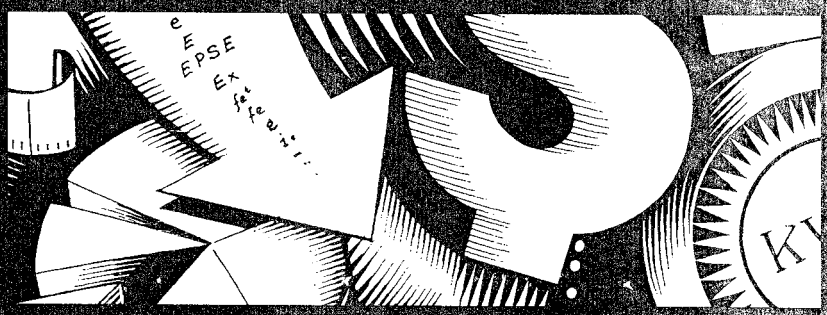


PHB Hagler Bailly

MANAGEMENT AND ECONOMIC CONSULTANTS

RISK ASSESSMENT METHODOLOGY OPTIONS

THE ISSUE

According to the current connections section of the proposed Transmission Code for Ontario, load customers who wish to connect to the grid have two options for funding any new facilities required to support their interconnection:

- the connecting party may choose to pay for the facilities themselves, or
- the connecting party may ask the pool to fund the construction of the facilities.

In the latter case, the construction investment made by the pool must be repaid in some form. This repayment can take the form of a " 'financial contribution', load guarantee, or other financing options".[1]

Regardless of the specific form the repayment takes, there is general agreement that the pool must be "held harmless" by the transaction, i.e., the pool will not suffer financial loss. In order to do this, it is proposed that the pool assign a risk classification to each potential load customer. This risk classification will correspond to an assigned "revenue horizon" for the recovery of pool expenditures; i.e., the year at which the discounted expenditure and revenue streams related to the new load and its interconnection will be equal. To minimize the risk of losses to the pool, the horizon should be shorter for higher risk companies than for those judged to present a lower risk. Tentatively, three risk categories (High, Medium, and Low) have been defined. The maximum revenue horizons proposed for these categories are five, ten, and twenty five years, respectively.

The key issue for the appropriate authority then becomes how to classify companies in a fair and objective manner into one of these categories. Four questions will form the basis for deciding the optimal way to carry out an effective categorization:

- What type of risk is most relevant for classification of load customers in this case?
- What type of methodologies and/or data are the best fits for assessing this type of risk?
- Are the data required readily available from accessible sources?

[1] Ontario Energy Board, minutes from Transmission System Code Task Force #4 (revised), March 27, 2000.

- How do we use these data and models to classify customers?

The following sections: explain the type of risk that is most relevant for an assessment of this nature, discuss publicly available tools and information of note, and present several accepted analytical methods for assessing. In support of the work on this issue, documents from the New England ISO (NE-ISO), the New York ISO (NY-ISO), and PJM Interconnection, LLC (PJM-ISO) were also reviewed to proved practical examples of how this issue is treated in surrounding pools. The relevant sections from these and other useful documents are provided as attachments to this paper.

TYPES OF RISK

There are several different types of risk that a company can face, which is why asking what type of risk is most relevant is a necessary first step. The two types of risk most often used to assess the financial strength of a company are *market risk*, which stems from uncertainties in earnings due to variations in market conditions (commodity prices, volatility, interest rates, liquidity, etc.), and *credit risk*, which represents the potential for losses due to a counterparty failing to meet financial obligations. When direct investment in a company is made, the investor is concerned that earnings, and hence the value of the company and the investment, grow at an acceptable rate over time. Thus, market risk is an appropriate measure of a the risk a company presents to an investment portfolio.

However, in financing a customer's connection to the system, the pool is not actually making a direct investment in the interconnecting company. It is primarily concerned with "holding the pool harmless" against its expenditures to connect the load customer to the grid. Essentially, the conditions under which a load customer would arrange to have the pool construct the facilities to interconnect with the grid are equivalent to the pool "lending" the cost of construction to the load customer. For the pool to be made whole these funds must be repaid. Thus, while earnings and other market risk metrics are without question a useful measure of a company's strength, the more relevant measure for this case is credit risk.

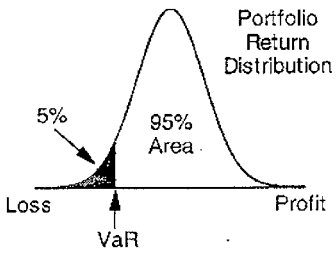
PUBLICLY AVAILABLE TOOLS AND INFORMATION

The next two questions that must be answered are: "What type of methodologies and/or data are the best fits for assessing this type of risk?" and "Are the data required readily available from accessible sources?". A starting point for answering these questions is to review available, credible sources of business risk profile information and evaluation methodologies.

Among the best-known methodologies for business risk assessment are the RiskMetrics™ and CreditMetrics™ methodologies developed by J.P. Morgan in the mid-1990s. RiskMetrics™ is a methodology that allows the estimation of market risk based on the Value-at-Risk (VaR) approach. VaR is an estimate of the potential losses within a specified confidence interval from

holding a position over a defined horizon (see **Figure 1**). RiskMetrics™ is typically used to analyze the uncertainty in earnings stemming from one or more changes in market conditions. This methodology, however, is a poor fit for the application OEB is studying for at least three reasons. First, it is generally used to measure market risk, not credit risk. Second, its intended use is to analyze *portfolios* of market securities or derivatives, not individual firms. And third, the level of complexity of the model is inappropriate for an application of this type.

Figure 1. Definition of Value-at-Risk[2]



This definition of VaR uses a 5% risk level (95% confidence): You would anticipate that losses exceeding the VaR amount would occur 5% of the time (or losses less than the VaR amount would occur 95% of the time).

CreditMetrics™ is a tool that was developed using RiskMetrics™ as a platform, in order to make precise, quantitative analyses of credit extension options, counterparty default risk, and risk-mitigating actions. However, it too is aimed at portfolio analysis, and is even more complex than RiskMetrics™ (because credit data is sparser and more infrequently priced than securities and derivatives). Also, in a section entitled "What CreditMetrics is Not" in the Technical Document for CreditMetrics™, J.P. Morgan points out that

> ...Most prior work has been on the estimation of the relative likelihoods of default for individual firms; Moody's and S&P have long done this and many others have started to do so... We have designed CreditMetrics to accept as an input any assessment of default probability which results in firms being classified into discrete groups...***It is important to realize, however, that these assessments are only inputs to CreditMetrics, and not the final output*** (emphasis author's). (CreditMetrics™ - Technical Document, J.P. Morgan and Co., 1997, page v.)

Therefore, the type of credit ratings classifications sought by the OEB are actually inputs to the CreditMetrics™ process, rather than model outputs. However, professional credit rating agencies regularly examine and classify companies based on credit risk metrics for bond and other debt

[2] Figure from *Risk Management: A Practical Guide* by the RiskMetrics Group, p. 4 (not a published document – available for download at www.riskmetrics.com)

instrument ratings. As discussed below, most ISOs rely on independent debt ratings from the major rating agencies as part of their risk mitigation process.

Independent debt ratings, such as those issued by Moody's , Standard and Poors (S&P), Duff and Phelps, and Fitch IBCA, are excellent indicators of credit risk. These ratings are considered credible and are widely accepted throughout the financial community. The reason for this is that there is sufficient comfort in the analytic rigor with which these ratings are developed. Moody's, for example, uses a multidisciplinary approach to risk analysis, which brings an understanding of a wide variety of risk factors and viewpoints to every rating analysis (see Attachments 1 and 2 for examples.). They then rely on the judgment of a diverse group of credit risk professionals to weigh those factors in light of a variety of plausible scenarios for the debt issuer, and come to a final conclusion on which rating to assign.

Through the transmission code or other appropriate document, the interconnecting party can be required to make their debt rating available to the pool. Both the NE-ISO and the NY-ISO have such clauses in their agreements (see the section entitled "U.S. ISO Risk Measurement"). However, ratings by the major ratings agencies will not be available for all potential transmission interconnection customers. Thus, the Ontario pool should also consider adopting a proven methodology for rating such companies.

ANALYTIC METHODS

There are several standard analytical methods for determining credit risk which use information that should be readily available from public companies. If the data is not publicly available, the ISO can make provision of such data a requirement for interconnection and use of the grid. The NE-ISO has adopt just such an approach, as shown in Attachment 3.

The following three methods were selected for consideration because they are recognized methodologies that specifically measure credit risk and require no information other than that available from financial statements. The latter condition greatly simplifies the data collection effort if an analytical process is chosen.

Funds Flow Coverage Ratio

The simplest measurement of creditworthiness is a solvency ratio that is typically called the *funds flow coverage ratio*. This ratio provides an indication of how comfortably a company's flow of funds can cover required expenditures. Note that payments such as dividends on common stock, capital investments, and other discretionary spending are not part of this ratio because there is an implicit assumption (however realistic) that these types of expenditures can be reduced to zero if the funds are needed for other expenses. The formula is computed as follows:

$$\text{Funds Flow Coverage} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \frac{\text{Debt Repayment}}{(1 - \text{Tax Rate})} + \frac{\text{Preferred Dividends}}{(1 - \text{Tax Rate})}}$$

For a firm to be considered healthy and viable in the long term, this ratio must be well in excess of 1.0. From the implicit assumptions described in the previous paragraph, an argument can be made that the pool should never fund facility construction for firms with ratios less than 1.0. For such firms, assuming they continue normal operation, it is not even clear that they can meet their commitment to the pool in the short term (i.e., less than five years).

While this formula is relatively straightforward to comprehend and compute, there are no published thresholds (other than 1.0 benchmark) to segment firms of high risk, medium risk, and low risk. The intervals that each of the three categories represent would have to be set by the pool before undertaking customer assessments. However, without publicly accepted benchmarks on which to base its classifications, the pool may leave itself open to dispute and potential litigation.

Altman Z-score Model

There are two models in finance theory for which there are accepted risk benchmarks. These models can be readily employed to segment companies into risk categories as desired. In fact, they were constructed with that type of use in mind. The first is the Altman Z-score model. The Z-score is computed as follows:

$$Z = .717*X_1 + .847*X_2 + 3.11*X_3 + .42*X_4 + .998*X_5$$

where

X_1 = net working capital/total assets

X_2 = retained earnings/total assets

X_3 = earnings before interest and taxes (EBIT)/total assets

X_4 = shareholders equity/total liabilities

X_5 = sales/total assets

When the Z-score is less than 1.2, the model predicts a high likelihood of bankruptcy, default, or other severe financial distress. Between 1.2 and 2.9, the Z-score is in a "gray area" where the

company's credit is neither definitively strong, nor dangerously weak. A Z-score above 2.9 indicates a firm with a strong credit profile. These intervals could be used to represent high, medium, and low risk firms, respectively.

If the Altman Z-score is:	Projected credit risk is
< 1.2	High
1.2 – 2.9	Medium
> 2.9	Low

Kaplan-Urwitz Model

The third model, and the most complex, is the Kaplan-Urwitz model. This has been used by financial analysts to predict bond ratings for firms, and has displayed consistency with either the actual debt ratings of the firm or the market yield on the debt. Kaplan and Urwitz developed two models; one, however, uses stock market data that may not be readily available for all firms. Since the goal is to ensure that the models and data are as accessible as possible, the alternate Kaplan-Urwitz model that uses only financial statement data is presented below:

Kaplan-Urwitz score[3] = 4.41
+ 0.0012 * total assets ($000)
– 2.72 * long-term debt/total assets
+ 6.4 * net income/total assets
– 0.53 * coefficient of variation[‡] in net income over 5 years
+ 0.006 * interest coverage

The score is then converted to a projected bond rating according to the following table:

If Kaplan-Urwitz score is	Projected bond rating is
> 6.76	AAA
5.19-6.76	AA
3.28-5.19	A
1.57-3.28	BBB
< 0	BB

[3] In the formal model, there is also a subtractive term if the debt is subordinated; the debt for this example is assumed to be unsubordinated, which makes this term zero. For detailed information on this model, see either the original paper (R. Kaplan and G. Urwitz, "Statistical Models of Bond Ratings; A Methodological Inquiry," *Journal of Business*, April, 1979, pp. 231-261) or the description of the model on pages 9-13 to 9-15 in *Business Analysis and Valuation* by K. Palepu, V. Bernard, and P. Healy (Southwestern College Publishing, 1996).

[‡] standard deviation/mean

The bond rating can then be applied to a risk category by the pool.

Simple models such as these cannot serve effectively to replace in-depth analysis of a firm. Therefore, if bond ratings from one of the major rating agencies are available, those ratings should be used as a primary source. In the absence of such data, however, these models can indicate roughly how a firm compares to others in terms of its credit risk profile.

EXAMPLES OF ISO RISK MITIGATION

Each of the three ISOs for whom documents were reviewed in preparation of this report have well defined credit risk mitigation strategies, although each ISO treats credit risk somewhat differently. In the NE-ISO, any user of the grid who is not an ISO participant is required to submit to NE-ISO their most recent audited financial statements, credit references, annual and quarterly reports, and debt rating agency report. (If the company is not publicly held and does not produce some of this information, NEPOOL will specify an equivalent alternate requirement for submission.) Among other conditions, if the debt rating is not investment grade (for example, ranked Baa or higher by Moody's or BBB or higher by Standard and Poor's), the customer must provide some other form of financial assurance, such as a cash deposit, letter of credit, or performance bond. The entire Financial Assurance Policy for NE-ISO is reproduced for reference in Attachment 3.

The requirements in NY-ISO are a bit more flexible. These are attached in Attachment 4. They provide customers with five means of proving sufficient creditworthiness:

- Demonstrating an investment-grade bond rating,
- Prepaying for service,
- Providing an irrevocable standby letter of credit,
- Demonstrating a long-term payment history with the ISO or one of the participating transmission owners,
- Obtaining a guarantee of responsibility for financial obligations from a parent company with an investment-grade bond rating.

If, at any point, adverse material changes cause a firm to no longer be able to demonstrate creditworthiness by any of these means, NY-ISO retains the right to terminate service with 60 days' notice.

The PJM-ISO has the least stringent credit policy, as shown in Attachment 5. All that is specified in the tariff is that the ISO "may require" some sort of credit review "in accordance with standard commercial practices" or an irrevocable letter of credit or equivalent form of

financial assurance. Of the three ISOs studied, the PJM-ISO is the only one that does not explicitly require submission of debt rating agency or similar information as a requirement for use of the grid.

CONCLUSION

The final question that must be answered is how these data and models are to be used to classify customers. From the discussion in the previous two sections, it appears that bond ratings are the best way to segment potential interconnecting parties into credit risk categories. That observation is supported by the analytic rigor with which the ratings are developed, and the fact that that NE-ISO and NY-ISO have written clauses into their agreements and tariffs that explicitly require such information. If obtaining this data is impossible, the Kaplan-Urwitz model and the Altman Z-score model may be useful analytical techniques should the pool wish to undertake its own credit review of the interconnection customer. These two models have demonstrated success in making precisely the types of judgements that the pool will have to make and rely exclusively on financial statement data that should be available for the vast majority of companies.

Whichever choice is made, it will be up to the judgement of the members of the pool to delineate the specific intervals of ratings or numeric values which represent high, medium, and low risk. The guidelines given in the explanation of the models should provide a starting point for estimating these intervals. The risk categories that result from this analysis should give the pool a way to mitigate risk and ensure that the pool is "held harmless" with reference to the financing of customer interconnections.

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ATTACHMENT 1

MOODY'S RATINGS METHODOLOGIES FOR TYPES OF LOAD THAT ARE REPRESENTATIVE OF POTENTIAL CUSTOMERS FOR IEMO

(not for further distribution)

Moody's Investors Service
Global Credit Research

March 1999

Rating Methodology

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RATING METHODOLOGY

Paper & Forest Products Industry

Moody's rating assessment of paper and forest products companies focuses on a range of factors that affect not only the companies' near-to-intermediate term cash flows and levels of debt protection, but also their profit potential and thus their credit quality over the longer term.

Like most other producers of commodity products, these companies' debt-protection measures are quite volatile. However, this volatility does not result in significant movements of the ratings because Moody's "rate through the cycle" approach factors out one or even two unusually good or bad years, allowing the rating to remain constant. We use our own projections of pricing levels for the next industry cycle, apply it uniformly to all companies within the industry, and assign ratings that capture these companies' probable levels of debt protection more or less at the middle of the up-coming cycle.

Overall, the ratings for this sector are constrained by high debt levels in this capital-intensive industry and by the thin margins and volatile earnings that plague most commodity producers. As result, the highest rating in the industry is currently an A1.

In addition, over the last several years, aggressive capacity additions have resulted in a weak pricing environment and in returns on assets that have been below the interest costs on funds borrowed to build/ purchase those assets. As a result, the rating for many companies has eroded.

The addition of many speculative grade companies in the past several years has meant that the industry rating range is quite broad, spanning from A1 to Ca. The determination of where any given company falls within that band is the result of several factors, the most important of which are:

- **Use of leverage:** Perhaps the most important rating factor is management's control over the company's level of spending so that the balance sheet remains relatively stable in a downturn and earnings-related debt-protection measures will recover quickly when demand turns up again.
- **Product mix:** The rating is affected also by Moody's expectations about the long-term supply/balance for the company's particular set of products because this balance varies somewhat between different paper and wood product lines.
- **Event risk:** While we can not forecast with certainty management's future action, some companies have demonstrated a tendency to make acquisitions. We therefore rate these companies at a level that leaves room for potential acquisitions.
- **Intangible assets:** Timberlands: Many larger companies have significantly undervalued assets in timberlands. This results in deceptively high debt-to-capitalization ratios, which Moody's adjusts for. These excess timberland holdings also provide some protection against rapid increases in fiber cost and are a possible source of cash in times of serious financial stress.
- **Application of new technology:** Moody's believes that the broad application of cloning to propagate uniform and fast-growing trees will result in greater fiber availability than is currently expected. Ratings could gradually separate between large and small paper and forest products companies as large companies with silva-culture programs, which dramatically raise yields per acre, supply their own fiber needs and rely less on purchased fiber.

continued on page 4

Paper & Forest Products Industry Ratings

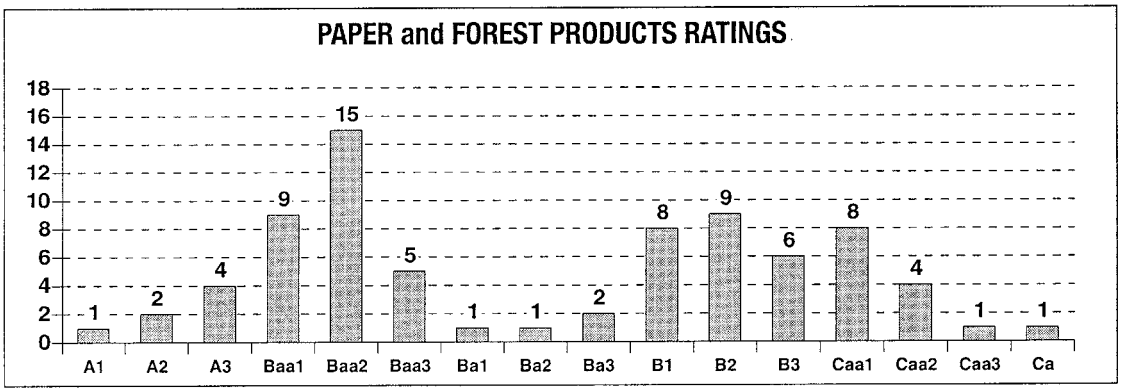
COMPANY	RATING	OUTLOOK
WESTVACO CORPORATION	A1;P-1	STABLE
SONOCO PRODUCTS COMPANY	A2; P-1	STABLE
WEYERHAEUSER COMPANY	A2; P-1	STABLE
INTERNATIONAL PAPER COMPANY	A3; P-2	STABLE
MEAD CORPORATION	A3; P-2	STABLE
SVENSKA CELULOSA AB	A3; P-2	STABLE
WILLAMETTE INDUSTRIES INC.	A3; P-2	STABLE
AMCOR Ltd	Baa1; P-2	STABLE
BOWATER CORPORATION	Baa1; P-2	STABLE
CARAUSTAR CORPORATION	Baa1	STABLE
CHAMPION INTERNATIONAL	Baa1; P-2	NEGATIVE
JEFFERSON SMURFIT plc	Baa1	NEGATIVE
OJI PAPER COMPANY, Ltd	Baa1	REVIEW FOR DOWNGRADE
POTLATCH CORPORATION	Baa1	STABLE
STORA ENSO OYJ	Baa1; P-2	STABLE
TEMPLE-INLAND CORPORATION	Baa1; P-2	STABLE
UPM KYMMENE OYJ	Baa1	STABLE
ASSIDOMAN AB	P-2	STABLE
REXAM plc	P-2	STABLE
ACX	(P) Baa2	STABLE
CARTER HOLT HARVEY Ltd	Baa2; P-2	STABLE
CELULOSA ARAUCO y CONSTITUCION S.A.	Baa2	STABLE
EMPRESAS CMPC S.A.	Baa2	STABLE
FORT JAMES CORPORATION	Baa2	STABLE
FLETCHER CHALLENGE Ltd	Baa2; P-2	STABLE
GEORGIA-PACIFIC CORPORATION	Baa2	STABLE
P. H. GLATFELTER COMPANY	Baa2	STABLE
METSA-SERLA AB	Baa2	STABLE
MacMILLIAM BLOEDEL Ltd	Baa2; P-2	STABLE
NIPPON PAPER INDUSTRIES CO. Ltd	Baa2	REVIEW FOR DOWNGRADE
NEXFOR, INC.	Baa2; P-2	STABLE
RAYONIER INC.	Baa2	STABLE
ROCK-TENN COMPANY	Baa2	STABLE
ABITIBI CONSOLIDATED INC.	Baa3	NEGATIVE
BOISE CASCADE CORPORATION	Baa3	STABLE
CHESAPEAKE CORPORATION	Baa3	STABLE
DONOHUE INC.	Baa3	STABLE
WEST FRASER TIMBER CO. Ltd	Baa3	STABLE
DOMTAR INC.	Ba1	STABLE
POPE & TALBOT INC.	Ba2	STABLE

Author	Editor	Senior Associate	Senior Production Associate
Nelson Noel	*Susannah Levine*	*Joseph Frish*	*Erech Swanston*

COMPANY	RATING	OUTLOOK
PAPERBOARD INDUSTRIES INTERNATIONAL	Ba3	STABLE
TEMBEC INC.	Ba3	STABLE
S.D. WARREN COMPANY	B1(Sr. Sub.)	STABLE
COPAMEX INDUSTRIAS, S.A. de C.V.	B1	REVIEW FOR DOWNGRADE
DAIO PAPER CORPORATION	B1	STABLE
DOMAN INDUSTRIES Ltd	B1	NEGATIVE
GRANT FOREST PRODUCTS INC.	B1(Sr. Sec.)	STABLE
PACIFICA INC.	B1	STABLE
SPECIALTY PAPERBOARD, INC.	B1	STABLE
U.S. TIMBERLANDS KLAMATH FALLS, L.L.C.	B1	STABLE
ARACRUZ CELULOSE S.A.	B2	STABLE
BEAR ISLAND PAPER COMPANY L.L.C.	B2	STABLE
GAYLORD CONTAINER CORPORATION	B2	STABLE
GRUPO INDUSTRIAL DURANGO S.A. de C.V.	B2	STABLE
INDUSTRIAS KLABIN de PAPEL e CELULOSE S.A.	B2	STABLE
JEFFERSON SMURFIT CORPORATION	B2	NEGATIVE
REPAP NEW BRUNSWICK	B2	NEGATIVE
REPUBLIC GROUP INC.	B2	STABLE
STONE CONTAINER CORPORATION	B2	NEGATIVE
AINSWORTH LUMBER COMPANY Ltd	B3	STABLE
CROWN PAPER COMPANY	B3(Sr. Sub.)	NEGATIVE
MILLAR WESTERN FOREST PRODUCTS Ltd	B3	STABLE
PLAINWELL INC.	B3(Sr. Sub.)	STABLE
RIVERWOOD INTERNATIONAL CORPORATION	B3	STABLE
UNIFORET INC.	B3(Sr.Sec.)	STABLE
ASIA PULP & PAPER COMPANY Ltd	Caa1	STABLE
APP FINANCE II MAURITIUS Ltd	Caa1	STABLE
APP FINANCE VI MAURITIUS Ltd	Caa1	STABLE
APP GLOBAL Ltd	Caa1	STABLE
APP GLOBAL FINANCE III CAYMAN Ltd	Caa1	STABLE
APP INTERNATIONAL FINANCE CO B.V.	Caa1	STABLE
CROWN VANTAGE INC.	Caa1	STABLE
TJIWI KIMIA INTERNATIONAL FINANCE CO. B.V.	Caa1	STABLE
CROWN PACKAGING Ltd	Caa2(Sr.Sec.)	STABLE
FOUR M CORPORATION	Caa1(Sr.Sec.)	STABLE
PT INTI INDORAYON UTAMA	Caa2	STABLE
RAPP INTERNATIONAL FINANCE	Caa2	STABLE
PT FAJAR SURYEA WISESA	Caa3	STABLE
FLORIDA COAST PAPER COMPANY, L.L.C.	Ca	STABLE

Sector Overview

Moody's currently rates 79 entities in the paper and forest products industry with a total of over $90 billion of rated long-term debt (both public and private bank debt) and preferred stock. Long-term ratings vary from A1 (Westvaco Corporation) to Ca (Florida Coast Paper Co., L.L.C.). Given the cyclicality of results and the resultant volatility of debt protection measurements, companies would have to maintain debt levels that are too low to be practical in order to be rated in the Aa category. Thus, there are no paper and forest products companies in that rating range.



CYCLICALITY OF DEMAND

While significant, the cyclical variation in final demand for paper products is not as great as product price variations would suggest. For example, final demand for uncoated white paper (typing and copying paper) tends to be essentially flat in typical economic slowdowns/recessions. However, inventories at the end-user level vary considerably. This expansion and contraction of user inventories results in significant changes in demand at the factory. The effect is exaggerated by the existence of distributors, (an additional link in the supply chain between factory and user) who supply end users with white paper from their own warehouses. As a result of these two inventory levels, a factory could experience a 10% demand decline from a flat end-user trend.

Manufacturers are slow to reduce operating rates because of high fixed costs, never producing at less than the mid-80% level and usually producing at 92% to 97%. This reluctance to reduce operating rates when demand falls or just flattens results in large price swings and thus variations in earnings, cash flow, and general debt protection measurements.

PRICE VARIATIONS

These factors, plus the commodity nature of the products that allow little, if any, product differentiation, results in the large price swings, as shown below. Prices for newsprint and linerboard are less volatile than for pulp and white paper. Since pulp is the main cost factor in white paper, it is not surprising these two prices track closely.

		Approximate	
Product	% Price Decline 1988-1993	% Price Gain 1993-1995	% Price Decline 1995-1998
Pulp	- 52%	+ 135%	- 47%
White Paper [1]	- 44%	+ 135%	- 43%
Newsprint	- 30%	+ 80%	- 35% [2]
Linerboard	- 27%	+ 70%	- 45% [2]

(1) 50-pound offset rolls
(2) Low point was in 1997

In 1993, most companies throughout the world lost money on both pulp and newsprint production. By 1997, cost cutting (staff reductions, more efficient equipment, better purchasing techniques) at most companies produced generally positive earnings results, despite the low prices.

In placing the rating, Moody's takes into consideration the relative cyclicality of the various paper products and resultant price volatility. Of all the products, pulp has perhaps the most variable prices, closely followed by white paper (uncoated free sheet). The greater the price volatility Moody's foresees in the company's product line, the greater the likelihood that the company's debt protection measurements will vary widely. If companies in the more price-volatile parts of the paper industry do not compensate with lower debt levels (relative to normalized earnings power), their ratings will be lower.

Forecasting Demand and Supply

Moody's also focuses considerable attention on its forecasts for the paper industry and how various companies would fare in the forecasted environment.

Supply is difficult to forecast from year to year in the forest products area, except for manufactured products like oriented strand board and plywood. Thus, we use longer-term trends of fiber supply. In the paper area, supply is readily forecastable by tracking capacity expansion plans for a certain product on a worldwide basis.

Demand, which depends on economic activity, is more difficult to forecast. We use capacity expansion plans as a supply ceiling then project what trend line levels of demand would be required to absorb this capacity. If, for example, it would take 10%-plus increases in demand to arrive at 94%-96% operating rates, and we are well into the paper upcycle, the industry is probably heading for price declines. If paper demand is at a cycle-low and future capacity increases are in the 0-1% per year range, industry prices will probably rise shortly.

Moody's makes these forecasts to get a sense of where prices are likely heading — where in the cycle the industry is currently and probable stresses on companies' ratios. We then place the ratings by rating through the cycle.

High Capital Costs

Pulp is the most capital intensive (capital cost relative to sales) product in the paper industry (and the most essential product). At the present time, building a pulp mill in Indonesia that produces 1 million tons per year would cost US$1 to US$1.5 billion — US$1,250/T. Building a mill in the US or Europe that produces750 thousand TPY would likely cost over US$1 billion — US$1,500/T. If pulp sells for an average of US$ 600/T over the cycle, this would mean each dollar of capex buys about 40¢ to 50¢ of sales. By way of comparison, 1 dollar of capex in chemicals usually produces over one dollar of sales. In smelting aluminum, one dollar of capex produces 75¢ of sales.

In recent years, returns on assets have been below the interest costs on funds borrowed to purchase and build those assets. This is a formula for liquidation of an industry, and is one of the reasons that many individual companies' ratings have tended to erode over the years. The new resolve emerging in North American and European companies not to expand capacity unless the rate of return is acceptable could raise paper prices (especially if followed by Latin American and Southeast Asian producers) to levels that would increase the sales/capex ratio. This would raise returns on investment, assets, and capital for the industry. However, the industry will have to demonstrate discipline in acting on this resolve.

Debt Levels

The paper industry has moderately high leverage. A sample of 20 large, worldwide paper companies (1 Indonesian, 1 Chilean, 1 Brazilian, 2 Canadian, 2 Swedish, and 13 American) was created of companies with pulp and paper capacity of over 100 million annual tons, probably representing one-half of the world's paper industry capacity.

The pure average (not weighted) of debt to capitalization was an estimated 46% at year-end 1998. These 20 companies were heavily skewed towards the higher end of the rating scale. Only 4 are speculative grade credits. If a larger blend of all of Moody's paper credits were included, unweighted debt-to-capitalization would have been higher. Given the volatile pricing of paper products, this high a leverage produces very volatile debt protection measurements.

The average rating of this group is Baa2. Nevertheless, one Baa2-rated company has a debt-to-capitalization level of 26%, another has 55%, and a third company has 44%. A single Moody's rating can allow for this variation in debt levels because we place greater emphasis on cash flow to debt, interest coverage, product mix, intangible assets (hidden timberland values) and most importantly, what is our forecasts of those factors in the future.

Interest Coverage

Interest coverage and retained cash flow (after dividend payments) to total debt varies between companies, even those with similar debt levels, due to different levels of profitability. A company with larger profits can service higher levels of debt. Also, companies may have assets on the balance sheet that increase equity but do not contribute to profits and cash flow. We, in effect, "write off" these assets in our analysis to arrive at true equity levels.

Rating Through the Cycle

In any industry as sensitive to economic cycles as the paper and forest products industry, results vary quite widely as the world economy moves from recession to expansion. Moody's approach is to place the rating more or less at mid-cycle. This presents two immediate problems.

One, it does no good to use the last cycle; the cycle immediately upcoming is the proper one. This means that Moody's must use its own forecasts for the cycle. This is not because Moody's is better than the issuers in forecasting the future but because different issuers use somewhat different cycles in their forecasts. We use our own forecasts to create a level playing field by applying the same shape and magnitude of the economic cycle to all paper and forest products issuers.

Two, history has shown that paper industry cycles have, for the past 10-15 years, not been regular sine waves. Downturns have been longer than upturns, and for some products, the downturn has been deeper than the upturn has been high. In consideration of this, Moody's shades the rating somewhat below the mid-point of the "sine wave."

For the last 10-15 years, profitability and returns on assets/investments has declined, resulting in a gradually downward-shifting mid-point on the sine wave. The industry is talking a good game on restraining capacity growth to improve these diminishing returns, but it remains to be seen if North American and European producers will, if fact, follow this regime. Of equal importance will be whether producers in Asia and Latin American countries will follow this lead, or exploit the zero-growth of capacity in North America and Europe to expand their own capacity, thus keeping product prices weak.

Moody's rating-through-the-cycle approach focuses more on alternate sources of liquidity for speculative grade issues. While large paper companies with reasonable levels of debt and well-established relationships with banks are nearly certain to survive the valley of a recession, some highly leveraged paper companies will not be able to stay in business until the upturn. Thus, for some highly leveraged (and usually small) companies, Moody's must make a judgment as to whether the company will survive what we believe will be the paper pricing environment over the next few years.

Non-Financial Factors

Moody's gauges the impact the current management team's approach to financing is likely to have on the issuer's future debt protection measurements. Management's impact on credit quality is quite likely the single most important rating factor. Because individual managements cannot control worldwide demand or supply of paper and forest products, Moody's places considerable weight on a factor management can control — the balance sheet — in making overall value judgments of the management team.

Management's aggressiveness in its spending plans, both for internal projects as well as acquisitions, will have an overriding impact on the level of debt on the balance sheet, affecting very important ratios like interest coverage and cash flow to total debt. The supply/demand balance is determined by the actions of literally hundreds of companies, and managers of individual companies can do little to affect the pricing of commodities such as paper and forest products.

However, by keeping spending in line with (or below) cash generation during periods of strong pricing, management can reduce debt levels when pricing, earnings, and cash flow are strong. When pricing falls — and it always does — cash or borrowing capacity is available to carry the company through the period of reduced profitability. This lower debt level will keep debt protection measurement from dropping too far. It could also allow management the flexibility to borrow money later to add production capacity at favorable costs, either by ordering new capacity when suppliers are hungry for new business or by buying companies whose stock prices are depressed.

The additional capacity, afforded by management's foresight, does not have to just add to present lines; it can be used to enter new and hopefully faster-growing and more price-stable products. Over the long term, this would result in better returns, profitability, balance sheets — and higher ratings.

Event Risk

Another factor Moody's incorporates into ratings is event risk. While we can not forecast with unerring accuracy a management team's future actions, some tend to make acquisitions. We factor in the risk this tendency introduces into rating.

Conclusion

The key rating factors for the paper and forest products industry fall into the following categories:

- The industry is very capital intensive. To expand and grow, companies must spend upwards of a billion dollars to build one new pulp or paper plant.
- The high fixed costs of operating the plant once it's built mean producers are reluctant to shutdown capacity when demands slows.
- Demand is quite cyclical, rising and falling with economic activity.
- The three layers of inventories (end-users, distributors, and producers) and the fact that the final two inventories are unknowable, amplify fluctuations in final demand.
- These factors, in combination with little if any opportunity for product differentiation, produce volatile prices, which often rise 100% only to fall 50% within 2 or 3 years.
- With little maneuvering room to protect the rating, managements' most important tool is control over the level of spending. When the balance sheet stays relatively stable, earnings-related debt-protection measures will recover quickly when demand turns up again.

Rating Methodology

Paper & Forest Products Industry

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Rating Methodology

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Industrial Company Rating Methodology

Overview

- Determining the predictability of future cash generation is the primary focus of Moody's industrial company analysis.
- On the macro level, we look at industry trends, such as cost and pricing, domestic and international competition, and the pace of and susceptibility to technological change, which provide important indications of future profitability, asset values, upcoming financing needs, and potential liabilities. We also look at the political and regulatory environment of the country or countries in which the company operates to determine the effect of potential government support, of the current state of regulation or deregulation, and of monetary policy and exchange rates on the company's ability to meet its debt service obligations.
- At the company level, management quality, although difficult to quantify is one of the most important factors supporting an issuer's credit strength. Management strategy can provide important insight into a company's ability to compete, how likely it is to use debt capacity, its treatment of its subsidiaries, its relationship with regulators, and its position vis-à-vis all fundamentals affecting the company's long-term credit strength. Moody's also looks closely at management's past performance versus plan. Once established, a record of consistency can provide an added level of comfort that management will perform well in the future, even under adverse conditions.
- Our analysis also focuses on 1) an assessment of a company's position in relation to its industry peers, particularly its ability to generate revenues while controlling costs; 2) on the company's financial position and sources of liquidity; 3) on company structure, with an emphasis on understanding the legal claims on the cash flow of the individual units within a corporate family; 4) on parent company guarantees and maintenance agreements; and 5)

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Rating Methodology

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on special event risk, or the possibility that an issuer's fundamental creditworthiness may decline sharply and suddenly because of a merger, acquisition, or leveraged buy-out; or because of an adverse judicial, legislative, or regulatory ruling; or an industrial accident.

- There is considerable variation as to which credit factors are most relevant to a given industry at a given time. There are very important differences in credit risks according to political, economic, and cultural trends in the countries in which each industrial issuer is domiciled and in which they have operations. There are also differences between investment-grade and non-investment-grade companies in terms of the relative weight issues such as indenture covenants bear in the final analysis of credit strength.

Introduction

The foundation of Moody's methodology for rating the debt of industrial companies worldwide rests - as does the analysis of all sectors covered by Moody's — on two basic questions: What is the risk to the debtholder of not receiving timely payment of principal and interest on this specific debt security, and how does the level of risk compare with that of all other debt securities?

When we speak of "risk to timely payment", we are measuring the ability of an issuer to generate cash in the future. Determining the predictability of future cash generation is therefore the primary focus of Moody's analysis. This determination is built on a careful analysis of the individual issuer and of its strengths and weaknesses compared to those of its peers worldwide, as well as an examination of factors external to the issuer, such as industry or country level trends, that could impact on the company's ability to meet its debt obligations. Of particular concern is the ability of management to sustain cash generation in the face of adverse changes in the business environment.

An assessment of a company's stand-alone capacity to repay debt obligations can be broken down very roughly into the following areas of inquiry:

- **Industry trends;**
- **National political and regulatory environment;**
- **Management quality and attitude towards risk-taking;**
- **Basic operating and competitive position;**
- **Financial position and sources of liquidity;**
- **Company structure, including structural subordination and priority of claim;**
- **Parent company support agreements; and**
- **Special event risk.**

There is considerable variation as to which credit factors are most relevant to a given industry at a given time. There are also very important differences in credit risks according to political, economic, and cultural trends in the countries in which each industrial issuer is domiciled and in which they have operations. This "checklist" is thus not intended to be exhaustive, but rather is a rough guide designed to help the analyst to ask the right questions.

The foreign currency debt ratings of industrial issuers (like those of all other issuers) are in most cases capped by Moody's sovereign ceiling for the nation in which the company is domiciled. The country, or "sovereign," rating is intended by Moody's to capture the possibility that during a foreign currency crisis the nation may choose to limit all foreign currency payments by entities subject to its legal jurisdiction. Moody's particular concern with foreign currency debt parallels what economists call "transfer risk" - that is, the probability that a borrower facing the obligation to make a payment in foreign currency might not be able to convert its own domestic-currency cash flow into the required foreign exchange in a timely fashion. Such transfer risk may occur, for example, because of a liquidity crisis in the international currency markets.

In addition to foreign currency ratings, Moody's has introduced local currency ratings, primarily for use in the emerging markets. In contrast to foreign currency ratings, local currency ratings are not specifically capped by the sovereign ceiling, although many of the variables required to determine a foreign-cur-

rency ceiling are similar to those which would indicate the level of country risk measured in a local currency rating.

After looking at company, industry, and country-specific risks, each security offered by an industrial company also requires a careful examination of all provisions and covenants written into the indenture that would indicate a higher or lower default risk relative to the company's inherent capacity to repay debtholders.

Analytic Framework

INDUSTRY TRENDS

This first facet of our analysis focuses on industry trends that provide important indications of future profitability, asset values, upcoming financing needs, and potential liabilities. For companies that operate in several industries, it is critical that each major business segment is analyzed separately, looking at each industry from a global perspective. The same is true for companies with significant operations or markets in many countries.

Vulnerability to economic cycles

Here, analysis focuses on an estimation of the industry's revenue and earnings streams and their potential volatility relative to national, global, and industry-specific economic cycles. Factors such as industry maturity, extent of unused plant capacity worldwide, and expected growth relative to each country's gross national product may provide important clues about the industry's cyclicality (i.e., its sensitivity to the ups and downs of the business cycle).

Supply of and demand for both the industry's major products and its production inputs are critical, as are other cyclical pressures that may affect prices. Trends in world energy prices, for example, have an obvious impact on oil producers, as well as a secondary impact on basic industry companies that require energy for production. A prolonged depression in gold prices, as another example, has resulted in weak gold mine company profitability despite mine closures and deferred capital expenditures and exploration costs.

Globalized commodity pricing

Many industries, including the oil and gas and metals and mining, benefit from fairly transparent, global, hard-currency commodity exchanges, such as the LME (London Metals Exchange). As a result of these global markets, where commodities are produced has become less critical to their ultimate consumption than how much they cost to produce and how much end users are willing to pay for them.

As a side effect of such globalization, supply or demand aberrations in isolated regions can uniformly and contemporaneously affect entire industries. An example is the effect of depressed Asian economies on the global pulp and paper market. Despite the relatively geographically confined nature of the demand slowdown, producers around the world essentially share equally the pain of margin reductions.

Domestic and global competition

Trends in the worldwide supply and demand for the industry's products are examined for their potential challenges to the company's competitive strategy. Such factors as the existence of (or potential for) government subsidies in specific nations may be critical. Similarly, international competitors may have significant labor cost advantages.

The role of the emerging markets can be significant as well. In the metals and mining industry, for example, low cost ore bodies in Indonesia and Peru, which previously were not exploited due to historically higher sovereign risk and associated lack of investment capital have since come on line. This new supply has significantly altered global cost curves and created more difficult competitive environments for long-standing industry players. On the positive side, growth of population and spending power in overseas markets may offer new market opportunities.

Barriers to entry

All current or potential barriers that will hinder the entry of new competitors into the industry are examined carefully. In addition to taxation, these may include such factors as prohibitively high costs for production or distribution facilities, strong market acceptance of the products or services of existing competitors, limited sources of supply, and entrenched regulatory support.

Cost factors

Among the multitude of potential cost factors, the nature of the industry's production and operations is key. Where production can be highly automated, there may be competitive opportunities to make the best use of flexible, computerized plant and equipment. In a service-oriented industry, by contrast, there may be less room for adding productivity, while wages are likely to continue rising annually.

The availability of raw materials and of appropriate means of distribution, as well as the future stability of supply arrangements, can also have a strong impact on industry profitability and the relative competitiveness of individual companies and are evaluated accordingly. Trends in labor practices and labor relations are also evaluated for their potentially negative impact on companies' ability to compete and to maintain stable operating cash flow.

Vulnerability to technological changes

The duration of development and introduction cycles for major technologies in the industry are also assessed for their likely impact on product competitiveness. An evaluation of the importance of research and development can indicate how susceptible the industry is to rapid increases in capital spending to meet competitive challenges. The degree to which patents offer competitive protection and the timing of their expiration may also be important.

NATIONAL POLITICAL AND REGULATORY ENVIRONMENT

In addition to trends that affect a company's potential cash flows by affecting, on a macro level, the industry in which it operates, Moody's also looks at the political and regulatory environment of the country or countries in which the company operates to determine potential limits on or support of its ability to generate cash and to meet its debt service obligations.

Home-country business practices

A company's basic operating position in relation to its international competitors may be greatly affected by potentially supportive relationships built into the traditional business culture of the issuer's home country, as well as the importance of its industry for government policy and the national welfare.

Moody's looks, in particular, at relationships fostered between the issuer and suppliers or customers, the banking system, and other sources of funding as these relationships may provide an added degree of stability in times of stress. For example, large banks in many European countries have historically been major suppliers of funding to domestic corporations. They may, therefore, have a strong stake in the management and welfare of the company and so may be willing to provide necessary funding in periods of illiquidity or to provide concessions on repayment of bank debt as a company experiences tightened cash flow. With capital constraints, the introduction of the Euro currency, and increased shareholder accountability, however, these relationships may be eroding.

Regulatory and deregulatory trends

Current and proposed government regulations may have strong effects on the competitive stance of companies within particular nations and may also have an impact on an industry or industries globally.

Deregulation and privatization in the European telecommunications, energy, publishing, and airline industries, for example, have resulted in crumbling cartels and eroding margins within these domestic markets. Major regulatory trends are evaluated for their potential effects on the issuer's industry globally. The existence or possibility of special taxation aimed at industry competitors in particular nations may be a negative for those companies, as would trade barriers against outside competitors.

Government guarantees and support

Although the late 1990s will be known as the era of deregulation and privatization, in some countries a lingering strong relationship between government and business may continue to provide a supportive environment for an industry as a whole, as well as for individual companies under stress.

The first key question is whether or not the government will directly guarantee the firm's debt. Where the guarantee is sound, the issuer would typically be rated by Moody's at the same level as the sovereign. The existence and nature of a specific link (as established by special scheme or by special legal status in certain countries) with the government is also examined to determine whether it creates onus and incentive on the State to intervene in a timely manner in stressful situations.

But even where there is no explicit support and in countries with generally weak links between government and industry, such as the United States, the potential for government support may be strong for companies and industries that are viewed as critical to the national interest such as national energy companies. Support may come in the form of specific credit support in the event of financial stress or potential default. Or it may come in the form of an active government role in fostering economic conditions, employment practices, or a favorable regulatory or international trade environment that may be advantageous to domestic competitors and aid the company's competitiveness abroad. It may come, for instance, through special taxes, tariffs, quotas, or other barriers to trade specifically designed to protect a domestic incumbent or developing industry to the detriment of potential foreign competitors. in the form

To determine the likelihood of future government support, Moody's assesses the past behavior of relevant government agencies, as well as announced plans and policy changes relevant to the company and its industry. For formerly government-owned companies in the process of privatization, the strength of government support during the privatization process—including explicit guarantees and implied support—is reviewed carefully.

Monetary policy and currency exchange rates

Moody's analysts weigh the likely impact of international monetary policy on exchange rates and examine the impact of exchange rates on the relative profitability of industry competitors. Analysts also look at the degree of mismatching in currencies in terms of the cost base versus the revenue sources for individual issuers.

As an example, the impact of the Euro on European corporate credit ratings is of special interest at this time. In the short- to medium-term, the credit impact of the single currency will be determined by the level of competition and liberalization in the new Euro-economy. The more competitive the market, the more potentially negative the credit impact, as in the intermediate term, Moody's analysts expect an acceleration of three trends:

1. Consolidation, which will increase event risk and leverage;
2. Development of Anglo-Saxon style shareholder pressure, which will push underperforming companies to more aggressive growth strategies and capital structures; and
3. Reduction in direct state support.

All of these trends are likely to lead to increased competition and accelerated structural change for European companies, as well as greater uncertainties for bondholders.

Management Quality

Although difficult to quantify, management quality is one of the most important factors supporting an issuer's credit strength. When the unexpected occurs, it is a management's ability to react appropriately that will sustain the company's performance. Assessment of management's plans in comparison with those of their industry peers can also provide important insights into the company's ability to compete, how likely it is to use debt capacity, its treatment of its subsidiaries, its relationship with regulators, and its position vis-à-vis all fundamentals affecting the company's long-term credit strength.

Moody's analysts try to understand management's business strategies, policies, and philosophies, as well as its past performance versus plan. Once established, a record of consistency can provide an added level of comfort that management will perform well in stress situations.

Strategic direction

Analysts study management's return-on-investment criteria and its desired business and geographical revenue mix in relation to forthcoming risks and opportunities in the company's business environment. They ask: Are company policies prudent in light of the condition of the company and the economy? How alert is management to potential competition globally, and what plans are in place to address the challenges? Has management demonstrated the ability to control growth, build market share, and create a market price umbrella? Has management demonstrated vision, depth and breadth? Have they demonstrated the talent to identify vulnerable businesses before they became problems, and to exploit profitable opportunities before they became known to the market?

Financing philosophy

Management's philosophy towards the use of its debt capacity for mergers, acquisitions, and capital restructuring such as share repurchases and LBOs is key as it may provide some insight into debtholder's susceptibility to special events. Given the challenge of growing earnings in mature markets, Moody's analysts monitor carefully the promises that have been made to shareholders and assess how these objectives could affect financial policy and the use of debt. In addition, analysts look at the company's capital allocation methodology in order to determine which projects will get financial support, and to examine the hurdle rates and the exceptions to general practice.

Conservatism

How conservative are management's overall financial policies, while sustaining necessary investment and research and development? How conservative are its accounting practices? Does management maintain a balance between long-term planning and short-term programs? How is management compensated vis-à-vis the strategy?

Track record

How has management responded to key events over the last five to 10 years —such as tightened liquidity, lawsuits, major competitive challenges, or regulatory pressures? What real rates of return has management achieved over the last five years in each major business segment compared with its global competitors? What has been their performance in different phases of the economic cycle as well as technological, supply-demand, credit and other cycles relevant to the industry?

Parent-subsidiary relations

What is the relationship between management's strategies and its organizational structure? Are individual units favored over others with respect to funding, marketing, and product development? Where outside directors, large equityholders, or significant funding sources such as major banks have a say in management decisions, their particular interests and capabilities are also examined.

Succession planning

Extensive reliance on one or a few top executives is a negative from the standpoint of credit risk. How well does existing management operate as a team? What plans are in place for new managers to take over when existing mangers retire or in the event of an emergency? Does the company have a strong board of directors?

Control systems

What internal auditing and financial controls are in place? How have these controls contributed to management's ability to maintain or improve competitive profit margins and generating efficiency? For multinational firms, how well have these methods been applied across the nations and cultures in which the firm does business? How far along is the company in solving its Year 2000 problem?

BASIC OPERATING AND COMPETITIVE POSITION

The focus here is on an assessment of the company's position in relation to its industry peers, particularly its ability to generate revenues while controlling costs. This ability to generate cash is assessed under current economic conditions, as well as under plausible future conditions such as a normal economic downturn, a severe downturn in one or more of the company's major markets, stressed supply conditions, or unfavorable exchange rates.

Outlook for relative market share

As a starting point, the company's current share of its major markets and changes in market share over the past five to 10 years are assessed, both by line of business and by major country exposure. Growth trends in each sector may provide clues as to future performance. More reliable forecasts must be determined through a careful analysis of risks and opportunities in each sector, as outlined above.

Other things being equal, a leadership position internationally or in particular countries or regions may indicate predictable cash flow generation over the long term. A good name and a long-standing relationship with customers in a given sector is a powerful sustaining force. Market leaders also tend to have the financial resources and economies of scale to meet competitive pricing and new product challenges. But any one of a multitude of possible changes in the market could indicate a weakening or strengthening position, especially for lesser industry competitors.

Diversification by business lines and revenue streams

The relative contribution of each business segment to the firm's overall profitability is examined with an eye to concentration in segments that are highly susceptible to swings in the business cycle, oversupply or overproduction, fast technological change, rapid deregulation, currency exchange fluctuations, or sovereign risk. Diversification along these variables can help to buffer the company against declines in any one sector. However, management's expertise in each sector and synergies between them is also a critical issue. The existence of long-term sales contracts and their distribution across the company's customer base should also be examined.

Cost structure

Here the focus is the company's production inputs, sources of supply, the efficiency of its production facilities or service networks, and related factors for each major sector in relation to international competitors. The costs and efficiencies of current operations are assessed with respect to spending levels required both (1) to maintain current operating efficiencies and (2) to improve operating efficiencies to meet domestic or international competition.

More importantly, expected future outlays and financing requirements for research and development, as well as new product introduction, are estimated in light of the sector's product or technical cycles.

Management's own assessment of forthcoming costs and product efficiency can provide important insights into the company's ability to maintain competitive levels of efficiency. It may also help to pinpoint financing requirements that could affect its capital structure over the near and long term.

The status of supply arrangements, trends in labor costs and labor relations, and vulnerabilities to supply-price increases are weighed for their implications on future production costs in each major business line. Here, too, diversification of production supply sources may be a positive from a credit perspective.

In commodity industries, cash production costs can be compared to historical and potential future commodity pricing trends to determine a company's resiliency to the inevitable ups and downs of the global business cycle, and thus to give a more reliable indicator of peak to trough performance within a given rating category.

FINANCIAL POSITION AND SOURCES OF LIQUIDITY

Examination of the firm's financial position includes a careful interpretation of its reported financial data over the past five or more years, along with a forecast of its likely cash flow generation and asset values in relation to its expected debt service and liabilities over a horizon of three to five years.

Evaluating financing flexibility

A key concern is the company's financial flexibility, which is essentially its ability to maintain sufficient liquidity to meet its debt obligations in a timely manner. This liquidity comes primarily from the company's ability to generate cash and secondly from its ability to access the capital markets for additional funding. Both sources of liquidity are, of course, highly related to the firm's overall profitability, as indicated roughly by various margins and returns measurements and, more importantly, by the firm's overall business position and competitive outlook.

Analysts forecast trends in fixed charge coverage and gross cash flow. Projected capital spending is separated into required and discretionary categories to judge better how much flexibility the firm is likely to have for increasing internal liquidity in times of potential stress. Accounts receivable and inventory turnover data are examined in light of sales projections to gauge near-term requirements for working capital. And myriad other factors may come into play, such as the company's level of short-term debt and the relative portion of interest-rate-sensitive debt in its capital structure.

The critical importance of back-up liquidity

In addition to a general assessment of the firm's liquidity position, special emphasis is placed on an assessment of more definite internal and external sources of cash that the company can use to meet debt payments that may become due in a very short period of time, particularly in a liquidity crisis. This analysis is important given the confidence-sensitive nature of commercial paper and other sources of short-term funding on which many industrial firms rely.

Indeed, most companies, if forced to do so, would be hard pressed to pay off all of their short-term obligations without access to some alternative sources, such as committed bank facilities or short-term assets that can quickly be liquidated or securitized to produce cash. An additional problem is that in periods of market stress, banks and other financial institutions may be unwilling to provide back-up liquidity even to regular clients and even at attractive rates.

Moody's analysis therefore emphasizes the availability and liability of back-up funding in periods of market turbulence and general illiquidity. Moody's analysis of back-up liquidity focuses on (1) the company's cash generation from operations, (2) its available borrowing power , and (3) liquidity available through the sale of readily-marketable securities. We typically use a one-year time horizon and assume the company would lose access to impersonal, non-relationship sources.

Assessing the relative need for back-up sources

While recognizing that each issuer's unique circumstances may require some modifications from the general approach, the analysts will in each specific case take into account the following considerations:

- The nature and size of short-term borrowings in relation to the company's capital structure. If a high level of short-term debt is issued for interim financing, the use of formal long-term bank commitments, such as a revolving credit facility, may be suggested.
- The maturity and payment structure of long-term securities, particularly where features such as interest-rate resets or variable interest rates could cause a rapid rise in debt servicing during a specific period.
- The nature, history, and reliability of a company's alternative borrowing sources.
- The character, stability, and history of the company's banking relationships.

- The rating level of the issuer. The rating level is an important consideration because market disruptions will tend to have the greatest impact on lower-rated companies. Moody's typically looks for stronger alternative liquidity back-up for companies as they move down the short-term rating spectrum within the "investment-grade" category.
- The quality, liquidity, maturity, currency, and stability of a company's money market and investment portfolios.
- Normal and expected operating cash requirements for the company.
- The degree of reliance on commercial paper and other short-term liabilities within the company's liability structure.
- The sophistication of the company's treasury activities.

Evaluating the quality of back-up facilities

The type of facility to which the company has access is a key consideration. To the extent actually available, any one of a myriad of different types of banking facilities or excess borrowing sources can be used to provide back-up liquidity. However, Moody's places the greatest credence in those facilities which are contractually binding with few or no escape clauses for the lending institution. Examples of different bank facilities are:

- A contractual lending commitment which is legally binding on the bank and which is not subject to various conditions such as a material adverse change (MAC) clause. Such a clause permits a bank to withhold funding under a borrowing facility if, in the opinion of the bank, there has been a significant negative change in the financial condition or operating position of the borrower.
- A line of credit for which the bank is compensated. This is a non-contractual bank facility which indicates the bank's intention to lend up to the line amount unless the bank believes, for any reason, it is inappropriate to do so.
- A line of credit for which the company does not pay.
- Internal bank guidance limits which are communicated verbally to the company.
- Demonstrable excess borrowing power due to the strength of a company's banking relationships.
- A "Revolving Commitment Vehicle Corp." (RCV) or structured liquidity backup line. In general, Moody's analysts view Moody's-rated RCV facilities for an industrial company no differently than a bank liquidity backup line with similar conditions to usage.

Evaluating the source

In considering the quality of back-up facilities, Moody's takes into account the credit quality of the banks providing the facilities and whether those institutions individually or as a class have "walked away" from bank facilities in the past.

Moody's in general gives significant weight to relationship-based borrowing facilities which are assured. In periods of company-related or market-related stress, it is more likely that relationship lenders will move to stabilize a company's liquidity position when market and transaction-oriented lenders have fled.

Moody's also considers the nature and history of a company's banking relationships within the context of the banking practices of the country involved, although the concept of a "house bank" (in Europe or Asia) and the comfort provided by long term banking relationships is rapidly fading.

Timing of funds available

Another important consideration is the timing by which funds would be available through each source and facility. The company must be able to demonstrate that alternative funds could be forthcoming, for example, in the event that the commercial paper markets do not permit the firm's paper to "roll over". If funds are needed in a time zone other than the issuer's own, special bank facilities may be needed to assure timely payment. In some cases, immediately available funds provided by bank "swing" facilities in an amount equal to several days maturities are needed to assure liquidity until other sources of funds become available.

Marketable securities as alternative liquidity

Our analysis also focuses on marketable securities which can be quickly liquidated and on other assets, such as receivables, that can be securitized to raise cash to pay maturing short-term obligations, such as commercial paper. If it can be demonstrated that the cash equivalent value of such securities (after appropriate value adjustments) is in excess of normal operating needs and will be maintained even during periods of stress, Moody's takes these positions into account in assessing the adequacy of available liquidity.

Companies with large, stable cash positions and cash-equivalent positions beyond what is required for normal operations can dedicate these positions as alternate liquidity, provided their continued availability is assured. Clearly, cash positions can be immediately mobilized to pay maturing commercial paper and Moody's will consider them as alternative liquidity. Analysts are mindful, however, that a variety of external shocks could cause a rapid depletion of cash, thereby putting weight on the relative creditworthiness and stability of the particular company.

Although each company's marketable securities and cash positions differ, Moody's applies general guidelines in determining to what extent a company's securities and cash portfolios would be considered available liquidity. They can be summarized as follows:

- Money market obligations of issuers rated in the investment-grade categories and other debt securities of investment-grade issuers maturing within one year are given heavy weight as available liquidity.
- Debt securities of investment-grade issuers maturing after one year are given moderate weight as available liquidity.
- If the securities available for back-up liquidity purposes are subject to currency exchange risk, Moody's assumes a loss of approximately 25% for this risk.
- Operating cash needed for normal business operations is estimated (typically 2% to 7% of sales) and is deducted.

In applying these guidelines analysts weigh the quality, liquidity, and maturity of the securities; the normal operating cash position a company must maintain; and possible currency exchange losses which could be incurred if the currency of the securities portfolio is different than the currency of the commercial paper.

The use of securitization in alternate liquidity planning

Used properly, securitization can improve liability management by diversifying funding, enhancing alternative liquidity, and by match-funding assets and liabilities.

COMPANY STRUCTURE

A review of the company's past performance and of its future projections also extends to an evaluation of its related entities. Moody's focus when examining an issuer within the larger context of its corporate family is on understanding the legal claims on the cash flow of the individual units within the group.

Importance of the subsidiary to the overall entity

The extent to which a parent (or controlling company) is likely to support (or abandon) an affiliate in the event of financial difficulty is generally a function of the benefits to the companies of continuing the relationship versus the danger of cutting ties. In general, the more indispensable the subsidiary is to the continued success of the parent, the more likely the parent is to intervene. Key questions in determining the closeness of a parent/subsidiary relationship may include: Does the unit provide a large and stable portion of revenues to the group? How does the unit fit into the group's overall strategic plan over the near and long term? Is the unit regarded as a good business fit with the group? Does it have assets, products, or name recognition of value to the group? What forthcoming spending requirements, lawsuits, regulatory or other problems could be a drain on the group?

The impact of a possible default on the parent's financial condition is also considered. Here, the size of the parent's investment is the critical factor. For example, if the investment is large enough that a default of the subsidiary would jeopardize the parent's viability, the parent will have a greater economic incentive

to maintain the financial health of the subsidiary in order to preserve its own continued corporate existence.

Relative financial condition

If the parent company is relatively weak, what is the probability that excess dividends may be withdrawn from the subsidiary to support the parent? Conversely, if the subsidiary is weak, the parent company may be forced to spend a large portion of its cash flow to support it, thereby jeopardizing its own financial health.

Legal environment

Moody's also examines the extent to which the laws and regulations of the relevant state or country would cause the parent to honor the debt of a subsidiary or an affiliate over which it exercises managing control, even in the absence of a formal support mechanism.

Joint venture partners and cooperative arrangements

On a related subject, growing numbers of international firms are entering into joint ventures and various forms of intercompany cooperative efforts for product development and operations. Where these are in effect or planned, how well will they be managed? Will they offer competitive advantages or could they drain the firm's resources?

Structural subordination and priority of claim

The position of a given debt instrument within the capital structure affects the priority of the claim of the debt holder, and therefore plays an important role in Moody's rating assessment. The uncertainty of priority of claim and the treatment of noteholders and bank lenders by bankruptcy courts in some emerging markets are also factored into the ratings.

All Moody's ratings are designed to factor in both probability and severity of default. However, as the probability of default increases, severity issues take on greater importance than they do when the chance of default is remote. The issues of structural subordination and of priority of claim therefore are more important with lower rated investment grade (Baa) and speculative grade issues than with their higher rated counterparts.

Most industrial holding companies rely on the upstreaming of cash from their subsidiaries. If operations are conducted through subsidaries that do not guarantee the debt, then the holding company debt is structurally subordinated to subsidiary obligations, including debt, trade payables and lease obligations. Upstream subsidiary guarantees typically mitigate this effect.

Indenture Covenants

After identifying the borrower and its position within the legal organization, the Moody's analyst identifies how debt with differing priorities of claim, bank covenants, bank collateral, and indenture covenants protect the noteholder against effective and structural subordination, particularly in the speculative-grade rating categories.

Similar to the mid 1980s, the quality of covenant protection in the late 1990s is eroding—a typical sign of the late stage of the credit cycle—just when it is most needed to protect bondholders from an array of event risks (defined below). Few investment-grade indentures contain covenants, other than the rather limp "limitations on liens". Indentures for speculative-grade companies generally are stronger, but these too have eroded. The more important covenants that may protect the investor from "event risk" in the high yield area include:

- Restriction in stock repurchases to prevent low investment grade and high speculative grade companies from decapitalizing in a vulnerable credit period.
- Restricted payments, liens, sale and leaseback transactions, and subsidiary debt. The limitation on subsidiary indebtedness is important when debt is concentrated at the holding company level. This covenant protects bondholders from the effects of structural subordination.

- Parallel covenants in bank agreements and indentures can protect bondholders from a material increase in bank debt for acquisitions without providing any offsetting benefit to the holders of notes.
- Limits on debt incurrence. At the end of this latest credit cycle, we see growing permissiveness regarding an issuer's ability to incur additional debt.

PARENT COMPANY GUARANTEES AND MAINTENANCE AGREEMENTS

These may include any one of several forms of contractual or quasi—contractual support instruments, typically between a parent company and its financially weaker subsidiary or affiliate, such as an operating company, a captive-finance company, or a financing conduit. Each contractual instrument should be analyzed separately to determine the degree of protection it will offer against loss under various special or adverse circumstances. The degree of protection will depend mainly on the form and scope of the contractual undertaking, its legal enforceability, and its provisions or mechanisms for assuring timely payment.

Parent guarantees

An irrevocable and unconditional guarantee from a parent company to a subsidiary is perhaps the most straightforward and strongest of the various types of parent company support agreements. The typical guarantee is structured to be a legally enforceable agreement that survives any insolvency of the debt issuer and provides for payment to investors. In effect, the terms of the guarantee and the availability of recourse are intended to allow the investor to rely on the guarantor, rather than the issuer, for repayment of the obligation. But even with such a direct, unconditional undertaking, risks exist that must be assessed.

First, there is the question of actual enforceability. A guarantee on behalf of a subsidiary from its parent may be deemed unenforceable for a number of reasons, including the absence of an "arm's-length" relationship between the two entities and the possibility that debt holders, as only indirect beneficiaries of the guarantee, may not be entitled to bring the enforcement action.

Second, questions may arise as to whether a guarantee, by its terms, is a primary or secondary obligation; that is, whether investors entitled to rely on its benefits must first obtain a judgment against a defaulting issuer before they are entitled to claim on the guarantee. In such a circumstance, the delay in receiving payments could be significant.

Third, there is the question of whether the guarantee continues to apply if payments made by the issuer are subsequently voided as preferential (improperly benefiting the debt holders at the expense of the issuer's other creditors) and must be returned. It may also be possible that payments under the guarantee might be recategorized by a court or regulatory authority as funds of the issuer and frozen or delayed in the event of the issuer insolvency.

Finally, it must be remembered that each of these risks is presently being compounded by the very fact of market globalization and its corresponding introduction of conflict of laws and regulatory practices across independent sovereigns.

This is not to say that parent company guarantees cannot be an excellent source of credit enhancement. Properly structured, they are among the surest forms of investor protection, warranting in almost all cases the assignment of the parent's short-term or long-term credit rating to that of the debt issued.

The key is proper structuring. Analysis of the actual terms of the guarantee—including the scope and timing of the support and the circumstances under which the guarantee was entered—along with the opinions of legal experts — all contribute to a determination that what has been conceived and intended in the contract has in fact been appropriately drafted, creating sound protections for debt holders.

Maintenance agreements

A simple substitution of the parent company's creditworthiness and debt rating for that of the subsidiary cannot be assumed under a maintenance agreement , as it may under a properly structured parental guarantee. In general, investors should not place sole reliance on a maintenance agreement to ensure full and timely payment, as several legal issues, explored below, can complicate enforceability of the contract and timeliness of payment. Other factors may also contribute to the quality of the maintenance agreement,

including the credit quality of the subsidiary and the willingness of the parent to provide support, as discussed above.

Companies are frequently reluctant to issue straight, unconditional guarantees on behalf of their subsidiaries in part because of differing accounting treatments (on-balance-sheet versus off-balance-sheet) and the regulatory ramifications of the obligations (for example, with regard to capital reserve requirements). Companies often try to avoid these issues through the use of less formal maintenance agreements. In the United States, it should be noted, however, that the consolidation of majority-owned subsidiaries required under the Financial Accounting Standards Board Rule 94 eliminates the difference in accounting treatments for US companies and for those international companies who reconcile their statements to GAAP accounting.

In most cases, a maintenance agreement significantly increases the likelihood that the parent will be forced by the courts or by regulators in the relevant jurisdiction to meet its contractual obligations, subject to the legal risks discussed below. As a result, the supporting company should be less likely to walk away from its affiliate under such an agreement than in its absence. The agreement may represent tangible evidence of the parent's commitment to its subsidiary. In other words, the parent's willingness to enter into a formal contract may indicate a greater desire on its part to maintain the financial integrity of its subsidiary and a greater incentive to honor the agreement when the circumstances warrant. Also, the costs associated with failing to honor written obligations might prove too high and thus might act as a deterrent.

Enforceability and timeliness of payment

In the typical maintenance agreement, the issues of legal enforceability and timeliness of payment are less clear than in parent-subsidiary guarantees and may again vary according to the relevant jurisdiction. This may best be illustrated by discussing two key issues with respect to the current treatment of maintenance agreements under US corporate law.

First, with respect to enforceability, maintenance agreements may be considered executory contracts; that is, contracts under which the obligations of the parties have yet to be performed. However, under Section 365(c)(2) of the US Bankruptcy Code, the bankruptcy trustee or the bankrupt entity as debtor in possession may not assume an executory contract if "such contract is a contract to make a loan or extend other debt financing or financial accommodations to or for the benefit of the debtor..." It is therefore not certain whether the terms of an executory contract — in this case, the maintenance agreement — would be enforceable against the supporting entity in the event of a bankruptcy of the subsidiary, should the parent elect not to provide the called-for support.

Indeed, legal opinions regarding the enforceability of maintenance agreements generally contain a qualifying statement to the effect that the agreement is enforceable against the supporting entity in accordance with its terms, subject to applicable bankruptcy, insolvency, and similar laws affecting creditors' rights. It is also noted that the existence of a maintenance agreement is not, in and of itself, complete protection against bankruptcy risk. Involuntary third-party filings, the timing of support, and even its form (support with illiquid versus liquid assets) may undermine the remoteness of bankruptcy risks.

Second, with respect to timely payment, the maintenance agreement is issued by the supporting entity to the supported entity. In the event of an insolvency, payments under a maintenance agreement would go directly to the supported entity rather than to the investor. Consequently, the funds, as the property of the insolvent estate, may get trapped in the bankruptcy proceedings. Since bankruptcy trustees have considerable flexibility in determining the obligations of the insolvent party, the ultimate amount of repayment to the investor is uncertain and considerable delay might ensue. In any event, the typical maintenance agreement does not address, and therefore does not ensure, timeliness in and of itself.

For commercial paper and other debt instruments issued in international markets, similar enforceability and delay risks must be addressed. Though not identical across independent jurisdictions, issues of enforceability and delay (whether imposed by creditors, legislative enactments, or regulatory bodies) are concerns for commercial paper investors regardless of the particular market in which they participate. Investors should also be aware that new debt markets may evolve more quickly than relevant legal and regulatory guidelines. This may cause uncertainty and inconsistency regarding the credit quality of structurally similar programs across different markets.

Terms and conditions of the agreement

The terms and conditions of the maintenance agreement, which help determine the degree of protection against loss for investors, are tailored to individual circumstance and therefore tend to vary widely. Strong covenants, such as a net worth maintenance agreement or a four-to-one leverage ratio for a credit subsidiary, can make the economic choice by the parent to support its subsidiary obvious, since they virtually assure that there is economic value in the subsidiary when the parent is called upon to act.

The strongest agreements also contain covenants that address the issues of legal enforceability and timeliness of payment in the event of the subsidiary's bankruptcy. In order to avoid the uncertainties that may surround the agreement's legal enforceability, a US parent may waive its right to take advantage of Section 365(c)(2), although this too may be unenforceable. A clause requiring the provision of funds to repay maturing obligations in a timely fashion can often resolve the question of timeliness.

The following terms are consistent with more highly-rated programs:

- maintenance of controlling ownership by the parent;
- a statement that any amendment or termination cannot become effective before all debt is repaid;
- notification to Moody's and debt holders of intent to amend or terminate the agreement;
- a statement that the benefits of the agreement accrue to the supported creditors and that the agreement is enforceable by them against the supporting entity in accordance with its terms;
- a statement that the agreement is governed by the laws of the country or state of domicile of the supported entity;
- if the supporting entity is domiciled in a country different from that of the supported entity, a statement that the supporter consents to the jurisdiction of the country of domicile of the supported entity;
- Other features, such as the maintenance of certain financial relationships and liquidity serve to strengthen the protection to the investor. Examples include:
  (i) the maintenance of a balance-sheet relationship, such as a leverage test (e.g., a 4:1 debt/equity ratio) or a specified net worth level (e.g., US$100m);
  (ii) an income maintenance clause, usually in the form of a fixed charge coverage (e.g., the parent must provide payments to maintain the subsidiary's required coverage of earnings available for fixed charges at, for example, 125%):
  (iii) a mechanism whereby funds are advanced to the subsidiary in the event of a liquidity shortfall for the full and timely repayment of all debt obligations.

SPECIAL EVENT RISK

A final consideration that is of particular relevance to industrial companies is the possibility that an issuer's fundamental creditworthiness may decline sharply and suddenly because of a "special event". In general, special events tend to have the strongest impact on a company's credit fundamentals when they involve a major change in management or a dramatic increase in debt leverage.

The most common special events in recent years are a result of the takeover boom in the United States during the 1980s and late 1990s. Included were mergers and acquisitions; capital restructuring programs such as share repurchases; and, at the extreme, leveraged buy-outs, in which all of a company's stock is repurchased to take the company private.

Less dramatically, event risk becomes prevalent in commodity industries during prolonged periods of commodity price weakness. Such periods of weakness often force industry consolidation through mergers and acquisitions, essentially to reduce variable and fixed costs associated previously independently owned assets. The gold mining industry, for example, has seen numerous transactions as gold has fallen from its January, 1996 peak of $415/oz. to its current level of approximately $290/oz.

A few special events over the past decade also resulted from litigation against companies or major industrial accidents, both of which resulted in large, unexpected claims against an issuer, leading to a substantial drag in future cash flows. In each case, such events are termed "special" because their precise timing and nature, and their impact on the firm's creditors, could not be fully predicted in advance by the

normal tools of fundamental credit analysis. In other words, there is an unavoidable element of surprise involved.

Event risk shading

When a special event occurs, debt holders may experience losses in two ways. First, the sudden drop in an issuer's debt ratings implies an added probability of long-term default for which holders may not be adequately compensated (because they will continue to receive interest agreed to before the special event occurred). Second, the downgraded bonds may only be salable in the secondary market at a considerable mark-down (i.e., to compensate purchasers for the added risk of default). Investors that mark their portfolios to current market prices will experience similar losses, at least on paper.

One approach that has been developed by Moody's to help investors manage these potential losses before they occur is event risk shading. Under this approach, analysts attempt to identify the industry groups and companies that are most susceptible to such special events and account for a portion of the added risk in advance through marginally lower credit ratings for those issuers. Accidents and most major litigation are typically one-off events, the risks of which cannot be readily weighed in advance. In the case of takeover-related event risk, however, it is possible to assess which categories of companies are likely to be more susceptible to such takeover-related activity, without pinpointing exactly which company will be involved. The result is a broadly lower rating average for companies in specific sectors.

From a global perspective, for example, it is clear that US companies have been the most susceptible to debt-financed takeover activity (albeit greatly reduced from the pre-1987 boom). This activity has been supported by a variety of factors including a broad overcapacity in US industry, and relatively inexpensive debt funding available through the high yield bond market, as well as from banks and various special purpose funds. However, with strong equity prices, most of the recent transactions have involved pooling rather than debt.

Moody's practice is broadly to factor into its ratings that portion of the risk that is known by means of a downward shading of debt ratings in the affected sectors. This shading is accomplished over time as an assessment of event risk is weighed as one of many factors in a decision to lower ratings of individual issuers. Conversely, ratings of companies whose debt might otherwise be upgraded because of improved credit fundamentals may not be raised because of the company's susceptibility to takeover activity.

In the late 1980s-early 1990s, many investors required that event risk protections be included in the indentures of new bond issues such that the protected bondholders would be returned full principal (at par) and accrued interest should a special event occur. However, along with many other formerly standard covenant protections, event risk covenants disappeared at the onset of the last bull market.

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Global Credit Research

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Rating Methodology

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RATING METHODOLOGY

Chemical Company

A Moody's publication that describes in detail a comprehensive general framework to rating methodology was provided in the *Industrial Company Rating Methodology* piece published in July, 1998.

The purpose of this report is to build on the rating concepts identified in the aforementioned publication by highlighting dimensions of the credit model that are high in importance or unique to the analysis of chemical companies. Along these lines, we discuss the analytical approach to how we look at two of the more important sub-sectors in chemicals: commodities and specialty chemicals, as well as other risk factors that tend to be systemic or unique to credits in the chemical industry.

For a broader discussion of the general analytical framework including the various aspects of analyzing industry trends, the regulatory environment, management quality and so on, the reader should refer to the *Industrial Company Rating Methodology* publication.

continued on page 3

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Analyzing Business Risk in a Highly Fragmented Industry

Two unique aspects of rating chemical companies are the characterization of business risk and the identification of peer groups for comparisons. What makes these activities somewhat unique is the lack of uniformity or homogeneity among the numerous companies that are often lumped under the heading "chemical." The more obvious and talked about categories are so-called commodities and specialties. It is often convenient to think of the industry as being polarized with companies or segments of companies falling into one of these two baskets. Commodities, which are volatile in price and performance, tend to have a high level of business risk, while value-added specialties are relatively low in business risk. This is to a large extent true and a number of names in the industry can be appropriately labeled as commodity or specialty.

But not all firms fall neatly into these categories and in reality many names tend to fall somewhere along a spectrum, and not necessarily in the two baskets at the end of the spectrum. In these instances, as in all cases, we strive to understand the true basis for competition in the company's markets and the critical success factors. We then compare these parameters with the company's strengths and weaknesses – text book credit analysis. The goal is to arrive at a qualitative measure of business risk so as to enable comparisons with an appropriate peer group, assuming one exists.

Notwithstanding our own disclaimer, it is worthwhile from a methodology perspective to talk about the unique set of risks and analytical challenges inherent in the more prevalent chemical markets:

What Matters Most When Rating Commodity Chemical Companies?

By now it tends to be widely known that Moody's looks at cyclical commodity chemical companies over the entire industry cycle. In other words, we attempt to understand the characteristics of the industry and the performance of a company at all points in the cycle with the objective of assigning ratings that we think will be most durable. (Note that the industry cycle is not necessarily the same as an economic cycle; the former is driven by industry supply growth, the latter by strength in the general economy and demand levels. Industry cycles tend to be more volatile due to the often large step-changes in supply). What we generally try to avoid is upgrading at peaks and downgrading during weak times. Central to this approach is the understanding the nature of the cycle, what happens in the industry during peaks and troughs, and the specific attributes of a credit that will drive its performance over the cycle (see Critical Success Factors below).

At troughs, we try to gauge the severity or depth by analyzing prior troughs and then use that information to attempt to model or estimate the degree of financial pain that the firm is likely to face at the next trough. This is obviously easier for single-product firms or firms with only a few products, since bottom-up models driven off of estimates of price and volume assumptions are possible. On the other hand, for firms more diversified and producing an array of commodity products, it is sometimes more reliable to simply drive the model with estimates of operating margins based on margins from prior troughs. This approach is taken for firms whose portfolios are pure in commodities, as well as for projecting performance of divisions or segments producing commodities at larger diversified firms. Generally speaking, the fewer the products, the greater the business risk, all other things equal.

The analysis of cycles and troughs recognizes that using pricing information from prior troughs and extrapolating is not always as straight forward as it seems and sometimes adjustments need to be made. In other words, this analysis must be careful to differentiate between cyclical trends and structural changes in the industry that will lead to different pricing behavior over time. As we've seen recently, prices in some commodities are lower than historical levels. This is due to shifting cost curves as new competitors enter the market. Regardless of the reason, we attempt to understand if and why future troughs might be different than prior ones when making projections for cyclical companies. This facet of rating a cyclical commodity chemical company, especially a single-product company or pure-play, can not be understated.

Recognition and analysis of cyclical peaks are also relevant to the analysis. Here the precision in product pricing or shape of the cycle are less important. More important are financial policies and the understanding of management's priority uses for excess cash. Considering the major possibilities — share repurchases, debt reduction, capital investment, and acquisitions – we attempt to understand how management might use cash when operating cash flow exceeds internal needs and is abnormally high. Management's

stated intentions and credibility are obviously important to formulating an opinion. Incentives tied to management's variable compensation and the related financial targets, willingness to act aggressively in pursuit of these targets, and past behavior during peak times, are also important factors that help in modeling expected behavior during cyclical peaks.

Critical Success Factors of Commodity Chemical Firms:

A company's performance over the cycle is driven by its cost position and other competitive advantages. In addition to the cyclical analysis discussed above, the following traits are important and given close attention when analyzing commodity chemical firms:

- Process technology
- Access to low cost feedstocks
- Economies of scale and low cost operations
- Market share positions on a global basis

Feedstocks — Availability and Low Costs Critical

Representing upwards of 2/3 to 3/4 of production costs, the cost of feedstocks is among the more important success factor in the production of most commodities in an increasingly competitive global arena. Moody's looks at how a company secures its feedstocks, whether a company has supply contracts and the nature of these contracts, and the procured cost relative to the industry. Supply contracts tend to be more valuable to the credit when they are longer term and when there is some form of price or margin protection. Volume commitments offer little in the way of credit strength. Feedstocks sourced from certain areas of the world, like the Middle East, Trinidad, Venezuela, or Western Canada, tend to have cost advantages and potentially enable better credit characteristics.

Low costs and leading positions have become cliché in the highly competitive commodity markets. But participants are finding that strong process technology and access to low cost feedstocks can provide an edge that is less easily duplicated.

Strong Process Technology – Another Potential Advantage to Commodity Firms

Moody's also explores the process technology capabilities and strengths of commodity chemical firms. Strong process technology improves competitiveness along several dimensions. It represents a valuable bargaining chip in ventures, serving as a useful springboard to growth, and as a means to secure feedstocks. Strong technology is also used in capital-conserving growth strategies. For example, Dow and Union Carbide have grown their effective capacities by contributing technology to ventures. This tactic opens doors to alliances with local firms in emerging markets, expanding volumes and earnings potential while minimizing investments in new grassroots plants.

Moody's Outlook For Commodity Chemicals

The near term performance outlook in many of the major commodity chemicals and plastics is poor as the industry has again slid into a low point in the pricing cycle. For the first time in awhile, operating rates across a large part of the chemical industry are feeling the double pinch of adverse trends in both supply and demand. Weakened economies and lower demand in Southeast Asia, Japan, Korea, and South America are expected to continue to ripple into western markets in the near term and probably the medium term as well, while planned capacity will glut markets in many product areas into 1999. Some margin relief is possible in the medium term (before the second half of 2000). But we don't expect anything close to peak-like conditions in this time period.

Another trough is expected soon. Even without a recession in the West and assuming economies stabilize in countries already experiencing recessionary conditions, the amount of new capacity underway in the US and the Middle East is expected to result in trough-like conditions again by late 2000 or early 2001.

Petrochemicals face more challenges than just cyclical weakness. Structural changes also loom large as the Middle East is on the verge of adding substantial capacity and as the major oil companies grow their positions in markets where shares are already substantial and operations align tightly with

refinery operations. Lower industry cost curves over time and a more competitive landscape will result. We expand on this topic in a special comment: *Petrochemicals – Structural Changes Increase Competitiveness*, January 1999.

Analyzing Specialty Chemical Companies

The approach to analyzing specialty chemical firms or specialty segments of diversified firms is different than that of commodities. This should not be surprising since the critical success factors for commodities and specialties are not only different, but tend to be at opposite ends of the spectrum. Whereas with commodities, the focus tends to be cost position and performance over the cycle, with particular attention paid to performance at the trough, the business risk analysis of specialty chemical firms hinges largely on the firms ability to produce products that have value-added characteristics or that are differentiated in some way from products produced by others. Moody's focuses on these capabilities when analyzing specialty chemical credits.

Accordingly, specialty firms that have established the following attributes have a better business risk profile:

1. A leading and sustainable position in technology and new product development. Admittedly, it is not always easy to measure these traits. But the best evidence of strong technology is wide and stable margins and leading market shares. The ability to adjust prices and sustain margins through the business cycle is a good litmus test that a company's products truly have value-added characteristics and that these attributes are in some way not easily duplicated by competitors.
2. Proven ability to rejuvenate the portfolio. This attribute is clearly tied to technological prowess. Having a high percentage of sales coming form new products developed in the last few years is a strong indication that a company possesses the internal processes to replenish the portfolio. This attribute tends to be associated with the larger, more diversified companies. R&D expenditures as a percentage of sales is relevant.
3. An array of core competencies and a multi-dimensional portfolio of specialty products. More skills and more lines of business reduce business risk and the potential impact from the risk of technical obsolescence in any one product or product line. A diversified portfolio also offers greater opportunities for growth, cross selling, or cross fertilization in technology.

Moody's Outlook For Specialty Chemicals

Relatively new and accelerating forces in the industry potentially affect the credit outlook for US specialty chemical firms in general (we discuss these issues in greater detail in the Chemical Industry Outlook, December, 1998).

Event risk is high in the specialty chemical sector. Many of these markets are expected to continue to face profit pressure as Asian demand remains weak and as global customers face lower demand growth. These forces, plus greater competition from larger European specialty firms, are likely to lead to a healthy dose of mergers and acquisitions in the US in 1999. Its also important to remember that given the nature of the specialty chemicals industry, where producers tend to operate in dissimilar lines of business or niche markets, not all specialty firms are feeling these forces equally.

General Considerations that Apply to Specialty Firms, Commodity Firms, and All Those in Between

Environmental and regulatory issues in the chemical sector tend to be more analytically relevant than in other industries. These risks come in many types and varieties, but two emerge as systemic and needing special consideration:

Risk associated with past remedial exposure, like superfund sites and other past site related problems. The risk here is that costs suddenly emerge after years of repose and lead to significant clean-up or legal obligations. To gain insight and some sense of comfort with these risks, Moody's takes advantage of various data, some publicly available, some not. Information sources could include third party reports and verification, EPA data, or information published in footnotes to company reports. We also consider what the company has produced in the past that might require future clean-up. Heavy metals, like lead or cad-

mium, pesticides and pesticide intermediates, and halogen chemicals, to name a few, tend to be in higher risk categories and represent potentially greater clean-up challenges and costs.

To help provide a relative or comparative dimension to the analysis, Moody's looks at ratios that include environmental accruals and expenses across many companies in the sector. Third party reports or consultant reports are typically only available in certain circumstances, such as in the case of project financings or sometimes with a new credit.

We look at the number of superfund sites in which a firm is identified as a potential responsible party and try to gain some insight as to the seriousness of such exposure, albeit mostly on a macro level. Along these lines, Moody's has analyzed EPA data including "site scores" that numerically rate the degree to which a site has been dirtied across four parameters of each of the roughly 1200 or so Superfund sites and data that identifies the PRPs to each site. The aim is to look at these quantitative measures to gain an overall sense of how dirty are the sites associated with a given firm. The logic to this approach is that there is likely to be a correlation between site scores and potential future clean-up costs.

The risk of product phase-down or phase-out is another major environmental type of risk worth noting. To help us think about what products might someday be phased-out or face future regulatory problems, we listen to what environmentalists are claiming about products and chemistries, recognizing that at times certain environmental groups tend to take extreme views or have emotionally driven agendas. Nonetheless, sometimes where there's smoke there's fire. Products at risk today include PVC plasticizers and certain PVC applications, (although if Greenpeace had there way, all PVC applications would be banned), MTBE (see special comment on MTBE published July, 1998), bisphenol-A derived can coatings, and certain pesticide chemistries, to name a few.

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ATTACHMENT 2

MOODY'S RATINGS METHODOLOGIES THAT PERTAIN TO THE ENERGY INDUSTRY

(not for further distribution)

Moody's Investors Service
Global Credit Research

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Rating Methodology

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Credit Risks of U.S. Investor-Owned Electric Utilities

The credit concerns that enter into the analysis of U.S. investor-owned utilities are dramatically different today than they were when Moody's first began rating these companies in the 1940s. As the driving force of deregulation spurs the "dis-integration" of many previously vertically integrated entities into separate businesses of generation, transmission, and distribution, a single set of rating criteria no longer applies. The financial parameters considered appropriate for a vertically integrated electric utility company are not necessarily suitable for a stand-alone generating company or distribution company. Nor are the parameters appropriate to one of these new business segments appropriate to the other.

Currently, Moody's rates 121 investor-owned utilities with outstanding debt of over $200 billion. The ratings for this universe range from a high of Aa2 to a speculative-grade Ba3. The industry average is an A3.

Going forward, Moody's believes that companies that choose to focus on generation will need higher cash flow coverages and stronger capitalization ratios to maintain the same rating given the increasing level of business risk to which they will be exposed as prices and sales volumes fluctuate in conjunction with changing market conditions. In addition to these quantitative measures, Moody's will also focus its analysis on the company's cost position relative to that of other producers in its region; management's cost control initiatives; its ability to hedge volume risk through fixed contracts with a distributor, transmission company, or aggregator; and the anticipated cost of acquiring generating assets divested from the IOUs and of capital improvements to existing equipment.

In the past, a utility was relatively assured of recovering all of its costs if they were deemed prudent by its regulator. With the shift from rate of return regulation to market-based pricing, this is no longer the case, increasing the importance of strict cost control and raising the specter of "stranded," or unrecoverable costs. Over time, stranded costs with regard to past investments will shrink in importance to a utility's overall credit quality as legislative or regulatory solutions, including competitive transition charges and/or securitization, are found. For pure generating companies, however, recovery of future investment will remain a concern, and, as in many developing markets, may lead to a tendency for these companies to underinvest.

On the transmission and distribution side of the business, continued regulation by the Federal Energy Regulatory Commission and state regulatory commissions, respectively, are likely to keep these companies' operating and financial risks low relative to those of their counterparts in generation. As a result, these companies are likely to enjoy relatively higher credit rating for similar levels of debt-protection measurements.

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Still, transmission and distribution company ratings are likely to remain diverse based on the level of support provided by the appropriate regulator and to the extent to which a company engages in activities that take on more market price sensitive activities. Aggregators, for example, which sell power and capacity at a relatively fixed price, face the risk that power prices will rise. Moody's believes that the core competencies needed to succeed as an aggregator of power are: marketing savvy; information on the operating performance of regional generating assets and the market prices these facilities can command during different time and seasonal intervals; derivatives expertise to manage price risks; and technical knowledge in maximizing utilization of regional transmission grids, despite certain constraints, during peak and off-peak periods.

More likely to enjoy higher debt ratings with all else being equal are those transmission and distribution that engage in the pure "wires" business and thus have virtually no exposure to the competitive and commodity price sensitive risks of their generating or marketing counterparts.

Introduction

This special comment focuses on the analysis of electric utilities that are privately owned and operated, but regulated by state and federal regulatory agencies. Because the United States has the longest history of such privately owned utilities (going back to the 19th century) this discussion primarily focuses on electric utilities in the U.S.

Still, some of the issues raised here may also apply to other publicly owned utilities long in existence, such as those in Canada. Other public utility systems — most notably water and electric utilities in the United Kingdom — have already transferred ownership and operation from government to private investors and managers. In addition to the UK, privatization programs are being considered in regions across Asia, Latin America, and Eastern Europe. As privatization initiatives carry their momentum into the third millennium, Moody's expects that more utilities worldwide will be accessing the capital debt markets.

Moody's has been rating the debt securities of the investor-owned electric utility industry since the 1940s. Currently, we rate approximately $200 billion of debt securities - including first mortgage bonds or senior secured debt backed by the pledge of assets; senior unsecured debt; pollution control revenue bonds, both secured and unsecured debt; preferred stock; and commercial paper – in this sector. The amount of debt outstanding has grown many folds, particularly during the 1970s and the 1980s when the electric utilities constructed large nuclear-fueled and fossil-fired generating power plants to meet increasing demand for electricity.

The senior secured ratings of the 121 rated IOUs currently in Moody's electric utility peer group universe range from a high grade of Aa2 to a speculative-grade of Ba3.

Moody's believes that electric utilities in the U.S. can no longer be judged according to a single set of standards. Historically, these utilities have been vertically integrated, engaged in the generation, transmission, and delivery of electricity. Today, as the generating side of the business is deregulated, many formerly vertically integrated utilities are "dis-integrating," - dividing along functional lines and divesting themselves of one or more classes of assets to become pure generating or pure transmission and distribution companies. Others will remain vertically integrated, but will add new business lines, such as a gas distribution and trading operation, to their repertoire. Financial parameters considered appropriate for a vertically integrated electric utility company with a defined service territory are not necessarily suitable for a stand-alone generating or distribution company. Nor are the parameters appropriate to one of the new business segments appropriate to others.

A Changing Environment

Since the enactment of The National Energy Policy Act (NEPA) of 1992 and the Federal Energy Regulatory Commission's (FERC) Order 888 of 1996, the pace of wholesale and retail competition has picked up tremendously. In the past, the supply of electricity within a geographic region was seen as a natural monopoly, and the state public utility commissions (PUCs) awarded utilities exclusive franchise areas. State PUCs required IOUs to serve all customers in their franchise areas at regulated, bundled rates, covering generation and delivery, based on rate-base "rate of return" and "cost of service" rate-making mechanisms. In the future, IOUs will no longer charge one bundled price for service. Customer bills will

include separate tariffs for generation, transmission, distribution services, and a non-bypassable or competitive transition charge, if one is permitted by the state commission. (A competitive transition charge is intended to recover past investments or capital expenditures in high-cost generating plants or to buy out or buy down above-market priced power purchase contracts because the costs of such may not be fully recovered in market-based prices.) Prospectively, all customers will be able to select each particular service from a separate provider or supplier.

The FERC regulates interstate transmission services and interstate wholesale power transactions (sales to IOUs, electric cooperatives, and municipalities for resale), whereas the states regulate the retail sales of their IOUs. Therefore, while NEPA and the FERC order specifically address competition at the wholesale level, retail competition has been left up to the state legislatures and their PUCs to review, address, and implement.

"Wholesale" and "retail" presently have meanings in the electric utility industry different from their use in other industries. The terms have legal significance in that they are used in current federal legislation to designate the regulatory jurisdiction of power sales. "Retail" is defined as the sale of power to an end-user of electricity such as industrial, commercial, and residential customers. "Wholesale" power sales are all other power sales that do not involve the end user, i.e., sales from one IOU to another, from an IOU to a municipal utility, or from an independent power producer (IPP) to an IOU. Thus, an industrial customer buying large quantities of power would still engage in transactions at rates that are regulated as "retail".

Prior to NEPA and the FERC order, owners of transmission lines, primarily IOUs, could effectively prevent other suppliers from using their facilities to transport power to their ultimate customers, thereby inhibiting competition. NEPA provided all generators of electricity (utilities and non-utility generators or IPPs) with open access to transmission, allowing power to be delivered to almost anywhere in the U.S., barring any physical transmission constraints, if it is economical and there is demand for such power

Specific details of how wholesale competition would be implemented were established in FERC Order 888 in April 1996. The order fulfills the directive of NEPA and culminates the move toward an open wholesale market begun by the Public Utility Regulatory Policies Act of 1978. The order addresses the two issues, pricing and access, that are key to the establishment of an open market for electric power. Furthermore, the order plays a large role in the development of a competitive retail energy market by providing a framework to resolve technical, ownership, and operational issues.

The primary objective of the FERC order is the elimination of monopoly power over the transmission of electricity. To achieve this goal, FERC required all IOUs and municipal electric utilities that own, control, or operate facilities used for transmitting electric power in interstate commerce to: (1) file open access non-discriminatory transmission tariffs containing minimum terms and conditions by July 1996; (2) take transmission service, including ancillary services, for their own new wholesale sales and purchases of electricity under open access tariffs; (3) develop and maintain a same-time information system that will give existing and potential users the same access to transmission information and service that the electric utilities control to provide power to their own customers; and (4) separate the transmission functions from generation, communications, and marketing.

NEPA and FERC's landmark order have fostered the separation of electric utility services into three distinct operations: generation, transmission, and distribution. While generation will compete freely in an open market, distribution and transmission will remain regulated. Transmission companies, which are expected to function within regional independent system operators, will be regulated by FERC. Distribution companies will remain regulated by the state PUCs. As the generation side of the business is deregulated, this sector will lose the safety net of regulated returns and base rates that it had enjoyed in the past.

Analytic Framework

Apart from the complexity of current reform initiatives, there are many common elements of financial, operating, and business risk facing the electric utility industry, both in the US and abroad. From the fixed-income investor's point of view, the most important of these elements fall into the key areas outlined below. The weight given to any particular credit concern will, however, vary from one company to the next in our peer group of 121 IOUs. Quantitative measurements of financial flexibility such as a stronger

common equity to total capitalization, coverage ratios, and cash flow measures of leverage, for example, take on greater importance for those companies operating within the riskiest business segments and most volatile operating environments.

Competitive Position

Electric utilities, as a result of their unique infrastructure and related cost factors, have little flexibility in responding to change. The industry has traditionally been burdened with very large financing requirements, often stretching over decades. And whether operating as transmission and distribution companies or as generation corporations, electric utilities are likely to remain highly capital-intensive.

Much of the IOUs cost of service stems from huge investments in plant and equipment – large generating facilities by generation companies and expensive transmission and distribution lines and networks by transmission and distribution entities. Much of this infrastructure takes years to construct and put into service. With some exceptions, technical upgrades in the utility business also require large new investments. And, unlike the assets of most industrial companies – such as research facilities, factories, airplanes, or automobiles – electric utilities' assets are dedicated to specific functions and cannot easily be remodeled or transformed for some other use.

STRANDED COSTS

As the regulatory safety net that protects profits on the generating side of the business is removed, electric utilities are likely to find a portion of their investments, "stranded," or unrecoverable at the prices dictated by a competitive marketplace.

Based on Moody's stranded cost model, developed in 1994, we estimate that this industry faces approximately $132 billion of stranded costs. Stranded costs may originate from expensive investments in nuclear generating facilities and high-cost state and federally mandated purchased power contracts with independent power producers (IPPs).

In general, utilities that have built nuclear generating facilities are comparatively less competitive and have a weaker credit profile than their non-nuclear counterparts. For example, nuclear-fueled power plants have initially required substantial amounts of debt financing to fund the associated high construction costs. For one thing, nuclear technology proved to be far more complicated and demanding from an engineering and construction standpoint than fossil fuel technology. Strict safety and licensing standards required by the Nuclear Regulatory Commission, particularly since the 1979 Three Mile Island accident, have also been a major cause of the high cost of nuclear plants. And because many nuclear utilities carried lower bond ratings than their non-nuclear counterparts at the time of debt issuance, their interest expense burden has been correspondingly greater.

In addition to construction and start-up costs, the non-fuel operating and maintenance costs (fixed charges) tied to nuclear power generation are significantly greater than those relating to fossil-fueled or hydroelectric power. Nuclear plants do, however, maintain a marginal cost advantage over most other types of power plants. With the exception of hydroelectric projects, which have no fuel expense, nuclear fuel is generally the cheapest by far when compared to the cost of fossil fuels.

In addition to nuclear-powered generation, power purchase contracts, particularly with non-utility generators or IPPs, have added to many utilities' stranded cost concerns. Beginning in the late 1960s and early 1970s, the economic fundamentals of IOUs began to change, and competition began to emerge. The energy crisis of 1973-1974, the growing expense of nuclear power, and the need to comply with ever-changing environmental regulations caused electric rates to escalate dramatically. Against this backdrop of skyrocketing rates, the Public Utility Regulatory Policies Act of 1978 (PURPA) was legislated. In response to calls for greater price competition, the act mandated a market for electricity generated by non-utility entities. This power was sold to a utility at avoided cost rate – the rate at which a utility would add the least efficient unit to its system and still have a profit. Practically, the law's effect was to open the floodgates to alternative power, – often at very steep prices.

For several years now, there has been an industry-wide focus on cost reduction to mitigate exposure to potential stranded costs. Many companies have, for example, either bought out, paid down, or renegotiated their PURPA-mandated, above-market priced contracts with non-utility generators. Yet for

those IOUs with significant exposure, a stringent cost control strategy is simply not enough. Therefore, these companies are exploring other alternatives to ensure full recovery of their past investments and of the ongoing costs of providing power to their customers. Included among the alternatives is pursuit of legislation to allow for securitization of stranded costs.

With these contributions to the utilities' cost positions as a backdrop, Moody's assessment in the new open market environment of any given utility's competitive standing relative to its peers includes its customer segmentation, rates, and potential stranded costs.

SECURITIZATION

The major advantages of securitization from a credit standpoint are the expected lower financing costs of higher-rated securities and the greater certainty of recovery of stranded costs. In its simplest form, a securitization isolates a dedicated stream of cash flow into a separate legal entity and uses that stream of cash to service the securitized debt. Securitization has been used for general working capital financing by Centerior Energy; to finance demand-side management expenditures by Puget Sound Energy; and to finance the recovery of stranded utility costs by Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas and Electric Company. In all of these cases, the utilities obtained a much higher rating for the securitization than for their existing debt, thereby providing a source of lower-cost financing. Future securitizations to help recover stranded utility costs are likely, as enabling legislation currently exists in numerous states, including Illinois, Pennsylvania, Montana, and Connecticut.

The most important aspect of the securitization is the manner in which the issuing utility uses the proceeds. Most of the IOUs issuing securitized bonds in conjunction with stranded cost recovery are required by state law to maintain at least the same percentage of debt, preferred stock, and common equity in their capital structure as existed prior to issuing the securitized bonds. To the extent that a utility applies a higher percentage of the proceeds to debt reduction, thereby improving capitalization ratios, the utility's underlying credit rating can be strengthened.

Moody's treats the securitized bonds as being fully non-recourse to the utility even though the Securities and Exchange Commission's guidelines require the debt to appear on the utility's balance sheet. Consistent with this view, all cash flow measurements (those involving funds from operations and retained cash flow) will be adjusted downward to reflect the fact that a material portion of cash flow each year will be set aside to service repayment of the securitization bonds. These adjustments will better reflect the cash flow stream available to utility fixed income investors.

Accordingly, investors will need to remain cautious. We expect that most utilities will use securitization proceeds to pay out both shareholders and bondholders in a proportion that retains essentially the same capitalization ratios, albeit while shrinking the balance sheet. Fixed income investors will, however, need to appreciate the fact that although the pool of company bondholders will shrink under this scenario, a new, potentially large pool of securitized bondholders will enter the picture. The new class of investors will be entitled to the same cash flows that were previously available to just the company's bondholders. Thus, an integral part of our analysis will involve assessing whether the cash flow cushion for the remaining bondholders will be the same as before. In the extreme case of a bankruptcy, securitized bondholders are likely to be in a superior position, since the bonds are issued through a bankruptcy remote vehicle, making continuation of debt service payments to those investors entirely likely.

CUSTOMER RATES AND SEGMENTATION

While stranded cost estimates provide critical information concerning a utility's cost structure and its ability to operate competitively — and profitably — in an open market, of equal importance to the analysis of competitive position are the rates it charges and the composition of its customer base.

In a regulated monopoly, as the electric utility industry has historically been, customer rates were of analytic importance in terms of those investments admitted into rate base by regulators and the allowed return on these assets. Going forward, as in the past, customer rates will determine revenues, and ultimately they may dictate the IOU's ability to maintain adequate cash flow to meet its substantial debt servicing requirements. However, in a competitive climate, the rates a utility charges different customer classes also become important on a relative basis –that is relative to the rates charged by other utilities. Customer rates exceeding national and/or regional levels could expose the utility to potential customer losses. Both national

and regional rankings are important, but regional are more so, as they more closely represent the pool of potential competitors given physical constraints on wheeling power beyond certain distances. Rates relative to regional averages tend to capture similar financial risk as the stranded cost estimates.

Customer segmentation is likewise an important analytic consideration, as over-dependence on a particular customer or customer class could result in more volatile cash flows, either as a result of customer loss or discounts, or in conjunction with a downturn in a particular industry to which the company is heavily exposed. Even before the onset of wholesale and retail competition, most IOUs have been selling to their large industrial customers at a discount – with regulatory blessing – in exchange for a commitment under multi-year contracts. While such discounts have tended to reduce margins, earning some profit on the sale of lower-priced energy was deemed better than earning no margin on sales lost to self- or cogeneration. (Cogeneration is the simultaneous generation of thermal or steam and electric energy.) The rate pressures created by large concentrations of industrial customers will likely increase as more power supply alternatives become available and could negatively impact regulatory treatment of some utilities' potential stranded costs.

Pace of Deregulation

Regulation and legislation have the potential to either weaken or strengthen an IOU's credit quality. In subsequent years, how the restructuring process evolves and resolves at the state and federal level provides a critical backdrop to Moody's evaluation of cash flows, rates, stranded cost recovery, and management strategy. Factors central to rating considerations are the timing of transition to retail competition, patterns and duration of phase-in, stranded cost recovery mechanisms, and legal issues such as irrevocability of legislative or regulatory initiatives.

As far as Moody's is concerned, stranded cost recovery remains uncertain until detailed, irrevocable mechanisms that ensure substantial recovery regardless of market prices are in place. Negotiated agreements indicate consensus, which is favorable, but approval of these agreements with irrevocable legal standing is what really counts in reducing uncertainty and gaining comfort with a company's financial forecast.

In the absence of binding settlement agreements, the actions of state regulators remain difficult to predict. The two primary purposes of state utility regulation have, after all, always been inherently at odds. Such regulation is designed to implement public policy goals, such as reliable, efficient and economical service, and to prevent the abuse of the IOU's monopoly, while at the same time assuring the utility and its investors a fair rate of return on investments in plant, equipment, and operating expenses. And today, with the pace of deregulation and restructuring, technological advancement, continuing customer pressures for lower energy prices, and changing product and service needs, it is even more difficult for the regulators to perform their jobs and implement balanced public policy rules and regulations.

States such as California, Illinois, Pennsylvania, Maine, Montana, Nevada, New Hampshire, Rhode Island, Massachusetts, Connecticut, Virginia, and Oklahoma have already enacted electric restructuring legislation, requiring the states' utilities to phase in retail access beginning as early as 1998/1999 with full retail customer choice by 2001/2002. This legislation also calls for customer rate reductions and permits recovery of at least a portion of stranded costs either through the issuance of securitization bonds or the collection of a non-bypassable transition charge.

Retail restructuring legislation adopted in California and Massachusetts, for example, not only permits customers to select their energy supplier, but also requires the IOUs to divest their generating plants because of market power concerns. The supportive transition plans crafted by the legislature and the regulators of these states provide a reasonable time schedule for the IOUs to recover their stranded investments and to prepare themselves to compete in a fully competitive retail market. Prospective business risk will also be significantly lower for these companies since the distribution companies will continue to be regulated by the state PUCs, and the transmission company will continue to be regulated by FERC. More importantly, these companies will no longer be exposed to the volatile commodity price fluctuations of generation and supply. A portion of the proceeds from the sale of generation assets will be used to reduce debt and strengthen the companies' capital structure.

Management Strategy

When Moody's looks at management strategy it looks for consistency. The actions of the company are evaluated in the context of the utility's corporate strategy as defined by senior management. Is the company doing what it has said it would? Is it positioning itself for where it wants to go?

Moody's also looks for innovation. An important rating criterion is whether senior management has a flexible mindset and thinks and acts out of the traditional utility paradigm. Is the company responsive to changes in its business environment? Is this response reactive or ahead of the curve? Undoubtedly, deregulation is driving the electric utilities to make concerted, innovative, and meaningful changes that will enable them to not only survive, but to be successful competitors in an open market. In fact, some companies have searched for experienced senior executives from competitive industries, such as the financial, gas, telecommunications, and industrial sectors to bring new vision in the early stages of reform, as well as to manage the various business units.

In measuring a utility's responsiveness to a changing business environment, Moody's looks specifically at management's actions to cut costs, lower rates, and introduce new programs to retain customers. We also look at the extent to which it has pursued non-core business activities in the search of new revenue opportunities. And perhaps, most significantly, we look at management's decisions with regard to the organization of its core business units, including, in some cases, the decision to divest one or more of the core functions of generation, transmission, and distribution.

COST-CUTTING AND CUSTOMER SERVICE INITIATIVES

Most well-managed electric utilities have already implemented cost-cutting initiatives, including: renegotiating or buying out expensive power purchase contracts, retiring uneconomic nuclear generating facilities early, replacing steam generators for highly efficient nuclear plants to prolong their usefulness, outsourcing of certain operating functions, upgrading computer systems, replacing existing billing and metering systems, and other programs geared toward greater operating efficiency.

By passing these savings on through rate reductions, IOUs can engender customer loyalty, promote customer satisfaction, and improve their competitive standing at a time when it really counts. Other customer retention ingenuities include customer-oriented marketing programs, discounted rates for large commercial and industrial customers in exchange for multi-year or national contracts, time-of-use rates for load or demand-side management, and state-approved rate incentives for promoting economic development in the utility's service area.

DIVERSIFICATION

In pursuit of stellar earnings and common equity return, many IOUs have become increasingly preoccupied with diversification strategies. Diversification may include the introduction of innovative products and services to complement existing operations and assets, acquisitions of other companies, and expansions of their non-regulated businesses both in the United States and abroad. Moody's believes that regardless of what opportunistic strategies management selects, ambitious growth in non-traditional energy investments not only increases a utility's debt leverage, but also creates a greater level of business risk and financial volatility for the company, thereby pressuring the bond rating.

Acquisitions of and mergers with domestic electric, gas, and even water utilities represent the acquiring company's desire to increase market share through the expansion of their customer base and service territories. Acquisition of regional distribution companies in the United Kingdom and Australia represent both a springboard for earnings growth and a valuable opportunity to learn about the challenges of competition, given that both the UK and Australia have already deregulated or privatized their utility industry. There are currently many opportunities for these companies particularly in less developed countries (such as Brazil, Bolivia, Columbia, Poland, Russia, India, China, and Pakistan), which critically need the construction of nonexistent or antiquated infrastructure such as transmission network, generating facilities, and distribution systems.

Realistically, not all utilities are venturing abroad to seek growth opportunities. The smaller companies not only lack the financial resources, but they are heavily involved in preparing themselves for heightened industry competition at home or merging with a neighboring utility.

DISAGGREGATION

Although many states have yet to pass retail choice legislation or mandate the divestiture of generating assets, the more sophisticated companies have functionally disaggregated all their business lines. In fact, some IOUs have required the discrete business units (such as generation, transmission, and distribution or delivery, energy services, power marketing, and non-regulated investments) to operate individually and be responsible for meeting their own strategic objectives and profitability goals. Others are divesting themselves entirely of one or more of these business lines to become solely a transmission and distribution company or a generating company.

The differing credit risks that apply to transmission and distribution companies and to generating companies are explored in detail below, followed by a discussion of Moody's assessment of key financial parameters for both segments.

Credit Risk of a Transmission and Distribution Company

Electric utilities that divest their generating assets will, in our opinion, substantially reduce their business and financial risks. All other factors being equal, this shift in business composition will lead to generally higher credit ratings for those companies than for companies with similar debt protection parameters that choose instead to focus on the fully competitive generating side of the business.

We expect transmission and distribution revenues and cash flows to be reasonably stable and more predictable than generating revenues because the rates charged by the transmission and distribution companies will continue to be regulated while generation shifts toward market-based pricing. Competition in the electric utility industry, for the moment at least, means competition in generation only. Since generation accounts for roughly 50% of the total assets of the industry, it is not surprising that this segment would be the first deregulated, following the theory that deregulation should have impact, yet it should be incremental to give market participants time to adjust.

Conventional wisdom says that deregulation will not only begin but end with generating assets since transmission and distribution are natural monopolies — meaning it is in everyone's best interest to have just one wire between the generation source and the consumer. This theory has been tested in the natural gas industry and in the telephone industry with results arguing against the theory of natural monopolies. In the natural gas industry, competition in transmission has resulted in excess capacity in some markets and lower prices, generally. In the telephone industry, the mere possibility of local phone service deregulation has unleashed new technologies and brought new entrants into the industry that were not foreseen a decade ago. It is interesting to note that in the telephone industry while prices may have fallen, many customer bills have increased as new services are delivered using the same assets at little to no incremental costs, thereby improving margins.

For electricity transmission and distribution assets, deregulation is, therefore, not an immediate consideration, but is conceivable in the intermediate term. For the near-term then, at least. state regulation will continue to be an important rating factor for the less asset-intensive distribution companies, while FERC will regulate the transmission entities. Regulatory scrutiny of the transmission and distribution business is expected to be less contentious than that historically endured by the vertically integrated utilities, as long as the customers are receiving reliable electric delivery service and are connected to the transmission grid.

Some regulators are likely to be more supportive than others, however, and therefore distribution companies from one state to another are likely to vary significantly in financial performance and creditworthiness. It is, for instance, likely that some state regulatory agencies will impose price-cap or performance-based rate-making mechanisms to ensure reliable service.

Moody's will continue to capture differences in business risk, financial performance, and thus credit quality, within each company's ratings relative to the other rated companies in our peer group universe. These differences will stem not only from the regulatory climate within which each company operates, but also their corporate or legal structures, their business strategies, and their particular service functions. Distribution companies can provide a variety of service functions, which include delivering electricity, administrative services, contracting for energy purchases, and marketing services.

A distributor engaging solely in the delivery of energy or functioning as a pure wires entity – that is, it maintains the physical connection between the step-down substation and the end user — will entail the lowest business risk. A pure wires company will achieve its basic distribution revenue stream when it connects the customer or end-user to the transmission grid so that energy can be delivered. As a natural monopoly, it will remain state regulated. Although performance-based rate-making and the temporary effects of regulatory lags to recoup weather-related expenditures or other unforeseen operating interruptions, for example, may add slight volatility to its cash flows, the wires company's earnings prospects will remain highly predictable.

Aside from the sole responsibility of delivering reliable energy, many distributors will also be providing such administrative services such as metering and customer billing. Marketing functions will continue to play an important role in a customer-focused market. Therefore, maintaining data on customer preferences and purchasing patterns will provide a valuable marketing tool in the newly competitive landscape.

In certain states, distribution companies may be "default" electric providers – that is, the supplier for customers who do not choose a new electricity provider (or supplier of last resort)– in a company's service territory during the transition period to full competition. Under this scenario, the distributor may be subject to some price risk.

In contrast to the pure wires companies, aggregators that engage in the function of contracting for energy purchases or in the highly volatile power marketing business are likely to exhibit thin margins and uncertain cash flows due to fluctuating market prices in different regions of the U.S. The largest risk for these companies is price risk, as the aggregator usually sells power and capacity at relatively fixed prices and must find ways to hedge the risk that the price of power will rise. An aggregator packages large numbers of customers with similar consumption patterns or preferences and buys large quantities of power at favorable prices to meet each customer group's requirements, thus adding value for these consumers. While the largest customers will likely contract directly with generating companies for their power needs, smaller industrial, commercial and residential customers will rely upon aggregators to purchase their energy.

Moody's believes that the core competencies needed to succeed as an aggregator are: marketing savvy; information on the operating performance of regional generating assets and the market prices these facilities can command during different time and seasonal intervals; derivatives expertise to manage price risks; and technical knowledge in maximizing utilization of regional transmission grids, despite certain constraints, during peak and off-peak periods.

Well-operated transmission companies with well-maintained assets, for their part, enjoy low financial and operating risks, as well as steady and predictable return and cash flow streams. These companies are likely to maintain their dominant role as providers of an essential service regulated by FERC's price-setting mechanism.

More specifically, the transmission and distribution entities can have a higher debt leverage to total capitalization ratio and lower common equity to total capitalization and still earn the same rating, as they exhibit lower operating and financial risks and are less-capital intensive in nature. Unlike generating facilities, which require substantial amounts of debt and equity capital, the wires and pipes business will have smaller and more manageable construction budgets and require less cash resources to expand, maintain, improve, and replace existing infrastructure.

In addition, pure distribution companies operating in a reasonably supportive regulatory regime with minimal capital spending requirements can also exhibit lower interest coverage ratios to maintain the existing bond rating. Given that cash flow coverage ratios remain the most important measurement of financial risk, the distribution companies that can demonstrate stronger cash flow coverage will be able to achieve a higher debt rating.

On the opposite end of the risk continuum, transmission and distribution companies engaging in more market-price-sensitive types of operations where their margins and cash flows are more volatile and less predictable will require higher coverage ratios, stronger common equity to total capitalization, conversely lower debt to capitalization, and stronger cash flow coverage ratios to maintain the existing debt rating or to attain an upgrade.

Credit Risk of a Generating Company

The credit issues explored below are not new. In fact, Moody's has been analyzing generating companies, or GENCOs, since the first public debt issue by an independent power producer in the 1980s. What is new is that rather than being a specialized segment of the industry, GENCOs are becoming the largest segment of the electric industry. As old intercompany relationships give way to new contracts or market forces, a larger number of combinations of business and financial risks will be possible in the generating sector of the electric industry.

New opportunities in the U.S. will largely be restricted to the purchase of existing IOU generating assets and the development of merchant plants, which, unlike projects with long-term contracts for off-take, will sell power in the competitive market. Not only will capital requirements be sizable, but, unlike the thinly capitalized start-ups of the past, non-recourse project lenders will demand relatively large amounts of sponsor equity as a means of hedging uncertain market risk. In addition, any opportunities abroad will likely be the construction or purchase of large-scale generating assets, or the acquisition of shares in entire utility systems being privatized by local governments. In such cases, capital requirements will be significant.

In addition to the substantial capital needs, new investments in competitive U.S. generation and overseas assets will elevate business risk. The single most effective mitigant for this higher risk will be increased earnings power – the result of a large and diversified portfolio of projects. Such earnings potential will not, however, be easily achieved due to expected heightened competition in the energy market. The addition of high quality assets to a company's portfolio, particularly in today's market environment, will require a high degree of financial flexibility, as well as the will to reject transactions that offer unacceptable risk-adjusted rates of return.

ACQUISITION PRICE

In a forthcoming special comment, Moody's will assess the divestiture of generating assets by electric utilities. In most cases, the divestitures are driven by a pact with regulators that allows for recovery of stranded costs associated with power purchase contracts and regulatory assets in exchange for the elimination of market power issues. These actions promise to reconstruct the industry and to bring efficiencies that will translate into lower prices to retail customers.

In whatever manner a generation company acquires its assets — whether they are contributed by a utility into a wholly owned generating subsidiary, spun-off into a stand-alone generating company, acquired through public auction, or sold in a private transaction — the purchase price paid for the asset will become a major credit consideration. In the regulated world, acquisition prices were not scrutinized to the degree that will now be required since in a regulated world the price could be recovered from ratepayers. In a deregulated market, a key earnings and competitive advantage may be gained from acquiring assets at a bargain price.

Moody's believes that the new class of generating companies, in which generating assets of the domestic utility industry are spun off from the wires business or sold in a public auction, will compete head-to-head with today's IPPs and owners of merchant power plants. Many of these entities will have the benefit of a large base of generating assets, the capital costs of which have already been recovered from captive rate-payers. However, it is currently uncertain whether these newly created generating companies will be able to produce the earnings and returns in a deregulated marketplace.

TRIPLE CREDIT CONSIDERATIONS OF MERCHANT RISK: MARKET PRICE, DIVERSIFICATION AND VOLUME

All other things being equal, a GENCO will carry more business risk and, therefore, a lower rating than a transmission and distribution company. The single largest contributing factor to the increased business risk of a GENCO is the price volatility risk it will face in a competitive environment.

Moody's analysis of merchant plants – power projects that generate electricity for sale in the open market – focuses heavily on their cost profile in relation to current and potential future competitors. However, even for competitive project, the absence of some form of market price hedge – whether in the form of power sales contracts, tolling agreements, linkage of fuel costs to pool prices, or subordination of

operating expenses to debt service – is likely to preclude the attainment of an investment-grade rating, at least at any capital structure that would make economic sense for its owners.

Moreover, we believe that the difference between investment-grade and non-investment grade merchant projects will ultimately derive from the level at which the owners of these power projects hedge their exposure to potentially volatile commodity pricing, not a particular capital structure or debt coverage level.

Whether operating in the merchant or contract market, the benefits associated with portfolio diversification are another important rating consideration. Financing structures which spread risk across a number of markets, stability of long-term contracts with financially sound customers, or generating technologies will, from a ratings standpoint, be viewed favorably. For example, investment-grade rated generating companies, such as National Power plc (A2 senior unsecured debt) and PowerGen plc (Aa3 senior unsecured debt) in the United Kingdom, and Endesa (Baa1 senior unsecured debt) and Chilgener S.A.(Baa1 senior unsecured debt) in Chile, are active in competitive markets, have competitive cost structures, contracts that are structured prudently to protect against non-operating risks, and conservatively financed investments in various overseas infrastructure projects.

In a regulated arena, companies made decisions based on their discussions with regulators and estimated growth in electricity consumption to determine how they could best meet their obligation to serve and maintain reliability of the system. As long as their decisions were deemed prudent, they had relative assurance that all of their costs would be recovered through rates.

In a competitive landscape, prices (i.e. customer rates) will be set by the market and the market will determine not only whether management's actions were prudent, but whether they were necessary. Moreover, in a developing marketplace, there tends to be higher price volatility than in a mature market. Operating in such an environment, companies tend to under-invest because a wrong investment could have long-term competitive implications.

From a credit analysis standpoint, Moody's will consider management's cost control efforts, as well as the company's position as a low cost producer in its territory, the enterprise's ability to withstand significant price fluctuations, and its anticipated capital improvements relative to the condition of its equipment.

In assessing the quality of the revenues of a GENCO, in addition to price, an analyst will consider the volume risk that is the demand for power. Historically, the demand for power on average has increased over time although there have been instances of decreases. This risk can be mitigated by contracts to supply power at market prices to a distribution company, transmission company, or aggregator. Some observers believe that the industry will operate without contracts of any significant duration, as is the model in other countries which have deregulated. However, transferring the volume risk can greatly enhance the credit profile of a company. The rating importance of volume risk will rest with the general review of the service territory.

DIFFERENTIATION BY FUEL TYPE

To begin, one would look at the plant's fuel type whether it be nuclear, coal, natural gas, oil or renewables. In general, hydroelectric plants are the cheapest from a production standpoint, followed by nuclear, coal, natural gas, fuel oil and then other renewables.

In analyzing fuel type, one must be region specific, since the interplay among technologies changes with region's prices for fuel, location relative to fuel source, and local attitudes to certain fuels. Where there is an abundant supply of coal or gas, there will be a greater tendency for that region to favor these resources.

While we place emphasis on the regional analysis to determine the relative favor or disfavor of a plant fired with a particular fuel, we also must look at national trends such as licensing of nuclear plants and potentially large capital requirements associated with environmental compliance for coal plants.

In conjunction with the fuel type assessment, we would consider the forecast prices for the fuels to determine if any fuel might have a cost advantage in the future and whether that might alter the plant's competitive position. Combining the fuel type analysis and the fuel price forecast, one can determine the intended use of the facility, such as whether it is expected to be run around the clock as a base-load facility, less often as a "mid-merit" facility, or only occasionally during periods of high demand as a peaking facility. This type of analysis has generally been found in project finance for the financings of individual plants.

However, as GENCOs constitute themselves with an array of facilities, it will be necessary to distinguish more clearly the role of each plant in management's strategy — whether that strategy is to have some assets of each type or to concentrate assets under a peaking strategy, for instance.

The various permutations will all have different ratings implications. While we can safely say that all base-load plants with the lowest regional production costs should carry a relatively higher rating when compared to other combinations of the same fuel type, we cannot determine a ranking with other facility type combinations. It may well be that a portfolio of peaking plants in an area with erratic weather patterns and resulting swings in electricity demand might carry a higher rating than a group of mid-merit plants where the weather is placid. With regard to facility type, deregulation has spawned the possibility of generating companies with operating strategies that carry very different ratings implications than the regulated, integrated utilities that now exist.

Another issue for generating companies that will receive heightened attention is access to transmission lines, with attention to system constraints and load balancing attributes a plant might bring to the system. Like other issues, this aspect of a plant's contribution to the electrical energy system was buried in the integrated utilities, but will be an important consideration in a "dis-integrated" world.

Key Financial Parameters

Because generating companies will be operating in a fiercely competitive commodity market, while distribution companies will continue to operate in a regulated one, analytical comparisons between these types of companies will no longer be valid. In addition, as companies adopt ever differing strategies, the homogeneity of the industry will disappear, and logical comparisons to other commodity-based or highly regulated industries, like paper and chemicals, or gas distribution, will become more appropriate.

The following chart illustrates some of the more important financial ratios used to determine creditworthiness.

Industry	Average Rating	Int. Cov.	Debt/Cap.	RCF/Debt	Op.Margins
Food	A3	6.1x	45.6%	30.8%	8.5%
Chemicals	A3	6.6x	36.7%	50.9%	10.1%
Electric Utilities	**A3**	**3.8x**	**49.6%**	**20.0%**	**15.0%**
Gas Transmission	Baa1	3.2x	52.9%	19.7%	—
Paper/For. Prod.	Baa2	2.7x	45.2%	18.3%	8.7%
U.S. Retail	Baa2	16.6x	37.9%	102.0%	5.0%

The industry most like the electric utilities in terms of its financial profile is paper and forest products. Also a capital intensive industry, it has high leverage and lower coverage than other industries. Its operating margins are still lower than those of the electric utility industry. More importantly, its average rating is Baa2, as opposed to the A3 the electric utility industry has enjoyed as a result of the regulatory safety net with which it has operated for the past 60 years.

As the electric industry evolves and as a company's business profile improves or deteriorates depending on the risk of the lines of business it chooses to pursue, ratings will be adjusted to reflect the change in the balance between business and operating risk and the associated financial profile.

CAPITAL REQUIREMENTS

Because of the IOUs' capital-intensive nature, financial analysis focuses on cash requirements and a company's ability to meet those requirements through internal versus external sources. Construction expenditures typically account for the largest component of capital requirements.

A company's ability to meet cash capital requirements (including debt maturities and sinking fund payments) through internal cash generation is a key indicator of financial strength. Sources of internal funds include: net income less preferred and common stock dividends, capitalized financing costs, and equity income of non-consolidated subsidiaries plus depreciation and amortization accruals; deferred income taxes and investment tax credits. The internal cash calculation should subtract non-cash contributions

CASH FLOW MEASUREMENTS OF LEVERAGE

Cash flow continues to be an important measurement of a company's liquidity position, as well as its financial flexibility. Moody's considers two ratios – funds from operations to total debt, and retained cash flow to total debt – not only strong indicators of a company's financial flexibility, but also a better gauge of leverage than pure balance sheet leverage, which reflects historical costs and accounting practices. Moreover, restructuring initiatives such as write-downs of assets to fair market value are making balance sheet analysis increasingly less meaningful.

The ratio of funds from operations to total debt (FFO/Debt) measures how much cash cushion a company has (before paying preferred and common stock dividends) to cover long-term and short-term debt obligations.

The ratio of retained cash flow to total debt (RCF/Debt) measures how much cash flow cushion a company has (after paying preferred and common stock dividends) to cover long-term and short-term debt obligations.

In analyzing these two ratios, Moody's recognizes that companies could reduce or eliminate common stock dividends under severe financial strain, and/or interrupt preferred dividend payments. IOUs could also reduce capital expenditures by canceling or delaying discretionary spending.

Moody's also adjusts the debt balance to include other off-balance-sheet fixed commitments such as purchased power contract costs and leveraged leases.

COVERAGE RATIOS

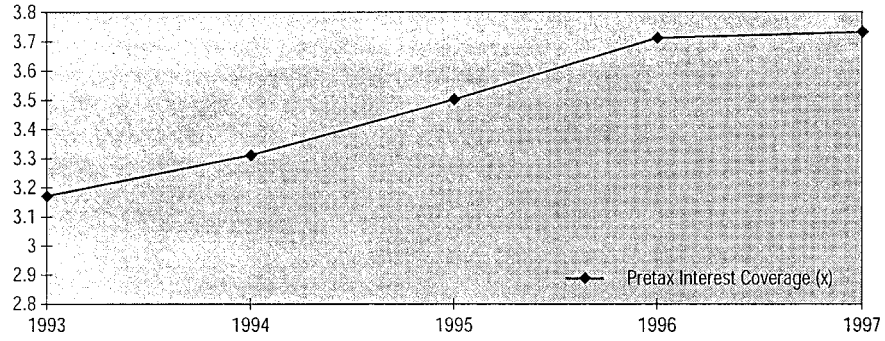
Coverage ratios are also very important measurements of a creditor's protection and of a company's financial flexibility to repay fixed debt obligations. The ratio of funds from operations to total interest expense (FFO/Interest, including adjusted interest expense), fixed charge coverage, and the ratio of earnings before interest expense, taxes, depreciation and amortization (EBITDA) to total interest expense are good indicators of a company's financial flexibility to manage all types of uncertainty or an illiquid situation. Higher earnings, cash flow, and financial flexibility will enable a company to make timely payment of its debt service obligations to avoid insolvency, while also helping to avoid a cash shortfall in an unforeseen financial crisis.

In analyzing these ratios, Moody's examines their current levels, past trends, and their sustainability in comparison with the peer group average for the rating category. Still, quantitative comparisons make up only one part of the overall analysis. When comparisons with peer group averages are made, we also consider the relative strengths, weaknesses, and trends of the rating level peers. Utility group averages are published in Moody's Global Credit Reports for the individual electric utility companies. This peer group includes 121 electric IOUs. For information on how financial ratios are calculated, please refer to Moody's Electric Utility Credit Research Guide, April 1996.

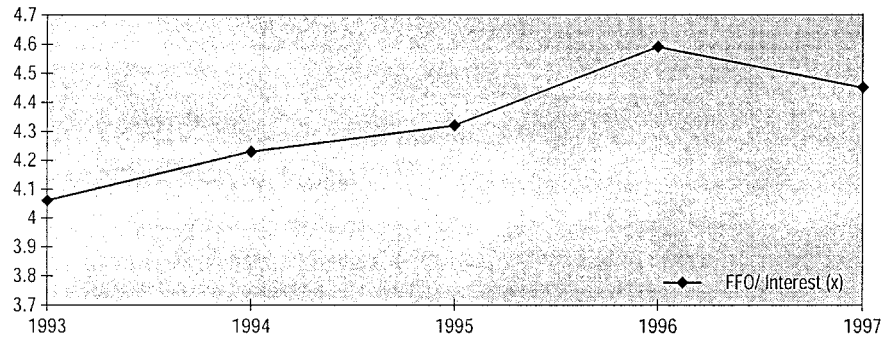
When analyzing a utility's financial forecast, we also consider whether a company's corporate strategies have been strong and consistent, and whether they have delivered the anticipated financial performance over the past several years.

Industry Financial Ratio Graphs

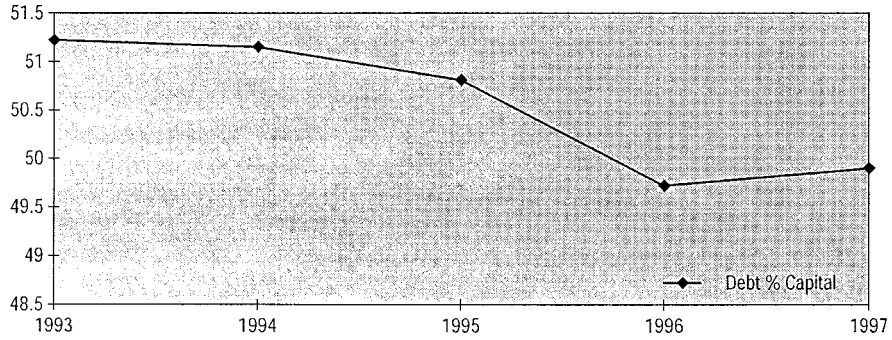
Industry Average: Pretax Interest Coverage (x)



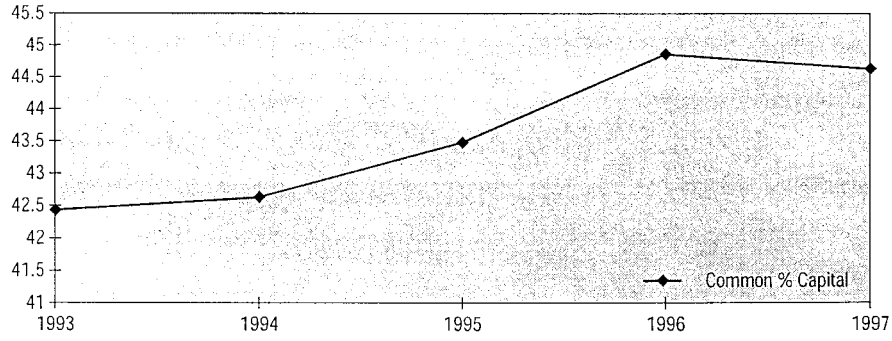
Industry Average: FFO/Interest (x)



Industry Average: Debt % Capital



Industry Average: Common % Capital



Industry Financial Ratios For Rating Categories (1993-1997)

1997

Rating	EBIT/ Interest (x)	FFO/ Interest (x)	Tot. Debt % Tot. Cap	Pref Stk % Tot. Cap	Common % Tot. Cap
Aa2	4.37	5.20	46.11	3.97	49.93
Aa3	4.08	5.55	43.34	5.48	51.18
A1	3.94	4.90	47.51	6.25	46.24
A2	3.34	4.48	49.67	4.63	45.69
A3	3.62	4.15	49.64	5.88	44.47
Baa1	3.37	4.29	49.90	5.63	44.47
Baa2	2.96	4.41	48.98	6.71	44.31
Baa3	2.28	3.56	56.11	6.37	37.52
Ba1	1.93	3.44	61.43	6.75	31.82
Ba2	1.22	3.16	60.65	5.47	33.88
Ba3	3.23	2.51	67.79	4.41	27.80

1996

Rating	EBIT/ Interest (x)	FFO/ Interest (x)	Tot. Debt % Tot. Cap	Pref Stk % Tot. Cap	Common % Tot. Cap
Aa1	4.29	5.35	44.82	6.68	48.51
Aa2	4.33	5.75	45.75	3.63	50.62
Aa3	4.13	5.42	44.72	4.52	50.76
A1	3.88	4.83	46.75	5.15	48.10
A2	3.56	4.51	50.56	4.44	45.00
A3	3.35	4.15	50.04	5.54	44.42
Baa1	3.36	4.29	49.07	6.04	44.88
Baa2	3.30	4.48	49.79	6.25	43.96
Baa3	2.68	3.38	57.42	5.48	37.10
Ba1	1.75	2.99	57.39	7.17	35.44
Ba2	1.54	2.00	64.73	0.41	34.86
Ba3	2.25	3.41	68.88	4.90	26.23

1995

Rating	EBIT/ Interest (x)	FFO/ Interest (x)	Tot. Debt % Tot. Cap	Pref Stk % Tot. Cap	Common % Tot. Cap
Aa1	4.36	5.55	44.75	6.80	48.45
Aa2	4.28	5.37	45.96	4.00	50.04
Aa3	4.24	5.32	43.54	5.24	51.22
A1	3.69	4.61	47.62	5.23	47.15
A2	3.45	4.40	50.18	4.99	44.83
A3	3.40	4.27	49.11	6.75	44.14
Baa1	3.10	4.14	50.38	5.05	44.77
Baa2	3.05	3.98	52.27	6.73	41.17
Baa3	2.46	3.53	61.42	3.64	35.56
Ba1	2.65	3.51	61.45	4.82	33.73
Ba2	1.98	2.60	64.56	6.73	28.70
Ba3	1.52	2.37	93.50	4.80	1.70

1994

Rating	EBIT/ Interest (x)	FFO/ Interest (x)	Tot. Debt % Tot. Cap	Pref Stk % Tot. Cap	Common % Tot. Cap
Aa1	4.88	6.19	42.78	6.99	50.22
Aa2	4.16	5.20	45.11	4.89	50.00
Aa3	4.19	4.89	44.84	5.56	49.60
A1	3.69	4.60	47.11	6.00	46.90
A2	3.35	4.30	49.49	6.20	44.32
A3	3.14	4.19	49.37	6.71	43.92
Baa1	3.07	4.07	51.78	6.30	41.93
Baa2	2.59	3.83	53.99	6.60	39.41
Baa3	2.11	3.20	62.06	5.33	32.61
Ba2	2.25	3.13	60.71	8.36	30.93
Ba3	1.18	1.79	89.87	0.50	9.64

1993

Rating	EBIT/ Interest (x)	FFO/ Interest (x)	Tot. Debt % Tot. Cap	Pref Stk % Tot. Cap	Common % Tot. Cap
Aa1	4.76	5.75	43.42	5.23	51.34
Aa2	4.03	5.12	44.55	4.87	50.58
Aa3	3.75	4.67	47.72	6.07	46.20
A1	3.55	4.49	46.33	5.60	48.08
A2	3.28	4.08	48.93	6.82	44.24
A3	3.41	3.93	48.58	7.49	43.94
Baa1	3.10	4.13	52.37	6.03	41.60
Baa2	2.68	3.52	54.39	7.11	38.49
Baa3	2.58	3.76	63.43	4.19	32.38
Ba2	n/a	2.16	64.06	9.55	26.38
Ba3	3.16	4.05	51.50	6.16	42.34

Glossary of Terms

Baseload Plants: Plants built to meet a utility's minimum steady demand. These plants produce electricity almost all the time.

Capacity: The amount of energy, measured in kilowatts, that a plant or a system is capable of producing.

Cogeneration: A process in which industrial companies, municipalities, and other organizations use waste heat to produce both electric power, which may be sold to regulated electric utilities, and steam for industrial use.

Competitive Transition Charge (CTC): A customer charge permitted by enabling state legislation which allows IOUs to recover stranded investments stemming from above-market purchased power contracts or expensive generating plants.

Demand-Side Management: Incentive programs employed by a utility to reduce demand. These include time-of-day rates, the sale of energy-efficient appliances, and interruptible industrial service contracts.

Energy: The actual electricity generated, measured in kilowatt-hours.

FERC: Federal Energy Regulatory Commission regulates interstate transmission services and interstate wholesale power transactions.

IPPs: Independent power producers are non-utility energy providers that sell electric power to electric utilities and directly to industrial customers.

ISOs: Independent system operators are associations intended to govern and manage the operation of specific regions of the transmission grid.

NEPA: The National Energy Policy Act enacted in 1992.

Peaking Capacity: That portion of a utility's capacity that is designed for use during periods of peak demand.

Peaking Unit: A plant designed to operate only during periods of peak demand.

Project Financing: A financing tool for individual construction projects requiring large capital expenditures. Debt service and amortization come solely from cash flow of the specific project.

PURPA: Public Utility Regulatory Policies Act enacted in 1978.

Qualifying Facility (QF): A non-utility power producer or cogenerator that meets specific operating, efficiency, size, and fuel source standards established by the Federal Energy Regulatory Commission. The Public Utility Regulatory Policies Act of 1978, which established the QF to promote alternative energy sources, ensured a market for QF power by requiring local utilities to buy power from the QF under long-term contracts.

Rate Base: The value of that part of a utility's plant and equipment that is in use or that is deemed by regulators to be useful for future public service. The utility is only allowed recovery of and a return on investments that are allowed into rate base by the regulators.

Rate Order: The decision by the regulator regarding prices, service provisions, capital expenditures, conservation programs, etc.

Retail Competition: Competition for the business of end users of electricity.

Retail Sales: Sale of energy to end-users, which include four categories of customers: residential, commercial, industrial, and public authorities.

Retail Wheeling: The sale of electricity to an ultimate customer located outside of a utility's service territory, using the transmission system of another utility company.

Securitization: In a stranded cost securitization, the asset is the irrevocable property right to collect cash from a competitive transition charge on utility customers imposed by a utility with the approval of state regulatory authorities. Legislation typically allows the utility to sell, assign, or transfer the property right to a bankruptcy-remote, single purpose financing vehicle.

Stranded Costs: Capital costs associated with high-cost generating facilities and above-market purchased power contracts that may be unrecoverable through rates in a retail customer choice environment.

Wholesale Sales: The sale of energy or capacity to municipal utilities or cogenerators within an investor-owned utility's service territory.

Rating Methodology Credit Risks of U.S. Investor-Owned Electric Utilities

Report Number:
37088

Moody's Investors Service
Global Credit Research

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Rating Methodology

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Moody's Approach To Rating Gas Transmission And Distribution Companies

This special comment addresses the qualitative and quantitative factors that are important in understanding the ratings of gas transmission and local distribution companies.

A key conclusion: Moody's does not rate purely by numbers.

Financial performance is important in our analysis, as is evident in the attached statistical supplement, listing the fiscal 1997 results of the gas companies by ratings. For LDCs (local distribution companies, i.e., regulated gas utilities), ratings broadly correlate with returns and coverage, but show little relationship to leverage and other measures. For diversified companies, the situation is the same, except that leverage measures have higher correlations. However, correlations do not always hold, and ratios listed frequently do not line up.

What accounts for those anomalies? One cause is that the supplement shows historical statistics for a single year, rather than expected long-term future trends reflected in Moody's ratings. The rest can be explained by qualitative factors, which this report will discuss, including the following points:

- Credit statistics are not good indicators of Moody's gas company ratings, because companies manage them for regulatory reasons.
- Qualitative factors often determine regulated gas company ratings. They include regulation, management, event risk, ownership, and operational factors.
- Gas company ratings reflect the benefit of their regulated status and the proportion of regulated business.
- Deregulation is causing managements to take more risk, to diversify, and to pursue acquisition opportunities.
- Consolidation has raised the importance of event risk and ownership.
- Diversity of supply and demand helps to enhance a company's business position and to mitigate risks brought about by deregulation.

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Regulation

Regulation is a major factor in regulated gas companies' ratings, because the regulatory environment sets the stage for how the company is managed. Among the things that regulators determine or must approve:

- How much a company can earn on regulated assets
- What non-income taxes it will pay
- What costs can be recovered from customers, how much, and how soon
- What capital structure is desirable
- Financings
- Restructurings
- Acquisitions
- What diversified activities it can engage in and how it may interact with these affiliates
- What social obligations it will have to its customers and its community

In return for submitting to these many regulations, is LDCs and gas transmission companies (i.e., pipelines) enjoy the safety net that regulations provide in the form of protected markets and rates ensuring certain returns. LDCs, whose operations are substantially all regulated, have a strong average rating of A2 despite their financial measures, which would suggest a lower rating for an unregulated business. Diversified companies, which are more exposed to their unregulated activities, have an average rating of Baa1. Their regulated pipeline subsidiaries, which enjoy less regulatory insulation than do the LDCs, are rated to reflect the risks of their parent companies – usually one notch higher than the parent. Consequently, pipeline companies may have ratings that seem low given their financial measures.

A major reason why financial statistics have limited usefulness for the analysis of regulated gas companies is that regulators determine a company's allowed returns on equity (ROE) and tolerance of leverage. This motivates a regulated company to manage earnings, returns, and capital structure in a way that's different from unregulated companies. Thus, a high ROE may not simply be indicative of a company's performance, but the regulators' tolerance for the company's overearning on its allowed returns. Regulated operations' earnings and cash flows are more stable compared to unregulated businesses, so that regulated returns are set lower than unregulated returns. For example, LDCs allowed returns typically average about 11%.

Gas companies also manage their capital structure with their regulators in mind. A usual target capital structure for LDCs would be 50%/50% debt/equity mix, with occasionally a thin layer of preferred stock. Some companies that enjoyed a profitable 1997 found that their equity layer was getting too far above the 50% comfort zone. They remedied that by contributing equity to unregulated subsidiaries or by issuing debt to restore the balance. The reverse could be a problem, too, if the debt level gets too high. In addition to considering financial risk, management has a strong incentive to maintain its approximate 50% equity ratio in order to sustain its regulatory permitted returns. A shrinking equity base may prompt regulators to lower the company's allowed rate of return to reflect this lower equity base, which would reduce the revenues allowed under cost-of-service ratemaking.

Most LDCs are regulated by the state public service commissions. Some, such as in Texas, are regulated locally by municipalities. Interstate pipelines are governed federally, by the Federal Energy Regulatory Commission. Three gas companies – Consolidated Natural Gas, National Fuel Gas, Columbia Energy – are subject to the Public Utility Holding Company Act of 1935 (PUHCA), which is administered by the Securities and Exchange Commission. PUHCA limits subject companies to certain corporate structures and greatly restricts the type of investments they can make.

When we assess the impact of regulation on a rating of a gas company, we ask the following questions:

- What is the regulators' history of rate/tariff increases granted versus requested?
- How good is the relationship between the regulators and the company?
- Who are on the regulatory commission?
- What is the regulators' stance on deregulation?

- How open are regulators to alternative rate designs that may incorporate incentives for good performance?
- Do regulators allow a forward-looking test year, on which to base a rate increase?

  (In contrast, historical test years may be detrimental to fast growing utilities that have to first make large expenditures before they can file a rate case and eventually recover those expenditures. This regulatory lag may cause earnings and returns to fall in the interim.)
- How quickly do regulators conclude a rate case filing?

  (Regulatory lag is a concern not only when a company is investing heavily for a growing market. It is also a concern during periods of inflation.)
- Do they allow higher than industry average returns?
- What is their tolerance for earning above the allowed return?
- In the case of LDCs, do they grant weather normalization clauses that help to reduce sensitivity to weather?

Management

The overriding internal factor we explore when issuing a rating is management, since it is management that determines all other internal factors in a company, including its operations, its future strategy, its implementation, and its financing.

Gas utility managements are generally conservative. They tend to focus on steadiness of earnings that will enable them to continue raising their dividends incrementally every year. (LDCs have high payouts averaging about 70%, while diversified companies retain more earnings, because of the volatility of unregulated activities.) These managements are more willing to use hedging (e.g., for oil and gas prices, weather) to minimize earnings volatility than their unregulated counterparts, who may be less willing to hedge away earnings' upside potential. Many of them issue common stock regularly to maintain a strong balance sheet.

Nevertheless, risk appetites vary widely from company to company. As these companies face deregulation and greater competition, many companies are taking on more risk. And each company reveals its risk appetite in its strategy. Many companies are responding to deregulation by diversifying or acquiring other companies, both strategies that are likely to increase the risks of those companies (see Moody's Special Comment, "Unregulated Activities of Gas Utilities - The Risks and Rating Implications," March 1998).

Management is less risky when it is a team that is used to working toward a consistent long-term strategy. This smoothes transition when one executive retires, leaves, or is disabled. Although we do not advocate the entrenchment of mediocre management, sudden management departures often indicate internal turmoil. We also view favorably boards of directors that are independent and proactive.

Management track record is important as an indicator of future performance. Numerous or very large write-downs may reflect a history of overpaying for investments or an inability to produce expected returns. Another red flag is frequent reversal in strategy that suggests a lack of a consistent vision or an inability to carry it out.

Event Risk

Gas companies are becoming more prone to event risk, as deregulation of the gas and electric industries proceeds, and utilities acquire others in response to increasing competition. If PUHCA is repealed, we would expect to see more M&A activity.

Event risk is an important factor for those companies which have chosen to grow through acquisitions. Moody's assesses the type of acquisition a company will likely make (regulated or unregulated), the strategic fit, what the size of the acquisition would be, and how it would be financed.

Event risk, for example, has been a major factor for Southern Union Company, for whom we expect continuing improvement in its profitability and efficiency, and growing excess cash flows. Despite these improvements, its Baa3 rating continues to reflect event risk related to its strategy to grow by acquiring other utility companies. Such an acquisition may be large and will most likely be debt-financed, as was the

$400 million acquisition of Missouri Gas in 1994, which doubled Southern Union's assets and raised its debt-plus-hybrid preferreds-to-capital ratio to 70%. Since then, leverage has moderated (62% in the quarter ended March 1998), but another major acquisition could raise it again. Just under 50% of Southern Union's common stock is held by insiders and their families, which affects the company's willingness to issue additional equity for any major acquisitions.

Event risk was also a factor for K N Energy, Inc., a company that was making acquisitions to meet its asset growth target. We lowered K N's ratings from A3 to Baa2 at the time of its $3.5 billion acquisition of MidCon in January 1998. Although the acquisition raised K N's debt well into the 70% range, we did not lower it further, in part because the event risk had been diminished (we expect future acquisitions to be smaller and equity-financed). Other mitigating factors were the company's high proportion of regulated business, management's good record in integrating major acquisitions, and an improved business position.

Ownership

As consolidation of the electric and gas utility industries continues, ownership may become a more important issue. Two examples are ENSERCH Corp. and NorAm Energy Corp., two gas companies that were acquired by electric utilities in August 1997. We confirmed ENSERCH's senior debt at Baa2, when it was acquired by Texas Utilities Company, rated Baa3. We upgraded NorAm's senior debt to Baa1 from Baa3 when it was acquired by Houston Industries Incorporated, rated A3.

Although both companies' standalone 1997 financial results are weak for companies in their rating categories (they also reflect non-recurring items related to their mergers), their ratings reflect the various benefits of being part of large electric utility companies with substantial resources. For example, the merger will likely result in lower operating expenses through sharing of common services. We believe that both parent companies will maintain reasonable financial positions for their new gas companies. Affiliation with their new parent companies may ease their access to financing. Risks of ENSERCH and NorAm's international projects have been removed through transfer of those assets to other affiliates.

But this "halo effect" works both ways. Since March 1998, Moody's has had a negative outlook on Texas Utilities Company and its operating companies including ENSERCH, pending Texas Utilities issuing significant amounts of common equity to finance its $8 billion acquisition of The Energy Group PLC.

Operational Issues

For LDCs, we ask:

- What is the customer base? How fast is it growing?
- How strong and diverse is the local economy?
- How competitive is gas versus the alternative fuels available in the service territory?
- Does bypass by large industrial customers pose a risk?
- Does the LDC have flexibility and diversity of gas supply, such as ample storage capacity and access to multiple pipelines?

Gas distribution is a mature industry, with a industry average customer growth rate of under 2%. Assuming a favorable regulatory environment, good growth in the local economy will add to a company's margin and lessen the risk that it will unduly increase its risks through diversification. Large, diverse economies are better protected against cyclical downturns than those that are not.

LDCs have a high captive customer base of residential and small commercial customers that sustains them through business cycles. However, because most gas is used for space heating, most margins are earned in winter — the colder the better. Although large commercial and industrial customers have year-round energy needs, many can switch fuels or bypass the LDC by connecting directly to a pipeline.

In order to provide gas economically and reliably, it is necessary to have good access to diverse gas supply sources. It helps to be located near multiple pipelines and to have ample storage capacity.

Alternatively, an LDC can attain gas supply flexibility by having long-standing relationship with multiple gas producers and marketers, or joining a gas co-operative.

For pipelines, we ask:

- How diverse and plentiful is the gas supply?
- Does it have access to diverse and growing markets?
- How strategically located is the pipeline to interconnects with other pipelines?
- Does it have ample storage capacity?
- What is its utilization?
- How competitive is the market?
- Has it had to discount its rates?
- What proportion of capacity is under long-term, firm contracts?
- What is the contract life?

It is positive to the credit to have a large amount of capacity under long-term contracts to ensure a certain level of throughput. Diversified transmission companies commonly have a significant amount of their capacity committed to long-term contracts with sister distribution companies.

With pipelines facing increasing competition with each other (e.g., Chicago, Mid-Continent), capacity release and capacity turnback are concerns. Capacity release is when customers with firm contracts sell their unused capacity to others, often at discounted rates. Excess capacity could result in capacity turnback (when firm customers do not renew their contracts), as happened in the California market.

We monitor the contract lives of pipelines to see if there are any significant contracts coming due and the probability of renewal. Pipelines' major customers, the LDCs, are shortening the terms of their contracts in anticipation of unbundling (deregulation) — a trend that will reduce the certainty of future volumes for the pipelines.

Moody's also considers operating issues related to a company's unregulated activities. As such activities grow, the ratings may reflect more of the risks of those unregulated activities. For example, many gas companies have diversified into oil and gas exploration and production (E&P), a relatively high-risk industry whose median rating would be about the Ba-range. For that industry, we would assess the company's ability to replace its hydrocarbon reserves economically, its drilling success, and the value and production profile of those reserves, among other factors.

Key Quantitative Measures

The attached statistical supplement shows key credit statistics used in the quantitative analysis of gas companies. These would include measures of size, such as revenues, net income, and market capitalization. Bigger is not always better, but size does imply the degree of diversity — of businesses, customers, investors, etc. — which is positive for a credit. Market capitalization indicates the current measure of shareholders' equity and the degree of access to the stock market. LDCs, being monopolies in a limited market, are relatively small, with average revenues of $300 million. Diversified companies are much larger, with average revenues of $5 billion.

Profitability measures include operating income to either revenues or gross margin (which is revenues minus cost of gas sold) and operating expense to either revenues or gross margin. The latter is becoming increasingly important for LDCs, which are striving to improve their efficiency in preparation for more competition. Operating expense-to-gross margin is in the 40% range for LDCs, and many have improved this measure over the past few years.

Returns are generally low, reflecting the level of regulated returns. The average returns-on-equity is in the 10% range for both LDCs and diversified companies. Returns-on-assets range from 1% to 5%.

Degree of leverage is indicated by capitalization and coverage measures. The average ratio for debt-to-capital, including preferred stock and hybrids, is in the low 50% range for both LDCs and diversified companies. Fixed charge coverage (including fixed charges related to preferreds and hybrids) range from 1 to 5 times for LDCs and diversified companies.

Cash flow measures include retained cash flow-to-capital expenditures, retained cash flow-to-debt, and dividend payout. Moody's examines cash flow retained after dividends, because common dividends represent a commitment to shareholders that is kept except under very adverse conditions. Retained cash flow-to-capital expenditures indicate how much of its capital needs a company is covering through internal cash flow, and, conversely, how much external financing it needs. The average retained cash flow-to-debt is 15% for LDCs, 19% for diversified companies. Payout is high in the upper 60% range for both LDCs and diversified companies.

Conclusion

Moody's gas company ratings are a synthesis of many qualitative factors including regulation, management, event risk, ownership, and operational issues. Rating gas companies, therefore, involves a quantitative assessment of balance sheet strength and prospective earnings power combined with a qualitative assessment of the myriad of company-specific factors described above.

Quantitative measures have particular limitations in the case of gas companies, as regulations determine many of those financial measures. Gas company ratings also reflect the benefit of their regulated status. The more diversified a company, the lower its rating will be to reflect the risks of its unregulated activities. Management is a critical factor, since it runs the company and charts its future course. In the future, the prospect of further deregulation and greater competition will spur consolidation, increasing the importance of event risk and ownership as factors. Finally, Moody's looks at operational issues to assess the strength of a gas company's business position. A company is better positioned to meet cyclical changes when it has not only diverse markets and supply, but also a stable core margin that is underpinned by a large captive customer base or by long-term contracts.

Statistical Supplement

Key Quantitative Measures

LDC Peer Group

Rating	Company Name	Date	Gross Margin ($mm)	Net Income ($mm)	ROE (avg.)	ROA (avg.)	OI % GM	OE % GM	Fixed Charge Coverage	Market Cap ($mm) (4/30)	TD + Pref % Cap	RCF % Gross Capex	RCF % Total Debt	Common Div. % Inc. Avail.
	Nicor, Inc.									624				
Aa1	Northern Illinois Gas Company	12/31/97	602	107	15.6	4.8	34.9	25.1	4.6		54.2	107.6	13.7	100.9
	Indiana Energy, Inc.	09/30/97	208	21	7.0	3.0	36.7	38.3	2.8	711	42.6	57.4	19.0	125.8
Aa2	Indiana Gas Company													
	Peoples Energy Corp								1,271					
Aa2	North Shore Gas Company	09/30/97	77	15	16.1	6.3	37.5	35.3	5.7		41.9	158.6	28.5	91.3
Aa2	Peoples Gas Light and Coke Co	09/30/97	580	85	14.9	5.5	28.0	37.4	4.8		44.6	183.0	29.8	85.4
Aa2	Washington Gas Light Co	09/30/97	483	82	14.1	5.3	33.8	40.8	4.5	1,188	45.7	64.4	17.3	63.4
	Wicor Corp.									892				
Aa2	Wisconsin Gas Company	12/31/97	194	29	13.9	4.1	30.7	48.0	4.7		51.8	109.3	16.5	75.0
Aa3	Laclede Gas Company	09/30/97	249	32	13.2	4.6	27.2	43.7	3.6	435	50.5	102.0	17.2	70.5
	Energen Corporation									651				
A1	Alabama Gas Corporation	09/30/97	185	19	13.7	4.9	21.0	52.0	3.5		49.0	80.9	26.0	36.2
	Pacific Enterprise									3,158				
A1	Southern CaliforniaGas Company	12/31/97	1,679	184	13.1	3.5	24.2	54.7	5.0		56.4	141.2	16.3	67.8
	AGL Resources Inc.									1,178				
A2	Atlanta Gas Light Co	09/30/97	521	77	13.6	4.2	32.9	49.3	3.3		55.1	78.3	16.7	79.0
A2	Bay State Gas Company	09/30/97	211	26	11.1	3.7	25.1	55.1	2.9	512	54.9	31.2	6.3	81.4
	KeySpan Corporation	09/30/97	884	115	12.2	4.8	22.6	47.5	4.7	1,732	45.5	57.2	20.1	64.2
A2	Brooklyn Union Gas Co. [1]													
	MCN Energy Group Inc.									2,900				
A2	Michigan Consolidated Gas Co.	12/31/97	621	79	13.2	3.8	28.1	45.5	3.2		59.2	103.4	18.0	50.6
A2	Northwest Natural Gas Co	12/31/97	232	43	11.3	3.8	38.7	33.5	2.7	617	54.1	23.4	6.5	67.6
A2	Piedmont Natural Gas Co., Inc	10/31/97	315	54	13.4	5.0	36.8	40.3	3.6	1,028	49.8	88.3	19.5	66.6
A2	Public Svce Co of No Carolina	09/30/97	156	26	13.3	4.7	35.5	39.2	3.5	405	52.4	56.1	14.8	67.0
	Connecticut Energy Corp									297				
A2	Southern Connecticut Gas Co	09/30/97	119	16	12.2	4.0	31.2	41.8	2.7		55.7	85.9	14.1	74.4
	New Jersey Resources Corp									675				
A2	New Jersey Natural Gas Co	09/30/97	220	39	13.3	4.7	34.8	34.5	3.7		52.8	95.3	14.7	72.5

LDC Peer Group

Rating	Company Name	Date	Gross Margin ($mm)	Net Income ($mm)	ROE (avg.)	ROA (avg.)	OI % GM	OE % GM	Fixed Charge Coverage	Market Cap ($mm) (4/30)	TD + Pref % Cap	RCF % Gross Capex	RCF % Total Debt	Common Div. % Inc. Avail.
A3	Atmos Energy Corporation	09/30/97	330	24	9.5	3.0	20.2	56.3	2.0	873	59.7	6.6	1.7	110.8
	Eastern Enterprises									865				
A3	Boston Gas Company	12/31/97	302	39	15.4	4.2	28.9	56.4	3.5		52.6	118.1	21.3	49.9
	CTG Resources, Inc.									253				
A3	Connecticut Natural Gas Corp	09/30/97	136	17	10.1	3.7	32.9	40.0	3.6		47.8	89.6	14.1	94.7
	UGI Corp.									743				
A3	UGI Utilities, Inc.	09/30/97	222	39	18.4	5.4	34.8	55.5	3.6		57.5	89.5	15.6	66.9
Baa1	Cascade Natural Gas Corp	09/30/97	91	11	9.2	3.3	28.4	39.0	2.6	176	55.7	38.9	8.5	103.4
Baa1	Colonial Gas Company	12/31/97	85	16	13.6	4.3	38.8	40.8	3.9	248	57.1	60.8	14.1	71.3
	OGE Energy Corp.									2,219				
Baa1	Enogex Inc.	12/31/97	124	16	12.0	4.1	27.3	46.5	3.2		50.4	70.9	29.3	24.6
Baa1	NUI Corporation	09/30/97	207	20	9.9	2.7	22.1	46.1	2.4	318	61.5	71.9	10.6	53.8
	South Jersey Industries Inc									296				
Baa1	South Jersey Gas Company	12/31/97	146	22	13.3	3.2	35.2	33.2	2.4		61.9	44.5	8.3	76.9
	Texas Utilities Company									9,510				
Baa2	ENSERCH Corporation	12/31/97	560	-250	-34.7	-7.5	11.9	64.3	0.5		52.1	5.3	1.0	-6.7
Baa2	Southwest Gas Corporation	12/31/97	405	16	4.3	1.0	24.7	49.6	1.4	632	71.6	81.2	13.7	134.7
	Pennsylvania Enterprises, Inc.									225				
Baa3	PG Energy Inc.	12/31/97	80	12	10.6	3.0	36.8	37.3	2.5		56.0	28.6	5.7	1.2
Baa3	Southern Union Company	06/30/97	268	19	7.4	1.9	26.7	41.0	1.7	472	64.6	103.3	13.6	N/A
	Peer Group Averages		**338**	**34**	**10.8**	**3.6**	**29.9**	**44.1**	**3.3**		**53.7**	**78.5**	**15.2**	**68.4**

[1] Rating represents guaranteed revenue bonds

Diversified Peer Group

Rating	Company Name	Date	Total Revenue ($mm)	Net Income ($mm)	OI % Rev	OE % Rev	ROE (avg.)	ROA (avg.)	Fixed Charge Coverage	Market Cap $mm (4/30)	TD + Pref % Cap	RCF % Gross Capex	RCF % Total Debt	Common Div. % Inc. Avail.
A1	Consolidated Natural Gas Company	12/31/97	5,710	304	9.7	29.2	13.3	4.9	5.0	5,498	45.2	89.9	24.1	60.8
P-1	Questar Corporation [1]	12/31/97	933	105	18.2	21.9	12.9	5.6	4.3	1,781	44.5	89.2	26.3	48.7
A2	National Fuel Gas Company	09/30/97	1,266	115	18.7	22.8	13.0	5.2	3.9	1,756	46.0	98.2	27.0	56.6
A2	Equitable Resources, Inc.	12/31/97	2,151	78	6.3	11.8	10.0	3.5	3.7	1,200	46.1	28.9	10.4	54.7
A2	MDU Resources Group, Inc.	12/31/97	608	55	18.4	54.2	14.6	4.9	3.7	1,188	43.7	92.2	33.4	60.7
A2	ONEOK Inc	08/31/97	1,162	59	11.1	18.1	13.4	4.8	3.5	1,266	45.9	106.9	24.7	56.3
A3	Duke Capital Corporation PanEnergy Corp.	12/31/97	11,915	380	7.0	24.6	11.8	3.6	3.9		47.8	113.7	22.7	21.7
A3	PG&E Corporation PG&E Gas Transmission, Northwest Corp	12/31/97	240	34	52.0	26.4	7.3	2.3	2.4	13,522	56.6	101.2	6.8	186.4
A3	Sonat, Inc.	12/31/97	4,175	176	7.1	13.4	10.9	4.3	3.6	3,796	47.8	46.5	21.6	52.7
Baa1	Columbia Energy Group (The)	12/31/97	5,054	273	10.1	19.0	16.3	4.3	3.2	4,509	56.6	121.0	21.8	18.3
Baa1	MCN Energy Group Inc.	12/31/97	2,208	142	10.7	17.8	14.7	3.6	2.5	2,900	65.2	47.6	12.4	51.2
Baa1	Houston Industries Incorporated NorAm Energy Corp.	12/31/97	5,858	67	4.5	10.7	4.1	1.3	1.9	8,221	43.2	154.6	15.0	28.8
Baa2	El Paso Natural Gas Company	12/31/97	5,638	186	9.2	12.0	10.3	2.0	2.4	4,456	60.5	254.6	24.8	46.2
Baa2	Enron Corp.	12/31/97	20,273	105	3.4	6.9	1.9	0.4	1.1	15,309	57.4	15.0	3.4	276.1
Baa2	K N Energy, Inc.	12/31/97	2,145	77	6.6	9.2	13.7	3.9	3.2	1,866	62.7	26.8	8.2	44.2
Baa2	Williams Companies, Inc. (The) [2]	12/31/97	4,410	271	20.7	67.9	7.8	2.0	2.2	10,186	61.3	49.9	10.9	65.6
Baa2	Southwestern Energy Company	12/31/97	276	19	18.8	21.4	8.7	2.7	2.7	287	57.5	88.2	26.1	31.7
Baa3	Coastal Corporation (The)[3]	12/31/97	9,653	302	7.6	17.6	9.6	2.4	2.4	7,552	57.3	65.0	17.0	14.9
	Peer Group Averages		**4,649**	**153**	**133**	**22.5**	**10.8**	**3.4**	**3.1**		**52.5**	**88.3**	**18.7**	**65.3**

[1] Questar's subsidiaries Questar Gas Company and Questar Pipeline Company are rated A1.
[2] Williams Companies incurred a $79 million extraordinary items charge.
[3] Coastal Corporation incurred a $90 million extraordinary items charge.

US Gas Company Ratings/Outlooks

ISSUER	LT-RATING	ST-RATING	OUTLOOK
AGL Resources Inc.	Baa1	—	
. AGL Capital Trust	"a3"	—	
. Atlanta Gas Light Company	A2	—	
Atmos Energy Corporation	A3	—	
Bay State Gas Company	A2	P-1	Negative
Cascade Natural Gas Corp.	Baa1	—	
Coastal Corporation (The)	Baa3	—	Positive
. American Natural Resources	—	—	
.. ANR Pipeline Company	Baa2	—	Positive
. Colorado Interstate Gas Company	Baa2	—	Positive
Colonial Gas Company	Baa1	—	
Columbia Energy Group (The)	Baa1	P-2	
Connecticut Energy Corp	—	—	
. Southern Connecticut Gas Company	A2	—	
Consolidated Natural Gas Company	A1	P-1	
CTG Resources, Inc.	—	—	
. Connecticut Natural Gas Corporation	A3	—	
Duke Capital Corporation	(P)A3		
. PanEnergy Corp.	A3	—	
.. Panhandle Eastern Pipeline Company	A2	—	
.. Texas Eastern Corporation	A3	—	
.. Texas Eastern Transmission Corporation	A2	—	
Eastern Enterprises	—	—	
. Boston Gas Company	A3	P-2	
El Paso Natural Gas Company	Baa2	P-2	
. El Paso Gas Marketing Company	Baa2	—	
. El Paso Lng Co	Aaa	—	
. El Paso Tennessee Pipeline Co.	Baa3	—	
.. Tennessee Gas Pipeline Company	Baa2	—	
... El Paso Energy Credit Corporation	Baa2	—	
. El Paso Energy Capital Trust I	"baa3"	—	
. El Paso Energy Capital Trust II	(P)"baa3"	—	
. El Paso Energy Capital Trust III	(P)"baa3"	—	
Energen Corporation	Baa1	—	
. Alabama Gas Corporation	A1	—	
Enron Corp.	Baa2	P-2	
. Enron Capital LLC	"baa3"	—	
. Enron Capital Resources, L.P.	"baa3"	—	
. Enron Capital Trust I	"baa3"	—	
. Enron Capital Trust II	"baa3"	—	
. Enron Oil & Gas Co.	A3	P-2	
. Internorth, Inc.	Baa2	—	
. Northern Natural Gas Company	Baa1	—	
. Transwestern Pipeline Co.	Baa2	—	
Equitable Resources Capital Trust I	"a2"	—	
Equitable Resources, Inc.	A2	P-1	
Houston Industries Incorporated	Baa1	P-2	
. NorAm Energy Corp.	Baa1	P-2	
.. Noram Financing I	"baa2"	—	
Indiana Energy, Inc.	—	—	
. Indiana Gas Company, Inc.	Aa2	P-1	
K N Energy, Inc.	Baa2	P-2	
. K N Capital Trust I	"baa3"	—	
. K N Capital Trust III	"baa3"	—	
KeySpan Corporation	—	—	
. Brooklyn Union Gas Company, The	—	P-1	
Laclede Gas Company	Aa3	P-1	
MCN Energy Group Inc.	Baa1	—	Negative
. MCN Financing I	"baa2"	—	Negative
. MCN Financing II	(P)"baa2"	—	Negative
. MCN Financing III	"baa2"	—	Negative
. MCN Financing IV	(P)"baa2"	—	Negative
. MCN Financing V	"baa1"	—	Negative
. MCN Financing VI	"baa1"	—	Negative
. MCN Investment Corporation	Baa2	P-2	Negative
. MCN Michigan Limited Partnership	"baa2"	—	Negative
. Michigan Consolidated Gas Company	A2	P-1	

US Gas Company Ratings/Outlooks *(Continued)*

ISSUER	LT-RATING	ST-RATING	OUTLOOK
MDU Resources Group, Inc.	A2	P-1	
National Fuel Gas Company	A2	P-1	Negative
New Jersey Resources Corp	—	—	
. New Jersey Natural Gas Company	A2	P-1	
Nicor Inc.	"a1"	P-1	
. Northern Illinois Gas Company	Aa1	P-1	
Northwest Natural Gas Company	A2	P-1	
NUI Corporation	Baa1	—	
. Elizabethtown Gas Company (IRB)	Baa1	—	
OGE Energy Corp.	—	P-1	
. Enogex Inc.	Baa1	—	Negative
ONEOK Inc	A2	—	
Pacific Enterprises	—	—	
. Southern California Gas Company	A1	P-1	
Pennsylvania Enterprises, Inc.	—	—	
. PG Energy Inc.	Baa3	—	Positive
Peoples Energy Corp.	—	P-1	
. North Shore Gas Company	Aa2	P-1	
. Peoples Gas Light and Coke Company	Aa2	P-1	
PG&E Corporation	—	P-1	
. Pacific Gas & Electric Company	A2	P-1	
.. PG&E Capital I	"a2"	—	
.. Pacific Energy Fuels Company	—	P-1	
. PG&E Gas Transmission Corporation(GT)	—	—	
.. PG&E Gas Transmission, Northwest Cor	A3	P-2	
.. PG&E Gas Transmission-Texas(GTT)	Baa2	—	
Piedmont Natural Gas Company, Inc.	A2	—	
Public Service Co. of North Carolina, In	A2	—	
Questar Corporation	—	P-1	
. Questar Gas Company	A1	—	
. Questar Pipeline Company	A1	—	
Sonat, Inc.	A3	P-2	Negative
. Southern LNG Inc. (IRB)	A2	—	Negative
. Southern Natural Gas Co.	A2	—	Negative
South Jersey Industries Inc	—	—	
. South Jersey Gas Company	Baa2	—	
.. SJG Capital Trust	"baa3"	—	
Southern Union Company	Baa3	—	
. Southern Union Financing I	"ba1"	—	
Southwest Gas Corporation	Baa2	—	
. Southwest Gas Capital I	"baa3"	—	
Southwestern Energy Company	Baa2	—	
Texas Utilities Company	Baa3	P-2	
. ENSERCH Corporation	Baa2	—	
. ENSERCH Capital I	(P)"baa3"	—	
UGI Corporation	—	—	
. UGI Utilities, Inc.	A3	—	
Washington Gas Light Company	Aa3	P-1	
Wicor Corp	—	—	
. Wisconsin Gas Company	Aa2	P-1	
Williams Companies, Inc. (The)	Baa2	—	
. Williams Gas Pipelines Central, Inc.			
. Northwest Pipeline Corporation	Baa1	—	
. Transco Energy Company	Baa2	—	
.. Texas Gas Transmission Corporation	Baa1	—	
.. Transcontinental Gas Pipe Line Corpo	Baa1	—	
. Williams Capital I	"baa3"	—	
. Williams Capital II	(P)"baa3"	—	
. Williams Holdings of Delaware, Inc.	Baa2	P-2	
.. Williams Delaware Capital I	(P)"baa3"	—	
.. Williams Delaware Capital II	(P)"baa3"	—	

Natural Gas Watchlist

Ratings Under Review as of 6/30/98

Note: Ratings in bold type are currently under review. The long-term rating listed is for the most senior debt rated by Moody's.

Issuer	Long-Term	Short-Term	Possible Direction	Date Reviewed
Bay State Gas Company	**Baa1**	**P-1**	Downgrade	12/18/97
MCN Energy Group Inc.	**Baa1**		Downgrade	6/25/98
MCN Financing I	**"baa2"**		Downgrade	6/25/98
MCN Financing II	**(P)"baa2"**		Downgrade	6/25/98
MCN Financing III	**"baa2"**		Downgrade	6/25/98
MCN Financing IV	**(P)"baa2"**		Downgrade	6/25/98
MCN Financing V	**"baa1"**		Downgrade	6/25/98
MCN Financing VI	**"baa1"**		Downgrade	6/25/98
MCN Investment Corporation	**Baa2**	**P-2**	Downgrade	6/25/98
MCN Michigan Limited Partnership	**"baa2"**		Downgrade	6/25/98

Natural Gas Peer Groups

LDC Peer Group*	Diversified Gas Peer Group*
Alabama Gas Corporation	Coastal Corporation, The
Atlanta Gas Light Company	Columbia Energy Group, The
Atmos Energy Corporation	Consolidated Natural Gas Company
Bay State Gas Company	Duke Capital Corporation
Boston Gas Company	El Paso Natural Gas Company
Cascade Natural Gas Corp.	Enron Corp.
Colonial Gas Company	Equitable Resources, Inc.
Connecticut Natural Gas Corporation	K N Energy, Inc.
Enogex Inc.	MCN Energy Group Inc.
ENSERCH Corporation	MDU Resources Group, Inc.
Indiana Gas Company	National Fuel Gas Company
KeySpan Corporation	NorAm Energy Corp.
Laclede Gas Company	ONEOK, Inc.
Michigan Consolidated Gas Company	PG&E GasTransmission, Northwest Corporation
New Jersey Natural Gas Company	Questar Corporation
North Shore Gas Company	Sonat, Inc.
Northern Illinois Gas Company	Southwestern Energy Company
Northwest Natural Gas Company	Williams Companies, Inc., The
NUI Corporation	
Peoples Gas Light and Coke Company	
PG Energy Inc.	
Piedmont Natural Gas Company, Inc.	
Public Service Co. of North Carolina, Inc.	
South Jersey Gas Company	
Southern California Gas Company	
Southern Connecticut Gas Company	
Southern Union Company	
Southwest Gas Corporation	
UGI Utilities, Inc.	
Washington Gas Light Company	
Wisconsin Gas Company	

** Excludes Non-US Companies*

Moody's Approach To Rating Gas Transmission And Distribution Companies

Rating Methodology

Report Number
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Rating Methodology

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RATING METHODOLOGY

The Importance of Being Economic: Credit Risks of US Merchant Power Plants

Merchant plant analysis is an evolution of the fundamental analysis that Moody's has long undertaken when rating electric utilities and independent power projects (IPP). Currently, very few pure merchant plants — which sell energy and capacity into an open market, rather than under contract like an IPP — exist in the United States. However, more are likely to arise as formerly vertically integrated utilities sell off their generating assets as part of the gradual deregulation of the market for electric power.

Moody's believes that the rating of a merchant plant will be lower than that of a traditional single-asset independent power producer with the same capital structure and cash flow coverage of interest because of the greater volatility of its cash flows. Still, the better able a project is to absorb changes in prices and volumes, the higher the rating will be. We believe that an investment-grade-rated merchant power plant will have a break-even point, where it fully covers its debt service obligations, between 30% and 50% below a reasonable market forecast price. Liquidity, including the extent to which internally generated funds cover cash needs and the quality and quantity of available lines of credit, is another important measure of a plant's ability to weather price or volume fluctuations.

Moody's also believes that generators with the cheapest power on an all-in, per unit basis will have a clear advantage over higher-cost producers and thus bear higher ratings. Because consumers cannot generally differentiate the product in any other manner, price will be the key factor in the buying decision, as with any other commodity product. Moody's makes comparisons between each plant and its competitors on the basis of fuel costs; selling, general, and administrative costs; environmental compliance costs; labor costs; and total costs. We also look at debt per megawatt-hour in assessing the competitiveness of a given plant.

The type of demand the plant fulfills is also a key rating determinant. Generators that meet baseload demand are required around the clock and therefore will have relatively more predictable cash flows and – all other things equal – higher ratings. Intermediate plants – which meet expected increases in demand, such as summer air-conditioning – and peakers – which meet unexpected demand, such as on an unusually hot summer day – will face greater uncertainty in their dispatch and therefore in their cash flows.

The composition of the customer base is also important in assessing the prospects of a new plant. In general, we believe that some customers, such as large industrials, will maintain relatively constant demand in the face of electric price increases, while the demand of smaller customers will be more price elastic. We also look at general demographic trends within the region that the plant will serve to determine likely sources of new demand growth and long-term trends in per capita consumption of power.

Moody's looks closely at the market study provided by the independent consultant. However, our assessments of market prices deviate from these studies in several key areas, including projections of natural gas prices, the impact of technological advances on the dispatch of older plants, and the extent to which a market for capacity will develop. We view cash flows from capacity payments as more speculative than those derived from power sales and therefore discount them more heavily in our analysis.

continued on page 3

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Sector Overview

A merchant plant is a generator that sells its energy and capacity into an open market and as a result is exposed to fluctuations in sales volumes and prices. By this definition, very few pure merchant power plants exist in the United States, where deregulation is still slowly unfolding. However, Moody's rates several hybrid merchant plants, which sell a portion of their power under contract and a portion into the market, or whose contracts will eventually give way to open market sales.

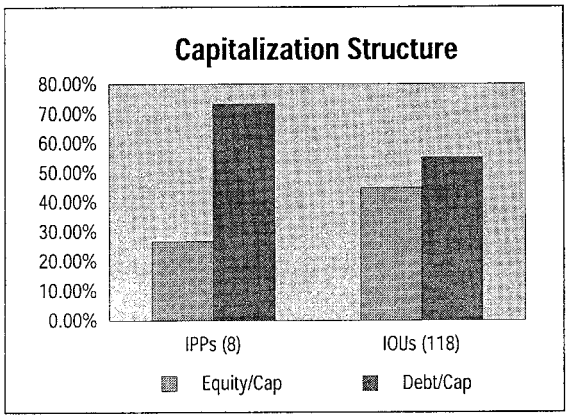
Pure merchant plants are likely to arise as formerly vertically integrated utilities in the US sell off their generating assets in exchange for the opportunity to recover past investments rendered uneconomic by deregulation. Several such divestitures have taken place in the Northeast and California over the past few years. And more power plants are slated for auction in 1999, piquing the potential buyers' interests in project financing for their purchases and investors' interests in their potential as fixed-income investments.

INDEPENDENT POWER PROJECTS VERSUS MERCHANT POWER PROJECTS

Most of the rated portfolio of single-asset power plants enjoy purchase power contracts with (investment-grade rated) regulated utilities. Under the Public Utilities Regulatory Policy Act of 1978, or PURPA, an incentive was created for independent power producers to build new plants financed on the strength of an offtake contract with a utility. This incentive required that new, non-utility entrants build and own at least 50% of new plant, which would begin to address, slowly, market power concentrations and diversify the nation's energy sources.

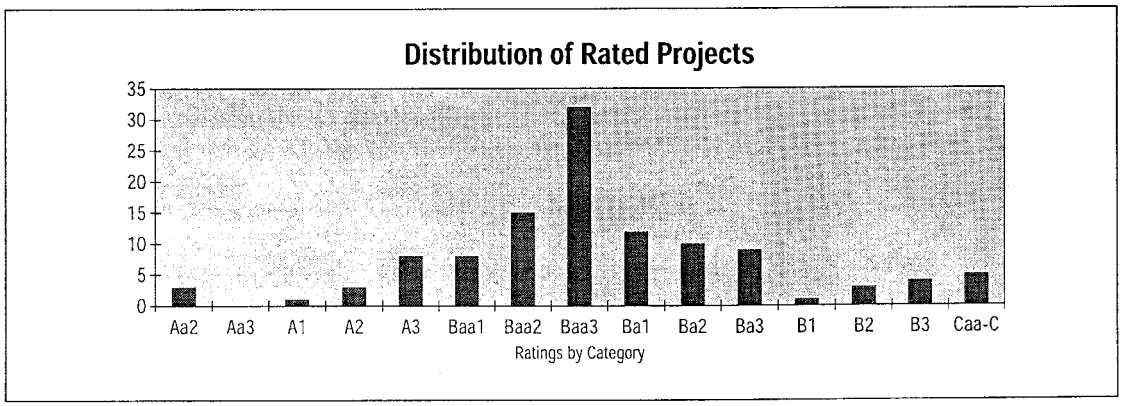
Since Federal law required the local regulated utility under certain conditions to buy power from the non-utility generator, as well as provide access to transmission, it was in the utility's best interest to negotiate some control over when the plant would generate power or be "dispatched".

From the standpoint of the new owner, a contract with a creditworthy utility that could pass contract costs along to ratepayers (after review by regulators) made the plant financeable with little equity investment. While few utilities had less than 40% equity in their capital structure, IPPs generally had 25% or less.



Furthermore, project sponsors and financial advisors structured the financings in a way to achieve the minimum investment-grade level rating of Baa3, as they judged that rating to give them access to a high-quality pool of investors and lower interest costs, while maintaining attractive rates of return on a relatively low equity investment.

From Moody's standpoint, the analysis of these transactions centered on the terms of the contract and how it defined the revenues of the power plant. Close attention was paid to whether the plant could be built and operated to the specifications of the contract, which then virtually assured the revenues.



"HYBRIDS" LINK BETWEEN IPPS AND MERCHANTS

In the post-Three Mile Island and energy-shock world of the 1980s and 1990s, PURPA was successful in shifting up to 8% of US generating resources to owners other than utilities. Still, this did not represent a competitive market. It took the Federal Energy Regulatory Commission (FERC) Orders 888 and 889, in response to the National Energy Policy Act of 1992, to set the stage for open competition in the electric generating sector and to spur the development of merchant power plants.

While historically there have been few legal restrictions on building a merchant power plant, practical considerations, such as access to transmission and customers necessitated the involvement of incumbent utilities in the building of non-utility generating plants. The only exception was an "inside-the-fence" power plant dedicated to a specific industrial user or complex. Since the utilities were charged with resource planning and had the customers captive, it only made sense that a non-utility generator would negotiate a power purchase contract with a utility to provide new generating capacity when required.

Now, as deregulation comes to the global markets we are beginning to see transactions that do not have 100% contracted revenues. In fact, three projects, Sutton Bridge in the UK, Kincaid Generation in the Midwestern US and Calpine Pasadena in Texas presented projects with a level of "merchant" or non-contracted sales risk. We classify these transactions as "merchant hybrids." In addition, similar transactions have been financed by commercial banks as well as on the corporate balance sheets of some sponsors.

In the cases of Sutton Bridge and Kincaid, the contracted revenues allowed the projects to achieve compelling economics such that the cash flow coverages of debt in a pure "merchant" environment were sufficient to achieve an investment grade rating of Baa3. In the case of Calpine Pasadena, which has since been refinanced with corporate debt, the qualifying facility status of the project and the sales to Phillips Petroleum were key ratings factors. Under Federal law a utility is required to purchase electricity from a qualifying facility. However, the uncertainty of the Texas market and of future cash flows kept the project from an investment grade rating and resulted in the initial assignment of a Ba2 as the Texas market develops. In Texas, the market is isolated and the large utilities have dominant market share and control. Furthermore, in the Houston market of Calpine Pasadena, Houston Light and Power received a 20% reduction in wholesale rates and only a 3% reduction in residential rates. It is with the much lower wholesale rates that the merchant power sales from the Pasadena plant competes.

DIVESTITURE PAVES WAY FOR PURE MERCHANT PLANTS

In the United States, the merchant power market is getting its biggest push from the very utilities that once feared it most. Since 1996, individual states have started to open their markets to competitive forces, at least in the generating sector. Not surprisingly, those states thought to be able to benefit most from an open market (i.e. high cost states) have been the first to move to a more competitive structure. As a trade-off for recovery of costs deemed unrecoverable in an open market, "stranded costs", utilities are divesting assets which are then becoming the basis for the competition.

Merchant Plant Category

	Megawatts	Financing @ $500/MW (Billions)
Operating	11,000	$5.5
Under Construction	5,000	$2.5
Under Development	8,500	$4.3
Reported	42,000	$21.0
Utility Divestitures	62,000	$31.0
Total	**128,500**	**$64.3**

Source: McGuire, Woods, Battle & Boothe LLP and Moody's internal data

As the chart to the right shows, utility asset divestitures comprise a large portion of the potential merchant power asset base. The chart illustrates not only how divestitures will increase the number of merchant power plants, but, assuming average costs, the potential capital market investment required to fund the merchant power market. The figures here are not meant to be a forecast of actual capital market issuances, but to be a guide to the increasing importance of merchant power plants in the next few years. Since the numbers are substantial at roughly $65 billion dollars, so is the market interest in the ratings of merchant power plants.

Analytic Framework

To adapt a basic tenet of physics, risk is neither created nor destroyed, only transferred. In considering the credit risks of merchant power plants, it is important to recall that the fundamental risks posed by such investments are not new, they have simply been borne by other parties. As power markets deregulate or "unbundle," these risks are shifted from the former vertically integrated utilities and must be allocated among the companies now performing their functions. Merchant plant analysis is therefore an evolution of the fundamental analysis we have long undertaken within the power group when rating integrated utilities and independent power projects.

That being said, the environment for all power generators is changing in ways that directly impact the ability of corporate entities and project companies to repay their debt, especially over the longer term. This transition to competition creates an added layer of uncertainty which must be factored into all ratings.

While this uncertainty affects all participants in the industry, it does not affect them equally. We see a divergence in power-related ratings across the United States, as well as around the world, as competitive markets develop at different paces. While most current activity is focused on the US market, it is important to remember that the analysis of merchant plants and the ratings attached to them will reflect the lessons we have learned from markets that have deregulated before the US.

In this phase of transition in the US, we believe that new market participants like merchant power plants face greater risks than they would in a fully developed competitive market. In general, this period of transition is intended not only to allow existing electric utilities to restructure their operations to compete in a new environment but also to ensure that the electric system in the United States maintains its high quality of service while the regulatory compact gives way to a competitive environment. Whatever the rationale, it is clear that the playing field has not yet been leveled, leaving new merchant plants at a competitive disadvantage to still dominant and protected utilities.

UNCERTAINTY AND VOLATILITY SET MERCHANT POWER APART

Overall, the rating of a merchant plant will be lower than that of a traditional single-asset IPP with the same capital structure and cash flow coverage of interest because of the greater volatility and uncertainty of its cash flows in an open market.

Historically, revenues of a power plant were determined by formula in the Purchase Power Agreement (PPA). The formulas used were negotiated and ranged from a simple fixed energy payment to a more sophisticated formula that was indexed to changes in fuel prices and inflation or tied to the "avoided costs" of the purchasing utility. Under ideal conditions, the PPA shielded the project from uncontrollable changes in the cost of inputs such that the real risk to the owner of the generating plant was whether the plant could operate to the specifications of the PPA.

In a deregulated market, electricity will trade and be priced as a commodity and generating plants will face changes in volumes and prices which will result in boom and bust cycles. Market participants will react to these cycles with decisions to expand or contract capacity, which will fuel more cycles. Managers will be forced to forecast demand and will face the repercussions of both over-forecasting, as excess capacity will lower prices and returns, and under-forecasting, as a capacity shortage will invite new competitors and/or re-regulation. And competitors will exploit poor management decisions in a way that was impossible in a regulated environment.

ELECTRICITY IS A COMMODITY, WITH A DIFFERENCE.

Moody's believes that those generators with the cheapest power on an all-in, per unit basis will have a competitive advantage over higher-cost producers. In general, consumers can not differentiate electrons provided by generators and therefore, price will be the key factor in the buying decision. This is the quintessence of a commodity product.

By extension, in a commodity market, an oversupply of power will cause prices to decrease and a shortage of power will cause prices to rise. The market will take its cues from the price of electricity, adding capacity when demand (or forecasted demand) exceeds supply, and retiring capacity when demand falls. This has been the experience in other deregulated, basic industries, and Moody's draws on this experience in its analysis of the future power markets.

However, complicating this economic analysis is the nature of the product itself. Electricity, with minor exceptions, can not be stored for later consumption. Therefore, demand is measured from moment to moment. Since generating facilities can not supply power instantaneously, there is a need to have excess capacity in order to provide the flexibility customers currently demand.

The ability of customers to have power at any moment is therefore a service which is separate from the generation of power. In the future, customers will be differentiated based on their demand for electricity services, which could be priced separately from the electric power provided by a generator.

DEREGULATION BRINGS LOWER PRICES OVER TIME

While our first assumption about the behavior of the markets in general is that prices will fluctuate based on economic fundamentals, our view is further refined to reflect the belief that prices will, in a broad sense, decline over time. The impetus behind deregulation is, after all, the idea that power industry participants will be able to deliver electricity more cheaply as competition forces them to improve the efficiency of their operations.

The actions of new, so-called "irrational" market entrants will also tend to lower overall prices and decrease the cash flow of all market participants over time. An irrational investor generally is one who requires a lower return on capital or is willing to assume different risks than current market participants. For such an investor, a lower return than that existing market participants are receiving may still represent the most efficient allocation of capital. Furthermore, the new entrant may be able to allocate risks more effectively and therefore accept a lower return than the current market might suggest.

Of course, these trends are on an aggregate basis, so prices within customer classes and for various types of demand could well fluctuate. Still, a forecast by any generator that the price of power will rise in its market would need to be tested in order to determine that the forecast is consistent with the idea that overall market prices will trend downward over time.

COMPETITION SPURS INNOVATION

As deregulation in the telecommunications industry demonstrates, once protected industries are opened to new competitors the result can be a boon to innovation. It was only after the break-up of AT&T that the cellular communication industry began to grow and invest. This was due in part to the change in the regulatory environment, as well as the sense that the playing field was even enough to justify research and development.

Moody's expects the same type of phenomenon in the power industry. While such developments could be either positive or negative for existing fixed-income investors in certain securities, the increase in service options and growth prospects should improve for the industry as a whole.

The Credit Risks of Merchant Power Plants

Rating pure merchant plants is dependent on a set of variables the importance of which change with each situation. Simply put, a critical rating factor for one plant might not need to be considered for a second plant. As the market evolves, there will certainly be greater predictability, but Moody's maintains that the weighting of ratings factors will be unique for each rating.

That said, we know that as a group merchant power plants face different risks from traditional contracted plants as a result of the market structure they face. This market structure, as we stated above, is characterized by traditional commodity-type risks of changes in volumes and prices, which heighten volatility in the cash flows.

Therefore, while the operational and technological risks faced by "traditional" power projects are still risks that receive great attention in credit analysis of a project, the investor in a merchant plant must assess also the market related risks that are now borne by the project and not the purchasing utility; namely, volume or demand risk and price risk.

VOLUME RISK: THE DEMAND FOR POWER

Merchant power plants (MPPs) face volume risk. This risk was traditionally absorbed by the utility, but in an uncontracted world each individual generator will be subject to the hour-by-hour fluctuations in the demand for power.

In assessing the risk profile of a merchant plant, Moody's will look to the type of demand risk a project is assuming and if the plant is well suited to supply that demand. Moody's believes that future power demand is likely to be differentiated based on its character: that is whether it is baseload power, which is demanded around the clock; intermediate load, which meets an expected increase in demand in response to expected occurrences (summer air-conditioning); or peak load which is used to meet unexpected demand (an unusually hot summer day or days).

Generators which meet baseload demand will, by definition, have relatively more predictable cash flows and — all other things equal — higher ratings. Intermediate plants and peakers will face greater risks given the uncertainty in demand they must incorporate in their business plan.

A second element of volume risk is the assumption that the demand for power is perfectly inelastic — or that consumers will require the same amount of power at any price. While Moody's would agree that the demand for electricity is overall less elastic than demand for most goods and services, it is clear that for different classes of customers the demand for power has different elasticity. This is economics-speak for the fact that some customers will pay almost any price for electricity (usually industrials) and some customers will use less electricity as the price rises. It is true that in developed economies electric customers have less tolerance for an unreliable electric system and, more importantly, they are willing and able to pay extra for that reliability. From a ratings perspective the composition by customer of the demand is important in assessing the prospects of each new plant.

A longer-term element of volume risk is the growth of electricity demand in the area in which a plant can supply power. This analysis is tied to the economic viability of a city, state or region compared to other areas, and focuses on broad demographic trends such as:

- Is population growing?
- Are new businesses being created? What is the depth of the business creation? Is it from one or two large firms or is it many small firms?
- Is there infrastructure to support growth?

Likewise, questions regarding individual demand for power or per capita consumption of power would affect a merchant plant. All of these questions would need to be answered on a market-by-market basis if there is more than one merchant generating station, or for the single market in the case of a single asset generating station.

PRICE RISK: THE SUPPLY OF POWER

The recurring theme of merchant power risk is increased uncertainty and increased volatility. Nowhere in the analysis is this phenomenon more evident than in the projection of the future price of power in a given market.

Moody's relies on issuers and market consultants to provide us with forecasts of the future price of power. The key to this analysis is the cost of supply at any given level of demand. It is this underlying cost of all market suppliers of power that will be determinate in the market price of power.

Consequently, a merchant plant's cost position relative to its current and potential competitors is one of the primary factors in assigning a rating. While determining the costs of a single plant is rather straightforward, determining its position relative to others and how each party may bid into an open power market is more complex. Since we have no fully functioning competitive power market, we must model the impact of how markets will develop and how certain participants will behave.

Moody's believes that a merchant plant will be subject to swings in prices as power markets develop. The better able a project is to absorb changes in prices (and changes in volumes) the higher its rating will be. Our belief is that an investment-grade-rated merchant power plant will have a break-even point, where it fully covers its debt service obligations, between 30% and 50% below a reasonable market forecast price.

The amount of the discount is determined by the characteristics of the market and the reasonableness of the market forecast assumptions. Therefore, our first step in assessing the price risk of a merchant plant is to assess the assumptions made in the market study.

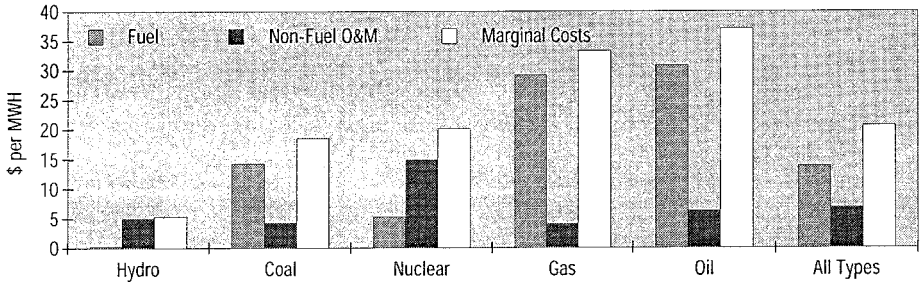
THE MARKET STUDY

The market study is intended to provide an assessment of the market structure and behavior of participants that then allows a credible projection of market prices. The predictive power of a market study is only as good as the assumptions that underlie the analysis. Since the ultimate goal of the market study is to predict the price of power, most studies use economic forecasts to derive demand and focus on the supply elements. Some of the key areas addressed in the market study are explored below.

Production Costs and Dispatch Curves

The starting point for the market study is to rank the existing and proposed capacity on the basis of the variable cost of production for each plant. In a competitive market, each generating plant would produce electricity or be dispatched according to the lowest marginal cost to produce the next unit of power, until the last unit of demand is fulfilled. Graphically representing this merit order of dispatch produces a dispatch curve.

Since fuel costs comprise a large portion of the variable costs incurred to produce power, those plants with low per unit fuel costs usually form the lowest end of the dispatch curve, i.e. are the cheapest marginal producers of power. In general, hydro plants are the cheapest, followed by nuclear, coal, gas and diesel fired plants, as shown in the chart below.



Source: Metzler Services Inc. Based on year end 1997 data.

When it comes to production costs the analyst must keep in mind that most markets are not fully competitive and therefore the market study must address market structure distortions. Such distortions include "must-run" plants, or plants that may not be the cheapest to produce power but that are necessary to keep the system reliable, and renewable energy plants, which are higher cost but achieve a public policy goal.

Still, in theory, the cheapest plants are dispatched until the current demand is met and the market energy price is determined by the last unit which is dispatched. The last unit only earns its marginal costs, while all the other dispatched units earn a contribution margin equal to the difference between their marginal costs and the marginal cost of the price setting unit. This "energy credit" is usually determined by the fuel type of the plant and its technology.

The market study assumptions regarding cost of fuel and technological advances are therefore the next critical assumptions we examine.

Cost of Fuel and Price Setters Vs. Price Takers

Overall, the aim of our fuel cost analysis is twofold: to find the most likely outcome and to determine sensitivity to critical assumptions.

The assumptions regarding fuel costs are very important to a system that has a variety of plants powered by different fuel types. If a fuel is considered to be "on the margin" it is the system marginal price setting plant and therefore, as its fuel costs go up, so does the price of electricity in that market.

With regard to the general level of fuel prices, Moody's looks at gas prices in market studies since gas is tending to become the system marginal fuel in many markets for an increasing percentage of the time. A contentious assumption with market studies in general is the fact that the price of natural gas will increase

at a rate above the general rate of inflation. This accelerated pace of price increases is attributed to the greater demand for natural gas as a more environmentally friendly fuel relative to other fossil fuels and to transportation constraints in markets of high demand.

WHY IS NATURAL GAS THE SYSTEM MARGINAL FUEL?

A confluence of events has made natural-gas fired power plants the choice for new generation capacity in the United States. The appeal of gas-fired plants is based partly on economics and partly on emotion. First, developers of new power plants have, in recent decades, been capital constrained independent power producers who liked the low capital cost of a gas-fired plant relative to a coal station or a nuclear power station. Since fuel costs have been generally passed through to consumers, the higher fuel costs of a gas plant was less important than the low capital costs. Furthermore, technological advances and low turbine prices due to over-capacity contributed to the momentum for building gas-fired plants rather than coal-fired plants or nuclear plants. From an environmental perspective, natural gas seemed to be the least objectionable alternative among hydro-electric dams which destroyed habitat, nuclear plants which create radioactive waste and coal-fired plants that had greater emissions than gas plants which are not emissions free. Given that renewables (wind, solar and geothermal) are not considered reliable enough at present or substantial enough in the case of geothermal plants, gas became the fuel of choice as a "clean" burning fossil fuel. Likewise, future expectations of stronger controls on coal emissions and continued stringent regulation of nuclear plants shifted projected economics toward gas plants.

So specifically, when one says gas is the system marginal fuel 30% of the time, what is meant? In such a market gas plants satisfy the last unit of electricity demand 30% of the time, which means that demand is high enough so that all other plants that are marginally cheaper are running at full capacity, and gas plants must be run to match supply of electricity with demand for electricity. This begs the question what sets the margin the other 70% of the time? The lower-cost units will set the margin when gas plants are not being run. Normally, that would mean the coal plants would be "on the margin". It is important to keep in mind that that 70% is made up of seasonal changes in demand (summer/winter) and daily changes in demand (workday hours/weekend hours). Lastly, we might ask if gas will remain the system marginal fuel. The answer to that question depends on the dynamics of the equipment supply market, the supply of natural gas, the price of coal and future government regulations regarding the environment. Some people hypothesize that stricter environmental regulation of coal plants will increase the marginal production costs of coal plants above natural gas plants which would put gas on the margin more often, all other things being equal. However, clean coal technologies and more deep pocket developers might cause a shift to the development of new coal plants that would push gas plants off the margin a greater amount of the time. For the near future, gas is expected to remain the system marginal fuel in most markets.

Moody's approach is to use a zero real growth in the price of natural gas as a check on the "fuel inflation" effect on power price predictions. For the intermediate term, it seems that natural gas supply is plentiful and that forecasts of rapidly appreciating prices are aggressive in most markets. However, in markets where specific events impact the price of natural gas, such as new pipeline capacity coming onstream or limited supply with little incentive to address the shortage, then different fuel price assumptions may be warranted. Barriers to entry in some markets may justify a increasing fuel price. The key to the credit analysis is to identify those barriers and the likelihood they will remain in place.

In Moody's analysis of fuel costs, the inter-relationships among the prices of different types of fuel are equally as important as the general level of fuel prices. The analysis under the market study is static in that it assumes that the price relationships among fuels is constant. However, experience has shown that this is not true. In the recent decline in price of crude oil, which sets the price of diesel fuel, diesel-fired plants in New England saw increases in dispatch. The conventional wisdom is that coal prices will continue to decline while oil and gas prices will increase. Should this not occur and something dramatically different happens, such as new environmental regulations and taxes that make coal very expensive relative to its current position, the dynamic between coal fired plants and other thermal plants could change.

Technological Advances and Advantages

Other debatable assumptions in market rate studies are capacity additions and improving technologies. Most market studies seen by Moody's to-date include some evolution in the technology used by power plants. Therefore, the advantage a plant has today from a cost perspective may disappear over time as the latest technology brings a more efficient (i.e. lower heat rate) machine to market and pushes existing plants up the dispatch curve.

However, as a test of the strength of the new merchant plant, Moody's uses sensitivity analysis to frontload capacity additions and bring onstream more efficient technology. Moody's believes that new technology has its greatest advantage today when its heat rate differential relative to the existing asset base is greatest. This may lead investors to build new plants to replace existing, less efficient ones. Since no one expects a quantum leap in technological improvement the greatest cash flow benefit for lower heat rate machines is right now, not a little over time as most studies bring them in.

Moody's analysis also keeps older plants on the dispatch curve longer. Most models assume that if an older plant is not efficient it is retired. However, Moody's has observed that with relatively little capital spending, old plants can be made quite competitive and may not be retired as predicted in a simulation model.

Such assumptions bring us to another analytical area in determining the price of power, the reserve margin assumptions and valuing capacity.

RESERVE MARGINS AND THE VALUE OF CAPACITY

Since electricity can not be stored, with some exceptions, and demand is seasonal and cyclical, regulators (and legislators) have required that a margin of safety be built into the supply of power. This reserve margin is some percentage of total market capacity above the observed historical and, in some cases, projected, peak demand.

In most market studies reviewed by Moody's to-date, the market consultant assumes the reserve margin developed under a regulated environment will be the same in a competitive environment. In some cases, a sensitivity analysis is performed lowering the reserve margin a few percentage points over time. There has, however, been no estimation of the efficiency gains that might accrue to the market as a whole as artificial market barriers erode and a more connected and orchestrated structure evolves.

Moody's believes that this area of analysis encompasses significant uncertainty. We therefore view cash flows derived from a very high capacity payment or a robust market for capacity as somewhat speculative, and the rating of a merchant power plant which depends on such flows will reflect this view.

Often the analysis of the capacity market utilizes a "remainder" approach in addition to a set reserve margin. That is, to the extent that the fixed costs of the generating assets dispatched on a merit order basis are not met, the market will provide a payment sufficient to cover those costs.

Based on economic fundamentals, this analysis is sound. The controversy and, thus, the rating impact surrounds the assumptions regarding the allocation of that payment. Will all participants receive the same payment amount? Will risk-taking aggregators contract for capacity at a lower, more certain price only to resell the capacity to market participants with a pricing scheme tailored to their needs and carrying a higher margin?

The answers to these questions will impact MPPs differently and could result in different ratings.

IMPACT OF THE CONTRACTED OR BI-LATERAL MARKET

Merchant plant ratings must also consider the extent to which a contract market exists and the impact it has on the power price predictions. From the above, we begin to get a picture of the market price for power. However, as we have seen in international markets, the existence of a large contracted market can increase the volatility of the "open" or spot market.

This effect is clearly seen in Australia, where transition or "vesting" contracts were negotiated between generators and distribution companies for the majority of the market demand. The spot market was used to sell excess power or was a market of last resort in high demand periods, and generally supplied only 10% of the market demand. Such a market is more volatile than a broader based market, affecting cash flows.

While some market studies address specific contracts that have been announced, the terms and oftentimes the very existence of many others is unknown, adding to uncertainty and volatility in the spot market.

RISKS OF RE-REGULATION AND MARKET STRUCTURE

Given the fact that merchant power plants are in essence a creation of deregulation, an assessment of the risk of re-regulation is also a part of Moody's analysis. For example, a recent Department of Energy study indicated that several, primarily Midwestern states would likely see electricity prices rise given the local utilities' low cost positions relative to adjacent markets. Such price increases could easily shake the commitment of local regulators to deregulation.

In the US and, in fact, in the developed world, the move to deregulation is somewhat philosophical: free markets bring a greater good to society. However, in the rough and tumble real world should economic development suffer due to higher electricity prices, the desire to reimpose regulation would surface, perhaps sending the market back to the "stability" of earlier times.

Presumably, an MPP would enjoy the same protections and not be disadvantaged relative to other participants in the event or re-regulation. ***However, if the "raison d'etre" of the plant was to capitalize on the volatility in a deregulated market the impact would be negative. For example, a peaking unit built to capture high volatile prices might not recover its costs in a price capped environment.***

In the emerging markets, the analysis is slightly different. Most emerging markets (and some developed) have dual purposes in deregulating power markets. One is the efficiencies of an open market; the other is the very large sums of money the business brings. Some observers would argue that, in fact,

there is no commitment to an open market and that the sole reason is the money. In these instances, the risk of re-regulation is heightened.

We believe that in the United States until the market is completely deregulated, the incumbent, vertically integrated electric utilities will continue to have a competitive advantage over new entrants. To the extent that existing players retain significant market share concentrations or critical access to customers, the ability of a merchant plant to compete in such a market is questionable. While it is assumed that state and federal regulators will appropriately deregulate and address such issues, MPPs are being built before such actions are being taken.

To the extent that it is not controlled, the ability of an incumbent utility to use its regulated (and protected) earnings to compete aggressively against a merchant plant puts the merchant plant at a distinct disadvantage.

TRADITIONAL RISKS OF A NON-RECOURSE POWER PLANT

While changing volumes and prices create a new set of risks for merchant power plants, we can not ignore the traditional risk analysis for a power plant. These risks can be categorized as follows:

Technology Risk. In addition to the risks we discussed earlier related to technological advances, there are operating risks surrounding the technology. While some observers tend to dismiss these risks as minor due to the fact that the technology has been operating in many forms for many years, Moody's believes that a poorly engineered plant will face significant incremental risk in an openly competitive market. It is important to make distinctions between plants whose technical design is adequate to meet the minimum requirements of a contract under which the plant is operating and plants built to a higher standard necessary to compete in an open market.

For example, in the early days of Power Purchase Agreements, minimum required plant availability, a measure of efficiency, ranged around 85% while in the current environment, guaranteed levels range around 95%. As the standard moves higher, the technical proficiency of each plant takes on greater significance for cash generation and, thus for a credit rating.

Construction Risk. Ignoring nuclear plants, the conventional wisdom is that power plants are easy to build and that construction risk is minimal. While this is true enough, there are differences among firms' abilities to manage the process and any advantage will help a new plant in a competitive market.

An additional risk is that as the backlog for equipment increases, so does the risk associated with delivery of equipment and the time critical sensitivity in the construction plan. Moreover, as a greater number of plants are being built the pool of available labor becomes smaller which could affect construction schedules.

Fuel Supply Risk. Increased fuel supply risk relative to traditional analysis will be a hallmark of merchant power plants. In traditional PPA analysis, fuel supply arrangements were expected to mirror the output and pricing provisions for power, thereby limiting the risk of mismatch. In a competitive market, no such natural hedge exists and the fuel supply risk for an MPP increases. Should the plant choose to lock in fuel supply arrangements at a fixed price, then changes in the price of electricity could cause a margin squeeze. On the other hand, failure to have access to fuel could have equally damaging financial effects. As always, the cost of cover (through some derivative products, if available) must be weighed against the risks being transferred.

Operations and Maintenance Risk. O&M risks are also heightened for a merchant power plant. For an IPP, as long as a plant could hit the operating standards of a PPA contract, investors were protected. In a traditional PPA structure, there was generally a "cure" period provided for problems a plant might encounter. During this cure period, a capacity payment might continue to be paid unless or until some trigger was reached.

With an MPP, no such luxury is provided by the open market. Therefore, maintenance reserves and scheduled outages become critical. In addition, there is the risk that due to the pressures of operating "without a net", repairs or maintenance may be rushed or be not as extensive as they should be in order to get the plant back on-line quickly.

Plants are already generally expected to perform at higher levels more consistently than in the contract era. Availability guarantees at a level above 90% are an increasingly common feature of new transactions. The good news is that the plants are regularly achieving such numbers, but the margin for error is decreasing.

Environmental Risks. By all accounts, environmental risks for power plants are increasing. Many investors assume that the problems are with coal-fired plants, but the fact is that emissions (nitrous oxide, carbon dioxide, sulfur dioxide) are problems in varying degrees for all power plants. To the extent that a plant is controlling its emissions and generating credits that are conservatively valued, it has a positive ratings impact. Likewise, a plant that ignores the current and potential environmental impact on its plant of emissions management does so at peril to its ratings.

Sponsorship Risks. Moody's analyzes the impact of a sponsor based on its internal expertise and its historical track record that is relevant to the project being proposed. Experience in dealing with all of the aforementioned risks is key to the qualitative assessment of sponsor support in a non-recourse financing. Also critical to the assessment is the "clout" with suppliers and customers a sponsor or sponsors might give to a project by virtue of its ownership — clout the project would never possess on a stand alone basis.

Another portion of sponsorship risk is assessing the strategic importance of the assets to a sponsor. There is a paradox in this analysis: If an asset or group of assets is vital to a company, why finance it on a non-recourse basis? For Moody's, strategic value comes from an asset's contribution to the cash flow generating capability of other assets owned by the sponsor. In this scenario, a sponsor is more likely to support a project if it is beneficial to the rest of the organization.

But, in the final analysis if a sponsor sees no way of recouping its return then suffice it to say that non-recourse means non-recourse. It is unlikely it will invest additional money in any non-recourse project.

Financial Analysis

Moody's financial analysis of merchant power plants focuses on the transaction's ability to absorb the volatility of the cash flows and meet debt service obligations. After we have analyzed the risks outlined above and we have adjusted the price and volume forecasts accordingly, we then assess the margin between the adjusted base case forecast and the break even point of the project where the breakeven point is at a 1:1 debt service coverage ratio.

Moody's believes that for a minimum investment-grade rating, the break-even point of a merchant power plant should be from 30% to 50%% below a credible forecasted market price. This range will allow most plants to withstand the volatility and uncertainty of the developing merchant market. Where a plant needs to fall within that range is dependent on the operating environment and market structure it faces. In addition, the difference in market price and break-even must cover the non-merchant risks as well as the market related risks.

DEBT PER MEGAWATT-HOUR AND ACQUISITION PRICE

While it may seem obvious that the price paid for a merchant plant will have a distinct impact on the profitability of the plant, it is a new concern arising from a deregulated electric industry. Prior to deregulation, the amount paid for a plant was screened for "reasonableness" by regulators, but it was not necessary, nor was there a competitive advantage, to be the highest value plant (i.e. greatest efficiency for the lowest cost).

Moody's looks to a measure of debt per megawatt-hour (Debt/MWh) which incorporates the acquisition costs, as well as the financing decisions, in one measure. Without specific data on the assets included in an acquisition, and making adjustments for transmission and distribution assets, it is difficult to derive comparable numbers. But the relationship is an important one to assess in determining the potential competitive position of a particular asset.

COST CONTROL

As revenues are not within the control of the MPP, cost and expense control takes on great importance in rating debt issued by these borrowers. Again, in the new environment, how each plant does relative to other plants becomes increasingly important.

As fuel is the largest component of generating costs, appropriate fuel management will drive comparisons of merchant power plants to determine whether a plant's fuel costs are reasonable. Adjustments must be made for differences in firm transportation and fixed price supply obligations to compare fuel costs at one project to fuel costs at another. However, a comparison of total fuel costs to total fuel costs is also relevant since it incorporates management strategies which trade costs with incremental risk to the project.

Similar comparisons can and should be made with regard to selling, general and administrative costs, environmental compliance costs, maintenance costs, labor costs and the other major expense categories.

Several companies, have taken the strategy to control costs by reducing the markup on engineering services from equipment manufactures and sub-contractors and through standardization of engineering design. Moody's believes this is but one example of the cost control efforts that will emerge with deregulation and force merchant power plants to a higher cost control standard over time.

LIQUIDITY

As cash flows become more volatile for merchant power plants, a larger degree of liquidity will be required than generating stations have traditionally needed to maintain. Likewise, the concentration of large purchasers argues for the need to support a merchant power plant with liquidity facilities to forestall operating difficulties. The quality and quantity of available lines of credit, as well as the extent to which internally generated funds cover cash needs will determine the MPP with the best liquidity profile from a ratings perspective.

Structural Enhancements

Moody's views structural enhancements as important in helping an economically sound project achieve a higher rating. Those enhancements which apply the cash flows of the project in a manner that offers maximum protection to debt holders will have the highest ratings impact. Conceptually, some of the enhancements used in other project financings which could be applicable to merchant plant financing include:

- Cash Flow Recapture Mechanisms
- Loan Life Coverage Ratios
- Derivative Products/Insurance Policies
- Synthetic Power Purchase Agreements
- Anchor Contracts
- Tolling Agreements
- Portfolios of Assets
- Sponsor Guarantees
- Fuel and/or Operating and Maintenance Expense Subordination
- Springing Liens

A highly rated project may include several of these enhancements. In a forthcoming special comment, Moody's will explore the relative value of each and the possible ratings impact of enhancements collectively.

Conclusion

Merchant power plants will increasingly become important for power plant financings with conservative estimates of known projects totaling to over US$ 60 Billion. The cash flow uncertainty and volatility engendered by developing market structures heavily influenced by politics and unique physical aspects of the product bring additional layers of risks for investors to assess. Unlike the historical experience where projects were relatively easy to distinguish, merchant power plants will have very unique characteristics which will require greater qualitative comparisons in the rating process and makes a rating based on a formulaic approach inappropriate for investors needs.

Moody's believes that the appropriate analytical beginning is to determine a credible market forecast and to assess the projects break-even position relative to that market forecast. A break-even point substantially below the market forecast allows a project to absorb unexpected market fluctuations in prices and volumes which is essential to an investment grade debt security. From this analysis, one can derive the appropriate capital structure for each project individually. In the future we may well see patterns emerge once market structures are well defined, until that point investors will require and Moody's will provide detailed qualitative and quantitative analysis which highlight the relative risks of each project.

Rating Methodology

The Importance of Being Economic: Credit Risks of US Merchant Power Plants

Report Number: 45451

Moody's Investors Service
Global Credit Research

July 1998

Special Comment

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Rating the New Energy Service Companies

This special comment is based on a speech given at Moody's Electric Industry Issuers' Conference.

Summary Opinion

Energy service companies, or ESCOs, are relatively new entities within the electric energy sector. As they lack a peer group for direct comparison, Moody's will rate ESCOs "from the bottom up". Cross-comparisons that are normally valuable analytic tools where a peer group exists would likely be inappropriate and misleading with ESCOs as their quantitative measures, such as operating margins, interest coverage, and leverage, can vary widely based on the size and the type of investment required by the sector in which they specialize.

Moody's analysis of these companies, therefore, has a strong qualitative component, which includes a detailed fundamental analysis of the markets the ESCO serves, its position within those markets, its corporate structure, its management and corporate strategy, expected cash flow patterns and the factors that could affect cash flow forecasts, and the degree of the company's financial flexibility relative to the business risks with which it is faced.

The term "ESCO" may have a different meaning from one person to the next. That is because the term functions as a catch-all for any company involved in energy-related services outside of the ownership of assets through which electrons flow. In other words, an ESCO is not a generation, transmission, or distribution company. ESCOs would include companies engaged in energy-related equipment leasing, plant or project management, energy efficiency auditing, metering, billing, or any number of other services to other electric companies or their customers. Power marketers also provide energy services, but we will exclude them in this discussion as we view them as a large and specialized segment of the industry in their own right.

Moody's expects the number of ESCOs to grow over the next few years as the profit incentives that reward risk-taking in the growing non-regulated segment of the energy industry give rise to new services, markets, and distribution mechanisms. The need for new products has been present in the past, but not the economic rewards for providers due to the limitations of regulation. Going forward, more technologically advanced services are likely to replace older ones, adding to market risks for all participants. Moody's believes that current market leaders will need continually to hone their market knowledge, marketing skills, and investment in the quality of their products and services to maintain their leadership position.

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Few ESCOs are rated to date. An ESCO is likely to request a rating only when it either achieves a size large enough to access public or private placement markets or when a rating would support its counterparty negotiations. However, an understanding of the underpinnings of ESCO credit quality is important because of its potential spillover into other parts of the electric energy industry. ESCOs may be a part of a complex holding company structure. As a company's investment in an ESCO increases, the risks assumed in the ESCO may begin to influence the ratings of its affiliates.

Defining The Sector

Energy service companies, or ESCOs as they are called, can refer to a variety of companies depending upon who is using the term. Moody's views the term "ESCO" as a catch-all category for all electric energy companies not owning assets through which electrons flow. [The companies in the path of electron flow are the generation companies, often called GenCos; transmission companies, or TransCos; and distribution companies, or DisCos.]

Some analysts include power marketers in the ESCO category, which is certainly appropriate as they provide valued services to the industry. Moody's, however, views them as highly specialized in energy trading and risk management and a large and growing segment of the industry in their own right. For that reason we will exclude power marketers from our definition of an ESCO. (Readers are referred to Moody's special comment *Power Marketer Ratings Reflect Portfolio, Counterparty, and Price Risks* published in December 1997 for a discussion of what factors would influence our ratings of power marketers.)

ESCO examples would therefore include companies that have been involved in traditional demand side management (DSM) programs and also those in new business lines that have developed in response to the profit potential embodied in competitive markets. These are:

- Energy efficiency audits and management (of lighting or high-volume air-conditioning)
- Energy-related equipment leasing
- Load management
- Load shifting
- Project management firms
- Generating plant management or comprehensive energy management firms
- Metering services
- Billing services

The energy service industry is currently very fragmented, but is changing rapidly. Moody's expects the larger energy companies to acquire the smaller, typically privately held ESCOs to both add to their customer service offerings and to build economies of scale, possibly delivering added value to shareholders, too. Until the ESCOs, either independent or owned by a large, more diversified energy company, reach a critical mass, we do not expect them to pursue ratings, although a rating may provide valuable support to counterparty negotiations. By critical mass we mean a size large enough to entail the minimum fixed-income capital requirements to access either the public or private placement markets. Initial financing of acquisitions and capital expenditures is more likely to be sourced from internal funds or downstream issuance of forms of equity from the parent.

Understanding The Nature Of The Business

Because ESCOs are diverse, small, and usually privately held, no publicly available peer group information for them exists. Therefore, the use of peer group comparisons will not provide a useful shorthand in the ESCO rating process. Ratings for ESCOs will therefore be developed from the bottom up, as they are in many areas of Moody's sharing similar peer group limitations.

As many of the ESCO markets may be new and/or may be growing dramatically, Moody's will devote considerable time to understanding the market dynamics, both revenue assumptions and cost structure. Moody's will approach forecasts of companies charting paths into new markets with a degree of skepticism, because fixed-income investors face all downside risks, but enjoy none of the benefits of any upside opportunities. Revenue forecasts entail assumptions about the current and future size of each market the

ESCO serves, what customer needs its products meet, alternative products that might be substituted for those products, and elasticity of demand. The relation between the cost structure, pricing, margins, and market share drive operating cash flow forecasts.

An analysis of the market an ESCO serves, the needs of that market, and its prospects for growth not only provide a basis for assessing future revenue and cash flow projections, but also should reveal the amount of investment necessary to be a player in particular markets and how much additional capital might be required to withstand a threat from a potential competitor.

The following table illustrates general differences in investment among companies in several industries by comparing commonly used ratios. The companies were selected because they are energy-related or exhibit characteristics that might be similar to one of the types of ESCOs. Two (ALCOA and Boise Cascade) are more like generating companies than ESCOs in that they are asset-intensive. The comparisons are very simplistic and serve only to broadly illustrate the differing investment requirements. Actual ratings are forward-looking, whereas the ratios shown below are historical. The ratios, which are unadjusted for goodwill and off-balance-sheet financings, also do not reveal the nuances, annual volatility, and trends that enter into the actual credit analysis underlying each company's rating.

Table 1: A Brief Illustration of Differing Levels of Investment Among Industries (Three-Year Averages 1995-1997)

	ALCOA	Boise Cascade	Thomas & Betts	US Filter	Baker Hughes	Manpower, Inc.
Sr. Unsecured Rating*	A1	Baa3	Baa2	Ba1	A2 (On Watch - Poss. Up)	Baa2
SGA/Sales	5.4%	10.7%	16.6%	19.0%	30.1%	14.7%
Operating Margin	10.7%	5.7%	9.3%	5.4%	9.4%	3.7%
Pre-Tax Interest Coverage	10.6 times	2.2 times	4.1 times	3.4 times	4.5 times	17.8 times
Prop.Plant.Equip/Total Assets	51.5%	54.4%	27.2%	16.8%	18.3%	6.9%
Asset Turnover	0.97 times	1.09 times	1.0 times	1.03 times	0.86 times	3.54 times
Leverage**	23.9%	54.8%	41.0%	42.5%	31.9%	41.8%

*As of July 22, 1998 ** Unadjusted

ALCOA and Boise Cascade (aluminum and paper companies respectively) are both asset-intensive process businesses, demanding significant capital investment, and both serve markets that are commoditized to a large degree, characteristics they share with the future deregulated generation market. (Boise Cascade obtains approximately half its revenues from an office products company, so it is only roughly comparable to a generating company.) Thomas & Betts (an electronic and electrical connector company), U.S. Filter (which makes environmental equipment), and Baker Hughes (providing technology-driven equipment and services to oil and gas companies) are less asset-intensive and serve less commoditized markets with shorter product cycles. The services they provide require more investment in people and selling. In particular, Baker Hughes must invest in a highly-skilled labor force, research and development, marketing, and information technology. Manpower also has a huge investment in people, but its income statement is not "grossed up" for the compensation received by its temporary employees. Its administrative expense is therefore smaller than otherwise might be assumed.

Moody's finds at least three years' history and five years of forecast horizon are needed as an adequate financial snapshot of the company's prospects.

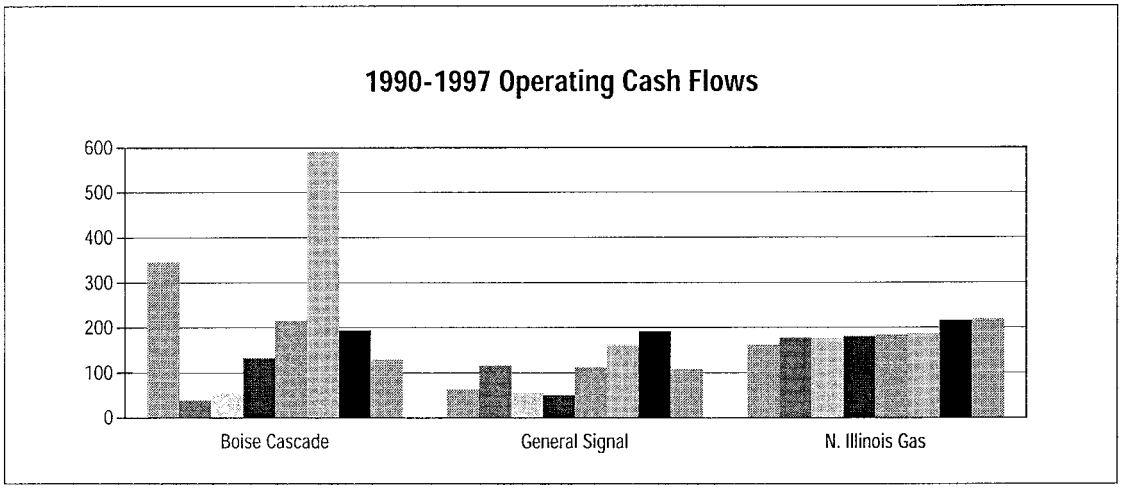
Assessing The Balance Between Business Risk And Financial Profile

Moody's assessment of two types of protection afforded fixed-income investors are extremely influential in the ratings assigned. The first is cash flow coverage ratios and equity ratios, which assess the company's cushion against expected volatility of future results. The second is the company's financial flexibility, which determines the company's additional ability to absorb unexpected volatility from unforeseen events.

Financial flexibility encompasses not only a company's coverage ratios, but also more subtle influences. The list below describes the most common contributors to financial flexibility.

- A strong overall credit profile, which facilitates access to a variety of capital markets
- An equity base sufficient to provide a cushion against volatility in markets served
- A balanced debt maturity structure, with durations matching economic asset lives and with no concentrations of maturities
- Alternate sources of liquidity, such as readily marketable securities or bank facilities that can be counted on when needed
- A strong guarantee or other substantive support from a more creditworthy parent
- Limitations on exposure to changes in interest rates through financial policy and derivative usage

The following table broadly illustrates how cash flows can vary from industry to industry. Companies doing business in a more volatile market sector would require greater equity cushion and sources of financial flexibility than a company in a very stable market sector to achieve a similar rating.



CONCLUSION

ESCOs are a small and fragmented, but growing segment of the electric energy industry. Few ratings exist on ESCOs at present, but Moody's expects the number of ratings to increase as ESCOs achieve the economies of scale to tap public capital markets. Over the intermediate term, those ratings will be developed from intensive fundamental analysis, as no public information is available to create a peer group for ease of comparison.

Special Comment

Rating the New Energy Service Companies

Report Number
36124

ATTACHMENT 3

FINANCIAL ASSURANCE POLICY – NEW ENGLAND ISO

ATTACHMENT E

Policy Statement

Financial Assurance Policy for NEPOOL Non-Participant Transmission Customers

This Financial Assurance Policy for Transmission Customers[1] that are Non-Participants ("Policy") shall become effective on January 1, 1999 (the "Policy Effective Date").

The purpose of this Policy is (i) to establish a financial assurance policy for Non-Participant Transmission Customers pursuant to Section 11 of the Restated NEPOOL Open Access Transmission Tariff (the "Tariff") that includes commercially reasonable credit review procedures to assess the financial ability of each Non-Participant applicant for service ("Applicant") under the Tariff to pay for service transactions under the Tariff and under the ISO New England Inc. Tariff for Transmission Dispatch and Power Administration Services (the "ISO Tariff"), (ii) to set forth requirements for alternative forms of security that will be deemed acceptable to NEPOOL and consistent with commercial practices established by the Uniform Commercial Code that protects the Participants against the risk of non-payment by Non-Participant Transmission Customers, (iii) to set forth the conditions under which NEPOOL will conduct business so as to avoid the possibility of failure of payment for services rendered to Non-Participant Transmission Customers under the Tariff and the ISO Tariff, and (iv) to collect amounts past due, make up shortfalls in payments, and terminate service to defaulting Non-Participant Transmission Customers.

In accordance with Section 11 of the Tariff, NEPOOL requires the following procedures and requirements to apply to all Applicants and Non-Participant Transmission Customers. Generally, any Applicant or Non-Participant Transmission Customer that does not have an investment grade rating by either Standard & Poor's, Moody's, Duff & Phelps, or Fitch (or in the case of Applicants and Non-Participant Transmission Customers that are not rated themselves, any Applicant or Non-Participant Transmission Customer that does not have outstanding debt with such a rating) will be required to provide financial assurances, as described in detail below.[2]

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1 Capitalized terms used but not defined in this Policy are intended to have the meanings given to such terms in Section 1 of the Restated NEPOOL Open Access Transmission Tariff, as amended.

2 The System Operator will act as NEPOOL's agent in managing and enforcing this Policy with the exception of termination of service issues, which are specifically reserved to the NEPOOL Participants and will be addressed by the NEPOOL Executive Committee, subject to appeal to the Management Committee. Accordingly, all financial information

(continued...)

GENERAL REQUIREMENTS

Each Applicant or Non-Participant Transmission Customer must comply with the following general requirements.

Proof of Financial Viability

Each Applicant must with its application for service submit proof of financial viability, as described below, satisfying NEPOOL requirements to demonstrate the Applicant's ability to meet its obligations, or must provide, prior to NEPOOL's filing of a Service Agreement for the Applicant and provision of service to the Applicant under the Tariff, financial assurance in the form of a cash deposit, letter of credit or performance bond as set forth below. An Applicant that chooses to provide a cash deposit, letter of credit or performance bond will not be required to provide financial information to NEPOOL.

Generally, each Applicant must submit a current rating agency report, which report must indicate an investment grade rating by either Standard & Poor's, Moody's, Duff & Phelps, or Fitch for the Applicant or, if the Applicant itself is not rated, for the Applicant's outstanding rated debt, in order for NEPOOL to file a Service Agreement for the Applicant and provide service to the Applicant under the Tariff without the Applicant being required to furnish additional financial assurances as described below.

Current Non-Participant Transmission Customers that have not already provided to NEPOOL financial assurances consistent with the requirements of this Policy must also provide a current rating agency report by the Policy Effective Date, as well as any of the financial statements and information set forth below if and as requested by NEPOOL within ten (10) days of such request. Those Non-Participant Transmission Customers that do not satisfy the rating requirement as set forth above must provide instead on the Policy Effective Date one form of the financial assurances set forth below. A Non-Participant Transmission Customer's failure to meet these requirements may result in termination of service by NEPOOL in accordance with the procedure set forth for payment defaults in Section 8.4 of the Tariff.

2(...continued)
required pursuant to this Policy is to be provided to the System Operator, which will keep all such information confidential in accordance with the provisions of Section 2 of NEPOOL Criteria, Rules and Standards No. 45.

Financial Statements

Each Applicant must submit, if and as requested by NEPOOL and within ten (10) days of such request, audited financial statements for at least the immediately preceding three years, or the period of its existence, if shorter, including, but not limited to, the following information:

Balance Sheets
Income Statements
Statements of Cash Flows
Notes to Financial Statements

Additionally, the following information for at least the immediately preceding three years, if available, must be submitted if and as requested by NEPOOL and within ten (10) days of such request:

Annual and Quarterly Reports
10-K, 10-Q and 8-K Reports

Where the above financial statements are available on the Internet, the Applicant may provide instead a letter to NEPOOL stating where such statements may be located and retrieved by NEPOOL.

Each Applicant may also be required to provide at least one bank reference and three (3) utility credit references. In those cases where an Applicant does not have three (3) utility credit references, three (3) trade payable vendor references may be substituted.

Each Applicant may also be required to include information as to any known or anticipated material lawsuits, as well as any prior bankruptcy declarations by the Applicant, or by its predecessor(s), if any.

In the case of certain Applicants, some of the above financial submittals may not be applicable, and alternate requirements may be specified by NEPOOL.

Ongoing Financial Review

Each Non-Participant Transmission Customer that has not provided a cash deposit, letter of credit, performance bond, or corporate guaranty must submit its current rating agency report promptly upon the request of NEPOOL, and 8-K Reports promptly upon their issuance.

In addition, each Non-Participant Transmission Customer that has not provided a cash deposit, letter of credit, performance bond or corporate guaranty is responsible for informing NEPOOL in writing within ten (10) business days of any material change in its financial status. A material change in financial status includes, but is not limited to, the following: a downgrade to a below investment grade rating of senior long term debt by a major rating

agency, being placed on credit watch with negative implication by a major rating agency if senior long term debt does not have an investment grade rating, a bankruptcy filing, insolvency, a report of a significant quarterly loss or decline of earnings, the resignation of key officer(s), and/or the filing of a material lawsuit that could materially adversely impact current or future financial results. A Non-Participant Transmission Customer's failure to provide this information as required may result in termination of service by NEPOOL in accordance with the procedure set forth in Section 8.4 of the Tariff.

If there is a material adverse change in the financial condition of the Non-Participant Transmission Customer that has not provided a cash deposit, letter of credit, performance bond or corporate guaranty, NEPOOL may require such Non-Participant Transmission Customer to provide one of the forms of other financial assurances set forth below. If the Non-Participant Transmission Customer fails to do so, NEPOOL may terminate service in accordance with the procedure set forth for payment defaults in Section 8.4 of the Tariff.

OTHER FINANCIAL ASSURANCES

Applicants or Non-Participant Transmission Customers that do not satisfy the rating requirement or NEPOOL's credit review process must submit instead one of the following additional financial assurances, depending on the specific aspects of the transactions they anticipate engaging in as Non-Participant Transmission Customers.

In general, Non-Participant Transmission Customers must provide additional financial assurance in the following amounts, based on their average or expected monthly charges for service under the Tariff, including amounts owed to ISO New England Inc. under the ISO Tariff (collectively the "NEPOOL Charges"):

Monthly NEPOOL Charges	Financial Assurance Requirement
$0 - $15,000	0 months' NEPOOL Charges
$15,001 - $30,000	1 month's NEPOOL Charges
$30,001 - $50,000	2 months' NEPOOL Charges
$50,001 or more	3½ months' NEPOOL Charges

The three and one-half months is based on the time required for a FERC filing made by NEPOOL to suspend service to be effective.

Therefore, a Non-Participant Transmission Customer with $32,000 in monthly NEPOOL Charges that does not satisfy the rating requirement or NEPOOL credit review process must provide additional financial assurances in the amount of $64,000 to NEPOOL.

In the case of new Non-Participant Transmission Customers, the Financial Assurance Requirement will be based on estimated monthly NEPOOL Charges, which estimate NEPOOL has the right to adjust in light of subsequent experience as to actual monthly NEPOOL Charges. In no event will the Financial Assurance Requirement exceed the anticipated charge for the service requested by the Non-Participant Transmission Customer.

Cash Deposit

A cash deposit for the full value of the Financial Assurance Requirement based on actual or anticipated NEPOOL Charges, as determined by NEPOOL, provides an acceptable form of financial assurance to NEPOOL. A cash deposit greater than or equal to one month's NEPOOL Charges of a Non-Participant Transmission Customer shall also serve as that Non-Participant Transmission Customer's deposit under Sections 31.3 and 41.2 of the Tariff.

If it is necessary to use all or a portion of the deposit to pay the Non-Participant Transmission Customer's obligation, the deposit must be promptly replenished to the required level; otherwise, termination of service proceedings may be initiated. In the event that actual NEPOOL Charges exceed those anticipated, the anticipated charges will be increased accordingly and the Non-Participant Transmission Customer must augment its cash deposit to reach the required level.

The cash deposit will be invested by NEPOOL in investments as may be designated by the Non-Participant Transmission Customer in direct obligations of the United States or its agencies and interest earned will be paid to the Non-Participant Transmission Customer. NEPOOL may sell or otherwise liquidate such investments at its discretion to meet the Non-Participant Transmission Customer's obligations to NEPOOL.

The requirement to continue the deposit may be reviewed by NEPOOL after one year. Consideration will be given to replacing the cash deposit with a corporate guaranty if certain conditions are met, as discussed below in the Corporate Guaranty section.

Letter of Credit

An irrevocable standby letter of credit for the full value of the Financial Assurance Requirement based on actual or anticipated NEPOOL Charges, as determined by NEPOOL, provides an acceptable form of financial assurance to NEPOOL. The letter of credit will renew automatically unless the issuing bank provides notice to NEPOOL at least ninety (90)

days prior to the letter of credit's expiration of the bank's decision not to renew the letter of credit.

If the letter of credit amount falls below the required level because of a drawing, it must be replenished immediately; otherwise, termination of service proceedings may be initiated by NEPOOL. If actual NEPOOL Charges exceed those anticipated, the Non-Participant Transmission Customer must obtain a substitute letter of credit that equals the actual NEPOOL Charges.

The form, substance, and provider of the letter of credit must all be acceptable to NEPOOL. The letter of credit should clearly state the full names of the "Issuer," "Account Party" and "Beneficiary" (NEPOOL), the dollar amount available for drawings, and should include a statement required on the drawing certificate and other terms and conditions that should apply. It should also specify that funds will be disbursed, in accordance with the instructions, within one (1) business day after due presentation of the drawing certificate.
The bank issuing the letter of credit must have a minimum corporate debt rating of an "A-" by Standard & Poor's, or "A3" by Moody's, or "A-" by Duff & Phelps, or "A-" by Fitch, or an equivalent short term debt rating by one of these agencies.

Please refer to Attachment 1, which provides an example of a generally acceptable sample "clean" letter of credit. All costs associated with obtaining financial security and meeting the Policy provisions are the responsibility of the Applicant or Non-Participant Transmission Customer.

The requirement to continue to provide a letter of credit may be reviewed by NEPOOL after one year. Consideration will be given to replacing the letter of credit with a corporate guaranty if certain conditions are met, as discussed below in the Corporate Guaranty section.

Performance Bond

A performance bond complying with the requirements set forth herein provides an acceptable form of financial assurance to NEPOOL. The penal sum of such performance bond shall be in an amount equal to the full value of the Financial Assurance Requirement based on actual or anticipated NEPOOL Charges, as determined by NEPOOL, and shall automatically be adjusted to reflect any adjustment in such Financial Assurance Requirement. The bond shall permit suit thereunder until two years after the last date that service is provided to the Non-Participant Transmission Customer under the Tariff.

If the amount of penal sum of the performance bond available to NEPOOL falls below the required level because of a payment thereon, it must be increased to the required level immediately; otherwise, termination of service proceedings may be initiated by NEPOOL. If actual NEPOOL Charges exceed those anticipated, the Non-Participant Transmission

Customer must either cause the penal sum of such performance bond to be increased accordingly or must obtain a substitute performance bond in the appropriate amount.

The form, substance and provider of the performance bond must be acceptable to NEPOOL. The performance bond should clearly state the full names of the "Principal," the "Surety" and the "Obligee" (NEPOOL) and the penal sum and should include a clear statement that the surety will promptly and faithfully perform the Non-Participant Transmission Customer's obligations to NEPOOL if the Non-Participant Transmission Customer fails to do so. The insurance company issuing the performance bond must be rated "A" or better by A.M. Best & Co.

Please refer to Attachment 2, which provides an example of a generally acceptable sample performance bond. All costs associated with obtaining financial security and meeting the Policy provisions, including without limitation the cost of the premiums for such performance bond, are the responsibility of the Applicant or Non-Participant Transmission Customer.

The requirement to continue to provide a performance bond may be reviewed by NEPOOL after one year. Consideration will given to replacing the performance bond with a corporate guaranty if certain conditions are met, as discussed below in the Corporate Guaranty section.

Weekly Payments

A Non-Participant Transmission Customer that does not satisfy the rating requirement may request that, in lieu of providing one of the additional financial assurances set forth above, a weekly billing schedule be implemented for it. NEPOOL may, in its discretion, agree to such a request; provided, however, that any weekly billing arrangement will terminate no more than six months after the date on which such arrangement begins unless the Non-Participant Transmission Customer requests an extension of such arrangement and demonstrates to NEPOOL's satisfaction in its sole discretion that the termination of such arrangement and compliance with the other provisions of this Policy (including providing another form of financial assurance, if required) will impose a substantial hardship on the Non-Participant Transmission Customer. Such demonstration of a substantial hardship shall be made every six months after the initial demonstration, and a Non-Participant Transmission Customer's weekly billing arrangement will be terminated if it fails to demonstrate to NEPOOL's satisfaction in its sole discretion at any such six month interval that compliance with the other provisions of this Policy will impose a substantial hardship on it.

If NEPOOL agrees to implement a weekly billing schedule for a Non-Participant Transmission Customer, the Non-Participant Transmission Customer shall be billed weekly in arrears on an estimated basis for all amounts owed to NEPOOL and the System Operator for

the week, with an adjustment for each month as part of the regular NEPOOL monthly billing to reflect any under or over collection for the month. The Non-Participant Transmission Customer shall be obligated to pay each such weekly bill within five business days after it is received. The Non-Participant Transmission Customer shall pay with respect to each weekly bill an administrative fee, determined by the System Operator, to reimburse the System Operator for the costs it incurs as a result of that Non-Participant Transmission Customer's weekly billing arrangement.

If a weekly billing schedule is implemented for a Non-Participant Transmission Customer in lieu of requiring the Non-Participant Transmission Customer to provide an additional financial assurance, the Non-Participant Transmission Customer may be required to provide an additional financial assurance at any time if the Non-Participant Transmission Customer fails to pay when due any weekly bill or, in its sole discretion, termination of service proceedings may be initiated by NEPOOL. In addition, upon the termination of a Non-Participant Transmission Customer's weekly billing arrangement, the Non-Participant Transmission Customer shall either satisfy the rating requirement set forth herein or provide one of the other forms of financial assurance set forth herein.

Use of Transaction Setoffs

Under certain conditions, NEPOOL may be involved in other transactions with a Non-Participant Transmission Customer in which NEPOOL is the buyer. In this event, the amount of the prepayment, cash deposit, performance bond or letter of credit required hereunder may be reduced ("setoff") by an amount equal to NEPOOL's unpaid balance or expected billing under the other transaction. The terms and the amount of the setoff must be approved by the System Operator. The System Operator is responsible for monitoring the status of the setoff and ensuring that an adequate financial assurance balance is maintained at all times until the transaction is settled.

Corporate Guaranty

An irrevocable corporate guaranty obtained from a Non-Participant Transmission Customer's affiliated company ("Guarantor") for the full value of the Financial Assurance Requirement based on actual or anticipated NEPOOL Charges, as determined by NEPOOL, may provide an acceptable form of financial assurance to NEPOOL.

If actual NEPOOL Charges exceed those anticipated, the Non-Participant Transmission Customer must provide a substitute corporate guaranty that equals the actual NEPOOL Charges.

A Non-Participant Transmission Customer for which a letter of credit, performance bond or cash deposit was initially required may have the opportunity to substitute a corporate guaranty if the following conditions are met:

1. NEPOOL determines that the Non-Participant Transmission Customer has satisfactorily met its payment obligations in NEPOOL for at least one year, which one-year period may in whole or in part pre-date the Policy Effective Date;
2. NEPOOL determines that the financial condition of the Guarantor meets the requirements of this Policy; and
3. The form and substance of the corporate guaranty are acceptable to NEPOOL.

Upon NEPOOL's written authorization, the Non-Participant Transmission Customer may substitute a corporate guaranty that is issued by the Guarantor for a cash deposit, bank letter of credit or performance bond when it has satisfied the conditions stipulated above. The corporate guaranty is considered to be a lesser form of financial assurance than a cash deposit, letter of credit or performance bond, and therefore is allowed as an acceptable form of financial assurance only to those Non-Participant Transmission Customers that have satisfied their payment obligations to NEPOOL in a timely manner for at least one year.

The corporate guaranty may only be used if the Non-Participant Transmission Customer is affiliated with a Guarantor that has greater financial assets, a strong balance sheet and income statements, and at minimum an investment grade rating by either Standard & Poor's, Moody's, Duff & Phelps, or Fitch.

The corporate guaranty should clearly state the identities of the "Guarantor," "Beneficiary" and "Obligor," and the relationship between the Guarantor and the Non-Participant Transmission Customer Obligor. The corporate guaranty must be duly authorized by the Guarantor, must be signed by an officer of the Guarantor, and must be furnished with either an opinion satisfactory to NEPOOL of the Guarantor's counsel with respect to the enforceability of the guaranty or accompanied by a certificate of corporate guarantee that includes a seal of the corporation with the signature of the corporate secretary. Additionally, adequate documentation regarding the signature authority of the person signing the corporate guaranty must be provided with the corporate guaranty.

A corporate guaranty must also obligate the Guarantor to submit a current rating agency report promptly upon the request of NEPOOL, to submit 8-K Reports promptly upon their issuance, to submit financial reports if and as requested by NEPOOL within ten (10) days of such request, and to inform NEPOOL in writing within ten (10) business days of any material change in its financial status. A material change in financial status includes, but is not limited to, the following: a downgrade to a below investment grade rating of senior long term debt by a major rating agency, being placed on credit watch with negative implication by a major

rating agency if senior long term debt does not have an investment grade rating, a bankruptcy filing, insolvency, a report of a significant quarterly loss or decline of earnings, the resignation of key officer(s), and/or the filing of a material lawsuit that could materially adversely impact current or future financial results. A Guarantor's failure to provide this information may result in proceedings by NEPOOL to terminate service to the Non-Participant Transmission Customer Obligor. If there is a material adverse change in the financial condition of the Guarantor, NEPOOL may require the Non-Participant Transmission Customer Obligor to provide another form of financial assurance, either a cash deposit or a letter of credit or a performance bond.

Non-payment of Amounts Due

If a Non-Participant Transmission Customer does not pay amounts billed when due and as a result a letter of credit or cash deposit is drawn down or a performance bond is paid on, then the Non-Participant Transmission Customer must immediately replenish the letter of credit or cash deposit to the required amount or cause the penal sum of the performance bond to be increased to equal the required amount plus all amounts paid thereunder. If a Non-Participant Transmission Customer fails to do so, NEPOOL may initiate termination of service proceedings against the Non-Participant Transmission Customer in accordance with the procedure for payment defaults set forth in Section 8.4 of the Tariff.

In order to encourage prompt payment of NEPOOL Charges by Non-Participant Transmission Customers, if a Non-Participant Transmission Customer is delinquent in paying on time its NEPOOL Charges, the Non-Participant Transmission Customer shall pay interest on any unpaid amount as provided in Section 8.3 of the Tariff .

ATTACHMENT 1

SAMPLE LETTER OF CREDIT

[DATE PROVIDED]

IRREVOCABLE STANDBY LETTER OF CREDIT NO.___

[EXPIRATION DATE] AT OUR COUNTERS ***[unless an evergreen l/c is obtained]***

WE DO HEREBY ISSUE AN IRREVOCABLE NON-TRANSFERABLE STANDBY LETTER OF CREDIT BY ORDER OF AND FOR THE ACCOUNT OF ON BEHALF OF [NON-PARTICIPANT TRANSMISSION CUSTOMER] ("ACCOUNT PARTY") IN FAVOR OF THE PARTICIPANTS IN THE NEW ENGLAND POWER POOL ("NEPOOL") IN AN AMOUNT NOT EXCEEDING US$ _____.00 (UNITED STATES DOLLARS _____ AND 00/100) AGAINST PRESENTATION TO US OF A DRAWING CERTIFICATE SIGNED BY A PURPORTED OFFICER OR AUTHORIZED AGENT OF NEPOOL AND DATED THE DATE OF PRESENTATION CONTAINING THE FOLLOWING STATEMENT:

> "THE UNDERSIGNED HEREBY CERTIFIES TO [BANK] ("BANK"), WITH REFERENCE TO IRREVOCABLE NON-TRANSFERABLE STANDBY LETTER OF CREDIT NO. ISSUED BY [BANK] IN FAVOR OF THE PARTICIPANTS IN THE NEW ENGLAND POWER POOL ("NEPOOL") THAT [NON-PARTICIPANT TRANSMISSION CUSTOMER] HAS FAILED TO PAY AMOUNTS DUE UNDER THE RESTATED NEPOOL OPEN ACCESS TRANSMISSION TARIFF OR THE ISO NEW ENGLAND INC. TARIFF FOR TRANSMISSION DISPATCH AND POWER ADMINISTRATION SERVICES, AND THUS NEPOOL IS DRAWING UPON THE LETTER OF CREDIT IN AN AMOUNT EQUAL TO $_____."

IF PRESENTATION OF ANY DRAWING CERTIFICATE IS MADE ON A BUSINESS DAY AND SUCH PRESENTATION IS MADE AT OUR COUNTERS ON OR BEFORE 10:00 A.M. _____TIME, WE SHALL SATISFY SUCH DRAWING REQUEST ON THE SAME BUSINESS DAY. IF THE DRAWING CERTIFICATE IS RECEIVED AT OUR COUNTERS AFTER 10:00 A.M. _____ TIME, WE WILL SATISFY SUCH DRAWING REQUEST ON THE NEXT BUSINESS DAY, FOR THE PURPOSES OF THIS SECTION, A BUSINESS DAY MEANS A DAY, OTHER THAN A SATURDAY OR SUNDAY, ON WHICH COMMERCIAL BANKS ARE NOT AUTHORIZED OR REQUIRED TO BE CLOSED IN NEW YORK, NEW YORK.

DISBURSEMENTS SHALL BE IN ACCORDANCE WITH THE INSTRUCTIONS OF NEPOOL.

ATTACHMENT 4

FINANCIAL ASSURANCE POLICY – NEW YORK ISO

billing information as soon as practical, and submit invoices to Transmission Customers. The ISO shall be under no obligation to comply with the billing procedure time limits specified in Section 7. Neither the ISO nor the Transmission Owners shall be liable, under any circumstances, for any economic losses suffered by any Transmission Customer, Market Participant, or third party, resulting from the implementation by the ISO of Back-up Operation or compliance with orders issued by the ISO or Transmission Owners that were necessary to operate the NYCA in a safe and reliable manner. Such orders may include, without limitation, instructions to generation facilities to increase or decrease output, and instructions to Load to reduce or interrupt service.

10B.0 Emergency Notification

The ISO shall notify the Commission and the PSC when an Emergency State exists.

11.0 Creditworthiness

For the purpose of determining the ability of the Transmission Customer to meet its obligations related to service hereunder, the ISO shall require reasonable credit review procedures. This review shall be made in accordance with standard commercial practices. In addition, the ISO may require the Transmission Customer to provide and maintain in effect during the term of the Service Agreement, an unconditional and irrevocable letter of credit as security to meet its responsibilities and obligations under this Tariff, or an alternative form of security proposed by the

Transmission Customer and acceptable to the ISO and consistent with commercial practices established by the Uniform Commercial Code that protects the ISO against the risk of non-payment.

Any service hereunder may be terminated on sixty (60) days prior notice by the ISO prior to, or any time after, the commencement of the service if the Transmission Customer fails to, or can no longer, demonstrate its creditworthiness. Each Transmission Customer shall be responsible for providing the information specified in this Section. Each Transmission Customer will be considered creditworthy if: (i) the Transmission Customer's long-term unsecured debt securities are, and remain, rated a minimum of BBB or Baa2 by Standards & Poor's or Moody's, respectively; (ii) the Transmission Customer either prepays for service or provides an irrevocable standby letter of credit issued by a domestic or Canadian bank with a minimum A (Standard & Poor's or Dominion), or A2 (Moody's) long-term unsecured debt rating, for an amount equal to the estimated sum of charges pursuant to Section 7 for the highest three (3) individual months over rolling twelve-month periods; (iii) the Transmission Customer has, as determined by the ISO in its reasonable discretion, a qualified long-term payment history with the ISO or an individual Transmission Owner; or (iv) the Transmission Customer's parent company, in a form satisfactory to the ISO, guarantees responsibility for all financial obligation associated with services and responsibilities hereunder and such parent company conforms to the minimum ratings specified above.

12.0 Dispute Resolution Procedures

12.1 Internal Dispute Resolution Procedures: Any dispute between a Transmission Customer and the ISO involving Transmission Service under the Tariff (excluding

ATTACHMENT 5

FINANCIAL ASSURANCE POLICY – PJM ISO

10.2 Indemnification: The Transmission Customer shall at all times indemnify, defend, and save each RTO and the Transmission Provider harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the Transmission Provider's or an RTO's performance of its obligations under this Tariff on behalf of the Transmission Customer, except in cases of negligence or intentional wrongdoing by an RTO or the Transmission Provider.

11 Creditworthiness

For the purpose of determining the ability of the Transmission Customer to meet its obligations related to service hereunder, the Transmission Provider may require reasonable credit review procedures. This review shall be made in accordance with standard commercial practices. In addition, the Transmission Provider may require the Transmission Customer to provide and maintain in effect during the term of the Service Agreement, an unconditional and irrevocable letter of credit as security to meet its responsibilities and obligations under the Tariff, or an alternative form of security proposed by the Transmission Customer and acceptable to the Transmission Provider and consistent with commercial practices established by the Uniform Commercial Code that protects the Transmission Provider against the risk of non-payment.

12 Dispute Resolution Procedures

12.1 Internal Dispute Resolution Procedures: Any dispute between a Transmission Customer, an affected RTO, or the Transmission Provider involving transmission service under the Tariff (excluding applications for rate changes or other changes to the Tariff, or to any Service Agreement entered into under the Tariff, which shall be presented directly to the Commission for resolution) shall be referred to a designated senior representative of each of the parties to the dispute for resolution on an informal basis as promptly as practicable. In the event the designated representatives are unable to resolve the dispute within thirty (30) days (or such other period as the parties to the dispute may agree upon) by mutual agreement, such dispute may be submitted to arbitration and resolved in accordance with the arbitration procedures set forth below.