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Renewable Energy Projects on Contaminated Property: Managing the Risks

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Managing brownfields risks requires complex technical and legal analysis. Analyzing risks in renewable energy projects is equally complex. Both projects involve several contracts that must be integrated and made consistent with each other. Combining these types of projects creates a unique combination of risks, including, for sites where institutional/engineering controls are part of the remedy, risks that will not diminish over time. The best risk management tool is an insurance program that can integrate property and commercial general liability (CGL) coverage for renewable energy risks with manuscripted coverage under a site pollution liability (SPL) policy for brownfield risks.

INTRODUCTION

The Obama administration's effort to double renewable energy generation in the United States by 2010 has increased the renewable energy sector's focus on risk management techniques.[1] Several federal initiatives are anticipated to spur the financing of renewable energy projects. On February 17, 2009, President Obama signed the American Recovery and Reinvestment Act of 2009 (the Stimulus Law).[2] The Stimulus Law extends production tax credits

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1 It is estimated that renewable energy production will increase 70 percent between 2006 and 2030. See OSWER Center for Program Analysis, "Data Guidelines for 'Clean and Renewable Energy Generation Potential on EPA Tracked Sites,'" http://www.epa.gov/oswercpa/maps/epa_tracked_sites_data_guidelines.pdf.

2 PL 111–5.

for eligible renewable energy projects and provides the opportunity to opt for an investment tax credit, instead of a production tax credit, for types of renewable energy equipment that were not previously eligible.[3] The Stimulus Law also allows developers or owners of renewable energy projects to forego production and investment tax credits altogether, instead receiving a nontaxable cash grant in an amount equal to 30 percent of a project's cost.[4] Additionally, on June 26, 2009, the American Clean Energy and Security Act (Legislation (HR 2454)) passed the House of Representatives.[5] That act requires electric utilities to provide an increasing share of their electricity from renewable sources: 6 percent in 2012, 9.5 percent in 2014, 13 percent in 2016, 16.5 percent in 2018, and 20 percent in the years 2021–2039.[6]

The prospect of cash flow into the renewable energy sector has left developers searching for appropriate project locations. To meet the renewed real estate demand for project locations, the federal government is touting contaminated properties, or "brownfields," as locations for renewable energy production facilities.[7] Brownfields are often well suited for renewable energy projects. The sites are often large with one owner and are situated in areas where aesthetic opposition is minimized and where existing electric transmission lines, capacity, and other critical infrastructure exists. Further, environmental conditions on these properties often are not well suited for traditional redevelopment such as residential or commercial.

However, the development of renewable energy facilities on contaminated properties presents a unique variety of risks that can be detrimental to the financing viability of such projects. Investor focus on the risk side of the risk-return equation for renewable energy projects has certainly increased in the current economic climate. Renewable energy projects already have a high risk profile, unclear risks in construction and operational phases,

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3 §1102 (Election of Investment Credit in Lieu of Production Credit).

4 §1603 (Grants for Specified Energy Property in Lieu of Tax Credits). On July 9, 2009, the Departments of Treasury and Energy released program guidance for the Grant in Lieu of Tax Credits program for renewable energy projects and announced $3 billion in funding for such grants. The program is expected to support approximately 5,000 renewable energy projects with an estimated total investment of between $10 and $14 billion. As of September 1, 2009, projects in eight states have received more than $500 million in the initial round of program funding. See *Bureau of National Affairs Environmental Reporter*, 40 ER 2107 (accessed September 11, 2009).

5 The bill has been placed on the Senate Legislative Calendar but has not yet been voted on in the Senate.

6 Many states have also set renewable energy portfolio standards (RPS) requiring utilities to use a minimum percentage of electrical power from renewable energy sources.

7 The U.S. Environmental Protection Agency (USEPA) is currently tracking approximately fifteen million acres of potentially contaminated properties across the United States for potential renewable energy development opportunities. USEPA's Web site contains maps showing opportunities to site renewable energy projects on brownfields in each state along with a listing of state incentives available for promoting renewable energy. The maps provide information relevant to siting renewable energy production facilities and to incorporating smaller-scale renewable energy production as part of other redevelopment projects, such as a housing, commercial, or industrial project (http://www.epa.gov/renewableenergyland/).

and often face financing gaps. While some insurance products address risks presented by renewable energy projects, very few policies are specifically tailored to address both renewable energy project risks and brownfield remediation risks. Without a tailored risk management program that includes a manuscripted site pollution liability (SPL) policy as well as property and commercial general liability (CGL) coverage specifically addressing project risks and relating to key project contracts, such projects may never reach successful implementation.[8]

GENERAL PRINCIPLES OF RISK MANAGEMENT

Risk management is frequently defined as a five-step decision making process: (1) identifying an organization's exposures to accidental loss; (2) examining feasible alternative risk management techniques (risk control and risk financing) for dealing with these exposures; (3) selecting the best risk management techniques; (4) implementing the chosen techniques; and (5) monitoring the results of the chosen techniques to ensure that the risk management program remains effective.[9]

Step one of this process, identifying and analyzing loss exposures, is arguably the most important step in the risk management process. Every loss exposure has three dimensions:

1. the type of value exposed to the loss;
2. the peril causing the loss; and
3. the financial consequences of that loss.

Loss exposures are commonly analyzed based on the first dimension, the type of value exposed, which results in four basic types of loss exposures: (1) property exposures; (2) net income exposures; (3) liability exposures (the value being freedom from liability); and (4) personnel exposures. Next, as part of the analysis, the perils affecting a particular economic exposure must be identified. Examples of perils to property exposures include fire, windstorm, earthquake, and rot. With liability exposures, the perils to the value—freedom from liability—are often intangible, such as legal claims brought against an entity because of a legal wrong it is alleged to have committed. Common perils to net income exposures include business interruption; contingent business interruption; losses of anticipated profits on finished goods; reduced rental income; decreased collection of receivables; and increased operating expenses.

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[8] Note that ASTM International is developing standards to minimize such risks. ASTM WK21811, *New Guide for Using Renewable Energy Projects on Brownfields in Climate Risk Management Strategies,* is currently being drafted.

[9] George Head and Stephen Horn, *Essentials of Risk Management, Vol. 1 (*Insurance Institute of America, 1991).

However, it must be noted that the same perils may affect more than one type of exposure. For example, a hurricane may result in first-party property and third-party liability claims. Similarly, business interruption can affect property and liability exposures.

RISK MANAGEMENT OF BROWNFIELD SITES

Environmental Risk Analysis

If identifying and analyzing loss exposures is the most important step in risk management generally, it is all the more important—and more complicated—in managing the risks at a brownfields site. Environmental liability is a subcategory of liability exposure. The value being exposed to the loss is still freedom from liability, but the peril created is not just the result of a strict liability regulatory framework. It is also the result of an actual pollution condition on, at, or under a site arising out of historic, current, or future operations. Thus, environmental perils or risks must be analyzed on both a technical and legal basis. Environmental lawyers often utilize a matrix such as the one shown in Table 1 to identify specific environmental risks of concern, with intersection points between liabilities and preclosing known and unknown conditions and postclosing conditions.

This matrix of pollution conditions and potential liabilities can only be filled in, and the specific risks of concern can only be identified, by examining site-specific conditions and remedies. The first step in such an exercise is to define known conditions so that known can be separated from unknown.

TABLE 1. Site Environmental Liability Matrix.

Liabilities	Known	Unknown	New Conditions
Response Costs			
On-Site			
Off-Site			
Bodily Injury			
Tenants			
Workers			
Neighbors			
Property Damage			
Physical			
Diminution in Value			
NRD			
Compliance			
IC/ECs			
Buyer Excavation Activities			
Business Interruption			

Known conditions must be characterized and defined before any risk can be properly identified and then allocated.

Environmental Risk Transfer Mechanisms

It is important to note that a corporate risk manager typically does not get to choose options for brownfields risk financing or risk control because those remedial and risk transfer techniques are often already chosen by environmental lawyers and consultants. There is usually a deal on the table with two and sometimes three contracts being negotiated—a purchase and sale agreement (PSA), a remediation agreement, and an SPL policy. The question is how well will these options be implemented. Each contract must be legally sufficient in itself but its terms and conditions must also complement and coincide with the terms and conditions of the other contracts.

Provided that environmental risks of concern have been isolated and identified—the matrix discussed above has been filled in—specific environmental risks of concern should be allocated within the environmental provisions of the PSA. Risks of concern differ from deal to deal. A typical scenario might be one where a seller is the responsible party for a remediation and is therefore willing to take responsibility in the PSA for known remedial costs. The seller, however, wants an indemnification from the buyer (who will be performing excavation) for cleanup costs arising from unknown conditions. Environmental indemnities for these risks will be drafted that allocate liability in the PSA. The role of environmental insurance in the deal should be clarified through an environmental insurance provision that will spell out how such insurance can support or substitute for the specific indemnities in the PSA.

The SPL policy potentially covers almost all risks of concern contained in the environmental liability matrix. It must be stressed, however, that there are many versions of this nonstandardized policy with important coverage differences in the language of their standard forms. Any SPL policy for a brownfield site will necessarily involve "manuscripting" for the very reason that some coverage of specific known conditions is usually involved. Nevertheless, the coverage provided by the policy form and standard endorsements is basically the same and tracks with the environmental liability matrix. The policy covers new and preexisting known or unknown conditions that give rise to:

- Third-party bodily injury and property damage, on a claims made and reported basis;
- Cleanup costs on a claims made and reported or discovery and reported basis (for first party/on-site cleanup costs);
- Other liabilities, e.g., business interruption and transportation, often by endorsement for an extra premium.

One confusing feature of SPL policies for brownfields is that coverage of known conditions is hidden in an exclusion for conditions that were known and not disclosed during the application process. This exclusion is often modified in one of two ways: (1) by an endorsement excluding certain liabilities arising out of the known conditions, typically remediation costs; or (2) if the insurer decides to cover known and disclosed conditions, by a disclosed document endorsement that stipulates that the conditions described in the scheduled documents are known and have been properly disclosed.

The manuscripted language of these endorsements involving known conditions must be carefully reviewed for legal sufficiency. The language of the exclusionary endorsement is particularly important. For example, such an endorsement will often state that when a no further action (NFA) letter is received, the exclusion will be removed or modified. Sometimes, however, the language states that this removal or modification is at the insurer's "sole discretion," which is clearly a problem. Another problem is that many remedies do not end with an NFA but with institutional/engineering controls (IC/ECs) over known conditions. This is known as the long-term stewardship problem. Most environmental underwriters typically add a failure to maintain IC/ECs exclusion when they know that IC/ECs are part of a remedy. However, it is possible to obtain a manuscripted endorsement providing coverage for IC/EC liabilities, i.e., failure to monitor, maintain, and enforce them under SPL policies. The long-term aspect of the long-term stewardship problem can be addressed by an "automatic" renewal endorsement stating that if the company is in existence at the end of the policy period the policy can be renewed.[10]

Implementation of such a manuscripted SPL policy covering known conditions is crucial and requires an expert broker and underwriter who can negotiate and tailor language that fits the specific risks of concern at any site. Language must be consistent with the environmental allocation provisions in the PSA. For example, if the PSA requires the seller to assume responsibility for known remediation costs and the buyer for everything else (i.e., cleanup costs arising out of unknown conditions and third-party bodily injury and property damage arising from known and unknown conditions) then the contamination exclusion endorsement should only exclude those cleanup costs arising out of known conditions. The language of both the PSA and insurance contract must carefully track each other.

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[10] At present, this manuscripted coverage for IC/EC liabilities with automatic renewal is available only through Chubb Environmental.

RISK MANAGEMENT OF RENEWABLE ENERGY PROJECTS

Structure of Renewable Energy Projects

The financing structure, and accordingly the financial risks of a renewable energy deal, have traditionally been driven by the type of renewable energy project and thus available tax credits. The renewable energy market relies on tax credits to help generate competitive returns. The primary credits available are the production tax credit (PTC),[11] which is principally used for wind, biomass, geothermal, and specified other renewable energy projects, and the investment tax credit (ITC),[12] which is principally used for solar projects.

A flip structure is the financing vehicle typically utilized for projects eligible for the PTC. A flip structure relies on partnership tax rules to allocate the tax benefits to tax equity investors. The developer and the equity investor form a pass-through entity, like a partnership or LLC, as a project company that owns the project. The members of the partnership are treated as the owners of the project. The partnership agreement allocates between the parties taxable income or loss and cash distributions. Once the project is placed in service and the tax equity funds its contribution, 99 percent of the tax benefits are allocated to the tax equity. The cash flow is typically allocated 99 percent to the investor once the developer has recovered a portion or all of its equity investment. Those allocations typically remain in place for ten years when all of the tax benefits have accrued. At that point, the allocations flip and the developer takes up to 95 percent of the cash and tax attributes.[13] Thus, the flip structure delays a developer's return on its investment, but reserves to the developer the potential upside potential in a deal.

Conversely, secured financing is typically utilized for projects seeking ITCs. This is so because the ITC is available to the owner of a facility, whether or not the owner actually produces electricity. Many solar projects utilize a sale/leaseback financing structure. Under that structure, a special purpose project entity is formed and the developer and operator of solar assets constructs and agrees to operate a solar facility and to sell the electricity produced to the owner of a property where the solar plant will be built under a power

[11] The production tax credit is claimed over a ten-year period and is based on the number of qualified kilowatt hours of electricity produced and sold during the tax year. The amount of the credit increases each year for inflation and currently equals 2.1 cents per kilowatt hour (1 cent per kilowatt hour for most biomass facilities).

[12] The investment tax credit is equal to 30 percent of the cost of the facility and is available to the owner of a qualifying solar facility placed in service before 2017. The ITC is taken entirely in the year the project is placed in service. The ITC is available to the owner of the property (including regulated utilities), whether or not the owner is engaged in the production of electricity, and regardless of the levels of production of electricity.

[13] The developer also typically has the option to buy out the tax equity's remaining 5 percent interest in the project.

purchase agreement (PPA). If the site owner has no need to purchase electricity for on-site use, the project entity may enter into a PPA and corresponding interconnection agreement directly with the public utility. In either event, the PPA terms will require that the private/public power purchaser buy all of the power produced at a fixed price, thereby locking in a revenue stream over the term of the PPA. The developer typically sells the solar property to a bank or other tax equity investor that leases the property back to the developer under a long-term lease. The lease is integrated into the deal and very often the lease actually becomes part of the PPA. The lease terms provide that the developer will share in the ITC and depreciation tax benefits through a reduction in rent and grants as collateral an assignment of the PPA and other revenues (such as funds from the sale of renewable energy credits).[14] Thus, this structure provides 100 percent financing. However, while a developer realizes a large up-front profit on the sale of the renewable energy project to the tax equity (and that sale steps up the basis of the project in the hands of the tax equity for ITC and depreciation purposes), it costs more for the developer to get the project back. After the lease terminates, the developer can only continue using the project by purchasing it from the investor. The structure also separates project ownership from operations, insulating the investor from operational risks.

With the passage of the Stimulus Law, investors and developers now have some flexibility in choosing financing structures. The Stimulus Law now allows PTCs to be converted into ITCs, and further allows the ITC to be converted into a cash grant. It remains to be seen whether the availability of up-front cash grants may prompt developers to forego capital from institutional tax equity investors altogether and instead finance projects through debt.[15] Accurate financial modeling is required to choose an appropriate deal structure. However, no matter what financing structure is utilized, critical to each project is a corporate and legal structure that provides investors with limited liability, reduces taxes to the greatest extent possible, facilitates operating permissions and power purchase contracts, and accounts for the various risk mitigation provisions found in key contracts governing the construction and operation of a facility.

[14] Renewable energy credits or certificates (RECs) are commodities that reflect the environmental attributes associated with investment in renewable energy generation. RECs allow electric consumers, wholesalers, and utilities to purchase "green power" on a notional basis without regard to the specific source of the generation. In a financing of renewable energy property, the RECs generated by the project can be sold by the developer to a utility or other purchaser to reduce the overall financing cost.

[15] However, tax considerations may quash that option as cash grants will not alleviate depreciation deductions. A developer choosing a grant will be left with depreciation deductions that it might not be able to utilize efficiently.

Risk and Exposures in the Life Cycle of a Project

The typical renewable energy project involves multiple parties: tax equity investors; equity investors; local utilities; engineering, procurement, and construction (EPC) contractors; operation and maintenance providers; renewable energy certificate (REC) buyers; host customers; and local, state, and federal governments. However, the project as a whole raises common exposures and perils for all of these parties. Successful risk mitigation depends upon not only identifying potential loss exposures but also understanding the perils causing such loss exposures and the context in which those perils arise during the phases of a project's lifecycle: project development, construction, operation, and decommissioning

Initially, owners/developers of a renewable energy project must assess technological feasibility, determine project structure, assess regulatory risks, negotiate key contracts, and make an overall assessment of market conditions. The following risks are presented during this initial project development stage:

- Acquisition of necessary permits and approvals is not successful
- Connection to the electricity grid is not feasible or too expensive
- Energy purchase agreement does not meet conditions posed by investors or lenders
- Regulatory policy changes delay project development or affect project viability
- Increased costs of equipment and services

Regulatory changes are of particular concern. Regulatory risks include not only the typical real estate-related risk of being unable to obtain the necessary permits and licenses essential to project implementation in a timely fashion, but also the more significant risk of adverse policy changes that might occur during a project's lifecycle that may have significant impacts on project profitability. Investors, developers, and lenders need to be mindful of the web of federal policy and regulations controlling renewable energy assets. Much of this falls under the purview of the Federal Energy Regulatory Commission (FERC), which is granted authority under the Federal Power Act (FPA). FERC's regulation of electric utilities and transmission forms a complicated and technical web of approval requirements, notices, and subsequent reporting requirements that must be met by the parties to a transaction. Unless exempted by qualifying for "small power production facility" status under the Public Utility Regulatory Policies Act (PURPA), owners and operators of generating facilities must comply with the provisions of Part II of the FPA and corresponding FERC regulations. Such regulation can potentially add years to the regulatory approval process.

As a project moves into the construction phase, several risks are presented, none of which are unique to the renewable energy sector:

- Cost and/or time overruns may negatively affect the cash flow of the project
- Contractor or subcontractors may not be able to meet the agreed upon technical specifications
- Contractor or suppliers may not perform as per the negotiated contract

The risk profile of the operational phase is crucial in determining the appropriate financial parameters of a project. Any disturbance in the production of energy will necessarily result in lower project income. Several risk types are relevant to this phase:

- **Performance risks**:

  - Underperformance of technology
  - Underperformance of technology due to improper installation
  - Underperformance of operation and maintenance (O&M)
  - Security-theft / equipment damage, terrorist attack

- **Resource risks:**

  - Variable availability of resources (e.g., windspeed profile or solar irradiation, or disturbance in biomass supply)
  - Natural catastrophe

- **Market risks:**

  - Demand risk (uncompetitive pricing policy of renewable energy projects)
  - Price risk (changes in market prices)

Finally, the risks presented during the decommissioning phase of a project are generally low. In many cases, the scrap value of the installation is higher than the decommissioning costs. However, disposal value at end of project life can be affected by increased cost of disposal and decreased financial feasibility for project overhaul. Thus, in many cases regulatory requirements impose the creation of some kind of decommissioning fund, which must be funded during the operation phase or at the beginning of the project.

Risk Transfer Mechanisms

One question pervades the above phases of a project's lifecycle: does the project structure provide the financial support necessary for successful project implementation? Well-drafted contract provisions in the agreements between the primary parties to a project, e.g., the project entity, facility owner, and utility, that are fully integrated with an insurance program addressing the exposures and perils of those parties will often make projects bankable. Such agreements, i.e., the PPA, the interconnection agreement, lease or purchase and sale agreement (PSA), should provide exit strategies that track the perils that may make a project economically unfeasible. Additionally, a project entity typically enters into a myriad of subsidiary contracts with various parties for the realization and operation of the overall project. These may include contracts with equipment suppliers, resource acquisition/fuel supply agreements, investment agreements, interconnection and net metering agreements,[16] off-take contracts, engineering procurement and construction (EPC)/installation agreements, operation and maintenance (O&M) agreements, marketing agreements, and REC sales agreements. The effectiveness of the terms of those subsidiary contracts in mitigating perils is also essential as those terms often dictate investor and lender terms for renewable energy projects.[17]

The PPA entered into by the public/private sector buyer and the project entity is perhaps the most crucial and highly complex component of any renewable energy project. It is an agreement for the sale and purchase of electricity and sets out the rights and obligations of the buyer and the project entity. It is also designed to address a variety of risks over a long term. Basic terms of a PPA include project term,[18] price, amount of electricity to be produced and purchased, measurement of electricity, point of delivery and transfer of title and line losses, insurance and indemnification, how renewable energy certificates or carbon credits will be treated, and removal of the system. The agreement allocates risks for delays in construction and defines damages for breach of contract. Power purchase agreements may also contain provisions for equipment leasing and financing and site lease in cases where the facility is on buyer's land. Project entities often find themselves as intermediaries balancing the interests of the host and the finance parties during the negotiation of the PPA.

Price is often the most negotiated term in a PPA. Price should be negotiated based on the cost of infrastructure and installation (including the administrative time to obtain necessary regulatory approvals), the efficiency and output of system, the present rate of electricity from the utility and anticipated future increases, and the actual or anticipated value of RECs.

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[16] Interconnection agreements between a power generator and a power grid company or agency ensure that the power generator is able to connect with and sell power through the grid. Interconnection agreements address such issues as the cost and placement of interconnection equipment. Many jurisdictions provide mandatory terms for access to power grids by renewable energy projects.

[17] For example, the terms of contracts dealing with equipment supply issues, such as fuel supply agreements, are particularly important in biomass and biofuel projects as well as waste-to-power plants. Contracts with equipment suppliers or with service companies should include performance guarantees over the project lifecycle so as to consistently ensure that a project has an adequate source of fuel at an acceptable price. They should also contain insurance provisions to back up those guarantees.

[18] Project term is typically defined by the life expectancy of the energy equipment, the term of the debt, or the duration of the power purchase agreement. Mechanisms such as reduced demand for power, reduced technical lifetime of the equipment, or revocation of operation permits can potentially affect the project term.

Another crucial concept of the PPA is the point of delivery, or the point of interconnection between a project and the utility. Typically, all equipment on the project side of the point of delivery is the responsibility of the project entity. Thus, the risk of adverse conditions affecting minimum load delivery, power system interruptions, or overload and loss of system generation is all born by the project entity.[19]

Most PPAs allocate risks and exposures through carefully drafted representation and warranties and indemnity and insurance provisions. The former may contain a covenants clause in which specific perils such as regulatory risks are addressed and that assign rights and responsibility for RECs. The latter typically allocate broad categories of loss exposures (all damages, loss, claims, liabilities, obligations, costs, and expenses, etc.). Most indemnity provisions in a PPA will only provide indemnity for claims arising out of acts or incidents first occurring during the period when control and title to the product is vested with such party (i.e., the period when the product crosses the point of delivery). Additionally, well-drafted indemnities may provide that neither party is liable to the other for consequential, incidental, or indirect damages, lost profits, or other business interruption damages. Often, however, the insurance provisions of the PPA stipulate that the required insurance cover some of these damages, particularly business interruption.

In addition to the central PPA and lease agreements, EPC and O&M agreements also allocate risks and exposures. EPC agreements provide for the design engineering and procurement of equipment and construction of infrastructure projects. There is an advantage to addressing these issues in a single, comprehensive agreement with one contractor that can provide for turnkey project construction transferring the responsibility and risk associated with construction costs and delays to the contractor. The agreement should contain performance guarantees, liquidated damages for nonperformance, and due diligence standards for the selection of subcontractors and suppliers. It is equally important that the contractor provide insurance, including professional liability and CGL insurance, that can support or complement its guarantees and indemnities. For instance, the risks associated with error or omissions in design can be covered in such agreements so as to avoid any design defect exclusions contained in insurance policies. Additionally, for many renewable energy projects, there exist technological risks inherent in generation technologies that continue to evolve. Outsourcing of operation and maintenance (sometimes to the same EPC contractor) and well-drafted equipment warranties can mitigate such risks. O&M agreements must ensure compliance with project contracts (including warranties) and compliance with offtake contracts, or PPAs. These EPC and/or O&M agreements should have

[19] Additionally, most PPAs provide that utilities are not liable for temporary curtailment of power purchase if due to safety or customer service issues.

appropriate insurance requirement clauses to support or complement such risk allocation provisions.

The insurance sections of a PPA (and often the corresponding interconnection agreement) are often very specific about the types and characteristics of the policies required, particularly the property and commercial general liability (CGL) policies. They often mandate that property policies provide full replacement costs, cover particular perils such as wind, flood, and earthquake, and contain business income and extra expense coverage (which applies to business interruption), boiler and machinery or machinery breakdown coverage, and (if a new building is planned) builder's risk coverage. The CGL requirements typically include bodily injury and property damage, products and completed operations, and personal injury liability coverage. Additionally, they often require contractual liability coverage under the CGL policy (which makes sense in view of the many parties and contracts involved in a renewable energy project) and sometimes require that the CGL policy have sudden and accidental pollution coverage.

It is important to note that, although a project entity may already have many of the above insurance policies, those policies will not necessarily address risks specific to a renewable energy project or fulfill some of the specific requirements mentioned above. Thus, it is important to involve an insurance broker with a specialty in renewable energy early in the process. The broker should approach the energy department of an insurance company with particular experience in and the capability to underwrite alternative energy clients and projects.[20] Those carriers have demonstrated that they know how to insure and assess risks for renewable energy producers, distributors, sites, and technologies including wind turbines, ethanol and biodiesel plants, solar energy systems, and hydroelectric power generators. Their policies will have special endorsements with language appropriate to these exposures and their perils.[21]

Further, the insurer should be one that also has an environmental department that can issue SPL policies (and the broker who goes to the insurer should specialize in environmental as well as energy issues). It is telling that some PPAs in a renewable energy project require sudden and accidental pollution coverage under a CGL policy. Clearly, there may be a concern, particularly by landowners who are not operating facilities, that the on-going operations of a renewable energy facility may create new pollution conditions. However, true environmental coverage can never be obtained under a CGL policy; most environmental endorsements to CGL policies provide illusory coverage at best.

[20] Chubb, ACE, and Zurich are examples of companies with energy, including alternative energy, departments.

[21] Note that it is always important to obtain related and possibly overlapping coverages from the same carrier; boiler and machinery and business interruption coverage under the property policy would be an example.

For instance, they do not usually cover cleanup costs. (And CGL underwriters do not know how to underwrite environmental exposures.) Therefore, environmental concerns should be addressed by an SPL policy that accompanies the property and CGL policies. In contrast to the CGL policy, the commercial property policy issued by such an energy department (or otherwise) potentially provides significant environmental coverage that may overlap with SPL policy coverage. It is always wise to obtain potentially overlapping coverages from the same carrier to avoid duplication of coverage and therefore higher costs.

Environmental coverage under the property policy would in a broad sense include coverage for the effects of climate change, e.g., the wind, floods, and earthquake coverage such as often mandated in PPAs. Such perils are not only directly covered under the property policy but their coverage is further facilitated by exceptions to its pollution exclusion in the property policy. including those for "specified perils," which usually include many of the very same climate change-related perils. Pollution exclusions in property policies contain other exceptions, varying from carrier to carrier, and the language of these exceptions should be carefully scrutinized to understand the breadth of the policy's pollution coverage. Most property policies also cover first-party on-site environmental cleanup costs (although usually with a small sublimit of no more than $50,000). Mold coverage can also usually be added by endorsement.

Green building coverage is also an environmental coverage since freedom from indoor air pollution and energy efficiency are environmental issues, and indoor air pollution can be covered by the SPL as well as the property policy. Although some carriers provide this coverage by endorsement to other sorts of policies, it is best obtained under the commercial property policy used for renewable energy projects and other real estate transactions. Green building coverage pays for restoring a building or other property to its previously green condition after a loss, or for upgrading that property to green after a loss. In the case of a loss to green technologies, the policy may cover the cost of rebuilding that technology system. This coverage can potentially fulfill contractual requirements that insurance include full replacement costs. The loss payment provisions and the "ordinance or law" provision in the property policy should be carefully scrutinized for how well they address the replacement cost and green building coverage issue.

In addition to green building coverage, carbon credit risk (i.e., risks associated with cap and trade regimes, including performance failure to achieve the required tax credits) is another climate change-related coverage that has been highly touted of late. Clearly, it is a coverage that may prove invaluable to a renewable energy project insofar as carbon credits and RECs may be the financial drivers of a project. Some carriers have offered separate policies addressing carbon credit risks, e.g., Zurich and Swiss Re. However, like green building coverage, this risk can be best addressed under the commercial property policy. There are two places in the property policy that can address this risk. First is the business income and extra expense section. This section covers loss of income caused by interruption of operations as the result of physical damage to covered property by an insured peril. The other place is the mechanical breakdown endorsement to the property policy that covers loss due to business interruption caused by technological breakdown. This section essentially substitutes for a separate boiler and machinery policy.

The CGL policy issued by the renewable energy insurer along with the property coverages will not contain environmental coverage because of the total pollution exclusion endorsement normally added to such policies. That endorsement eliminates coverage for products pollution coverage, i.e., for pollution caused by products once they are in the stream of commerce. Some environmental carriers that provide CGL coverage, however, are willing to remove the total pollution exclusion or to provide a separate policy with products pollution coverage. Obviously, such coverage may be very useful for particular projects. However, if that coverage is unavailable, products pollution risks should be addressed by the indemnities and insurance requirements contained in the contracts with product manufacturers.

The CGL policy issued by an energy insurer can have some very useful nonenvironmental coverages geared towards alternative energy. As noted above, contractual liability coverage is very important to cover indemnification clauses in the myriad of contracts involved in these projects. There should also be a coverage extension for failure to supply power liability in such CGL policies. Finally, if applicable, the underground resources and equipment hazard endorsement (which pays for property damage as a result of well blowouts) could be quite useful for geothermal and carbon sequestration projects. The CGL carrier's method of rating, or setting premiums, should also be carefully considered. Experienced energy underwriters know how to design simplified rating plans based on kilowatt hours.

RISK MANAGEMENT OF RENEWABLE ENERGY ON BROWNFIELD SITES

A renewable energy facility on a brownfield particularly requires a program combining the property and CGL policies issued by an insurer's energy department with an SPL policy issued by its environmental department. However, the SPL policy must be capable of manuscripting to address known and unknown preexisting conditions as well as the unique combination of risks or perils created by such projects. Consider the following examples of risks presented by the reuse of a brownfield site with an engineering control or cap as a remedial measure:

- Vibrations from technologies such as wind turbines not constructed and/or not operating according to specifications may disturb or crack the cap; or
- Heat and/or dehydration from solar accumulators damage the cap due to the failure of some cooling systems or other problems.

Whenever such damage may occur, a unique mix of potentially insurable risks arises:

- Pollution releases that can be covered by the SPL policy and property policy;
- Remediation risks ("green" remediations, and risks that the remediation will harm solar equipment or vice versa) that may be covered by the SPL and property policy;
- Performance failures—nondelivery of power intended to be generated on the site, technological failure that can reduce energy efficiency, which may be covered by the property, CGL, or SPL policies);
- Carbon credit risks that can be covered under the SPL or property policies (business income and extra expense, and machinery breakdown).

But the greater issue is that these risks do not decline over time, except insofar as pollutants might bioremediate on their own. At the same time, renewable energy projects in themselves often have terms of fifteen or twenty years. Thus, long-term stewardship coverage under an SPL policy as discussed above will be required, but it also needs to be paired with some form of long-term coverage under the CGL and property policies that accompany the SPL policy. A form of such long-term coverage can be achieved if the energy department is willing, for example, to lock in their rates for a period of years. In addition, the renewable SPL policy with IC/EC coverage provides a sort of long-term loss control by requiring that the IC/ECs be continuously monitored and certified on an annual basis. The energy department can equally provide significant loss control under the property policy by requiring and overseeing continuous LEED (Leadership in Energy and Environmental Design) certification and monitoring.

Such a tailored insurance program should be integrated with the various contracts allocating loss exposures in a renewable energy project, particularly the major PPA and lease agreements. Since most of the overlapping and unique combinations of risks discussed above are essentially environmental, they will ordinarily be addressed in the environmental provisions of the lease or PSA. The insurance program for the renewable energy on brownfields project integrating SPL and property/CGL coverages should therefore be required in an insurance provision within such an environmental section of the those contracts. The typical indemnity and insurance clause of the PPA will also probably need to reference this insurance program.

CONCLUSION

It is clear that managing the risks involved with renewable energy projects located on contaminated property is no simple task. Certain parameters of such a deal may be fixed, such as financing structure, capital costs, and off-take contracts. However, there are far more uncertainties associated with such transactions, such as regulatory and construction delays, energy output, known and unknown environmental conditions, and pricing and performance risks affecting each project. Performing the first step of the risk management process, risk identification and analysis, requires identifying and analyzing specific environmental as well as energy-related risks of concern at the site. The contracts and insurance policies critical to a brownfield transaction must not only be complementary and consistent with each other, but also must be integrated into key renewable energy project contracts and insurance policies covering alternative energy risks and exposures. Sound risk management requires the creation of a tailored insurance program that combines both environmental and property/casualty coverages. The development of such a program requires consultation with experienced counsel and, perhaps more important, a team of knowledgeable risk managers who can implement the risk transfer mechanisms involved in such a project in an integrated fashion.