counted on to deliver a given amount of power on a 24/7 basis. But even this argument seems to be diminishing in strength as the industry gains more experience with wind and becomes better at predicting (within certain limits, of course) the output of a wind farm in the short term. Thus the industry is beginning to see more reciprocal credit maintenance provisions in wind PPAs than has historically been the case.

- Interestingly enough, the project lender may not favorably view a wind PPA that requires the project owner to agree to a credit maintenance requirement. As the recent experience with the California energy crisis has shown, credit maintenance provisions are fraught with risk in that at the very time the project owner is encountering financial difficulties (as reflected in the credit rating downgrade that serves as the trigger for the credit maintenance provision), it is called on to post additional collateral as security for its PPA obligations—collateral that it may not have available or that will further undermine the financial position of the project owner if it is posted as required. Thus in recent years we have seen a number of major players default on their obligation to post collateral under PPAs in the face of a credit downgrade. The result is a default under

[7] In lieu of using a credit rating as the trigger, other triggers, *e.g.,* maintenance of a specified level of tangible net worth, are sometimes employed, either by themselves or in combination with a credit rating requirement.

[8] The experience here is similar to that under the Public Utility Regulatory Policies Act whereby the utility is forced to purchase the output of a qualifying facility: because the power purchase is not pursuant to a truly voluntary, bilateral arrangement for a resource that the purchaser would otherwise want in its portfolio, the purchaser has little incentive to bolster the credit of the PPA by agreeing to credit maintenance provisions.

the PPA that can give the power purchaser a right to terminate. Such a risk of termination may not be welcomed by the lender, who is keenly interested in seeing that the power purchaser has the ongoing obligation to purchase power during the entire PPA term (or at least until the project debt is fully repaid). Thus a lender may well view a credit maintenance requirement on the part of the project owner as a negative, and may prefer to have a PPA that does not impose any such requirement on the project owner so that the risk of termination for failure to meet the credit requirements is eliminated.

- *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.

- *Transmission Curtailment Risk:* Although 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 (based on wind conditions during the curtailment period) had the curtailment not prevented the plant from operating.

Assignments of Key Contracts and Permits: To ensure that it has control (via the security arrangements) over the entire project as a going concern, the lender will also require first-priority assignments of all key project contracts and permits. On the contract side, this includes the turbine supply agreement, the construction contracts, the interconnection agreement, the parts supply agreement, the equity contribution agreement among the owners of the project owner, the operation and maintenance ("O&M") agreement (if the wind farm 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 in the event 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 (*i.e.*, 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 (*e.g.,* 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 on 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 and 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 the lender a path forward 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.

Flow of Funds 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 the maintenance of the project operations so that the project will continue to produce power and earn the needed revenues from power sales. 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 will, in effect, create reserves to protect against adverse events that could interrupt the flow of project revenues.

Monies get paid out of the lockbox in accordance with the priorities or "waterfall" established under the credit agreement. Disbursement of lockbox monies 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 monies directly to the party to whom they are owed, 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:

- *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 until an amount (or reserve) equal to six months' O&M expenses is on hand.

- *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 an adequate debt service reserve amount (typically six months' debt service on the project debt, but sometimes as long as one year).

- *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.

- *Distributions to the Project Owner:* Finally, 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 only on a quarterly basis, 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 ("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[9] to annual debt service, expressed as a number, *e.g.,* "1.20" (which means net revenues for the fiscal year must be equal to at least 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, monies 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.

V. Conclusion. Many more topics could be covered under the heading of wind farm finance: insurance requirements, means of integrating third-party equity investments into the debt financing structure, monetization of production tax credits, issues relating to transmission and imbalance charges, the fine details of force majeure provisions in PPAs and other major project agreements, etc. But although the foregoing treatment is not exhaustive, it nevertheless provides a framework for approaching these and other topics. For no matter what aspect of wind farm financing one examines, the essential dynamic at play will be the search for credit and the corresponding effort to reduce or eliminate risk.

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[9] Net revenues equal (i) gross project revenues for the fiscal year in question minus (ii) operating expenses for that fiscal year, but not including debt service on the project debt.