2000

Moving Towards a Competitive Electricity Market - The Dilemma of Project Finance in the Wake of the Asian Financial Crisis

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INTRODUCTION

Over the last two decades, the rapid economic growth based on liberalization of trade and investment has led to the rising energy demand in developing nations of East Asia.[1] This dramatic increase in the demand for new power facilities has quickly exceeded the ability of emerging economies to finance such infrastructure development which is traditionally funded through public sources.[2] As a result, the developing nations of

* The author wishes to thank Professor Jim Chen and Mr. Weidong Wang for helpful comments on the article.

1. *See* David Blumental, *Sources of Funds and Risk Management for International Energy Projects*, 16 BERKELEY J. INT'L L. 267, 269 (1998); Richard Walsh, *Pacific Rim Collateral Security Laws: What Happens when the Project Goes Wrong?*, 4 STAN. J.L. BUS. & FIN. 115, 118, FN 13 (1999).

Planned Infrastructure Costs in East Asia & The Pacific 1995-2004 (US$ billion)

	Power	Telecoms	Transport	Water & Sanitation	Total
China	200	141	302	101	744
Indonesia	82	23	62	25	192
S. Korea	101	32	132	4	269
Malaysia	17	6	22	4	50
Philippines	19	7	18	4	48
Thailand	49	29	57	10	145
Others	25	18	14	4	61
Total	493	256	607	153	1,509

See also Handel Lee et al., *Preparing Itself for the Next Century*, 65 PETROLEUM ECONOMIST 19 (1998) (China, for instance, has become the world's second-largest consumer of energy after the United States).

2. *See* William M. Stelwagon, *Financing Private Energy Projects in the Third World*, 37 CATH. LAW. 45, 45-46 (1996); Laura A. Malinasky, *Rebuilding with Broken Tools: Build-Operate-Transfer Law in Vietnam*, 14 BERKELEY J. INT'L L. 438, 438 (1996).

East Asia have turned to private financing, by permitting foreign investors to own and operate power projects.[3] The demand for capital for large "greenfield" projects (projects developed from scratch without any prior track record or operating history),[4] combined with the globalization of capital markets, has resulted in the development of competing approaches to obtaining financing. Cross-border project financings are highly touted by both international investors and host governments.[5]

This note surveys the basic concepts of project finance in the power industry, and discusses new developments and challenges encountered in both developed countries (such as the United States and the United Kingdom) and emerging markets (such as East Asian and Latin American nations). Part I of this note provides a comprehensive background of the traditional risk allocation structures of project finance, which are primarily addressed in the power purchase agreement. Part II of this note examines whether "merchant power plants," a current trend in project financing in the United States, provide an acceptable solution to the problems encountered in the emerging markets, especially in Asia. Part III of this note evaluates the respective advantages and disadvantages of the traditional power purchase agreement-based mechanism and new merchant-power model in international project financings. This note concludes that, at least in the short term, neither the "one-stop shopping" afforded by power purchase agreements nor pure merchant plant model may provide the only answer, instead, this note suggests that the hybrid approach, which combines the two models, stands as a viable alternative.

I. THE ELABORATE STRUCTURES OF PROJECT FINANCE

A. DEFINITION OF PROJECT FINANCE

Project finance is the "primary vehicle for financing cross-border investments throughout the world."[6] Project financing was first used to fund power projects in the United States and

3. *See* Stelwagon, *supra* note 2, at 46.

4. *See* Anita Ahmed et al., PROJECT FINANCE IN DEVELOPING COUNTRIES 1, glossary, p. 95 (Int'l Fin. Corp., 1999).

5. *See* Jonathan J. Green, *Managing Risks in International Power Projects*, in PROJECT FINANCING 1993: DOMESTIC AND INTERNATIONAL, at 669, 669 (PLI/Com. L. & Practice Course Handbook Series, No. 672, 1993).

6. *See* Mark J. Riedy, *Legal and Practical Considerations in Structuring Business Transactions in India for the Conference Entitled: India Power,* 3 CARDOZO J. INT'L & COMP. L. 313, 318, FN3 (1995).

the United Kingdom; thereafter, its use has grown tremendously around the world.[7] Economic growth in East Asia and Latin America and the privatization of many former government monopolies and state-held enterprises has resulted in the explosion of project finance in developing countries.[8] Although project financing techniques can be used to fund various project developments, it has been used mostly to finance power generation facilities,[9] since it is most appropriate in industries where the revenue streams can be defined and fairly easily secured.[10]

Project finance is a complex venture. In a typical power project, the participants include project sponsors (usually foreign and/or domestic equity investors), project company (a single purpose company, partnership or other entity created by the project sponsors to develop, own and operate the project),[11] project lender, purchasing utilities, construction contractor, operation contractor, and fuel supplier.[12] Project finance is a technique of non-recourse financing that is "not primarily dependent on the credit support of the [project] sponsors or the value of the physical assets involved," but rather depends upon the expected "performance of the project itself."[13] "The credit appraisal of the project lender is therefore based on the underlying cash flow from the revenue-producing contracts of the project," independent of the project sponsor's credit in a traditional sense.[14] If the cash flows prove inadequate to service debt, "the project sponsor has no direct legal obligation to repay the project debt or make interest payments."[15]

7. *See generally* Daniel R. Bedford & Robert P. Feyer, *Tax Exempt Debt in Project Finance*, C133 ALI-ABA 203, 207 (1995); Michael J. Schewel, *Jurassic Sparks! Project Finance Revives Extinct Deals*, 12-APR PROB. & PROP. 26, 28 (1998).

8. *See id.*

9. *See* John B. O'Sullivan, *Chadbourne & Parke LLP: Project Financing Techniques*, in PROJECT FINANCING 1999: BUILDING INFRASTRUCTURE PROJECTS IN DEVELOPING MARKETS, at 61, 65 (PLI/Com. L. & Practice Course Handbooks Series, No. 784, 1999).

10. *See generally* AHMED, *supra* note 4.

11. *See* O'Sullivan, *supra* note 9.

12. *See* Edward D. McCutcheon, *Think Globally, (En)act Locally: Promoting Effective National Environmental Regulatory Infrastructures in Developing Nations*, 31 CORNELL INT'L L.J. 395, 413 (1998).

13. *See* Jay Facciolo, *Project Finance by Clifford Chance*, 11 B.U. INT'L L.J. 165, 168 (1993) (book review) (quoting Clifford Chance, *Project Finance* 3 (1991)).

14. *See* Scott L. Hoffman, *A Practical Guide to Transactional Project Finance: Basic Concepts, Risk Identification, and Contractual Considerations*, 45 BUS. LAW. 181, 182-83 (1989).

15. *See id.*

B. The Advantages of Project Finance

1. Non-Recourse or Limited-Recourse Debt Financing

Non-recourse debt financing, highly leveraged debt, and reduction of the overall risk for major project participants to an acceptable level,[16] are the most salient features of project finance.

In traditional corporate finance, the primary source of repayment for investors and creditors is the project sponsor, backed by its entire balance sheet.[17] Although project lenders will usually still seek to assure of the economic viability of the project itself, an more important factor in their decision is "the overall strength of the [project] sponsor's balance sheet as well as business reputation."[18] In contrast, a typical project financing is secured "solely by the project and its revenues and is completely 'non-recourse' to the project sponsor."[19] That is, if the project revenues are insufficient to cover principal and interest payments of the project debt, the project sponsors do not have any obligation to guarantee the repayment,[20] and the project lender relies solely on the project collateral in enforcing rights and obligations in connection with the project finance loan.[21] Thus, in corporate finance, should a project fail, project lender does not necessarily suffer, as long as project sponsor remains financially viable.[22] In project finance, the failure of a project can inflict significant losses on both project lender and project sponsor.[23]

Theoretically, project financing provides a structure that does not impose upon the project sponsor any obligation beyond its equity investment.[24] As a practical matter, however, project financing is often carried out on a limited-recourse basis,[25] especially in most developing market projects.[26] For example, during the construction period, the project lenders generally require

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16. *See* AHMED, *supra* note 4, at 4.
17. *See id*, at 5.
18. *See id.*
19. Daniel R. Bedford et al., *Project Financing*, C749 ALI-ABA 177, 181 (1992).
20. *See* Hoffman, *supra* note 14, at 185.
21. *See id.*
22. *See* AHMED, *supra* note 4, at 5.
23. *See id.*
24. *See* Hoffman, *supra* note 14, at 185.
25. *See* Nagla Nassar, *Project Finance, Public Utilities, and Public Concerns: A Practitioner's Perspective,* 23 FORDHAM INT'L L.J. 60, 68 (2000).
26. *See* AHMED, *supra* note 4, at 5.

project sponsors providing a contingent financial commitment under the terms of a project completion agreement.[27] Moreover, if the risks associated with a non-recourse debt are too high, the project lender may require various types of credit enhancement in the form of guarantees, warranties and other covenants from the project sponsor or third parties to support the risk allocation.[28]

2. *Highly Leveraged Debt*

Another important reason for selecting project financing is the ability of project sponsors to finance a project using highly leveraged debt without requiring as much project sponsor equity as in traditional corporate finance,[29] where the leverage percentage is often between seventy-five and eighty-percent.[30] Because of this advantage, project financing is commonly used to finance capital-intensive industries, such as power generation, waste recovery, mining and transportation,[31] especially greenfield projects. Project finance also can take advantage of the globalization of capital markets, which expanded the number of potential investors and creditors, created a broader spectrum of

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27. *See* Blumental, *supra* note 1, at 275; E. Waide Warner, Jr., *Standard & Poor's Global Project Finance: Petrozuata Finance Inc.*, in PROJECT FINANCING IN EMERGING MARKETS: SUCCESSFUL DEVELOPMENT OF POWER, OIL AND GAS, MINING, TELECOMMUNICATIONS AND TRANSPORTATION PROJECTS, at 443, 456 (PLI Corp. L. & Practice Course Handbook Series, No. 1145, 1999).

28. *See* Bedford & Feyer, *supra* note 7, at 207; Hoffman, *supra* note 14, at 184; Peter F. Fitzgerald, *International Project Financing: An Overview*, in PROJECT FINANCING 1998: BUILDING INFRASTRUCTURE PROJECTS IN DEVELOPING MARKETS, at 9, 16-17 (PLI Corp. L. & Practice Course Handbook Series, No. 1103, 1999) (explaining that "it is possible to allocate some of the risks to the host country government under credit enhancement, particularly for high-profile projects that are important to the host country's economic development").

29. *See* AHMED, *supra* note 4, at 7.

30. *See* Hoffman, *supra* note 14, at 186.

31. *See* Bedford & Feyer, *supra* note 7, at 207; Roger D. Feldman & Scott L. Hoffman, *Basic Concepts of Project Finance Documentation: Risk Allocation, Drafting, and Regulatory Considerations for Power Sales and Fuel Supply Contracts*, in PROJECT FINANCING 1987: POWER GENERATION, WASTE RECOVERY, AND OTHER INDUSTRIAL FACILITIES, at 399, 403 (PLI Real Estate L. & Practice Course Handbook Series, No. 297, 1987). *See also* Schewel, *supra* note 7, at 27 ("project financings are unusual for loans of less than $25 million and are common for loans over $1 billion").

financial instruments,[32] and therefore reduced the borrower's cost of funds.[33]

The compelling reasons to consider using project finance are its non-recourse or limited-recourse nature and highly-leveraged debt. In addition, as discussed below, allocating the recourse obligations and the financing needs of the project among a group of project participants and interested third parties, so that no one of them has to assume full risks for the project, makes project financing one of the few available financing alternatives in the capital intensive industries.[34]

C. RISK IDENTIFICATION AND ALLOCATION

1. *Overview of Various Risks*

Because of the non-recourse or limited-recourse nature of project finance, the complex financial and legal structures, and the project lenders' reliance on the underlying cash flow from the revenue-producing contracts over a long payment period, project financing requires a complex scheme of risk identification, evaluation and allocation.[35] The success of a project depends on a "proper allocation of each risk to the project participant who is best able to manage and mitigate the risk."[36] In general, the risks fall into three basic categories: commercial, political, and *force majeure*.[37]

32. Such as equity, commercial loans, subordinated loans, supplier credit, bonds, export credit agency facility, and multilateral or bilateral agency credit facility; each of investors and creditors demands a different risk and return profile for its investments or loans, a large project can raise these funds at a relatively low cost. AHMED, *supra* note 4, at 8-9.

33. *See* AHMED, *supra* note 4, at 8.

34. *See id*; Hoffman, *supra* note 14, at 181.

35. *See* Schewel, *supra* note 7, at 29.

36. *See* O'Sullivan, *supra* note 9, at 66; *see also* David N. Powers, *Selected Issues Regarding Construction and Operation and Maintenance Contracts*, in PROJECT FINANCING 1997: BUILDING INFRASTRUCTURE PROJECTS IN DEVELOPING MARKETS, at 143, 145 (PLI Com. L. & Practice Course Handbook Series, No. 749, 1997) (much of the financial and legal "engineering" in project finance involves allocating to project participants various project risks, such that the remaining unallocated project risks are financable.)

37. *See* Stelwagon, *supra* note 2, at 47. *See generally* Harold F. Moore, *Project Finance: Infrastructure Issues in Indonesia*, in PROJECT FINANCING 1999: BUILDING INFRASTRUCTURE PROJECTS IN DEVELOPING MARKETS (PLI CORP. L. & PRACTICE COURSE HANDBOOK SERIES, No. 1103, 1999); *see also* O'Sullivan, *supra* note 9. (*Force majeure* generally covers natural disasters. Since *force majeure* is not a viable defense in any dispute over payment obligations, a very broad definition of *force majeure*, e.g., labor disputes, governmental actions and changes in law, usually is included in the power purchase agreement to decrease risk and uncertainty for the project company).

Commercial risks include but are not limited to:

(a) construction risks (construction cost overruns, delay in completion, and failure to achieve target performance);
(b) operating risks (operating cost overruns and failure to maintain target performance);
(c) fuel risks (fuel price increases, fuel supply shortfall or interruptions, and transportation delay or interruptions);
(d) market risks (inadequate market demand for power, and inadequate market price of power);
(e) currency-related risks (exchange rate fluctuations and inflation); and
(f) environmental risk.[38]

Although commercial risks are common to all types of project financing, private infrastructure projects in developing countries are more susceptible to extensive political risks,[39] such as adverse changes in the law, currency inconvertibility or non-transferability, expropriation, and possible civil unrest.[40] The commercial and political risks of a project in a developing country must be carefully allocated among the participants: project company, project sponsors, the host country government, multilateral and bilateral agencies, project lenders and other project financing participants (purchasing utilities, construction contractor, operation contractor, fuel supplier, etc.).[41] In accordance with the fundamental theory of allocation of risk to the parties best able to manage it, the commercial risks associated with the completion and operation of the project are usually shifted to the private sector participants and insurance companies.[42] On the other hand, the political risks are typically allocated to the host country government, its agencies, and to multilateral and bilateral agencies providing political risk insurance.[43]

Project financing participants allocate projects risks through project contractual framework and contract terms.[44] For example, the parties allocate construction risks to the construction company using a fixed priced, date certain turn key construction contract (usually referred to as an engineering, procurement and construction contract ("EPC")), which includes detailed performance criteria and liquidated damages for a failure

38. *See* John G. Mauel, *Common Contractual Risk Allocations in International Power Projects,* 1996 COLUM. BUS. L. REV. 37, 42 (1996).
39. *See* Stelwagon, *supra* note 2, at 54.
40. *See* Mauel, *supra* note 38, at 55-58.
41. *See* Samuel Kern Alexander, *Current Issues in Multinational Financing,* 89 AM. SOC'Y INT'L L. PROC. 19, 23 (1995).
42. *See id*; O'Sullivan, *supra note* 9, at 74.
43. *See* Alexander, *supra note* 41, at 23.
44. *See* Schewel, *supra* note 7, at 29.

to meet the milestones or performance guarantees.[45] Similarly, the parties may contractually allocate the fuel pricing risk to the fuel supplier with a fixed price, long-term fuel supply agreement.[46] Alternatively, in a "pass-through" arrangement, the fuel pricing risk can be shifted to the purchasing utilities and ultimately to the retail utility consumers in the tariff.[47]

2. *Market Risks*

Market risks refer to risks associated with fluctuations in market demand and market price for power. These are primarily addressed in the power purchase agreement ("PPA").[48] The PPA is the central contract in a typical private power project. It establishes the power purchase-sale rights and obligations between the project company and the purchasing utilities, creates the sole revenue stream for repayment of debt and return to investors, and guarantees a market for power produced by the project.[49]

Because of the comparative advantage of the purchasing utilities in predicting and influencing the market demand and market price for the energy generated by the project, these risks almost uniformly shift to the purchasing utilities under the capacity payment and energy payment arrangements of the PPA.[50] The device for allocating the risk of an inadequate market demand for power typically is the fixed obligation of the purchasing utilities under a take-or-pay or firm-capacity payment agreement.[51] The capacity payment generally includes construction costs, project development expenses, fixed operation and maintenance costs, fixed fuel costs, financial costs, insurance costs, and usually all or most of the return on equity

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45. *See id*, at 30.

46. *See id*; Robert Thornton Smith, *Submission and Evaluation of Proposals for Private Power Generation Projects in Developing Countries,* in PROJECT FINANCING FROM DOMESTIC TO INTERNATIONAL: BUILDING INFRASTRUCTURE PROJECTS IN DEVELOPING MARKETS 1995, 183, 210-211 (PLI Com. L. & Practice Course Handbook Series, No. 707, 1995).

47. *See* Schewel, *supra* note 7, at 30.

48. *See* Mauel, *supra* note 38, at 52.

49. *See* John J. Beardsworth, Jr., *Financing Power Projects in Emerging Markets: Power Purchase Agreements and Related Financial Issues,* in PROJECT FINANCING 1998: BUILDING INFRASTRUCTURE PROJECTS IN DEVELOPING MARKETS, at 89, 93 (PLI Corp. L. & Practice Course Handbook Series No. 763, 1998); Robert Thornton Smith, *supra* note 46, at 226.

50. *See* Mauel, *supra* note 38, at 52.

51. *See id*; Robert Thornton Smith, *supra* note 46, at 219.

investment.[52] As long as the power plant is capable of producing the capacity, the take-or-pay obligation requires the purchasing utilities to pay for a specified, minimum quantity of available capacity even if they fail to accept delivery of such power.[53] Therefore, under such an arrangement, if market demand falls below projections, the purchasing utilities would nonetheless be obligated to make the capacity payments.[54] The capacity payment functions as an insurance policy for the project company, and is designed to compensate the project company for its fixed costs associated with project construction and operation.[55]

The tariff in a PPA is divided into capacity payment and energy payment components. The primary mechanism for allocating the risk of inadequate market price of power is covered in the calculation of the energy payments.[56] The energy payment is a variable payment based on the amount of energy actually delivered to the purchasing utilities.[57] It usually includes variable fuel costs (both purchase price and transportation costs) and variable operation and maintenance costs that are incurred only when energy is produced.[58] The equity investors' return on their investment may be covered by the energy payment, the capacity payment, or both.[59] The energy payment is designed to compensate the project company for all of the variable costs associated with generating dispatched electricity; the purchasing utilities are obligated to make payments based upon the formula stipulated in the PPA, escalating according to a certain index, regardless of changes in the market price of power.[60]

3. *Currency Devaluation Risk*

Because a project typically generates revenue stream in the local currency of the host nation, while the project company must serve its debt and provide returns on equity investment to

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52. *See* Beardsworth, *supra* note 49, at 94-95; O'Sullivan, *supra* note 9, at 91.

53. *See* Stephen W. Stein, *Construction Financing for BOT Project in Vietnam: Developing a Bankable Infrastructure Project,*, 17 NO. 8 E. ASIAN EXECUTIVE REP. 7, 21 (1995).

54. *See* Beardsworth, *supra* note 49, at 95. The most famous (and famously disastrous) use of take-or-pay contracts is in the U.S. natural gas industry during the 1970s and 1980s.

55. *See* Stelwagon, *supra* note 2, at 50.

56. *See* Mauel, *supra* note 38, at 52.

57. *See* Robert Thornton Smith, *supra* note 46, at 210.

58. *See id*, at 212; O'Sullivan, *supra* note 9, at 92.

59. *See* O'Sullivan, *supra* note 9, at 92; Schewel, *supra* note 7, at 28.

60. *See* Mauel, *supra* note 38, at 53.

its foreign lenders and investors in hard currency (e.g. U.S. dollar); international project financing in emerging markets, which usually are non-hard currency countries, often involves the risk of exchange rate fluctuations.[61] If the local currency depreciates significantly relative to the U.S. dollar, the cost of making payments can rise considerably and have a severe impact on the ability of the project company to service its debt.[62] Although the ability to hedge against or insure the devaluation risk is very limited, the capacity payment and energy payment arrangement may serve as a useful approach for mitigating and shifting this risk from the project company to the purchasing utilities, in the form of linking local currency capacity and energy payments to hard currency values.[63] For example, the project company and purchasing utilities may agree in the PPA to denominate the capacity payment and energy payment obligations in hard currency.[64] Another option is to denominate the tariff in local currency, it may then be pegged to the exchange rate of U.S. dollar at a certain benchmark date, and the tariff indexed to fluctuations in the exchange rate.[65]

The allocation of risks is a difficult and complex process in developed countries as well as in developing countries.[66] In developing countries, the process is substantially more difficult because there is often a lack of precedents upon which to build. The comparatively undeveloped legal and regulatory framework further hampers the process.[67] Although predictable regulatory and political environments and stable markets combine to produce dependable cash flow and assure enforcement of the bargain, developing countries may lack such predictability and stability.[68]

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61. *See* Stelwagon, *supra* note 2, at 55.

62. *See* Alexander, *supra note* 41, at 22.

63. *See* Fitzgerald, *supra* note 28, at 10; Mauel, *supra* note 38, at 54; Stelwagon, *supra* note 2, at 57.

64. *See* Alexander, *supra note* 41, at 22.

65. *See* Blumental, *supra* note 1 at 290.

66. *See* PROJECT FINANCE AND GUARANTEES DEPARTMENT, THE WORLD BANK, *Project Finance and Guarantees*, in PROJECT FINANCING IN EMERGING MARKETS 1998 at 63, 74 (PLI Com L. & Practice Course Handbook Series, No. 763, 1998).

67. *See id.*

68. *See* Hoffman, *supra* note 14, at 183.

II. THE MOVE TOWARDS A COMPETITIVE ELECTRICITY MARKET

A. DEREGULATION OF ELECTRICAL INDUSTRY AND APPLICATION OF MERCHANT POWER

A prime factor accounting for the tremendous growth of project finance is deregulation of the electrical industry.[69] "The [most] dominant force in the domestic and international power sector since 1995 has been deregulation,"[70] as a result, free market competition has begun to replace the government-regulated industry.[71] Nowadays, most countries count on market mechanisms to direct economic activities and on the private sector to provide investment.[72] Greater focus on the private sector naturally results in regulatory reforms and such reforms have in turn created new markets in areas which previously are the preserve of government activity.[73]

Prior to this development, the predominant electric power industry model had been the electric utility monopoly model, which was based on the theory that utilities had characteristics of a "natural monopoly."[74] This monopoly model is characterized by government ownership, government control, and the integration of both the generation and the distribution of the utility.[75] The state granted an electric utility a regulated monopoly which possessed all components of the electricity service: the generation, transmission (the wholesale of electricity from a generating power plant to the electric utility), and distribution (the retail side of the electric industry).[76] Since the 1980s, more and more nations have adopted a "fully unbundled, competitive

69. *See* AHMED, *supra* note 4, at 2.

70. See Kenneth V. Wilson, *Electric Utility Deregulation: the Recovery of Stranded Costs*, 33 NEW ENG. L. REV. 557, 557 (1999) (quoting Steven Ferray, Law of Independent Power 10-4 (release #11 1998)).

71. *See* Jeff B. Slaton, *Searching for "Green" Electrons in a Deregulated Electricity Market: How Green is Green?* 22 ENVIRONS ENVTL. L. & POL'Y J. 21, 23 (1998).

72. *See* AHMED, *supra* note 4, at 2.

73. *See id.*

74. *See* Joseph P. Tomain, *Electricity Restructuring: A Case Study in Government Regulation*, 33 TULSA L.J. 827, 832 (1998).

75. *See* A. John Armstrong, *Unplugged? The Effect of the New World Electric Power Order on Renewable Energy Industries,* 22 N.C.J. INT'L L.& COM. REG. 449, 457 (1997).

76. *See* Scott B. Finlinson, *The Pains of Extinction: Stranded Costs in the Deregulation of the Utah Electric Industry*, 1998 UTAH L. REV. 173, 184 (1998). There is a wrinkle in U.S. law. The states would regulate generation and distribution, but the federal government would regulate transmission. *See generally FERC v. Mississippi*, 456 U.S. 742, 102 S.Ct. 2126 (1982); *Arkansas Electric*

electricity market" model and this move has become the most significant worldwide trend in reforming the electric utility industry.[77] The new model breaks up the electric monopoly into three facets: generation, transmission, and distribution; and it also creates and extends competitions to place "an industry back in the hands of the market."[78] The United Kingdom and the United States have served as forerunners in the move towards deregulation.

The United Kingdom was the first country that unbundled its power sector.[79] The 1989 Energy Act privatized the power industry, institutionalized a scheme to deregulate the power business and to foster competition.[80] Through launching an electricity pool, the British government created a spot market[81] and commoditized electricity.[82] Following the United Kingdom's experiences, Latin American countries, such as Chile, Peru, Argentina, and Bolivia, implemented similar frameworks on the basis of unbundling the activities of power industries and creating a competitive market.[83]

Prior to the late 1970s, the electric utility industry in the United States was a closely-regulated monopoly, with local monopolistic utilities satisfying the growing needs of almost all consumers in its service areas.[84] In 1978, the Public Utilities Regulatory Policies Act (PURPA) was enacted in response to rising energy costs and fuel shortages, which required the local utility to purchase power from alternative generators of electricity called "qualifying facilities."[85] PURPA opened the door for privatization and competition in the generation market of the electrical industry,[86] and provided a well-built model for the de-

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Cooperative Corp. v. Arkansas Public Service Comm'n, 461 U.S. 375, 103 S.Ct. 1905 (1983).

77. *See* Armstrong, *supra* note 75, at 467.

78. *See* Tomain, *supra* note 74, at 829; *id.*

79. *See* Armstrong, *supra* note 75, at 467.

80. *See* Mark E. Haedicke, *Competitive-Based Contracts for the New Power Business*, 17 ENERGY L.J. 103, 117 (1996).

81. *See infra* text accompanying notes 94-95.

82. *See id.*

83. *See* Armstrong, *supra* note 75, at 467.

84. *See* Slaton, *supra* note 71, at 24. *See generally* Joseph D. Kearney & Thomas W. Merrill, *The Great Transformation of Regulated Industries Law* 98 COLUM. L. REV. 1323, 1353-54 (1998).

85. *See* Deirdre O'Callaghan & Steve Greenwald, *PURPA from Coast to Coast: America's Great Electricity Experiment*, 10-WTR NAT. RESOURCES & ENV'T 17, 17 (1996); *id.*

86. *See* Finlinson, *supra* note 76, at 185; Tomain, *supra* note 74, at 835.

velopment of project financing in other industrial countries.[87] In the 1990s, by enacting the Energy Policy Act of 1992 and the Federal Energy Regulatory Commission Order No. 888, Congress and the federal government took another step towards deregulation, which fundamentally restructured the interstate electric industry and promoted wholesale competition through open access and non-discriminatory transmission services by public utilities.[88] The third step towards full deregulation was the extension of "regulated-competition to the retail markets"[89] and this was under state jurisdiction. Unbundling of electric power at the state or local level allows direct access to power supply for all consumers through "retail wheeling,"[90] which effectuates competition in distribution areas and removes the foundation for utilities' monopoly power.[91] By 1997, forty-nine states had either proposed or developed retail competition programs.[92]

The open transmission and distribution access includes two main models for delivery of electricity: 1) trading through a spot market ("PoolCo model"), and 2) direct access through bilateral contracts ("bilateral model").[93] PoolCo model is a centralized, mandatory hourly spot market administered by an independent system operator; buyers and sellers trade in this power pool based on a single transparent market-clearing price established

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87. *See* AHMED, *supra* note 4, at 2.

88. *See* Kearney & Merrill, *supra* note 84, at 1354; Linda Jones, *Electric Industry Restructuring – Consumers Will Soon Choose Electrical Supplier*, 40-JUN ADVOCATE (IDAHO) 30, 30-31 (1997); Wilson, *supra* note 70, at 570; *Cajun Elec. Power Coop., Inc. v. FERC*, 924 F.2d 1132 (D.C.Cir.1991).

89. *See* Finlinson, *supra* note 76, at 187.

90. *See id*; Elisabeth Pendley, *Deregulation of the Energy Industry*, 31 LAND & WATER L. REV. 27, 72-74 (1996).

91. *See* Charles M. Studness, *The Calm before the Storm*, 131 NO. 10 PUB. UTIL. FORT. 37, 37 (1993).

92. *See* Kearney & Merrill, *supra* note 84, at 1354; *see also* Portia Owen Morrison & Christopher J. Townsend, *Electric Deregulation: Challenges and Opportunities for the Real Estate Industry*, 13-JUN PROB. & PROP. 51, 51 (1999) ("Approximately 13 states have already passed electric deregulation legislation, including Arizona, California, Illinois, Maine, Massachusetts, New Hampshire, Pennsylvania and Virginia. Other states—Maryland, Michigan, New Jersey, New York and Vermont— have issued comprehensive regulatory orders. Almost every other state is considering the issue either in its state house, before its utility commission or both.").

93. *See* Peter Navarro, *A Guidebook and Research Agenda for Restructuring the Electricity Industry*, 16 ENERGY L.J. 347, 381 (1995); Jim Rossi, *The Common Law "Duty to Serve" and Protection of Consumers in an Age of Competitive Retail Public Utility Restructuring*, 51 VAND. L. REV. 1233, 1321, FN 215 (1998).

through blind auction.[94] Under this model, the grid serves as a "contract network that dispatches power on an integrated network basis."[95] The bilateral model differs in that there is no central exchange market, power is traded via bilateral contracts and electricity buyers are able to negotiate individually with sellers.[96] In this model, all sellers have non-discriminatory access to the transmission grid, which provides an independent commodity and "functions as a contract path to consummate transactions with buyers."[97]

Merchant power plants are generating facilities established under the competing transmission and distribution system. They represent the newest form of energy project resulting from the deregulation of electrical industry, under which all power producers enjoy open access to transmit their power over transmission and distribution facilities on a non-discriminatory basis to reach wholesale as well as retail customers.[98] Merchant plants are designed and financed on the basis of market analysis by project sponsors and project lenders,[99] and are operated in a competitive market where long-term PPA are generally unavailable and electricity prices are determined by supply and demand.[100] Without the benefit of having the investment secured by a long term PPA, which provides an un-interruptible cash flow to meet the operation costs and debt service, merchant plants usually float with a much shorter-term market, often from one hour to two or three years).[101] Therefore, the project company and operation contractor, rather than the traditional retail customers, bear all of the risks correlated with development, construction and operations, as well as the broader mar-

94. *See id*; Becky Kilbourne and George Sladoje, *The Role of Power Exchanges in Restructured Electric Markets*, 137 NO. 18 PUB. UTIL. FORT. 28, 32-33 (1999).

95. *See* Peter Navarro, *supra* note 93, at 381.

96. *See id*; Sheila S. Hollis and Stephen L. Teichler, *Collision or Coexistence: the FERC, the CPUC, and Electric Restructuring*, 133 NO. 18 Pub. Util. Fort. 19, 19-20 (1995).

97. *See id.*

98. Carmen D. Legato, *New Dynamics Shaping Electric Utilities Deals*, 1 NO. 3 M & A LAW 1, 4 (1997).

99. *See FERC Conference Finds Varying Opinions on How Much Natural Gas Demand will Grow in the Northeast because of New Electric Generation and How to Meet that Demand*, 6/16/99 FOSTER ELECTRIC REP. 11, 19 (1999).

100. *See* Practicing Law Institute, *Division of Investment Management*, in THE SEC SPEAKS IN 1999, at 9, 1383 (PLI Comp. L. & Practice Course Handbook Series, No. 1106, 1999).

101. *See supra* note 105, at 19; *see also* P. Chrisman Iribe, *Retail Electricity Competition*, 5/25/99 Cong. Testimony, 1999 WL 16948451, at 5.

ket risks associated with the general business climate.[102] In short, merchant plants are distinguished from traditional power plants under typical project financing by being built and operated without the security of long-term PPAs, and they sell energy and capacity into an open market.[103] As a result, merchant plants are exposed to fluctuations in both sale volumes and prices,[104] and the project sponsors and project lenders bear higher risks.[105]

B. THE ASIAN FINANCIAL CRISIS AND THE CHALLENGE OF PROJECT FINANCE

The Asian currency and debt crisis began with the devaluation of the Thai baht in July 1997, spread to Indonesia and Korea, and destabilized the economies of Russia and Latin America.[106] As a result, excitement over Asia's potential for project sponsors and project lenders soured, and the financial markets' appetite for emerging market exposure diminished.[107] Project lenders and investors became more sensitive to political, legal and currency risks.[108] Because of currency devaluations, certain high-profile projects undertaken in the previous years were no longer financially feasible and some of them were permanently cancelled; many contractual arrangements proved to be wobbly and some of them had to be renegotiated.[109] For example, the purchasing tariff that Indonesia's utility paid for power from project companies was higher than its retail price.[110]

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102. *See id.*

103. *See* Christopher Seiple, *Merchant Plant Activity Set to Explode,* 135 NO. 8 PUB. UTIL. FORT. 14, 15 (1997).

104. *Power Report, Merchant Plants, Introducing a new generation,* 6/10/99 PROJECT & TRADE FIN. 28, 29 (1999).

105. *See* Carl J. Levesque et al., *News Digest,* 137 NO. 16 PUB. UTIL. FORT. 12, 19 (1999).

106. *See Review of the Year - Roundtable, the Rough with the Smooth 1998 Proved to be One of the Most Turbulent Years for Project Finance,* PROJECT & TRADE FIN. (1999), 1999 WL 10185078.

107. *See Power Roundtable, Second Generation Moves Forward,* 9/10/99 PROJECT & TRADE FIN. 28 (1999); Morris Black, *Meeting the Challenge (Industry Overview),* 6/1/98 PETROLEUM ECONOMIST 112, 115 (1998). *But See East Asia Needs to Invest 400 Billion USD in Power Sector Over 10 Years,* AFX NEWS, Apr. 27, 1999, 1999 WL 17040502. Although as a result of Asia's economic crisis, GDP growth forecasts have fallen across the region and are reflected in a diminished demand for power, Asia's long-term enormous need for power is undisputed. *Id.*

108. *See* Howard L. Moore, *Shifting Ground,* 7/1/98 GLOBAL FIN. 58 (1998).

109. *See* AHMED, *supra* note 4, at 3; Howard L. Moore, *supra* note 108, at 498, FN 12.

110. *See* Howard L. Moore, *supra* note 108.

As a result, Indonesia's government attempted to compel the project companies to renegotiate power tariffs by canceling or suspending PPAs.[111] In Pakistan, the government accused project sponsors of using corrupt methods to secure their project contracts.[112] Officials in the government urged a thirty-percent reduction of the tariff.[113] Failing renegotiation to modify the tariff level, they argued that the PPA could be terminated.[114] Conversely, China was regarded as being secluded from the Asian currency crisis.[115] A series of power projects reached financial close in 1997 and 1998, and it has had a relatively good track record with its international projects.[116] Despite these remarkable successes, the soundness of the Chinese PPAs has been put into question by complaints that the annual tariff adjustment has not been approved as projected.[117] In short, it seems that all that remains at issue is the tariff structure of the PPAs.[118]

Two years after the currency crisis first hit Asia's financial markets,[119] and as the notion of deregulation and competition took hold state by state in the United States,[120] academics and practitioners have been reconsidering the various structures employed to effect project financings in emerging markets.[121] Meanwhile, the Asian Development Bank is pushing the concept of merchant power.[122] Several countries, including China,[123]

111. *See id.*

112. *See* Mary Watkins, *Cover Story, Lights out for Power-Purchase Agreement,* 11/10/98 PROJECT & TRADE FIN. 23 (1998).

113. *See id.*

114. *See id.*

115. *See Cover Story, He Who Dares Wins,* 6/10/99 PROJECT & TRADE FIN. 20 (1999).

116. *See* Watkins, *supra* note 112.

117. *See id.; see also Cover Story, supra* note 115 (quoting AES's Ruccius: "There will be no more deals with a cost plus contract. And we are not prepared to have annual tariff approvals, because we know they don't happen.").

118. *See* Watkins, *supra* note 112.

119. *See supra* note 115.

120. *See* Howard L. Moore, *supra* note 108.

121. *See generally* Harold F. Moore, *supra* note 37, at 475.

122. *See id*; *see also East Asia Needs to Invest 400 Billion USD in Power Sector over 10 Years, supra* note 107 ("In China, the ADB has been working on the competitive markets reform in Yunnan province and with the Northeastern Power Network to prepare the transmission system for competitive markets."). This was the logic underlying the "Qualified Facility" scheme in *American Paper Inst., Inc. v. American Elec. Power Serv. Corp.*, 461 U.S. 402, 103 S.Ct. 1921 (1983).

123. Telephone Interview with Thomas T.M. Wu, Vice President of AES Orient, in Beijing, China (Oct. 24, 1999). China has started experimenting with six different competitive systems within six different provinces.

Philippines, Malaysia, and Indonesia, have, based on the belief that deregulation of electricity generation would improve efficiency and significantly reduce prices to retail utility consumers,[124] outlined plans to move towards merchant power systems.[125] The question remains, however, whether merchant plants are a solution for project finance in developing countries, and whether they provide a better approach than the long-term PPA arrangement.

III. HYBRID MODELS: A POTENTIAL WAY OUT OF THE DILEMMA

A. THE COMPETING TRANSMISSION ACCESS SYSTEM IN ASIA: PROS AND CONS

In the wake of the Asian financial crisis, some practitioners began to question the prudence of the expanded use of the contractually based approach of project finance.[126] They argue that the Asian crisis has highlighted the problem with reliance on contractual arrangements, especially PPAs that hope to predict tariff and guarantee payments over a twenty-year period.[127] PPAs include complex, cumbersome and largely inflexible mechanisms and are costly to negotiate.[128] The project sponsors and project lenders, seeking to prescribe fixed tariff structures in PPAs that extend for more than twenty years, appear to put too much faith and credit in the sacredness of the contractual arrangements without having looked at the underlying fundamentals, such as economic need.[129]

Market risks associated with international power projects are primarily addressed in the PPAs. During the Asian crisis, however, many purchasing utilities found it difficult to continue providing sufficient assurances on many of these key issues.[130] For example, Indonesia and Pakistan have demonstrated that

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124. *See* Legato, *supra* note 98.

125. *See id*; *see also Malaysian Newspaper Highlights,* ASIA PULSE, May 18, 1998, 1998 WL 2962157 ("[t]he much-awaited power pooling system — also known as the merchant power system — is expected to be implemented soon")

126. *See* AHMED, *supra* note 4, at 3.

127. *See* Watkins, *supra* note 112.

128. *See* Cordell Hull & Phillip Fletcher Milbank, *For & Against,* 12/10/98 PROJECT & TRADE FIN. 48 (1998), "[i]t can take longer to draft and finance a PPA than it does to build a power plant. World Bank data shows that a significant amount of project costs are absorbed by contract-related issues."

129. See World Bank, Industry Analysts Urge IPP's to Shift Their Focus to Distribution, 3/5/99 INDEPENDENT POWER REP. 1 (1999), 1999 WL 11483251.

130. *See id.*

they are quite susceptible to volatility in currency.[131] Thus, even dollar-denominated PPAs may not seem advisable in a country whose currency has the potential to fluctuate wildly, and make the tariff rate absurd for retail utility consumers.[132]

The key requirement for a financially viable power sector is to have certainty of access to a market.[133] A competing transmission system[134] creates a transparent and stable market, allowing project sponsors and lenders to assess the economic viability of the project in relation to it's competitors by reference to a dispatch merit order.[135] Moreover, since the credit quality of purchasing utilities remains a key barrier,[136] an "open access" system offers the project companies the possibility of direct access to more creditworthy retail utility customers.[137] Therefore, under a merchant power system, project companies will take true commercial risks.[138] Latin American countries, which adopted competitive market frameworks, provide a model for the development of project financing in emerging markets.[139] "For any jurisdiction wishing to attract rapid and significant generation investment, without placing undue burden on the state or dominant utility, achieving a clear, stable and open electricity market may be the best way forward."[140]

On the other hand, some practitioners objected to the argument that the PPA structure should be replaced by merchant power plants. To them, the idea that the projects in Asia could be restructured as merchant power plants is "devastatingly wrong," and the problems arising in the Asian crisis would be "exaggerated" if the projects in question were operated under a competitive market.[141] Under the merchant power system, the risk of inadequate market demand for power and market price of power is allocated to the project sponsors and project lenders.[142]

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131. *See id.*

132. *See* Barbara Joiner & Suraj Bhatia, *For & Against,* 7/10/98 PROJECT & TRADE FIN. 48, (1998).

133. *See* Hull & Milbank, *supra* note 128.

134. *See supra* text accompanying notes 93-95.

135. *See id*; Hull & Milbank, *supra* note 128.

136. *See* Black, *supra* note 107.

137. *See supra* text accompanying notes 95-95; *see also* Martin Stewart-Smith, *Private Financing and Infrastructure Provision in Emerging Markets,* 26 LAW & POL'Y INT'L BUS. 987, 993 (1995).

138. *See* Watkins, *supra* note 112.

139. *See* Black, *supra* note 107, "Latin America is stealing Asia's thunder, attract more attention of power developers and financiers from Asia."

140. *See* Hull & Milbank, *supra* note 128.

141. *See* Harold F. Moore, *supra* note 37, FN 21.

142. *See supra* text accompanying notes 105-105.

With regard to currency fluctuation risk, the major problem caused by the Asian crisis, the PPA-structure provides for currency fluctuation adjustments.[143] Although the Asian crisis warned that the devaluation risk in any international project financing in an emerging market can never be completely eliminated due to the mismatch between obligations denominated in hard currency and revenues denominated in local currency, the PPA-based model at least provides a mechanism to mitigate the risk.[144] However, this mechanism is unavailable under the merchant power model.[145]

In adopting the competitive market system, governments seemed convinced that the new merchant power model would encourage new investment, and provide electricity to the numerous retail utility consumers at the lowest possible price.[146] However, because merchant plants are not secured by a long-term contract that creates a revenue stream to match the costs of operation and debt service,[147] this system "may have a chilling effect on the financial markets' underwriting of private-sector investment."[148] Project sponsors and project lenders have remained hesitant to move away from the contract-based PPA model, which gives a degree of comfort and security.[149] Thus, long-term PPAs will still exist as the basis for most project lenders financing power projects, especially in Asia.[150]

B. HYBRID MODELS OF PPA-BASED STRUCTURE AND MERCHANT POWER SYSTEM

The trend towards merchant power is perhaps one of the most significant developments in the global power industry.[151] Merchant power plants represent perhaps "the most efficient and competitive way to create more reliable, lower-cost power

143. *See supra* text accompanying notes 61-64.

144. *See* Harold F. Moore, *supra* note 37, at 475-76.

145. Also, devaluation risk is difficult to shift to insurers, for example, "neither MIGA nor the [Overseas Private Investment Corporation] insurance protects against devaluation risk." *See* Stelwagon, *supra* note 2, at 57.

146. *See* Armstrong, *supra* note 5, at 500. The classic counter-statement to this principle is the conclusion to *FCC v. RCA Communications*, Inc., 346 U.S. 86, 73 S.Ct. 998 (1953).

147. *See supra* text accompanying notes 105-105.

148. *See* Armstrong, *supra* note 75, at 500.

149. *See* Watkins, *supra* note 112.

150. *See* Hull & Milbank, *supra* note 128.

151. *See* Michael Burr, *Energy Finance,* March 1, 1999 INDEP. ENERGY 10 (1999), 1999 WL 23757633.

without the risk and cost falling on customers."[152] However, any greenfield project seeking to operate under the merchant power system will be in competition with the established projects, the short-term pricing mechanisms of a pure merchant power system do not provide special consideration for the development of a greenfield project which is burdened with start-up costs that are not borne by the established facilities.[153] Thus, a pure merchant power system may discourage long-term investment and tend to favor existing generators, whose cash flow allows debt secured by a proven income stream.[154] As a result, project lenders may shift away from greenfield projects to acquisitions or upgraded projects.

Moreover, as indicated earlier, under a PPA-based project, once a PPA had been signed, the greatest market risks were shifted to the purchasing utility, and the remaining risk became whether the purchasing utility was willing and able to honor and perform its obligations under the contract.[155] However, in the merchant plant model, the market itself would decide the short-term price of electric energy and capacity, and project sponsors and lenders would finance a project based on their assessment of economic need.[156] Given the uncertainty inherent in all forecasts, project lenders are cautious about financing merchant plants without a contractually obligated cash flow.[157] As a compromise, a combination of corporate and project financing has been arranged for some merchant power projects, and project lenders may allocate the higher risks to the project sponsors and project companies.[158] The tools include initial equity contributions on the part of the sponsors as high as fifty-percent, substantially higher debt service coverage requirements than are found in PPA-based projects, and full funding of reserves for debt service and operation and maintenance.[159]

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152. *NEMA Calls Merchant Plants Key to Competition,* GAS DAILY, Aug. 26, 1999, Vol. 16, Issue 164 (quoting Craig Goodman, President & CEO of NEMA).

153. *See* Armstrong, *supra* note 75, at 501.

154. *See id*; Navarro, *supra* note 93, at 393.

155. *See* Keith W. Kriebel & Michael D. Hornstein, *United States: Financing Merchant Power Plants,* July 1, 1999 INT'L FIN. L. REV. 3034 (1999), 1999 WL 23416698.

156. *See id.*

157. See Financing for True Merchant Plants Still Has Roadblocks, Say Bankers, 2/5/99 INDEPENDENT POWER REP. 1 (1999), 1999 WL 11483115.

158. *See id.* Telephone interview with Linda Wong, Project Manager of the AES Corporation Latin America group (Oct. 30, 1999). Project lenders may require letter of credits from project sponsors.

159. *See* Kriebel & Hornstein, *supra* note 155.

A PPA has been considered the cornerstone of a typical project financing transaction.[160] It has sought to allocate to purchasing utilities and retail consumers such risks as change in law and force majeure.[161] More importantly, by the mechanism of "capacity payment" and "energy payment" in a take-or-pay arrangement, PPA has been instrumental in providing project company with guaranteed market, and an assured and stable revenue stream.[162] Furthermore, a dollar-denominated PPA could allocate currency volatility risks to the purchasing utilities.[163] However, the underlying economic rationale for PPA-based structure does not introduce incentives for project companies and purchasing utilities to improve efficiency and reduce prices to captive consumers.[164] The project company and purchasing utility enter into a "regulatory bargain" on the understanding that reasonable costs would be recovered in tariff rates.[165] Thus, with few exceptions, the "cost-plus-pricing" regulation allows project companies to increase their tariff rates to the extent necessary to recover increased costs.[166] In addition, because of the take-or-pay contractual obligations, purchasing utilities may be unable to follow the rules of market economy, such as giving priority to the lower marginal cost facilities to sell their generation, and thus affording consumers the lowest price among the power producers. As a result, project companies have few incentives to minimize costs because there is little threat of competition. Moreover, the rigid tariff formula in PPAs based the "cost-plus-pricing" regulation performs normally well in price stable periods but badly in times of high inflation, because it fails to limit power producers to a reasonable return on capital and led to excessive investments.[167] Since high electricity price contributes to a higher inflation, and a strong reaction from util-

160. *See* Burr, *supra* note 151.

161. *See* Hull & Milbank, *supra* note 128; *see also supra* notes 37-43 and accompanying text.

162. *See id*; *see also supra* text accompanying notes 48-60.

163. *See supra* text accompany notes 61-65.

164. *See generally* Richard J. Pierce, Jr., *Reconstituting the Natural Gas Industry from Wellhead to Burnertip*, 9 ENERGY L.J. 1 (1988).

165. *See* John Burritt McArthur, *Cost Responsibility or Regulatory Indulgence for Electricity's Stranded Costs?* 47 AM. U. L. REV. 775, 854 (1998). *See generally* Judge Starr's concurring opinion in *Jersey Cent. Power & Light Co. v. FERC*, 810 F.2d 1168 (D.C. Cir. 1987).

166. *See* Richard J. Pierce, *Reconsidering the Roles of Regulation and Competition in the Natural Gas Industry*, 97 HARV. L. REV. 345, 359 (1983).

167. *See* Bernard S. Black & Richard J. Pierce, Jr., *The Choice between Markets and Central Planning in Regulating the U.S. Electricity Industry*, 93 COLUM. L. REV. 1339, 1344 (1993); Navarro, *supra* note 93, at 350.

ity consumer groups, these may force purchasing utilities to respond by suppressing rates below what power plants otherwise required to return their capital.[168] This in turn will place the PPA in a shaky situation.[169]

Even though the merchant power has become a dominant system, there are very few countries in which merchant power is the *only* supply basis for the power market.[170] For example, when adopting the spot market system in its electrical industry, the United Kingdom has established a "renewable set-aside" program to help finance renewable energy industries (such as wind energy plants, hydroelectric dams), requiring more capital investment and longer construction period.[171] To help the private investors overcome the obstacles to the development of power projects under the merchant power system, especially the financial difficulties involved in greenfield projects, some hybrid models might better serve foreign invested projects. In hybrid models the PPAs cover only a portion of the output of a project, or the total output but only a given period of time, leaving the remainder to be sold on the open market.[172]

1. *The Two-Step Approach*

Greenfield power projects require high front-end expenditures. In addition, classic project financing usually provides commercial term loans of no more than seven years of duration following the completion of construction. This means that the project company has to pay off all interest and principal payments within seven years after the generation facilities enter commercial operation. As a result, in order to maintain a sufficient cash flow required to ensure debt service, the tariff of a greenfield plant is usually high during the period of the greatest amortization of the project's debt, such as the first seven years. And the project company will be able to lower its tariff only after repaying interest and principal. Therefore, in a competitive market, it is highly unlikely that a plant in its first year of oper-

168. *See* Navarro, *supra* note 93, at 351.

169. *See generally* Nassar, *supra* note 25, at 65. Supply of services such as electricity, water, telecommunications, or transportation are of public concern and politically sensitive. Providing these services "for an exaggerated charge is not a politically desirable situation for any government, be it a developed or developing country."

170. *See supra* note 107.

171. *See* Armstrong, *supra* note 75, at 472; *see also* Black & Pierce, *supra* note 167 on negawatt programs in the U.S. .

172. *See* Kriebel & Hornstein, *supra* note 155.

ation will be able to compete effectively against another plant in its eighth year of operation. A solution would be to divide the whole commercial operation period of the power plant, usually twenty to thirty years or longer, into two phases: repayment and post-repayment periods. During the repayment period, the purchasing utility and project company would enter into a PPA to offer protection to the greenfield plant and provide cash flow to match the debt service. The PPA will terminate upon the termination of the loan agreements. In the post-repayment period, the power plant will enter into competitive market, and project sponsors will no longer have the benefit of having that investment secured by the regulated utility rate base. This solution is based on the theory that compared to lenders, the investors tend to take a long-term view of their investment, and they would be willing to take more risk in exchange for higher returns in the future.[173]

2. *The Two-Tier Approach*

This approach is based on the two-portion electricity pricing system of "capacity payment" and "energy payment." As discussed above, the capacity payment is designed to recover the fixed costs of the project, including construction costs, fixed operation and maintenance costs, and financial costs.[174] The energy payment is designed to compensate the project company for all variable costs of operating the project, including cost of fuel and variable operation and maintenance costs associated with the actual production of energy.[175] Although the tariff structures may vary among projects, the combined tariff of capacity and energy payment would be served to recover all costs and provide a stable revenue steam to the project company over the term of the PPA's.[176]

The two-tier approach will separate the combined tariff of capacity and energy payment. In addition, it will put shareholders' investment equity return into the energy payment, although it is sometimes covered by the capacity payment. Under this approach, the project company and the purchasing utility enter into a PPA that only recovers the fixed costs of the project. In

173. *See* AHMED, *supra* note 4, at 8.
174. *See supra* text accompanying notes 51-60; *see also* Robert Thornton Smith, *supra* note 46, at 210.
175. *See supra* text accompanying notes 51-60; *see also* Stelwagon, *supra* note 2, at 53.
176. *See supra* text accompanying notes 51-60; *see also* Robert Thornton Smith, *supra* note 46, at 210.

other words, the PPA will only guarantee the capacity payment portion of the tariff. The energy payment portion can be recovered in the competitive market. For example, assume that in order for a project company to recover all of its capacity and energy payment, it has to operate 5,500 hours per year; assume among the 5,500 hours, 3,500 hours would cover the capacity payment. The purchasing utility will have an obligation to purchase the electricity produced from 3,500 hours of operation. The remaining 2,000 hours' output would be available for sale into the open market on condition that its price is lower than the competitors of the project company. On the other hand, the project company would have chance to sell more than 5,500 hours' output if its price is competitive.

This approach will provide equal competitive opportunities to new greenfield plants and existing facilities. By providing the capacity payment, this approach ensures that sufficient revenues will be available to cover all debt service and fixed operation and maintenance costs. Thus it would relieve the burdens placed on greenfield plants of high front-end expenditures and loan repayment, and provide the project lenders with an adequate degree of comfort to finance a project. On the other hand, the capacity payment will only create a regular cash flow necessary for the project to meet its payment obligations under its loan agreements. As for the shareholders, this approach guarantees recovery of their capital contribution. For returns on equity, shareholders have to take market risks.

CONCLUSION

The most significant trend in the worldwide reform of the electric utility industry is the move towards the implementation of a "fully unbundled, competitive electricity market" model. But before policymakers of developing countries rush to embrace the merchant power model in the electric industry, they should carefully evaluate its advantages and disadvantages. Policymakers should also be aware of limits of the merchant power model. In situations where political, legal, and currency risks are likely to be high, the central features of a PPA, certainty of market and of price, still make the PPA relevant for a considerable portion of power financing. However, the somehow flawed underlying economic rationale for such an approach may eventually dilute the effectiveness of the PPA. While the Asian financial crisis illustrated that reliance solely on the "one-stop shopping" afforded by PPAs may bring about some problems, the pure merchant power model may not be the only effective solution either. Hybrid models, which employ modified PPA-structure to provide the financial security base for a part of the electric power purchase, and also use merchant power to introduce incentives to improve efficiency and reduce prices, may serve as an effective and a viable alternative.