

2008

# Global Project Finance Yearbook

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# Letter To Our Readers

**S**tandard & Poor's Ratings Services is pleased to present our 2008 Global Project Finance Yearbook. In it, you will find in-depth commentary about some of the latest trends in project finance worldwide, articles outlining key rating criteria for project finance transactions, and a summary reference of all our project finance ratings. Every year Standard & Poor's is presented with financings for new asset types and new financial structures that are increasingly complex and 2007 was no exception. The articles in this Yearbook address the many different areas that we focused on over the past year, including our views of the changing landscape of project finance and how we incorporate subordinated debt in the capital structure of a project finance transaction.

Even during the global credit crisis of 2007, sponsors and asset owners continued to use project finance debt at high levels to acquire assets and fund new projects. The amount of project debt rated in 2007 topped \$20 billion for the third year in a row. In 2007, some of the highlights include ratings on new sport stadiums being built around the world, ratings on large transportation infrastructure projects, and ratings on a number of power assets acquired by nonstrategic investors.

We expect that 2008 will continue to build on this momentum. There are a number of external factors already in place that contribute to this expectation, including:

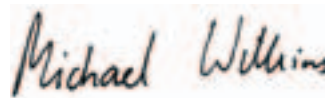
- The dire need for basic infrastructure in many regions around the globe;
- An increase in the use of public-private partnerships and privatizations throughout the world;
- The lofty level of electricity prices, which will likely lead to more investment in traditional coal- and gas-fired power plants; and
- The ongoing quest for alternative sources of energy, which will lead to increased spending on wind, solar, and ethanol facilities.

As a result, bankers, borrowers, and lenders continue to turn to Standard & Poor's independent project finance credit research and the detailed analysis on which it rests. We hope that the 2008 Global Project Finance Yearbook delivers new insights into what is becoming a progressively more accepted—but complex—financing technique and that you will turn to it as a reference.

The 2008 Global Project Finance Yearbook is available in hard copy by contacting Theresa Hearn in New York at 212-438-7987 or at other Standard & Poor's local offices. The Yearbook is also available on the web at <http://www.projectfinance.standardandpoors.com>



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# Project Finance At A Glance

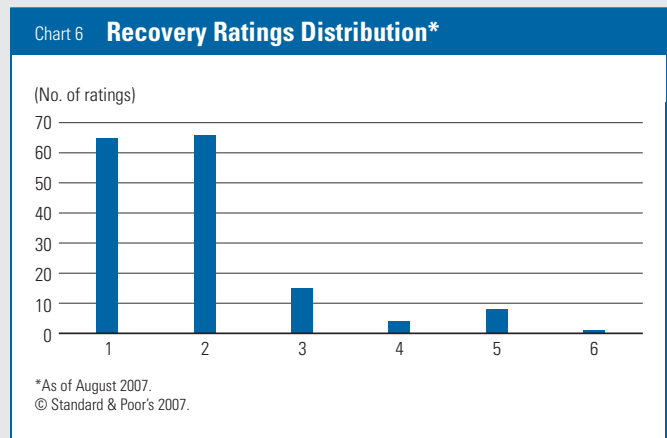
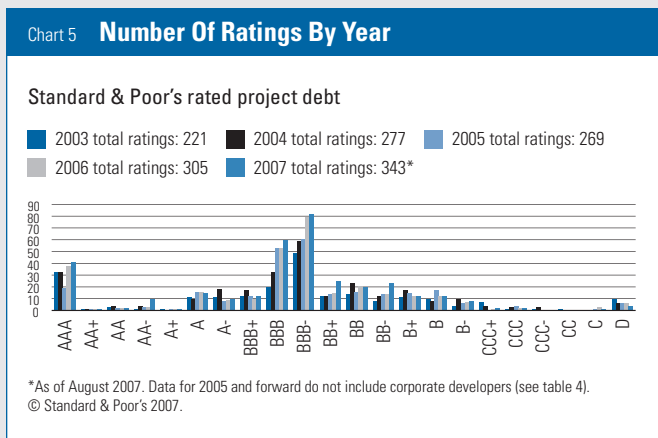
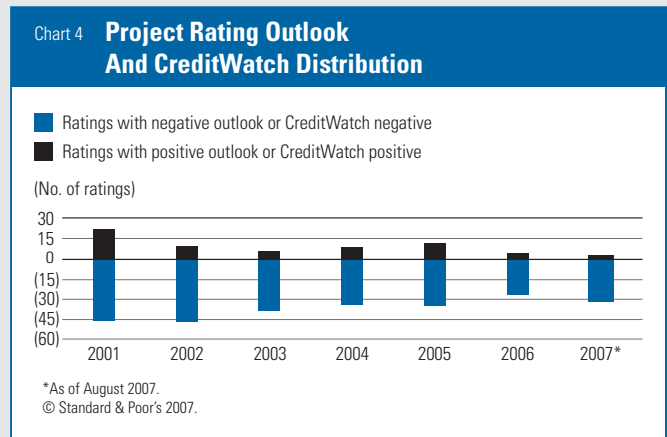
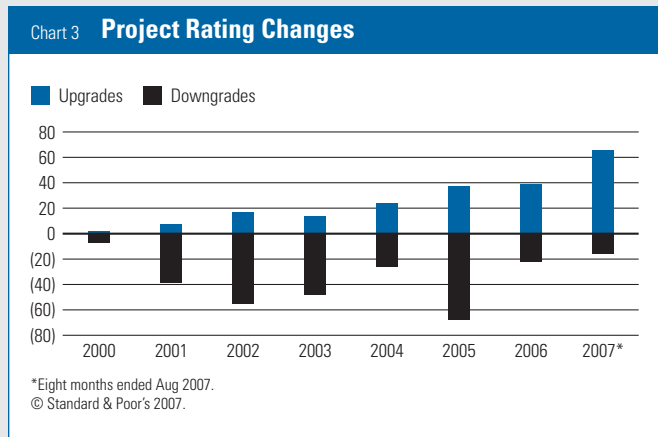
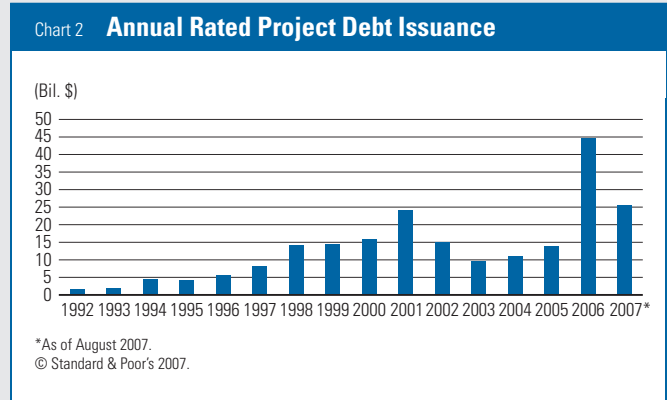
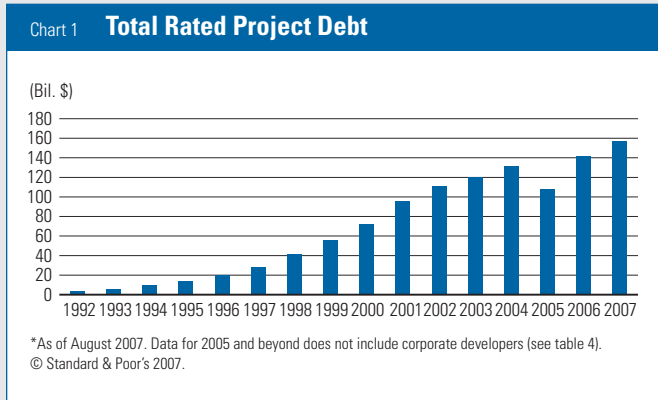




Chart 7 Regional Project Debt Issuance

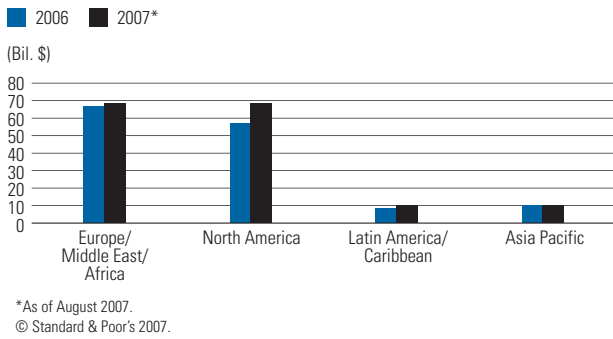


Chart 8 Cumulative Percent Distribution Of S&P Rated Project Debt

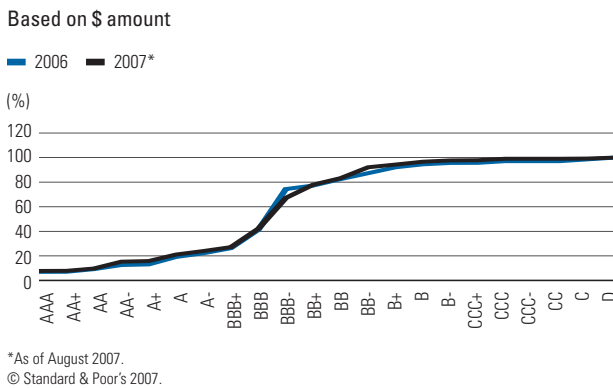


Table 3 Project Rating Outlook Distribution

	2006	2007*
Positive outlook	4	2
Negative outlook	21	16
Stable outlook	220	269
Developing outlook	1	1
CreditWatch positive	1	1
CreditWatch negative	6	16
CreditWatch developing	1	0
Not meaningful	51	38
Total ratings	305	343
Outlook/CreditWatch positive	5	3
Outlook/CreditWatch negative	27	32

\*As of August 2007.

Table 1 Rating Distribution For Project Debt

Rating	Number of ratings	% of total	Par amount (mil. \$)	% of total
AAA	41	12.0	11,991	7.7
AA+	1	0.3	112	0.1
AA	2	0.6	2,933	1.9
AA-	10	2.9	8,729	5.6
A+	1	0.3	763	0.5
A	15	4.4	8,237	5.3
A-	10	2.9	4,429	2.9
BBB+	12	3.5	4,889	3.1
BBB	60	17.5	23,333	15.0
BBB-	82	23.9	38,916	25.0
BB+	25	7.3	16,855	10.8
BB	20	5.8	8,206	5.3
BB-	23	6.7	13,663	8.8
B+	12	3.5	3,470	2.2
B	12	3.5	3,724	2.4
B-	8	2.3	1,532	1.0
CCC+	2	0.6	325	0.2
CCC	2	0.6	1,852	1.2
CCC-	0	0.0	0	0.0
CC	0	0.0	0	0.0
C	1	0.3	193	0.1
D	4	1.2	1,209	0.8
Total	343	100	155,359	100

Table 2 Project Rating Changes

	2002	2003	2004	2005	2006	Eight months ended Aug 2007
Upgrades	17	14	24	37	39	66
Downgrades	55	48	26	68	22	16
Total rating changes	72	62	50	105	61	82

Table 4 U.S. Corporate Power Developers

	Corporate credit rating	Total rated debt (mil. \$)
The AES Corp.	BB-/Stable/—	10,284
Edison Mission Energy	BB-/Stable/—	15,196
Cogentrix Energy Inc.	BB-/Stable/—	1,105
Mirant Corp.	B+/Watch Neg/—	5,023
NRG Energy Inc.	B+/Stable/B-2	12,564



## The Top Trends

# The Changing Face Of Infrastructure Finance: Beware The Acquisition Hybrid

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**B**ank lenders and institutional investors have traded favorable debt terms against the management of credit risk during the infrastructure finance boom of the past 18 months. Now, with the cycle turning in the global credit markets, loosely structured and highly leveraged acquisition loans are looking far less attractive. As a result, it is estimated that up to \$34 billion of leveraged infrastructure loans may be left paralyzed under current market conditions.

Cheap debt with relatively generous terms has been the order of the day among infrastructure sponsors. To meet market demand, banks have combined project finance structuring techniques with covenants prevalent in leveraged finance facilities—allowing sponsors to acquire infrastructure assets at record-breaking debt multiples.

Despite the advantages for borrowers, Standard & Poor's Ratings Services believes that this new form of acquisition hybrid poses a significant credit risk to the infrastructure sector. Many assets recently purchased for eye-watering acquisition multiples have failed to boast the operating and cash flow strengths assumed typical of infrastructure assets. Such risks are likely to be exacerbated as credit markets become increasingly volatile and investor confidence fragile.

With \$332 billion in leveraged loans currently sitting on banks' balance sheets globally, bankers are unlikely to be keen to lend to infrastructure assets in the current climate without comfort that credit risks are well mitigated. Investors and lenders alike therefore need to examine the risks associated with each individual transaction and, if necessary seek more credit protection than is currently being provided within the hybrid structure to ensure that the level of debt can be supported by the underlying asset. This is particularly pertinent as new assets are

brought under the infrastructure umbrella—with car parks, motorway service stations, and motor vehicle certificates now claiming to be strong infrastructure assets.

### Breaking New Boundaries: Hunger For Infrastructure Drives Development

Over the past few years the boundaries of infrastructure finance have been increasingly pushed, with investors hungry for new types of assets and financing techniques. Consequently, the lines between project finance and leveraged finance have become evermore blurred, with investors marrying together structuring techniques from both financing classes to acquire infrastructure assets. Crucially, the high debt multiples usually associated with project finance transactions have been adopted in conjunction with the relatively flexible controls, hurried due diligence, and weak security packages more common in LBOs. As a result, increased debt multiples are often coming at the expense of necessary risk mitigants.

Since 2006 a phenomenal appetite for infrastructure assets has spread worldwide (*see "The Amazing Growth of Global Infrastructure Funds: Too Good to be True?" published on Nov. 30, 2006, on RatingsDirect*). This, in turn, has fuelled a surge in the number of acquisitions within the sector, making it a significant area of growth for the syndicated loan market. Landmark deals include the purchase of U.K.-based airport operator BAA Ltd. (BBB+/Watch Neg/—) by a consortium led by Grupo Ferrovial S.A. in February 2006 for \$30.2 billion, the acquisition of the Indiana Toll Road for \$3.8 billion by Macquarie Infrastructure Group and Cintra Concesiones de Infraestructuras de Transporte, and Goldman Sachs' Admiral Acquisitions consortium's £2.8 billion acquisition of Associated British Ports (ABP).

### Fusion Of Project Finance And Leveraged Finance

As for the financing of “greenfield” infrastructure assets, investors have turned toward project finance to raise funds when acquiring mature infrastructure assets—securing high leverage multiples due to the stable cash flows and monopolistic environment. They have then incorporated leveraged finance structuring techniques instead of carrying out an LBO of the asset as would traditionally have been the case for the acquisition of mature infrastructure assets (see table for the various structuring techniques typically associated with leveraged finance transactions and project finance transactions, respectively).

Of key concern for Standard & Poor’s is that, in combining techniques, investors have been trading favorable debt terms against the management of risk. Often we are seeing new infrastructure acquisition financing structures employing structural features, such as short shareholder lock-in periods, that are weaker than those of traditional transactions, coupled with a very aggressive financial structure. ABP, for example, was purchased for £2.8 billion with an enterprise value (EV)-to-EBITDA ratio of 16.6x. Despite the asset’s strong monopolistic position and stable cash flows, these terms are unlikely to fully mitigate risk arising from the high level of debt. Nor are they likely to mitigate market risks such as

the increasing environmental and regulatory hurdles limiting ABP’s ability to expand capacity in the future.

### Infrastructure—An Ever Expanding Asset Class?

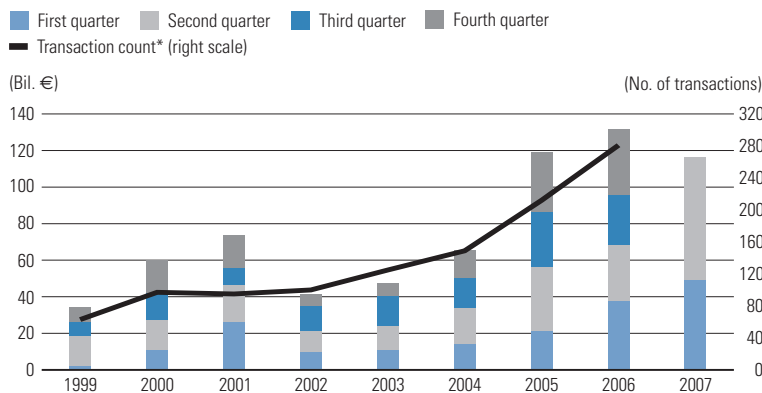
For the past 18 months, sponsors have also been using the hybrid structure to acquire assets not traditionally considered as infrastructure. These assets do not benefit from the significant track record of other sectors such as ports and airports and therefore may not be suitable to support high debt multiples, lacking the necessary long-term stable cash flows or a strong monopoly position in the market.

The recent refinancing of Autobahn Tank & Rast Holding GmbH, a German motorway service area operator, is a clear example of the market opening up to new assets and financing acquisitions that would not previously have been recognized as infrastructure-style deals. Indeed, the initial acquisition of Tank & Rast by private-equity investor Terra Firma for €1.1 billion in November 2004 involved traditional leveraged finance techniques. The acquisition was financed using an all-senior debt facility, with a debt multiple of 6x debt to EBITDA.

As little as two years later, in June 2006, Terra Firma was able to refinance the debt, obtaining greater leverage at a cheaper price. The refinancing transaction involved a €1.2 billion seven-year senior loan with a cash sweep, and leverage was about 8x. Significantly thinner margins were attained via the refinancing—with pricing falling to a range of 125 basis points (bps) to 150 bps in 2006, from a range of 212.5 bps to 262.5 bps in 2004. Importantly, the arrangers of the refinancing—Royal Bank of Scotland, Barclays Capital, Société Générale, and West LB—marketed the transaction as infrastructure play, highlighting the asset’s 90% market share and stable, predictable cash flows.

Investors and lenders need to be aware of the credit risk of applying significant leverage to a new asset type. The experience of U.K. motorway service operator Welcome Break Group demonstrates the pitfalls of assuming that this asset class can support significant levels of debt. Standard & Poor’s believes that applying infrastructure-style financing techniques to less mature asset types could

European Senior Loan Volume 1999–2007\*



\*Transaction count takes first- and second-lien portions of a single transaction as one event and excludes any amendments. For the first half of 2007, the transaction count was 214. © Standard & Poor’s 2007.

serve to undermine the sector’s reputation for strong, long-term revenue flows if appropriate risk mitigants are not employed.

### The Origins Of The Acquisition Hybrid

Hybrid acquisition financing structures are fairly new to the infrastructure sector, with the South East Water deal in 2003 heralding the first transaction of this kind on a large scale. It was the subsequent flurry of French toll road deals in 2005 and 2006 that brought infrastructure acquisition transactions into the mainstream—with Eiffarie’s purchase of Autoroutes Paris-Rhin-Rhone (APRR) providing a template for future transactions.

Techniques from both leveraged finance and project finance were evident in the APRR transaction. The €1.8 billion revolving credit facility, for example, has a medium-term maturity and a weak structural package with respect to shareholder lock-in periods. Such terms are typically associated with leveraged finance transactions. The aggressive financial structure of the APRR acquisition—due to high consolidated leverage and low debt service coverage ratios—is, however, more akin to those seen within the realm of project finance. Similarly, the facility’s cash sweep, as well as the inclusion of future capital expenditure requirements, are also project finance techniques.

Notably, the revolving credit facility carries an investment-grade rating, as does the recently rated €500 million term loan facility, reflecting the asset’s strong, recurring cash flow generation capability. This and other credit

strengths served to offset the transaction’s aggressive financial structure, significant refinancing risk, and weak structural package.

### More Protections Necessary To Mitigate Risk And Offset Poor Performance

The lack of security measures among hybrid structures and the diminishing level of controls and due diligence, if left to persist, could negatively affect credit quality in the sector.

For example, the extremely high leverage involved in Macquarie’s acquisition of the U.K. mobile phone mast owner, National Grid Wireless, for £2.4 billion could have been mitigated by a stronger structural package. Significantly, this purchase—financed at a 17.5x estimated EV-to-EBITDA presynergies multiple—ran into difficulties during syndication, with banks appearing uncomfortable with the level of risk in the transaction and its fit within the infrastructure space.

Several key assets in the sector have recently demonstrated the need for strong security covenants. Notably, Eurotunnel S.A.’s historic underperformance prompted the third restructuring of its debt, with a long and bitter battle between shareholders and several classes of creditors. This eventual restructuring allowed Eurotunnel’s senior debt, Tier 1A, Tier 1, and Tier 2 be fully repaid in cash at 100% par including accrued interest, with shareholders receiving 13% of the new company’s equity. The lower ranking creditors were not compensated nearly as well, however, with some Tier 3 creditors threatening lawsuits.

Poor performance at Eurotunnel, as well as at U.K.-based underground rail infrastructure financing companies Metronet Rail BCV Finance PLC and Metronet Rail SSL Finance PLC, has served to highlight that there are some important exceptions to the rule that infrastructure represents a stable asset class. Nevertheless, for well-structured and more conservatively leveraged transactions, such as the refinancing notes issued in August 2007 by Channel Link Enterprises Finance PLC as part of the £2.8 billion securitization of Eurotunnel, it is still possible to achieve investment-grade underlying ratings. Prior to the latest restructuring and securitization, the company had an unwieldy and complex debt burden of more than £6.2 billion. Another example of how leveraged acquisition hybrids

Leveraged Finance And Project Finance Structuring Techniques	
Leveraged finance	Project finance
Corporate entity in competitive environment	Asset with stable cash flows over the long-term, monopolistic environment
Debt capacity dictated by market-driven multiples	Debt capacity dictated by discounted cash flows
Medium-term maturity, lower leverage, bullet repayment	Long-term maturity, higher leverage, amortizing repayment, lower margins
Standardized due diligence	Detailed due diligence
Key ratio: debt to EBITDA	Key ratio: loan to project life coverage
Flexible financial undertakings	Fixed financing structure, monitored/ updated
Capital expenditure lines accounted for, but not mandatory future capital expenditure	Future expenditure (i.e., restoration of assets) accounted for
Standardized security interest charges	Ring-fencing security and “cash waterfall” controls

are now tapping the capital markets, despite current turbulent conditions, is the recent £4.1 billion refinancing of U.K.-based Thames Water Utilities Ltd. (BBB+/Watch Neg/—), which also launched and closed in August.

### **Credit Deterioration Across Markets Heightens Risk For Infrastructure Deals**

Deteriorating credit quality has not been constrained to certain segments of the infrastructure sector alone, with credit quality declining most notably across leveraged loan markets in general. A rise in M&A activity and leverage multiples has been evident across the European loan market in the benign credit environment of the past few years (*see chart*). Contractual terms have also been weakening elsewhere in the loan markets, with the introduction of “covenant-lite” LBOs further reducing lenders’ control over borrowers’ performance. Furthermore,

Standard & Poor’s has recorded that the level of senior debt amortizing within European LBOs has dropped steeply, to 15% at the beginning of 2007 from 50% in 2001. With risk mitigants deteriorating in this fashion across the loan market in general, Standard & Poor’s does not believe that the infrastructure asset class can withstand a continued deterioration in underwriting quality. Hybrid acquisitions must therefore be restricted to infrastructure assets operating within monopolistic environments with stable cash flows over the long term. Moreover, high leverage should be accompanied by the necessary structural package and creditor protections.

### **Notes**

Additional data provided by Thomson Financial. Additional research by Caroline Hyde of Moorgate Group. ■

# The Anatomy Of Construction Risk: Lessons From A Millennium Of PPP Experience

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**A**lthough public-private partnerships (PPP) are widely acknowledged to have a better record of asset delivery than conventional approaches to public-sector procurement, a major survey of construction risk by Standard & Poor's Ratings Services suggests that their successful delivery remains dependent on a number of critical prerequisites. The survey indicates that, absent these prerequisites, the construction-phase performance differential between PPPs and conventional procurement methods can narrow considerably.

PPPs are increasingly employed globally for the procurement of essential public-sector infrastructure assets. Financing needs are dominated by substantial upfront capital-expenditure requirements for asset refurbishment, enhancement, extension, or new build. The attendant multiyear construction works programs are often the most challenging stage in any PPP project's life cycle. There is, however, limited published empirical evidence from which lenders can gauge the true nature, extent, and prevalence of construction risk associated with PPPs. Accordingly, late in 2006, Standard & Poor's launched the PPP construction risk survey to begin to address this.

The survey drew 161 responses from bankers, construction contractors, procuring agencies, technical and financial advisors, insurers, and project companies. Reflecting the global nature of PPPs, survey responses were received from market participants in 22 countries. On average, respondents reported between six and seven years' experience of PPP projects—representing an aggregate experience base of nearly 1,000 years.

This article presents the initial survey results of our PPP construction-risk research.

A key output of the construction-risk survey is the first version of Standard & Poor's PPP Construction Risk Index (*see* "Enhancing Credit Quality Analysis: the Construction Risk Index" *on page 18*). The Index is an empirically derived template, against which lenders and their technical advisors can map PPP projects and their associated risk mitigants and contractual protections, in order to

identify potential areas of residual PPP construction-risk exposure.

## Project Characteristics And Political Concerns Dominate The Agenda

### **Risk cuts across asset classes**

Although PPPs are generally acknowledged as more effective at asset delivery than conventional procurement methods, survey respondents indicate that exposure to construction risk remains highly contingent on the specific characteristics of a project, its contractual provisions, and its associated transaction structuring. Critically, market experience suggests that, in the absence of a number of the elements outlined below, the performance gap between PPPs and alternative procurement approaches narrows considerably.

Assessments of credit quality based simply on the "acceptability" of certain asset classes (conventionally regarded as being at the conservative end of the credit-risk spectrum), and the "unacceptability" of others, are not supported by our findings. Indeed, market experience suggests weak, if any, correlation between investor exposure to construction risk and the type of project to be financed. Rather, respondents look to the particular attributes of a construction mandate, and the specific contexts of works that have previously exposed lenders to PPP construction risk. Many of these attributes cut across all asset classes.

### **Public-sector shortcomings and political risk cited as key concerns**

Construction risk typically finds expression in a departure from expectations about the outturn cost of works, their specification, or associated schedule. Survey respondents were asked to identify the main reasons behind such departures from expectations.

Major failures by private sector partners are often headline grabbing in this regard, and they certainly feature in our survey responses. However, by far the most frequently reported cause of distress affecting PPP construction works relates to the inexperience, lack of commitment, lack of engagement, bureaucracy, and

interference of public-sector project participants; and associated scope changes and enforced delays. It is reported that “partnership” is not always the spirit with which the public sector enters these long-term, collaborative contracting arrangements. The survey responses indicate that PPP lenders should continue to pay close attention to political risk.

### Survey Scope And Objectives

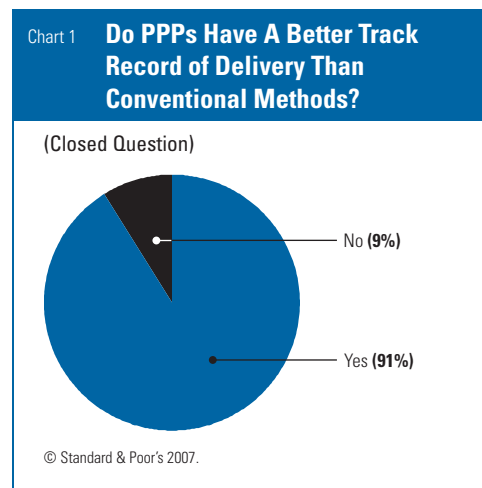
Our survey asked respondents to provide information based on their general experience of PPPs, and additionally asked a series of more detailed questions about specific PPP projects known to them. In this article, we focus on general PPP experience. Our general questions covered three main, related areas of interest:

- What is the experience of PPP project delivery?
- In terms of delivery, are some asset classes more reliable than others?
- What are the main reasons behind construction phase distress?

Each of these questions is now considered in turn.

### Construction-Phase Delivery: PPP Finds Favor Over Conventional Procurement, But Concerns Remain

Survey respondents were asked if PPPs had a better track record of delivery than conventional public-sector procurement methods. When constrained to answering either “yes” or “no”, more than 90% responded affirmatively (see chart 1).



However, a significant number of those surveyed qualified their answer to this question—many stating that PPPs’ comparative success depends on wider considerations. When contingent qualifications such as “it depends...” are factored in, the results look somewhat different (see chart 2).

### PPP's relative superiority depends on a number of factors

One-third of respondents whose experience suggests that PPPs have a better track record of delivery qualified this assertion—stressing that the comparative success of PPPs depends on:

- Adequate and accurate definition of the technical solution required;
- Adequate and accurate definition of contractual obligations, responsibilities, and risk allocation;
- Appropriate equity commitment, performance incentives, and penalty regimes;
- The objectives, commitment, engagement, experience, and sophistication of the public sector partner or partners;
- Adequate protection against political interference and current position in the election cycle;
- The experience and capacity of the private-sector partners;
- The quality of project management and the extent of day-to-day, hands-on project supervision;
- The limitation of scope for claims and changes, and contractual clarity regarding the processes for accommodating change orders and variations;
- The implementation of policies and practices to avoid extended negotiations;
- The efficiency of existing public sector procurement practices; and
- The caliber of the individuals involved.

Several qualifications underscored the fact that this question was asked in a relative context (Are PPPs better than conventional procurement?). Generally, respondents pointed to particularly poor experience with conventional public sector procurement practices in terms of timely project delivery within budget and to specification. In this context, PPPs are reported to perform very well.

On the other hand, some respondents benchmarked PPP performance against already efficient international public sector procure-



ment processes, incorporating stringent performance standards and penalty regimes. In this regard, PPPs are reported to perform less well, or to offer equivalent performance.

A general note of caution is sounded by a couple of respondents who replied that it was too soon to say whether PPPs offer a better track record of delivery than conventional approaches. This reflects an important limitation of any PPP research—namely that PPPs are a relatively recent development. Globally, many PPP projects remain in the planning or construction phase. Furthermore, most of those postconstruction are only in their earliest years of operations, when the assets are still new (possibly still in their warranty or latent defects periods) and there is limited visibility of whole-life experiences and costs.

Finally, in response to this question, a number of those surveyed identify—and in some cases name—individuals that have contributed to the success of PPPs; principally through their project management and leadership skills. This appears to be overlooked or commonly given a low ranking in most analyses of construction risk. Knowing more about key personnel, their background, experience, involvement, and certainty of retention, would appear to offer potential for better understanding and containing construction risk.

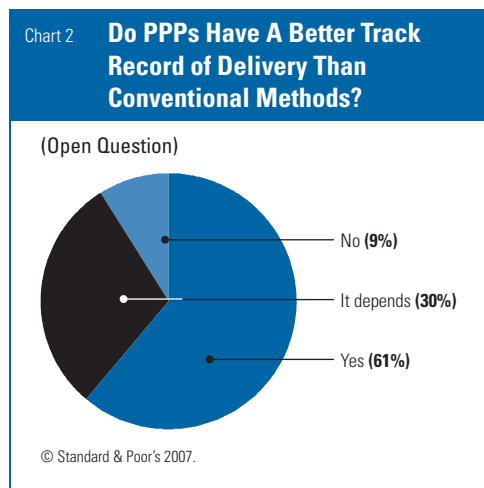
### Are Some Asset Classes Better Than Others?

Our survey asked respondents to identify the type of PPP project most likely to encounter construction-related budgetary or scheduling

distress. Our expectation was that specific asset classes would be identified as more or less exposed to risks through this question. Asset-specific responses were, however, the exception. Although a number of those surveyed specifically mentioned IT projects, sub-surface and demolition works (especially those with an asbestos presence), and refurbishment and renovation projects, most respondents failed to identify any correlation between asset class and construction-risk exposure. In fact, most respondents either inferred or stated that, in their experience, there was little correlation between asset class and construction risk.

Rather, respondents focused on the nature of the construction obligation itself. A number of recurring themes arose in the survey returns, highlighting key areas of concern. These were:

- New, untested or unproven technologies, technical standards, and process innovation;
- Poor performance definitions that are open to interpretation;
- Very large, complex, specialized, or highly technical requirements with a lengthy construction phase;
- Changing legislative, regulatory, and best-practice environments;
- Aggressive scheduling with little contingency, often to meet politically sensitive deadlines (for example, hosting a high-profile international sports event);
- Limited or late detailed design;
- Multisite construction programs on operational sites with access constraints, especially those in densely developed urban areas with decant requirements;
- Long, linear—rather than concentrated—construction sites, such as new-build tramways;
- Weak or inexperienced contractors (especially if there is limited contractor default protection);
- Heavy reliance on skilled trades or specialist subcontractors, or specific materials with supply chain uncertainties;
- Limited due diligence, understanding of ground conditions or investigative works, and legacy issues related to existing assets;
- Multiparty interfaces—especially if these rely on cooperation and goodwill;
- Incomplete expropriation, permits, approvals, consents, or licences; and
- Complex project phasing and subphase inter-relationships, dependencies, and constraints.



### Main Reasons For Construction Budget And Schedule Problems

Respondents were asked to draw from their PPP-related experience and list the main reasons they had encountered problems with construction budgets and schedules. The top 10 responses are presented in chart 3.

#### Conflicts and disputes

It is, perhaps, unsurprising to find conflicts and disputes at the bottom of the top 10. Conflicts and disputes—particularly those relating to claims—have traditionally been endemic in public sector procurement, and experience indicates that contractors have used them as a major contributor to profitability. PPPs were developed specifically to design-out the potential for claim-related cost escalation through refocused risk allocation, tight legal terms, and contractual clarity regarding change orders and variations. According to market participants, this appears to be working. The incentive for contractors to complete has replaced the incentive to claim.

#### Condition of existing assets

A number of PPP projects bundle new-build obligations with operational and maintenance responsibilities for existing assets. Inadequate due diligence or investigative works—often blamed on unrealistically tight public sector timescales—was frequently cited by respon-

dents as the cause of defects going unidentified, overestimation of the remaining life of existing assets, or underestimation of their maintenance requirements and costs.

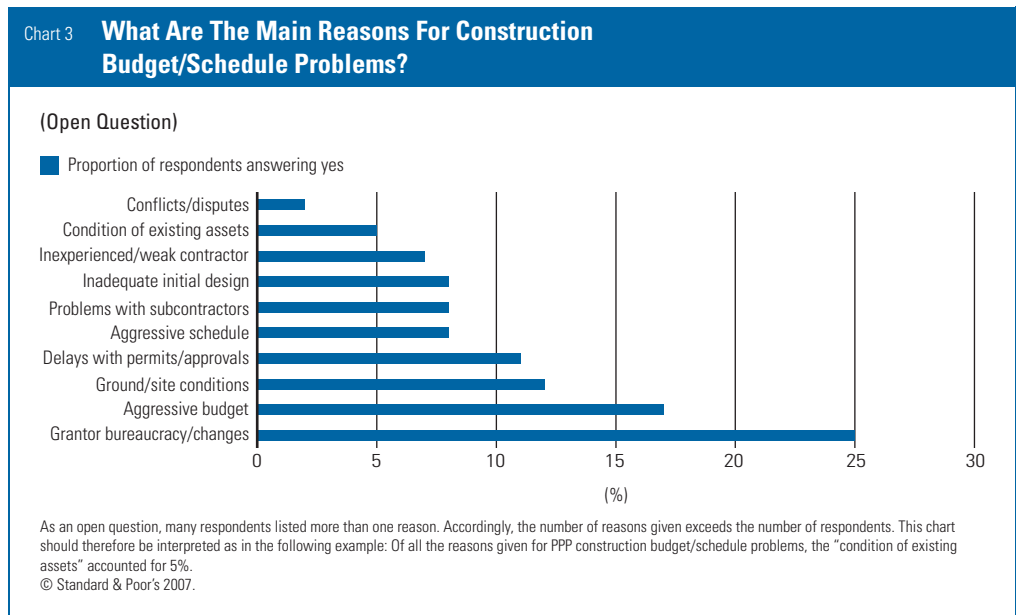
#### Inexperienced or weak contractors

Weak construction contractors are mentioned by a number of our survey respondents, although they remain toward the bottom of the top 10. Comments suggest that this is because the scale of most PPP projects limits participation to the larger, more established firms in a sector; because company capabilities and their financial standing are subjected to multiparty scrutiny; and because a number of contractors have actively sought a foothold in the PPP sector and have reputational issues at stake.

Survey respondents linked contractor-related problems to:

- A focus on short-term construction profits (at the expense of long-term project commitment),
- Inadequate incentives (limited penalties or equity participation),
- Optimism in terms of unfamiliar work, sectors, or jurisdictions,
- Poor project and/or subcontractor management,
- Inappropriate risk allocation, and
- Bad labor relations.

A number of those surveyed state that they had little insight into a contractor’s responsi-



bilities beyond the PPP project until external workflow commitments started to affect the contractor's performance.

Contractor replaceability was a key concern for many respondents, a number of whom sought adequate contractor default protection provisions and project liquidity to enable them to replace a failing construction contractor at a cost premium.

#### ***Inadequate initial design***

Our survey responses suggest a negative correlation between the extent of detailed design work completed by financial close and subsequent project exposure to variations and cost overruns.

The amount of upfront design is reported to vary significantly between projects, ranging in scope from conceptual drawings with ill-defined technical specifications through to detailed final design (1:50 plans).

The survey results indicate that the potential for inadequate initial design to affect the delivery and operation of projects is exacerbated by the life-cycle design philosophy central to PPPs—a philosophy that seeks to integrate design, build, and operations; ideally with the operator or facilities-management contractor involved from the outset. Additional detail provided by some respondents suggests that inadequate design symptomizes the existence of a public sector that fails to understand PPPs, or that regards conventional design and build contracts as sufficient to achieve the wider risk transfer and long-term partnership objectives of PPPs.

#### ***Problems with subcontractors***

Survey respondents cite subcontractor issues as more common causes for construction-phase distress than problems with the main construction contractors. This is noteworthy as, in our experience, independent assessments of construction risk often focus on the primary contractors and stop short of any detailed evaluation of subcontractors and their subcontracts.

Subcontractor-related issues raised by survey respondents include replaceability concerns (particularly for specialist subcontractors from a limited pool of expertise, or those working in highly competitive markets attracting premium rates); dispute potential between

the primary contractor and their subcontractors, or between subcontractors; and the sheer number of subcontractors used by some primary contractors causing problems with project management and works coordination.

#### ***Aggressive scheduling***

Tight works programming with aggressive milestones, delivery, or long-stop dates, is highlighted in a number of survey responses as a key reason for construction-phase distress. Respondents were wary of aggressive scheduling on projects where site access is constrained (limited to certain times of the day or months of the year) or restricted by, for example, weather or tidal conditions—absent relief from contractual performance. Politically-driven (or sensitive) timescales with little contingency or “float” are a particular concern among those surveyed.

#### ***Delays with permits and approvals***

More than 10% of the reasons cited by respondents as causing construction-phase problems relate to delays with outstanding permits, approvals, consents, and licenses. Several respondents warned that public-sector reassurances at financial close that these would be quickly secured should not be relied upon.

Particular circumstances reported as having caused delays include allocating responsibility for securing permits and approvals to private-sector partners and the involvement of multiple tiers of government or numerous statutory agencies or third parties in the granting of permits—particularly where there is no legal or commercial incentive for those parties to act. Respondents specifically noted that the issuing of permits typically takes longer than any desk-top study of the law in a particular jurisdiction would suggest.

#### ***Site conditions***

Unforeseen ground conditions are a key reason cited for construction delays. Some respondents pointed to circumstances under which preliminary subsurface investigations were rushed or incomplete, or where poor location of bore holes and trial pits resulted in deficient soil or rock sampling. Others highlighted that, as geologic investigative techniques rely on sampling, the possibility for different ground conditions to be present between exploratory

## The Top Trends

points always exists. In such cases—as with unexpected archaeological or mining discoveries—respondents were keen to emphasize that these risks should remain entirely with the public sector or should, at least, be shared between the private and public sector partners.

### **Aggressive budgeting**

Given competitive tendering, it is perhaps unsurprising that so many survey respondents identified aggressive budgeting as a key reason for construction-phase distress. Comments about insufficient liquidity,

reserves, and contingency funds; and an inability to absorb (sometimes relatively minor) cost overruns were frequently noted in the survey responses.

A number of respondents point to the fact that the public sector remains fixated with lowest price, and that—given affordability pressures—it takes a strong, sophisticated, and politically courageous grantor to identify and eliminate potentially winning bids that have been strategically underpriced. In the absence of benchmarking against observed cost ranges, it seems that bid-evaluation criteria that con-

<b>PPP Construction Risk Index; Version 1.0</b>		
<b>Risk Category</b>	<b>—Risk Assessment—</b>	
	<b>Low risk</b>	<b>High risk</b>
<b>Project preparations</b>		
Expropriation	Complete	Outstanding
Design	Detailed	Conceptual
Permits/consents	Granted in full	Granted in part
Investigations/site sampling	Rigorous	Partial
<b>Project characteristics</b>		
Construction challenge	Uncomplicated	Complex/highly technical
Construction skills	Standard civil engineering	Specialist engineering
Construction materials	Readily available	Supply-chain constraints
Construction scale	Small	Large
Construction duration	Short	Long
Construction technology	Proven	Innovative
Construction location	Greenfield	Brownfield (busy/operational)
Construction site	Contained	Long, linear
Number of sites	Single	Many
Site access constraints	None	Many constraints/limitations
Existing asset condition	Fully understood	Partially/not understood
Interfaces	Few/none	Multiparty interfaces
Works phasing	Simple/no interdependencies	Many interdependencies
Construction budget	Observed range/sufficient float	Aggressive
<b>Concession agreement</b>		
Technical solution	Clear	Unclear
Performance requirements	Clear	Unclear
Risk allocation	Standard	Unique/unclear
Schedule	Sufficient float/no long stop	Aggressive
Deadline	None	Fixed by asset-use requirements
Performance incentives	Strong	Weak
Variation/change procedure	Clear	Unclear

sistently and transparently score value above price could be an important contributor to the subsequent credit quality of a PPP project.

**Grantor bureaucracy and changes**

Nearly 25% of all responses about the causes of construction-phase problems for PPP projects identified public sector partners, either directly or indirectly. Many respondents went to some length—with illustrative examples—to point out that their comments were not restricted to countries new to PPPs or to sovereign counterparties with lower credit quality.

Examples of ways in which the public sector had frustrated the construction of PPP projects can be summarized under a number of key headings:

*Capability.* The client does not possess the experience, technical skills, or resources to

manage the public sector obligations associated with a long-term, active partnership with private sector providers.

*Legacy.* The client tries to manage PPPs as they have previously managed conventional design and build contracts, including using amended design and build contracts, in an adversarial, “them-and-us” environment.

*Preparation.* The client fails to define a clear output specification, to complete enabling works, to secure land, or to grant permits or approvals.

*Expectations.* The public sector client’s expectations of who is responsible for what, and what has to be delivered (by when) fail to match the private sector’s understanding.

*Process.* The client fails to establish streamlined, transparent procedures for day-to-day liaison with its private-sector partners.

PPP Construction Risk Index; Version 1.0 (continued)		
Risk Category	—Risk Assessment—	
	Low risk	High risk
<b>Private sector</b>		
Experience	Highly experienced	Inexperienced
Capacity	Sufficient	Limited
Project management	Strong	Weak
Commitment	Long-term focus	Short-term focus
Personnel	Broad skills base	Reliance on key personnel
Financial standing	Strong	Weak
Contractor replacement	Straightforward	Complicated/restricted scope
Project importance (reputation)	High/strategically important	Low
Subcontractors	Few/standard	Many/specialist
<b>Public sector</b>		
Experience	Highly experienced	Inexperienced
Commitment	Strong	Questionable
Engagement	Active	Hands-off
Project management	Strong	Weak
Supervision	Active	Minimal
Personnel	Broad skills base	Reliance on key personnel
Practices/procedures	Simple/streamlined	Complex/ill-defined
<b>Political/regulatory risk</b>		
Support	Broad, cross-party	Limited
Elections	Past	Upcoming
Protestors	Uncontroversial project	Controversial project
Legal/regulatory framework	Stable	Evolving

Bureaucracy is slow and resistant, and projects are dogged by extended negotiation periods and delays in achieving sign-off.

*Oversight.* Existing deficiencies in the client's project supervision and control procedures will not be cured, absent any other changes, simply by moving from traditional procurement methods to PPPs.

*Change.* The client pushes for scope or specification changes, or variations, with limited regard for cost or time implications, or in the absence of contractual clarity about how such changes should be accommodated.

Importantly, it is clear from the survey results that a number of PPP problems stem from incomplete public sector “buy-in” to the very concept of PPPs. Practical examples reported included situations where:

- A political champion is promoting PPPs, with limited support from colleagues in their own political party;
- A government department is promoting PPPs, with limited support from its sister departments or other tiers of government;
- A municipality is promoting PPPs, with limited support from neighboring municipalities;
- A political party is promoting PPPs, with limited support (or, indeed, outright hostility) from opposition parties;
- Politicians are promoting PPPs, with limited support or considerable skepticism from civil servants.

The survey results appear to reinforce the notion that the large scale and highly visible, essential public-service nature of most PPP projects makes them easy targets for factions with explicit or implicit political agendas that may be hostile to the concept of private-sector participation in public-sector infrastructure projects.

Given the long-term nature of the contractual relationship, which will likely span a number of administrations with different decision-makers, strong, cross-party support and engagement; and professional, non-politicized client-side management were identified by many survey respondents as important mitigants of political risk.

### **Enhancing Credit Quality Analysis: The Construction Risk Index**

A key output from our first-cut PPP construction risk results is the derivation of

Standard & Poor's PPP Construction Risk Index (version 1.0). This version is based upon the results from our survey which, in turn, draw upon the practical experience of many seasoned market participants.

The Construction Risk Index presented here is an empirically-derived template against which lenders and/or their technical advisors can map PPP projects and their associated risk mitigants and contractual protections. This enables potential areas of residual construction-risk exposure to be highlighted when evaluating credit quality, and allows for focused consideration of further risk prevention, reduction, transference, acceptance, or contingency. Subsequent versions of the Index will evolve as we advance our PPP construction-risk research initiative.

Our Construction Risk Index register (version 1.0) is presented on pages 18 and 19. It reflects the risks identified by our PPP research to date. We are aware that in the structured world of project finance, senior creditors may be insulated from a number of these “raw” risks. The purpose of the index is to identify construction risks acknowledged to have caused problems in the past—such that the particular structural provisions and contractual protections associated with specific transactions can then be overlaid, thereby highlighting creditors' residual construction-risk exposure. It represents a consistent, logical, and evidence-based method for identifying PPP construction-risk exposure. The Index will be extended and fine tuned as our PPP-related research program rolls forward.

Practical application of the Construction Risk Index requires the evidence-based risk register to be expanded to allow for transaction-specific mitigants to be incorporated, therefore highlighting any mismatch between the shape and size of the risk and those of the associated mitigant package. The steps are as follows:

- Based on the project characteristics, define a score for each of the risk categories in the Index using the low-risk/high-risk spectrum.
- Identify the transaction mitigants pertaining to each of the risk categories.
- Employ mismatch analysis to determine creditors' residual risks. This may then become the focus for further analysis or negotiation, and can be explicitly factored into any assessment of PPP construction-phase credit quality.

Chart 4 **Sample PPP Construction Risk Score Card (Pertaining To Project Preparations)**

Risk category	Risk assessment		Mitigants	Residual risk exposure
	Low risk	High risk		
<i>Preparations</i>				
Expropriation	Complete	Outstanding	Relief event	None
Design	Detailed	Conceptual	95% complete	Negligible
Permits/consents	Granted in full	Granted in part	Few permits granted so far	Significant
Investigations	Rigorous	Partial	Further bores to be drilled	Developing

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**Survey Methodology**

In September 2006, Standard & Poor’s initiated original, evidence-based research into the specific construction risks associated with PPPs. A Web-based questionnaire was selected as our primary survey instrument, in view of its global reach, convenience for survey respondents, and a successful pilot survey. Internal privacy and e-mail policies required us to promote the research (through national and specialist press) and have market participants register their interest with us by completing a short screening survey.

By February 2007, we had received 319 expressions of interest from bankers, con-

struction contractors, financial advisors, insurers, institutional investors, procuring agencies, project companies, and technical advisors, all with PPP sector experience.

**Response rate**

Links to our Web-based survey were forwarded to the 319 registered market participants. By late March 2007, we had received 161 valid responses (a response rate of 50%). The average exposure of the participants to PPP projects was six to seven. Responses were received from participants in 22 countries; mainly in Europe but also representing the U.S., Canada, Latin America, Africa, and the Asia-Pacific region (mainly Australia). ■

# Right-Way Risk Can Enhance Hedging Capabilities Of Higher-Risk U.S. Energy Companies

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**W**ith the increase in volatility in U.S. energy markets in recent years, commodity sales contracts have the potential to move in and out of the money rapidly. Asset owning companies, such as oil and gas exploration companies or electricity generators, that want to reduce their commodity exposure can enter hedge contracts. When these hedge contracts are longer term and cover a large portion of a company's producing assets, Standard & Poor's Ratings Services reasons that a company's risk profile is reduced due to the more predictable and stable cash flow.

However, the swings in the mark-to-market value of these hedge contracts can be big and the hedge counterparties can have very large exposures to the sellers if commodity prices move up. To protect themselves, the hedge counterparties require collateral to be posted by sellers for most out-of-the-money contracts or participate in some form of asset-based lending program. This can lead to large and sometimes prohibitive liquidity requirements for the hedger, often limiting the amount of hedging that a speculative-grade player can execute, which in turn limits the company's ability to transfer market risk to another party.

In response to this, letter of credit (LOC) providers and some counterparties have been developing innovative structures that allow an entity to provide credit support to counterparties for hedging activities, while absorbing less credit capacity and preventing a company from getting into a liquidity squeeze under a high price scenario—where the company would otherwise be healthy. Since the market value of the assets pledged to the LOC provider is growing with the exposure, the LOC provider has more comfort that it will be kept whole if a bankruptcy of the commodity seller were to occur during that period of high commodity prices. This concept has been referred to as right-way risk.

## How Right-Way Risk Works

In the situation where an issuer is an owner of commodity producing assets, such as oil

and gas properties or a generation facility, and that issuer is solely attempting to hedge the future production and sale of those assets, the exposure the counterparty has to this asset owner increases when the price of the commodity increases. As such, the counterparty may require the seller to post increasing amounts of collateral as commodity prices rise. The form of collateral required can be cash, physical assets, or the posting of an LOC from a highly rated bank. If an LOC is the form of collateral, then the physical security is pledged to the LOC provider as more LOCs are posted to the counterparty.

However, because of the correlation between higher market prices for energy and the value of the assets pledged as collateral, the lenders can benefit from right-way risk. Thus, even as a counterparty's mark-to-market exposure increases, the risk may be mitigated by a simultaneous improvement in the hedger's ability to pay.

## Right-Way Risk In Standard & Poor's Rating Analysis

When Standard & Poor's assigns corporate credit ratings, issue-specific ratings, and recovery ratings to a company or project, we consider how right-way risk affects default and recovery risk. This is summarized below:

- An LOC obtained to support hedging arrangements is not counted as debt for the purposes of ratio calculations unless it is actually drawn on by the counterparty. In many cases the LOC cannot be drawn unless there is an issuer default. Since defaults are less likely in a high price environment, Standard & Poor's projections do not assume drawn LOC facilities.
- Commitment fees are counted as interest expense for the purpose of ratio calculations.
- We perform interest expense sensitivity analyses to determine the effect on ratios under a condition where LOCs are posted (i.e., commodity prices have risen). It is often the case that some capacity remains unhedged, and the increase in costs related to posted LOCs is offset by the increased



- margin earned on the unhedged capacity.
- For recovery ratings, default scenarios typically are low commodity price environments. Therefore, it is assumed that any LOCs that are available solely for hedging purposes are not drawn in bankruptcy. However, we also consider that a default could occur under different scenarios (discussed more fully below).
  - Similarly, to the extent a counterparty is given a first lien on assets as collateral for a hedging arrangement, this will not be viewed as disadvantaging other lenders in a bankruptcy scenario, as long as the lien is only in place in high price environments and the bankruptcy scenario is one of low commodity prices. This is because the likely bankruptcy scenario would be one of low prices and there would be no lien in place with regard to the LOC under such a scenario.

#### Right-Way Risk LOC Facilities Still Have Other Risks

Although the approach is consistent across rated entities, the ultimate effect on the issuer credit rating and the rating on the LOC facility itself may vary for different entities due to the unique characteristics and risks of the credit facility. The risks associated with these types of facilities may be greater in some situations than others. The risks include:

- Operating risk. To the extent a commodity-producing asset fails to produce (e.g., an event like a hurricane limits natural gas production or a power plant or refinery has a catastrophic failure or chronic operating problems), assets could lose value even in a high-priced environment. Such a situation would lead to exposure for the hedge providers and a situation where other lenders are disadvantaged in a bankruptcy. This risk can be mitigated by redundancy in operating units (operational diversity), strong operating histories with proven technologies, insurance, etc.
- Overhedging risk. In situations where a hedger is a large-scale trading operation, there is a risk that the company speculates that prices will fall and actually overhedges its production. In such a situation, rising prices would lead to a loss for the company. Having the producer covenant not to take such positions tries to address this risk.

- Imperfect hedge risk. To the extent a company is hedging one commodity with another (e.g., using natural gas to hedge electric generation) or the hedge is exposed to basis risk, there is a risk that the hedge could be imperfect. In such a scenario, the hedge could be in-the-money for the counterparty while the producing asset is losing money. Standard & Poor's reviews the terms and conditions of the hedge to assess the extent of this basis risk or "dirty hedge."

#### Right-Way Risk In Our Rating History

Standard & Poor's has rated a number of companies and projects that incorporate LOC facilities or collateral postings that are exposed to a form of right-way risk. These include refiners, exploration and production companies, electricity generating companies, and single-asset power plants. Some examples and their differing risk exposures are discussed below.

##### ***Coffeyville Resources LLC (CCC+/Watch Neg/—)***

Coffeyville is a midsize, 100,000 barrel per day independent refiner in Coffeyville, Kan. In addition to the refinery, Coffeyville also has an adjacent nitrogen fertilizer plant with annual capacity of 410,000 tons of ammonia and 655,000 tons of urea ammonium nitrate. The company was financed with a \$275 million first-lien term loan and a \$275 million second-lien term loan.

As a single-asset refiner, Coffeyville is exposed to variability in crack spreads. Coffeyville's term loan B debt structure requires the company to repay debt with 50%-75% of excess cash flow. Therefore, sustained positive spreads are necessary for Coffeyville to repay its debt. As such, the company entered into a four-year crack spread hedge to protect against downside risk in crack spreads. Such a hedge exposes the counterparty to Coffeyville credit risk if crack spreads increase. Therefore, Coffeyville obtained a \$150 million LOC facility that can be used solely for posting collateral for the hedge. The LOC provider has a first lien on the assets and to the extent that exposure rises above \$150 million, there will be no posting, but the counterparty would get a first lien on the assets in the amount that the exposure is above \$150 million.

Such a structure presents an analytical challenge, especially for recovery, because the first lien exposure is not fixed. Rather, it will vary depending on economic conditions in the refining industry. Standard & Poor's default scenario assumes that crack spreads on the unhedged volumes and fertilizer prices will revert to midcycle levels. Under this scenario, there is no exposure under the LOC facility. For the first-lien loan, the hedge provides excess cash flow during its term to prepay a certain amount of that loan. Standard & Poor's analysis resulted in over 100% recovery on the first-lien loans.

Key risks for Coffeyville's LOC facility include the operating risk associated with the single-asset nature of the refinery. Any sort of chronic operating problem, large increase in operating costs, or catastrophic failure could expose lenders to the LOC facility and greatly disadvantage other lenders. Again, Standard & Poor's views such a scenario as unlikely, but to the extent that such risks begin to be realized, rating changes would likely occur due to the change of recovery potential across the capital structure. In addition, Coffeyville's hedge is imperfect, and there is some basis risk. This risk is not as meaningful as the operating risk from a right-way risk exposure, but is still a consideration.

In this case, overhedging risk is small. Coffeyville is not a large-scale trading operation and does not engage in speculative positions. Coffeyville has a negative covenant that limits the amount of exposure under commodity agreement to 75% of actual production for a term of six years.

### ***Texas Genco LLOC ('BB-' corporate credit rating in 2004)***

One of the first applications of this approach was in the rating of Texas Genco. In December of 2004, a consortium of private equity firms acquired 100% of the capital stock of Texas Genco for a total purchase price of \$3.65 billion. Texas Genco is the second-largest generating company in Electric Reliability Council of Texas (ERCOT), with 12 power plants (62 units) totaling over 14,000 MW of generation capacity. Of this capacity, eight units totaling over 5,200 MW consisted of base load coal, lignite, and nuclear. The funded capital structure consisted

of \$1.625 billion in first-lien senior bank debt, \$1.125 billion in senior unsecured high yield notes, and \$900 million in equity contributions from the sponsors. In addition, the company had a total of \$825 million in unfunded debt, including a \$344 million special LOC facility to support counterparty credit requirements under power hedging contracts.

Texas Genco earned the predominance of its margins from its base load generating capacity. Therefore, it was exposed to variability in these margins. Texas Genco's bank loan structure required it to repay debt with a portion of its excess cash flow. As such, the company entered into a series of electricity hedges for protection against lower electricity prices. Such a hedge exposed the counterparty to Texas Genco credit risk if electricity prices increased. The special LOC facility provided collateral for these hedges. The LOC provider had a first lien on the assets and to the extent that exposure rose above the facility's capacity, there would be no posting, but the counterparty would get a first lien on the assets in the amount that the exposure was greater than the facility size.

A key consideration in the analysis was the potential for a default to occur in an increasing price environment, with the most likely scenario being an operational failure. Because Texas Genco had a diversified pool of base-load units, such a failure was substantially less likely than if this were a single asset such as Coffeyville. Moreover, Texas Genco's strategy was to leave enough base load capacity open so that at least one unit would have always been available to compensate for a failure of another unit. In addition, the company's large amount of gas-fired capacity also provided a mitigant. In both cases, it was assumed that defaults would be caused by a low electricity price environment; however, in the single-asset case, a default caused by an operating failure is more likely. In this situation, the recovery rating could fall rapidly.

Overhedging risk was not a concern at the time that the company was first rated. The company had a defined strategy with respect to keeping some capacity open and would not enter into a short position. In addition, the company did not have any covenants restricting entry into such positions. Imperfect hedging risk was also a small issue.

The hedges were financial in nature, but Standard & Poor's saw very little potential for basis risk. However, the company did use natural gas to hedge a portion of its generating production, especially when hedging beyond three to four years where electricity pricing is less liquid. Although gas is highly correlated to electricity in ERCOT, this relationship could change.

**Chesapeake Energy Corp. (BB/Positive/B-1)**

Chesapeake Energy is an independent oil and gas exploration and production company. As of Dec. 31, 2005, Chesapeake's proved reserve base was 7.5 trillion cubic feet equivalent, 92% of which was natural gas and 65% developed. Chesapeake is the largest speculative-grade oil and gas company rated by Standard & Poor's, and the company is also an active hedger. In addition to entering into forward and swap contracts with members of its bank group (who generally don't require cash collateral), Chesapeake hedges with other large financial institutions on a bilateral basis. These institutions can demand cash collateral, but Chesapeake has negotiated caps to mitigate the potential liquidity crunch.

Chesapeake also maintains two \$500 million secured hedging facilities that allow the company to enter into a number of longer-dated swaps with these counterparties. These facilities are structured such that the swap counterparty has a lien on certain proven reserves owned by Chesapeake. Similar to Texas Genco and Coffeyville, as commodity prices increase, the counterparties' exposure to Chesapeake increases, as does the size of the lien. However, in this case, there was no LOC facility provided—just the first lien on the proven natural gas reserves.

When analyzing Chesapeake and its debt obligations, Standard & Poor's does not consider the lien provided to the hedge counterparty as disadvantaging other creditors because Chesapeake is likely to be more creditworthy in

periods of high natural gas prices. If Chesapeake were to default, it would likely be in a low gas price scenario. In such a case, the counterparty would not be exposed and there should not be any senior claim that would disadvantage existing lenders.

In examining the credit facility, it is important to periodically evaluate the value of pledged reserves, incorporating conservative commodity pricing, and examine cost data and reservoir reports. This mitigates operational risk. Also in this case, the collateral facility places volume limitations on Chesapeake's hedging activity such that it can't get into an oversold position, thus mitigating overhedging risk. Lastly, while imperfect hedge risk is a consideration due to basis risk, Chesapeake actively hedges this risk.

**Outlook For Facilities With Right-Way Risk**

Credit facilities and collateral postings that result in exposure in a rising price environment are useful in allowing speculative-grade credits to continue to hedge without incurring massive liquidity requirements and risk. Although such right-way risk facilities are beneficial, they are not without risk. Although unlikely, defaults can still occur in a rising commodity price environment. Therefore, all of these situations are not created equally.

Operating risk, overhedging risk, and imperfect hedge risk can all cause exposures that can make some situations more "right" than others. Given these risks, if they are properly mitigated it is possible to structure a credit facility that can be rated higher than an issuer's corporate credit rating and even other first-lien debt ratings. If the facility is only available to provide liquidity to cover collateral postings for hedges, the facility itself will not be as exposed to market risk like the rest of the company. This means that the providers of the facility may experience a loss lower than other lenders, potentially even first-lien lenders. ■

# Turning Coal Into Liquid Gold: Alchemy? No, Polygeneration

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**T**ransforming coal into a variety of super-clean, value-added energy products may sound like the result of some futuristic technology. But even though most people outside the energy business have never heard of “polygeneration,” the process of taking coal and turning it into synthetic natural gas, gasoline, diesel and jet fuel, and many other refined products was actually developed in Germany after World War I and has been in use in South Africa since the 1970s.

Now, amid today’s concern about climate change, some participants in the energy debate in the U.S. are looking at coal-to-liquids (CTL) and coal-to-gas (CTG) technologies as potential solutions for bridging the gap between long-term environmental objectives and real-world economic and political considerations. Polygeneration technology proponents say CTL and CTG could create a wide variety of cleaner energy sources using abundant domestic coal supplies as a feedstock while still relying on existing railway and natural gas pipeline infrastructure. Polygeneration could also decouple strategic industries from their dependence on increasingly volatile imported oil.

Commercializing this technology on a large scale, however, has its challenges. Standard & Poor’s Ratings Services believes lenders will need to consider several critical items for any proposed debt financing of CTL and CTG projects.

## Ratings Implications

We don’t expect to assign credit ratings to many CTG or CTL projects in the near future, given the significant additional development that will be required to obtain regulatory approvals, negotiate sales (or “offtake”) agreements, and improve initial cost estimates. Nonetheless, we do expect that CTG will likely be at the forefront of polygeneration development in the U.S. because it’s a relatively more certain technology. CTL plants with true polygeneration capability are probably still several years away from seeking broader access to credit markets. Initial projects in these areas will not likely have investment-grade charac-

teristics during construction and the initial years of commercial operation. But after such plants establish a reasonable commercial operating record, investment-grade ratings could be possible if long-term, price-certain contracts with creditworthy counterparties (or government entities) are in place.

## How Polygeneration Works

Polygeneration refers to using coal as the primary feedstock to produce a wide range of energy resources that include synthetic natural gas, methanol, diesel fuel, naphtha, steam, and electricity. These projects are also referred to as “independent fuel producers,” as opposed to “independent power producers.” For the purposes of this article, we will discuss primarily the challenges and opportunities for this technology to convert coal to either natural gas or fuel liquids, such as naphtha or diesel, although a polygeneration facility can make many other refined products.

Chart 1 illustrates the general chemical processes through which coal is first gasified and then further altered to create a synthetic fuel. In turn, that synthetic fuel can be converted to electricity using integrated gasification combined-cycle (IGCC) technology, directly synthesized into pipeline-quality synthetic natural gas (SNG) through a methanation process, or further refined through additional chemical reactions like the Fischer-Tropsch (FT) process to create higher value-added products such as gasoline.

To understand the financial risks and economic benefits of CTG and CTL, it’s imperative to understand the coal gasification and FT synthesis components of a polygeneration project. Chart 2 provides a closer look at how the gasification, methanation, and FT processes interact. It’s based on technical schematics that industry experts expect will be used in commercial-scale CTL or CTG projects currently under development.

The initial coal-gasification process CTG or CTL projects use is identical to the technology currently under development for IGCC units. Oxygen, coal, and water are combined during

gasification in a controlled chemical reaction to create a combination of carbon monoxide and hydrogen called crude syngas. Byproducts from the process include hydrogen sulfide, carbon dioxide (CO<sub>2</sub>), and slag (i.e., mineral residue from the coal). These must be removed from the syngas before it's suitable for industrial application or power generation.

The first step in the syngas cleanup process is extracting residual mercury compounds through a commercially demonstrated vapor-phase process. Results at an Eastman Gasification Service Co. coal-gasification facility suggest that this technology is effective at removing upward of 94% of the gasified coal's mercury content. Next, a solvent is introduced to the syngas that results in the physical or chemical absorption of sulfur and CO<sub>2</sub>. Currently, three different technologies exist for this "acid gas removal" procedure, each of which is distinguished by its choice of chemical catalyst, operating temperature, and absorption capability. Two primary technologies (Selexol® and Rectisol®) appear to have the widest industry acceptance as syngas cleansing technologies, and each has the ability to eliminate more than 99% of residual sulfur and from 50% to over 90% of the carbon in the original coal feedstock. As with the mercury removal, acid gas removal has shown to be highly reliable based on operating experience at a large number of petrochemical units worldwide.

After most impurities are removed, syngas may be processed in a methanation plant to create synthetic natural gas or methanol. Synthetic gas created through these techniques is of high quality and meets purity standards for interstate pipelines. Alternatively, the syngas can be synthesized into refined chemicals and diesel fuels using FT processes. FT synthesis involves subjecting the syngas to a high-pressure environment, adding a catalyst such as iron or cobalt, and modifying the reaction temperature to either directly produce a liquid fuel or produce an intermediate-stage wax hydrocarbon that's further catalyzed (or "cracked") into an end product.

### What Are The Benefits Of CTG And CTL?

There are three main benefits for CTG and CTL—fewer carbon emissions, more fuel diversity, and better energy security for the U.S.

### Low carbon emissions

CTG and CTL proponents cite a number of environmental, economic, and strategic benefits from large-scale commercialization of these technologies. Environmentally, the syngas cleaning process automatically transforms about 50% to 70% of the coal's total carbon content into CO<sub>2</sub> that's ready for compression and sequestration. To the extent that hydrogen would form the ultimate end product of a CTG plant, additional carbon capture of up to 90% is possible.

Although CTL and CTG plants' environmental benefits are reasonably attainable with available technology, it's important to note carbon-capture benefits aren't automatic. They depend on an additional investment in compression and sequestration infrastructure that's outside the scope of gasification and FT technologies themselves. A recent Massachusetts Institute of Technology (MIT) study suggests that without a method of compressing and storing a polygeneration plant's CO<sub>2</sub> byproducts, FT processing can actually increase CO<sub>2</sub> emissions by 150% compared with directly refining petroleum-based fuel products.<sup>(1)</sup> The MIT study further suggests that CO<sub>2</sub> emissions from the gasified coal would be up to 175% higher for SNG created without carbon capture versus regular natural gas. The higher emissions are due to the relative inefficiency of gasification and FT technology, which requires more coal to be processed and increases the absolute amount of carbon byproduct. Fortunately, because the CO<sub>2</sub> created through gasification and FT synthesis is a relatively pure byproduct, industry experts estimate that the incremental cost of carbon-capture technology is almost one-third less than for the closely related IGCC technology.<sup>(2)</sup>

### Fuel diversification

Beyond purely environmental considerations, economic interest in CTL is growing in the airline and transportation sectors, both of which have suffered from increasing oil and natural gas price volatility in recent years. Naptha, gasoline, and diesel fuel created from FT processes have the potential to provide transportation companies with a fuel source less correlated to global oil price volatility. Furthermore, these industries may be able to

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better hedge their exposure to changing fuel costs through longer term supply contracts with CTL refiners when these producers' operational characteristics become better understood.

### **Improved national energy security**

Finally, many participants in the coal and defense industries think CTL and CTG technologies can have strategic and political benefits for U.S. energy security. The Energy Information Administration (EIA) estimates that net imports of liquid fuels in 2005 accounted for about 60% of total domestic consumption.<sup>(3)</sup> Furthermore, imports should remain at these levels through 2030, as increasing domestic oil production isn't likely to significantly offset projected consumption growth. Some worry that reliance on global markets to meet most of U.S. energy needs exposes the economy to supply disruptions from politically unstable regions. Even absent geopolitical turmoil, some observers predict an inevitable slowdown of U.S. economic growth as increasing oil demand from emerging economies like China, India, and Brazil causes future commodity prices to rise.

CTL and CTG supporters suggest that the U.S. can curtail its import dependence by as much as 5% annually by exploiting domestic coal reserves, which in 2006 were estimated to be about 267 billion short tons.<sup>(4)</sup> This suggests a 240-year domestic reserve life at 2006 consumption rates. The addition of coal-based technologies provides a much larger array of domestic resources on which to base economic growth. Also, the location of U.S. coal

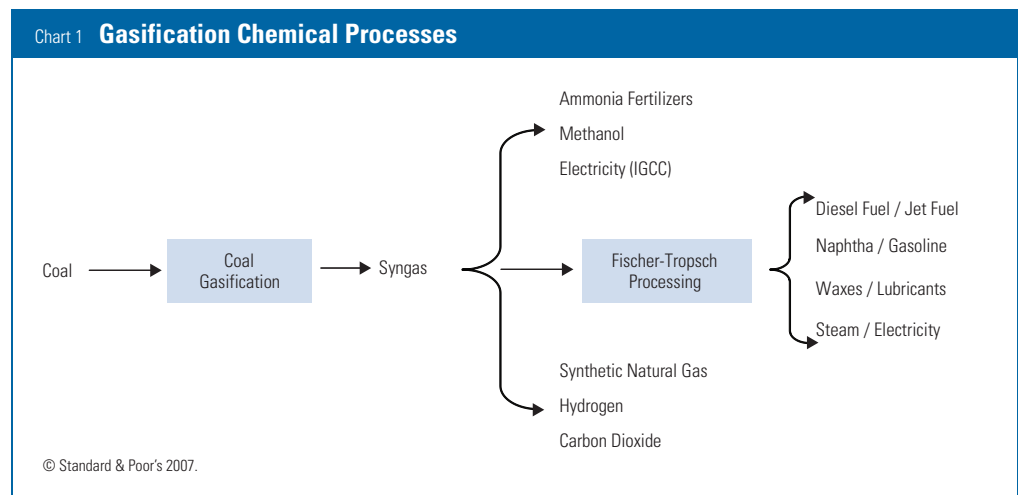
reserves—across 26 different states—would diversify fuel production away from the Gulf Coast, with its weather-related supply interruptions and limited domestic refining capacity.

### **Key Risks For Polygeneration**

Although CTL and CTG projects are probably several years and a few pilot projects away from finding wide acceptance in the financial markets, project sponsors and potential lenders will need to consider a number of risks and credit issues in the near term when evaluating the risk profile and commercial viability of any investment opportunities. Standard & Poor's believes lenders should consider several key items as the dialogue surrounding this technology continues to expand.

### **Technology risk**

In the 1920s, German scientists pioneered the FT process that lies at the heart of the poly-generation concept to bridge the gap between that country's inability to finance petroleum imports and the need to rebuild its economy after World War I. The Nazis later expanded FT technology to achieve energy independence during World War II, when total synthetic fuel production peaked at 124,000 barrels per day (bpd) across 25 plants.<sup>(5)</sup> Second-generation development of FT technology occurred in the 1970s and 1980s at Sasol, a South African company that has to date developed the world's only fully operational CTL plants. Although privately owned Sasol has not publicly disclosed any operating statistics or technological specifics of its Sasol II



and Sasol III plants, their long-term operating performance has been sufficiently reliable to provide between 30% and 40% of South Africa’s fuel requirements over the past 20 years.<sup>(6)</sup> Likewise, the methanation process used to convert syngas into synthetic natural gas is a commercially proven technology widely used in the chemical industry.

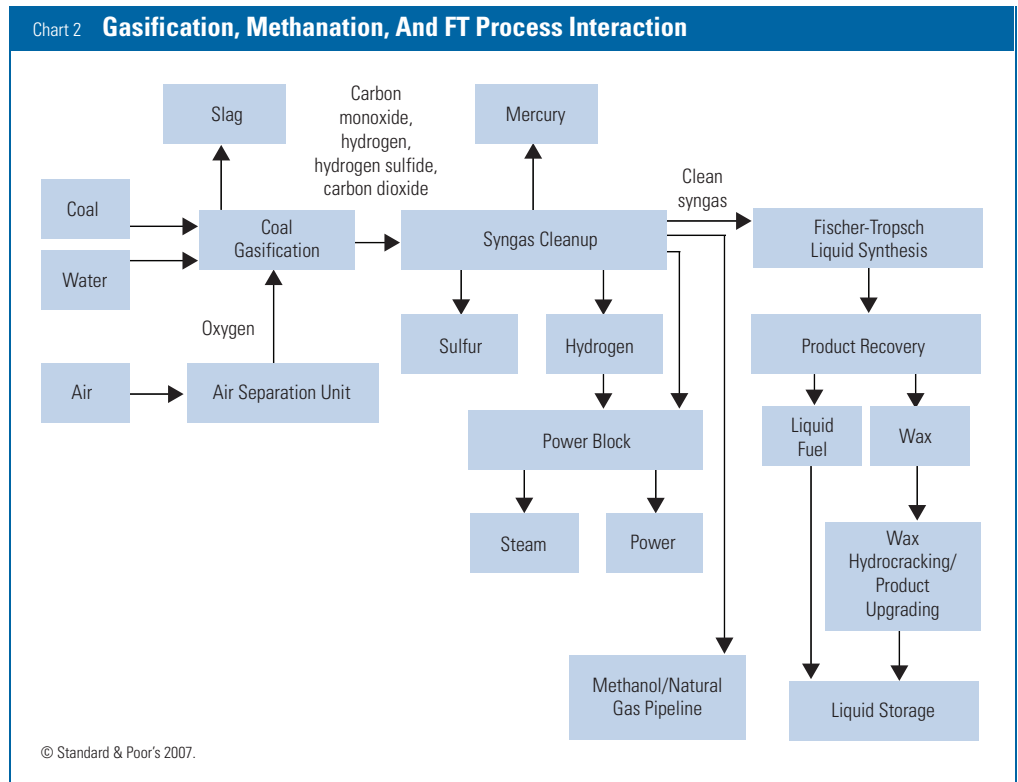
As previously mentioned, Eastman Gasification has successfully demonstrated that CTG units can be reliably operated for 20 years. Since 1984, Eastman’s CTG facility has posted an average forced outage rate of less than 2% and has had single unit reliability of up to 90%. Even higher reliability has been achieved by using redundant gasifier units during planned and unplanned maintenance. Moreover, most planned CTL/CTG facilities will use five or six small gasifiers. This results in gasifier availability of more than 90% and is an important distinguishing factor from IGCC, where the plants are usually designed to have two large gasifiers, with resultant lower overall reliability. A solid operating track record for the gasification components is good news for potential lenders to these projects because the gasifiers

contribute an estimated 25% to 30% of the hard project costs of CTL and CTG facilities.

**Integration risk**

The relatively long history of polygeneration’s component processes suggests that pure technology risk may be less of an issue for new projects. Scale-up risk, however, is likely to be a significant concern for CTL and CTG facilities. Currently, the Sasol plants in South Africa produce 80,000 barrels of diesel fuels per day. The company’s familiarity with the technology and extensive experience have enabled this level of output. In the U.S., no local operators or project developers have direct experience with CTL units, so demonstration projects under development are much smaller than Sasol’s units and can produce only 5,000 to 10,000 bpd. Most project sponsors agree that commercial-scale plants would require 30,000 to 40,000 bpd output to remain economical.

Sasol doesn’t make operating data for FT liquefaction reliability publicly available, and therefore reliability represents a more significant technical risk for CTL lenders than for CTG facilities that don’t employ the FT. In



most project financings, integration risk is typically addressed through engineering, procurement, and construction (EPC) contracts that provide cost certainty to lenders. These are backstopped by substantial performance guarantees that ensure that the plant's design achieves a minimum operating level.

Based on discussions with project developers, Standard & Poor's believes that traditional turnkey, EPC-style contracts will not be available for CTL projects, given that FT units' operating performance isn't well understood outside of Sasol. Engineering firms like General Electric and Eastman may be able to provide performance guarantees on gasification units they supply, but these guarantees are unlikely to apply to FT liquefaction units. And they're likely to have liquidated damage provisions less than the 20% to 30% of total contract cost that's normally associated with investment-grade projects. Furthermore, FT providers in the U.S. are smaller, more entrepreneurial companies whose balance sheets do not support significant performance guarantees for their technologies. CTG units also appear unlikely to attract turnkey EPC contracts given the lack of a single vendor owning all available technologies.

Notably, although integration risk is one of the main concerns for lenders, it may be more manageable in a CTG or CTL plant compared with IGCC because the production process is fairly linear, with fewer feedback loops for steam, gas, and other process elements. Reliability issues in an IGCC facility often result from these integrations aimed at improving process efficiency. However, this advantage will ultimately need to be tested under operating conditions.

### ***Capital cost versus commodity exposure***

Obtaining good cost estimates for a CTG or CTL project is difficult. Project sponsors indicate that a polygeneration plant's operating cost structure will be very site-specific and could vary considerably due to differences in plant configuration, access to coal supplies, and local infrastructure. Industry participants Standard & Poor's interviewed estimate that to build a viable commercial-scale CTL facility it would need to be able to produce 30,000 to 60,000 bpd, with construction costs of about \$100,000 to \$120,000 per barrel (in 2007

dollars). Preliminary cost estimates are about one-half as much for a CTG facility with a 30 billion to 50 billion cubic feet per year output capability. This puts the range for CTL hard capital costs between \$3 billion and \$3.6 billion, and from about \$1.5 billion to \$1.8 billion for a CTG plant. Recovering these large amounts will require lenders and equity sponsors to have a long-term view toward the project's success, as well as some price certainty surrounding the plant's output.

In general, CTL pilot plants are likely to produce either naphtha or diesel fuel as their primary product. Naphtha is preferred due to the significant pricing premium it commands on the open market as a higher value-added refined product. In addition to the market conditions for the final end product, the competitiveness of a CTL refined product will depend on prevailing oil prices, the facility's operating and financing costs, and the period of time that both equity and debtholders should reasonably expect to recover capital costs. Therefore, estimates concerning the price at which CTL projects will become economical vary widely and are extremely sensitive to the operating and financing assumptions specific to the project. In general, project sponsors and academic research estimate that CTL products are likely to become competitive on a production cost basis when oil prices are around \$55 to \$65 per barrel, whereas CTG plants are likely to become competitive with natural gas at prices between \$6.50 and \$8.00 per thousand cubic feet.

Given commodity prices' volatility in recent years, it's possible that CTL and CTG projects could become more cost-competitive, but lenders to these projects would need significant protection from downturns in the commodity cycle over the 20- to 25-year cost recovery period that appears reasonable for these types of investments. This suggests that CTG or CTL projects without long-term, price-certain offtake contracts, or government tax incentives or price protection are likely to be untenable, at least initially.

### ***Regulation and government support***

It seems almost certain that a lot of governmental support will be required to commercialize CTL projects in the U.S., given the high capital costs involved, technology risks,



and oil price uncertainties. Standard & Poor's believes that without some federal or state government commitment to commercial-scale pilot projects, the financial risks related to CTL projects are simply too large for traditional fixed-income investors to bear. For example, Sasol would have been unable to successfully complete its South African facilities without loan guarantees and price supports from the South African government. Furthermore, federal, state, and local agencies are well situated to take many of the longer-term risks that the financial community is unable to accept. We believe this is appropriate given that many of the environmental and strategic benefits (i.e., cleaner air, improved energy security, and increased fuel diversification to support strategic industries) are too broad to easily assign costs and benefits to specific groups. The Department of Defense is a much sought-after potential customer for liquid fuels from CTL projects.

CTG projects differ from CTL in two important ways that somewhat lessens the former's reliance on government support. First, methanation technology is better understood than FT. Second, rather than depending on the federal government for fixed-price guarantees, CTG projects may be able to enter into long-term, fixed-price contracts with creditworthy utilities that would purchase natural gas for their gas-fired power plants. However, state regulatory support that allows investor-owned utilities to pass "out-of-market" costs along to consumers without regulatory disallowances or extensive prudence reviews would remain necessary for these projects to achieve higher ratings.

Such support could take a variety of forms. However, it's important that the support directly addresses the most important issues to potential lenders, such as ensuring a long-term offtake, contributing to price certainty, or protecting against financial losses due to technical failure. Examples of governmental support that would improve a polygeneration facility's credit profile are:

- Federal and local municipalities or agencies could serve as the primary long-term offtaker for CTL or CTG products, or agree to act as a "buyer of last resort" if market prices don't support sales to private market participants.
- Federal loan guarantees could be provided

to projects to lower capital costs for investors, though we expect that they're likely to be insufficient in their current form and would require modification. Currently, for many programs, the government guarantees only 80% of the loan amount, effectively leaving the debt rated at the project's intrinsic credit quality.

- Governments could provide a minimum price support if global commodity prices fall below predetermined thresholds that render CTG or CTL products uneconomical.
- Federal and local tax incentives could increase capital returns to investors and lower the cost of capital for project sponsors.

Although polygeneration may appear to be modern-day alchemy, the base technology has been with us for almost 80 years, and now may hold the key to achieving important advances in lessening the effects of climate change. The benefits that polygeneration provides with respect to energy independence and fuel diversity make future CTG and CTL projects likely beneficiaries of both public and private market support for environmentally friendly energy alternatives. Ultimately, however, risk allocation between these constituents will determine how much capital markets can do to support these investments.

## Notes

- (1) Massachusetts Institute of Technology. "Coal-Based Electricity Generation," *The Future of Coal: Opportunities for a Carbon-Constrained World*, Massachusetts Institute of Technology (2007).
- (2) Ibid.
- (3) Table A.11—Liquid Fuels Supply and Disposition—Reference Case, *Annual Energy Outlook 2007*, Energy Information Administration (February 2007).
- (4) "Coal Reserves Information Sheet," Energy Information Administration (November 2006): <http://www.eia.doe.gov/neic/infosheets/coalreserves.html>.
- (5) "Fischer-Tropsch History." *Coal Gasification & Fisher-Tropsch: CCTR Basic Facts File #1*. Indiana Center for Coal Technology Research (July 2006).
- (6) Geertsema, Arie; "CTL and SNG Production: Issues and Opportunities," *GTC Workshop* (March 14, 2007). ■

# Biomass Will Grow In Importance With Caps On CO2

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The expectation that new U.S. laws will place some type of cap on carbon dioxide (CO<sub>2</sub>) emissions is fueling renewed interest in biomass power generation with energy created from plant life, including its waste and byproducts. The last major build cycle for biomass-fired generating plants closely followed the enactment of the Public Utility Regulatory Policies Act of 1978. The act promoted alternative power generation by requiring utilities to buy power from independent power producers at the utilities' avoided cost of electricity (the avoided cost was a proxy of what it would cost the utility to procure power). This worked well for biomass generators when fossil-fuel prices were high. But after prices plunged in the 1990s the average utility's avoided cost became lower than the cost of generating power from renewable resources, making them uncompetitive.

Biopower has always had a price-tag problem because it costs about 50% more to produce energy from biomass than from coal. Any policy that adds to the cost of generating power from coal and natural gas could remove this obstacle. Federal and state programs, such as production tax credits and renewable portfolio standards (RPS), which help developers offset some of the high production costs and ensure market demand for renewable generation, have so far had limited success in attracting investment in biopower. This is mainly because wind power costs less than biopower and meets many RPS requirements. Still, adding the estimated costs of CO<sub>2</sub> capture and sequestration to the cost of fossil-fuel generation makes biopower a viable option, especially where other alternatives, such as wind, are too unreliable to meet base load demand. So, at a minimum, greenhouse gas (GHG) regulation is likely to provide a pricing mechanism that will promote the value of biomass as a CO<sub>2</sub>-neutral resource.

In fact, besides hydroelectric, biopower is already the largest contributor of renewable generation, and currently accounts for about 2.3% of the U.S. power supply, according to the U.S. Energy Information Administration. The main types of existing biomass fuels are:

- Wood and agricultural products,
- Municipal solid waste (MSW),
- Landfill gas, and
- Alcohol fuels derived from plants.

Wood accounts for 60% of all generation, with MSW contributing 30%. Power generation could be accomplished through direct combustion of biomass in a dedicated plant, co-firing in a coal plant, or burning biomass-derived fuels such as syngas, ethanol, and biodiesel.

## Direct-Fired Dedicated Plants

Most existing biomass power generation results from direct combustion in stoker-fired or fluidized-bed boilers. These are proven technologies that are typical in coal-burning power plants. The boiler produces pressurized steam that drives a turbine to generate electricity. Plant efficiency ranges from 20% to 25%, significantly below the 30% to 40% of coal plants. This is one contributing factor to the high cost of biopower.

Biomass fuels also have lower heating values and significantly higher moisture content than coal. Therefore, an important factor in determining appropriate technology is the fuel type and variability, which greatly influences the boiler's combustion process and efficiency. One positive for biomass fuels is their low nitrogen and sulfur content. When combined with lower combustion temperatures, this results in less nitrogen oxide (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) pollution.

## Costs

A greenfield (i.e., built new from the ground up) wood-fired biomass plant's estimated cost of generation is about 9.1 cents per kilowatt-hour (kWh) compared with 5.8 cents for a pulverized coal plant and 6.6 cents for a natural gas combined-cycle (NGCC) generator without carbon capture technology. However, with CO<sub>2</sub> capture, pulverized coal and NGCC costs climb to 12 cents per kWh and 9.4 cents per kWh, respectively, making both more expensive than biopower. Table 1 shows the costs of operating a wood-fired plant.

Generation costs aside, the other major concern for biopower is fuel supply reliability. Although supply appears ample, the infrastructure for large-scale fuel delivery has not been tested. Most of the existing biopower facilities are located adjacent to their fuel supply and, in practice, any plant larger than 10 MW will probably need a dedicated fuel supply from a sustainable managed forest or farm.

#### **Direct-fired waste-to-energy (WTE) plants**

WTE power plants operate like traditional coal plants, except that they burn trash to produce the steam that turns the turbines for electricity generation. Only 7% of MSW produced in the U.S. goes to WTE facilities. This leaves a lot of MSW that can be used for power generation. MSW-burning plants have an advantage over other biomass-fired generation because they receive tipping fees for waste disposal in addition to revenues from power sales. Even in the current environment, WTE generation costs about \$57 per MWh (see table 2) and can compete with coal in markets with high tipping fees. These markets tend to be close to densely populated areas that have limited landfill capacity and high electricity prices.

As an alternative to landfill waste disposal, combustion reduces the volume of waste that

ends up in landfills by up to 90%. Studies have shown that burning MSW generates 550 kW per ton of MSW, about three times as much electricity as landfills that capture landfill gas (190 kW per ton of MSW). WTE plants are, however, more controversial and more difficult to get permits near large cities than other biopower plants. No greenfield facility has been built in the U.S. since 1994.

Federal agencies such as the EPA consider MSW a clean, renewable energy source, but not all states do. The states that oppose WTE are mainly concerned about emissions, about burning plastics, and about contaminants contained in the ashes. To its credit, the industry has done a lot to reduce emissions, cutting them by about 90% from levels in the late 1980s, but public perceptions haven't really changed. Getting approval to site a WTE facility is still a major challenge.

When a WTE plant does get a permit, the biggest factor affecting its economics is how fast landfill costs rise. This is because landfill costs determine the tipping fee paid for waste disposal in most markets, and these costs are likely to go up with GHG regulation. Landfills are the largest source of anthropogenic methane emissions, a GHG with 21 to 23 times the heat-trapping potential of CO<sub>2</sub>. The EU, which is well ahead of the U.S. in regulating GHG, has mandated members to cut back on landfills by as much as 60%. In the U.S., the EPA requires owners of large landfills to capture gas, but on average they capture only about 60% of methane emissions. If Europe is any indication of what may happen in the U.S., regulation could assign a cost to landfill gas not captured, which would make the economics of WTE more compelling. By avoiding methane emissions, WTE plants may also be able to obtain carbon-offset credits that could be yet another revenue source. One uncertainty is whether the GHG associated with the combustion of nonbiological waste like plastics found in MSW will require offsetting; plastics make up about 15% of MSW, and recycling rates appear to have reached a plateau.

#### **WTE technology**

There are two main technology options for WTE: mass burn and refuse-derived fuel (RDF). Mass burn involves burning MSW

Table 1 **Cost Of Wood-Fired Generation\***

	<b>Assumptions</b>
Capacity (MW)	50
Capital cost (\$/kilowatt)	2,500
Capacity factor (%)	85
Operational hours per year	7,450
Gigawatts generated per year	372
Energy penalty to capture CO <sub>2</sub>	0
Total cost of capital (%)	10
Capital cost recovery period (years)	30
<b>Cost per megawatt-hour (\$)</b>	
Capital cost	36
Fixed and variable operations and maintenance costs	28
Fuel cost	27
Cost of carbon capturing	0
Total cost with CO <sub>2</sub> emission	91
*Fuel sourced within a 50-mile radius.	

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without any preprocessing, while RDF requires extensive preprocessing and involves significant sorting and handling. A typical RDF plant will remove noncombustible items and then shred the remaining solid waste into smaller pieces for burning. RDF can also be made into pellets that can be used for co-firing with other fuels, for instance in coal plants. About 80% of existing WTE facilities are mass-burn facilities, and new ones are likely to deploy mass-burning due to significant cost advantages over RDF.

### Co-Firing In Coal Plants

The first phase of growth in using biomass as a fuel could come through co-firing in existing coal plants. Coal plants can replace up to 10% of the fuel heat with biomass without sacrificing boiler efficiency. This option eliminates the need for a dedicated biomass plant and capitalizes on the coal plant's scale, flexibility, and efficiency. It's also the least capital intensive because capital is typically required only for modifications for fuel handling, storage, and ash removal. The immediate benefit of co-firing is the reduction of GHG, NOx, and SO2 emissions. Several coal plants periodically co-fire biomass as a means of managing costs when emission allowance costs soar. However, the decision to co-fire requires

careful consideration of retrofitting costs, efficiency losses, possible reduced power production, and fuel costs. In general, beyond a 50-mile radius, fuel transportation costs for biomass become prohibitive.

Fuel supply reliability is also an issue, even with co-firing, because of a typical coal plant's size (100 MW to 1,000 MW). Substituting 10% of fuel heat with biomass requires just as much fuel, if not more, as a standard wood-fired plant (10 MW to 50 MW). The lower heating value and higher moisture content of wood significantly increases the volume of fuel a co-firing plant handles. The average heat content of wood waste is about 4,500 BTU per pound, compared with 12,500 BTU per pound for eastern coal. This means that in the case of a small 100 MW pulverized coal plant that consumes 40 tons of coal per hour, substituting 10% of fuel heat would require 12 tons of wood per hour, or about 245 tons of wood per day assuming an 85% plant capacity factor. A bigger facility would require even more biomass fuel, and to ensure a reliable supply may require a dedicated farm. Capital spending to modify a coal plant for co-firing can range from zero to 4 cents per kilowatt.

### Co-firing with refuse-derived fuel

RDF goes through an extensive process that screens size and shreds MSW into a more uniform consistency suitable for co-firing in a coal plant. Co-firing could be in a pulverized coal boiler, stoker, or fluidized bed boiler. However, fluidized bed boilers best withstand the corrosive nature of the fuel. Processing RDF isn't cheap, at about \$40 per ton of MSW, and requires some scale (at least 1,000 tons per day) to make economic sense. The coal plant may also require modification to handle more fuel and ash because of the lower heating value and higher ash content of RDF compared with coal. Control equipment can address emissions from co-firing, but utilities will need strong economic incentives to convert to co-firing because of engineering concerns about performance and reliability.

### Gasification

In theory, this is the most efficient process to convert biomass to energy and uses heat, pressure, and steam to convert biomass

Table 2 **Waste-To-Energy (Mass Burn) Cost Estimate Assumptions**

	<b>Assumptions</b>
Waste disposal capacity (tons/day)	1,000
Capital cost per ton (\$)	150,000
MW capacity	26
Capital cost (\$/kilowatt) (derived)	5,769
Capacity factor (%)	85
Operational hours/year	7,450
Cost of capital (%)	10
Capital cost recovery period (years)	30
Tipping fee (\$/ton)	60
<b>Cost of waste-to-energy per MWh (\$)</b>	
Capital cost	82
Fixed and variable operating and maintenance costs	72
Fuel cost	(97)
Cost of carbon capture	0
Total cost per MWh	57

directly into gases composed primarily of carbon monoxide and hydrogen. The gases are then burned to generate electricity.

Gasification faces several technological challenges, but it could potentially threaten existing, direct-firing technologies in the long run.

### Credit Implications

The credit considerations for a biomass facility won't differ significantly from those of other power projects. If the project has secured power-supply contracts, the credit quality of the power buyer will be a major consideration. Operating requirements under the contract should also be consistent with historic operating parameters of the technology deployed.

Projects without contracts have higher risk profiles because cash flows are subject to greater volatility; in any case, the project's market competitiveness is always a factor.

Tipping fees at a WTE plant and potential carbon credit benefits that climate change legislation may award to biomass are important factors that will support project economics,

reduce power pricing risks, and may result in higher credit quality. In fact, tipping fees may sometimes account for as much as two-thirds of a WTE project's cash flows, especially if the project is located in a highly populated metropolitan area.

We believe that direct-firing biomass technologies are well proven and that technology risk won't be a major credit concern. This is a positive for biomass projects, unlike other carbon-friendly technologies such as IGCC and coal-to-liquids. Co-firing projects without an operating history will require a higher reserve for debt service and major maintenance due to increased operating risks. Finally, cost of fuel supply and delivery infrastructure is an issue that will need to be clearly addressed.

Overall, there's significant potential for biomass—an indigenous, sustainable, and renewable fuel source—to play a larger role in the U.S. generation resource mix in a carbon-constrained world. As with previous biomass cycles, we think the next one will also closely follow government policy, this time on climate change. ■

# Solar Power's Potential Shines Brighter As Technology Advances

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**R**ising concerns over climate change and energy security, increasing fossil fuel costs, and state and federal regulatory support that enables utilities to recover costs of new investment have renewed the U.S. power industry's interest in fuel diversification. Solar energy is one option that's gaining more attention, thanks to its potential to help generators meet peak demand and reduce emissions.

According to the American Solar Energy Society, the U.S. has enough sunshine and surface area to provide at least 200 gigawatts (GW) of capacity. While that would still be a tiny fraction of current U.S. utility generating capacity, it's a lot bigger than the 0.5 GW the Energy Information Administration (EIA) reported for 2006. The EIA further reported that solar power accounts for less than 1% of renewable energy in the U.S., which in turn represented less than 4% of all U.S. energy consumption for the same year. Historically, solar has been unable to compete evenly with other renewable technologies such as wind. Low capacity utilization of 25% to 30%, high capital costs, large land requirements, geographic concentration of potential capacity in the sunny U.S. Southwest, and transmission constraints have all contributed to limited interest in solar power.

That's changing now, however. A Standard & Poor's Ratings Services analysis finds that credit elements are in place that could allow solar projects in the U.S. to achieve an investment-grade rating. Concentrating solar power (CSP) technology will likely dominate future utility-scale, central station solar power plant construction in the U.S. The parabolic trough technology certain CSP plants use is considered a "proven technology" due to its operating history. We think an appropriately structured power-purchase agreement (PPA) may allow a solar project using this technology to achieve investment-grade ratings. Other CSP technologies are comparatively less proven and carry more technology risk. Large-scale adoption of solar power will likely depend on regulatory support. However, the potential exists for a com-

bination of regulation, economies of scale, and technology improvements to create an environment of rapid growth for solar power that could rival wind energy's rise in the late 1990s.

## Two Kinds Of Technology

Grid-connected solar technology is commonly divided into two categories: photovoltaic (PV) and CSP. In the U.S., utility-scale projects typically use CSP technology, though Europe has seen significant PV development. A hybrid of these two technologies, concentrating photovoltaic, is developing more modestly.

### Photovoltaic

PV technology converts sunlight to electricity, typically by using silicon-based solar cells. In Europe, PV technology is more prevalent in large-scale, grid-connected projects, which represented more than 98% of the 645 MW of capacity installed in 2005. (Total overall installed capacity in Europe is now about 1,793.5 MW).(1) In the U.S., high silicon costs—about 40% of the total cost—have impeded large-scale deployment of PV technology, which is limited to comparatively small installations in commercial and residential settings to decrease or offset purchased electricity needs.(2) The total installed capacity for grid-connected PV in the U.S. at the end of 2005 was 246 MW, and, according to the EIA, projected development is expected to be slight.(3)(4) Off-grid PV installed capacity was 233 MW at the end of 2005. Although expensive, PV benefits from regulatory support, such as California's "Million Solar Roofs" plan approved in August 2006, which is eventually expected to provide 3,000 MW of additional capacity in the state.(5) Residential PV installations in California offer owners the option of "net metering," or selling electricity back to the grid to reduce their electric bills. Additional examples of support include the tax credits and interest-free loans that exist in Arizona and Colorado.(6)

### Concentrating solar power

To date, large commercial applications of solar energy have come through CSP. This

technology is further divided into the sub-categories of parabolic trough, power tower, and dish-engine. All of these use mirrors to focus sunlight onto a heat-transfer element (HTE) that either produces steam that powers a turbine (parabolic trough and power tower) or mechanical energy for a power conversion unit (dish-engine). A portion of CSP's total capacity is commonly supported by fossil fuels as back-up in case solar conditions are suboptimal. CSP may also employ thermal storage, which allows heat generated during peak hours to power turbines during off-peak hours, increasing the capacity factor. The table below presents a summary of technologies, costs, and projects; the parabolic trough and power tower cost estimates include six hours of thermal storage technology.(7)

### Technology Improvements Needed For Economic Viability

The data above for key factors that have limited solar power thus far—high capital costs, low conversion efficiency, and low capacity factors—reflect proven performance or likely development in the near future. These issues indicate areas where advances in technology will be needed to improve

solar power economics.

- *Capital costs.* Solar panels make PV energy expensive, but prices are beginning to fall as technology evolves. CSP has lower capital costs than PV, but they're still substantially higher than fossil-fuel technologies and wind energy, mainly due to the high cost of mirror arrays, tracking systems, and heat-collection elements. Although we expect capital costs to decline as demand increases production, the dollar-per-kilowatt (\$/kW) costs are still high enough to require regulatory support for projects to be economically viable.
- *Fixed operating and maintenance (O&M) costs.* We expect parabolic trough and power tower technologies to exhibit significant economies of scale due to declining manufacturing costs in \$/kW and fixed O&M costs related to running the plant. SolarPACES reports that the same number of people is required to run a 30 MW plant as a 320 MW plant using parabolic trough, and that O&M costs for power tower technology should become economically viable at a capacity of 30 MW.
- *Variable O&M.* Parabolic trough and power tower arrays use steam turbines that

## Concentrating Solar Power Technology Comparison

Description	Parabolic trough	Power tower	Dish engine
	Rows of linear parabolic shaped mirrors that track the sun east-to-west on a single axis and focus its energy on a long tube containing a heat-transfer element (HTE) channeled to a conventional steam turbine	An array of heliostats (mirrors) that track the sun on two axes and focus its energy to a centrally located tower in the middle of the array. Molten salt as HTE may facilitate thermal storage and allows for higher operating temperatures and increased efficiency	"Satellite dish" mirror arrays that track the sun on two axes while focusing its energy to a receiver housing a power conversion unit (PCU). The PCU's proximity to the receiver increases efficiency, but reduces the possibility of thermal storage
Installed costs (\$/kW)	2,500-4,000	2,800-4,400	3,000-5,700
Fixed O&M costs 33 (\$/kW-year)	30	3	
Variable O&M costs (\$/MWh)	30	30	11
Cost drivers	Parabolic mirrors; mirror washing and reflectivity monitoring; O&M for power plant	Heliostat field; tracking axes; salt storage; O&M for power plant	PCU (engine); mirror array; O&M costs comparatively low due to the mechanical simplicity of the receiver-PCU connection
Efficiency* (%)	12-14	15	23-29
Capacity factor (%)	30-43	20-43	12-30
Examples of solar plants	SEGS (354 MW, California), Solar One (64 MW, Nevada—pending)	Solar Tres (15 MW, Spain) New builds (500 MW, California—pending)	New builds (1,700 MW, California—contracted but uncommitted)

\*Recent concentrating solar cells have achieved efficiencies of over 40%. O&M—Operating and maintenance. kW—Kilowatt. MWh—Megawatt-hours. Sources—Data ranges compiled from solarpaces.org, PIER Renewables, Sargent & Lundy, and State of Nevada solar study.

require a higher level of staffing than the simpler mechanical process associated with the dish engine arrays. However, the number of individual dishes currently required to reach large-scale capacity numbers make capital costs of dish engine arrays more expensive than the other technologies.

- *Efficiency.* Efficiency of conversion of solar energy resulting in higher HTE temperatures is another key to economics. If used in tandem with thermal storage, however, higher temperatures may create a need for pressurized storage tanks, and such tanks are presently too expensive for commercial use. Molten salt may improve efficiency by doubling as both the HTE and thermal storage medium, but requires close monitoring so as to avoid freezing at night.<sup>(8)</sup>
- *Capacity factors.* Boosting capacity utilization by operating in nonpeak hours, or during hours with low solar radiation, may materially improve solar plants' economics. Without technology improvements that enable this, thermal storage is the primary means of achieving increased capacity today, albeit at higher capital costs. In addition, hybrid facilities use gas-fired supplementary power. The SEGS I solar power plant in California had thermal storage for up to three hours; today, storage up to six hours is commercially available for similar designs. The easiest ways of increasing capacity utilization for a given turbine size is by using a larger field array and greater thermal storage. However, it's unclear if such increases currently lead to lower total cost of electricity, given the additional capital costs.

Ultimately, regulatory and political support will be key to solar power's growth, initially lowering costs and also providing economies of scale. Some recent actions by regulators and governments to encourage new solar projects at a time when the cost of solar power is not economical include:

- The 30% investment tax credit provided by the Energy Policy Act of 2005,
- The Energy Act's production incentive of 1.5 cents per kilowatt-hour,
- The Western Governors' Association target of 30,000 MW of clean energy by 2015,
- California's aggressive 33% renewable portfolio standard (RPS) goal, and
- Nevada, New Jersey, and Colorado's

requirement for a portion of their RPS to come from solar power.

An important question is whether an upsurge in demand created by regulatory support will create economies of scale and drive down prices for capital equipment as it has done for wind costs in the past 10 to 15 years.

### Credit Factors For Solar Projects

We anticipate that solar financings that we will be asked to rate will predominantly have a project finance structure. Given that a large solar financing can incorporate a portfolio of smaller projects, we may also give attention to the portfolio effect created by the diversity in the solar resource profile. In any case, we would consider in our ratings elements of our project finance criteria, including contractual structure; technology, construction, and operations; competitive market exposure; counterparty risk; legal structure; and financial profile. In project finance, we typically rate through the term of the debt, including the construction period. While any of the above risks may be present in a project to various degrees, we focus here on key issues, in no order of priority.

#### **Contractual structure**

PPAs with terms lasting until the project debt matures are crucial because solar is unlikely to be competitive on a merchant basis for a long time to come. To date, existing and planned output of solar plants has been contracted to investment-grade utilities in California and Nevada. The PPAs for these deals typically involve payments for both energy and capacity, but—unlike traditional PPAs and like wind energy—it is the former that drives revenues. However, unlike wind, solar's resource profile is well correlated with peak load. This makes solar capacity more valuable than wind from a resource planning perspective and raises the possibility that solar projects may receive meaningful capacity payments. Indeed, solar projects owned by FPL Caithness Funding Corp. in California receive a capacity payment from Southern California Edison Co. (BBB+/Stable/A-2) due to their designation by the FERC as "qualifying facility" projects. (A qualifying facility is a co-generator or small power producer with a right to sell its excess power output to a



public utility.) Capacity payments may vary due to cost and operational considerations. Future projects, however, may not receive such capacity fees.

### **Sun resource**

CSP plants only produce energy when there's direct sun and therefore are much more seasonal than wind farms. CSP produces less energy in winter, while wind, and even other solar technologies like PV, have capacity profiles that are unaffected by seasonality. Also, while CSP needs direct sunlight, wind power plants can still produce energy at night.

Reliable data on resource levels is critical. When analyzing solar projects, the site area and the amount of sunlight it receives (insolation) will be important factors in our analysis. As with wind, reliable data on the amount and volatility of the power source—in CSP's case, direct, normal insolation—is essential. CSP requires direct solar radiation; therefore our analysis will focus on historical and forecast hours of direct sun. We will require wind assessments for the project site as well. Strong winds can deposit soil on the arrays, which can reduce efficiency or incur additional operating expenses.

Sensitivity tests for the rating will test variability associated with both the solar resource as well as winds and with conservative assumptions regarding thermal storage and the use of natural gas as back-up. The use of natural gas may also create other issues for the electricity buyer because it reduces the project's renewable content and will emit CO<sub>2</sub>.

### **Technology, construction, and operations**

We consider parabolic trough to be a proven technology, with several operational plants around the world. The SEGS projects in California, for instance, have performed adequately, with availabilities generally about 90%, and have met their contractual obligations for power generation. Moreover, given the seasonality of the solar resource, availability is key in the summer months and is less important during the rest of the year, which provides ample downtime for routine maintenance of the project. However, power tower and dish-engine plants are riskier from a credit perspective because they lack an operational track record.

Likewise, construction and start-up risk is considered less of a risk for parabolic trough technology than for power tower and dish-engines. Nevertheless, as with any project, the terms of the engineering, procurement, and construction (EPC) contract and the design and construction firms' experience and ability will be key. For example, SolarGenix is a design and construction firm that's leading the Nevada Solar One project, for which the firm Lauren E&C has obtained the EPC contract. The German companies Schott and Flabeg have experience with heat collection receivers and parabolic mirrors, respectively, and Luz II LLOC is involved in the power tower projects that Pacific Gas & Electric Co. has announced. Given the limited installed base of solar power, performance guarantees from a creditworthy EPC contractor will be an important factor in achieving an investment-grade rating.

O&M for the solar field consists primarily of replacing HTEs that have degraded in performance and damaged mirrors, as well as routine mirror washing. During a typical year, the Caithness facilities collectively replace about 1,000 HTEs (2.4% of the total) and 2,000 mirrors (0.5%). These numbers may be lower for the Nevada Project, which is a more advanced technology, but there are no major credit issues that arise from O&M matters if the project benefits from an experienced operator. Operating a solar plant is simpler than running traditional fossil-fuel units and the projects require little staffing. This is a positive for credit quality.

### **A Bright Credit Outlook?**

Ultimately, the ability of projects using proven CSP technology to achieve investment-grade ratings will depend on having a PPA with a creditworthy counterparty that lasts for the term of the debt and whose capacity payments can cover debt service and O&M expense under conservative assumptions for energy output. To the extent that such capacity payments and debt service coverage ratios (DSCR) are relatively insensitive to plant availability, that would further support prospects for investment-grade ratings. For an investment-grade rating, we would expect the DSCRs to be robust under different scenarios, including stresses for sun hours, plant avail-

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ability/performance, and O&M cost increases, assuming that construction and technological risk are adequately mitigated.

Federal and local incentives, such as the investment tax credits and production incentives, can provide crucial cash flow support and reduce the cost threshold and therefore, the cost of electricity for the PPA counterparty. A long track record of stable solar insolation will be favorable, as it mitigates the uncertainty of energy production and would therefore be reflected in the level of stress required in the sensitivities on energy production.

As in the case of wind, we expect to see solar projects adding more to the diversity of the U.S. fuel portfolio as the economics and technology of solar power continue to improve.

## Notes

- (1) <http://www.epia.org/03DataFigures/DataEurope.htm>.
- (2) "Bright Prospects," *The Economist*, March 8, 2007.
- (3) <http://www.iea-pvps.org/isr/01.htm>.
- (4) Energy Information Administration Assumptions to Annual Energy Outlook 2007.
- (5) <http://gov.ca.gov/index.php/press-release/3588/>.
- (6) <http://www.dsireusa.org/library/includes/map2.cfm?CurrentPageID=1&State=CO&RE=1&EE=1>.
- (7) <http://www.energy.gov/news/4503.htm>.
- (8) [http://www.nrel.gov/csp/troughnet/thermal\\_energy\\_storage.html#heat](http://www.nrel.gov/csp/troughnet/thermal_energy_storage.html#heat). ■

# Which Power Generation Technologies Will Take The Lead In Response To Carbon Controls?

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The U.S. utility sector is in the midst of a large capital-spending cycle to add capacity. It's unclear what type of plants will be built in the face of impending new climate change policies plus growing base load capacity needs. All that's certain, given rising fuel prices and capital costs, is that regulators who authorize the building of new plants will try to ensure the lowest overall cost to ratepayers.

Many factors will determine the choice of technology, be it a conventional coal-or natural gas-fired plant, newer integrated gasification combined-cycle (IGCC) technology, or alternatives such as nuclear, solar, wind, geothermal, and biomass. The obvious key quantitative issue for each technology is the cost of the electricity it will produce, but deciding which to choose also involves gauging various qualitative factors. A central question is: How will carbon costs alter the playing field for competing technologies, and how will those choices affect the sector's credit quality?

As we look at the construction cycles of the past, it's clear that one technology has always dominated—coal, nuclear, and natural gas—at various times. Each technology was popular for a variety of reasons, such as the perception that nuclear energy was almost “too cheap to meter” or domestic gas would always be inexpensive and plentiful. However, no such dominant view exists now. Rather, in the current construction cycle various directions seem possible, and each path favors a different technology.

Some key factors are:

- Volatile and high natural gas prices, which have made favorites of coal plants and existing nuclear units because of their relatively low and stable variable costs.
- Rising utility bills for consumers, owing to a combination of demand growth, higher commodity fuel prices, and sharply increasing construction costs. This has created support for energy efficiency and demand-side management programs and provides regulators the incentive to minimize power plant construction.
- National security advocates who cite pro-

liferation, terrorism, and safety concerns surrounding nuclear power and call for more use of coal and domestically available renewable resources while avoiding increasing dependence on imported natural gas in the form of LNG.

- Climate change concerns that support renewable energy and new nuclear units but, in the short term, suggest the increased use of natural gas to displace coal-fired generation to reduce emissions.
- State mandates requiring utilities to diversify their fuel supply to include renewable resources.

Also notable in this cycle is the sharp rise in capital costs for power plants and less-favorable engineering, procurement, and construction (EPC) contract terms, with many contractors unwilling to offer fixed prices on materials and labor.

## Conflicting Electricity Supply Needs Lead To Few Certainties

Given these conditions, perhaps there are only two things that industry players know for sure:

- Fuel and technology diversity is a reality—no single fuel or technology will dominate, unlike in past construction cycles. Coal, IGCC, nuclear, natural gas, wind, geothermal, solar, and biomass are all serious possibilities. While only the first four are contenders for base load generation, we expect industry participants to use all these technologies to varying degrees.
- States will remain particularly sensitive to the total cost of electricity. Given that virtually every trend is pointing toward higher electricity prices, state regulators will be challenged more than ever to manage the ultimate price paid by customers. In making that judgment, regulatory bodies will likely factor in not just current capital costs or fuel price volatility, but also longer-term uncertainties, such as carbon capture and sequestration, nuclear decommissioning and waste disposal, and the electrical grid's reliability given the growing reliance on

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intermittent renewable resources, such as wind energy.

### Climate Change Policy Considerations

Climate change appears set to emerge as an overarching policy consideration that will affect how utilities procure resources, although issues of cost, system reliability, fuel diversity, and other factors can be at odds with carbon controls. With carbon legislation appearing very likely within the next few years, many states are viewing current resource decisions through the lens of climate change. The National Association of Regulatory Utility Commissioners (NARUC) recently announced the formation of a 10-member task force to study climate change and make recommendations for the pending federal legislation. Also, stricter standards may exist at the state level, as on the West Coast, in the Northeast, and in other regions, where states have embraced ambitious renewable portfolio standards (RPS) in response to climate change.

Yet another factor increases the importance of focusing on power generation options. Studies have shown that in a carbon-constrained world electricity is likely to account for an ever-increasing share of the total energy

supplied in an economy (1). The reason: A shift from direct fuel consumption to electricity use provides the best route to reducing carbon emissions because a majority of the low or nonemitting energy technologies are associated with the power sector.

Under emissions limitation cases that present all sectors of the economy with a common marginal cost for carbon dioxide (CO<sub>2</sub>), the use of electricity increases relative to other energy sources, such as gasoline and diesel. Thus, an important outcome of climate change concerns could be an increase in the electrification of the energy supply system, coupled with a move toward cleaner power generation technologies.

### Comparing Technologies' Cost Differences

We've undertaken a cost comparison of the different technologies in a carbon-constrained world. Our analysis is confined to the major central power station alternatives. Many energy efficiency and combined heat and power alternatives have the potential to reduce demand or supply power at lower prices. From the perspective of this analysis, those options can be seen as reducing the need for power plants. Below are the major assumptions that underlie our analysis (see table 1):

Table 1 **Technology Cost Assumptions**

	Pulverized coal	Natural gas combined cycle	IGCC Eastern	IGCC PRB	Nuclear	Wind	Solar	Biomass
Plant capital cost (\$/kW)	2,438	700	2,795	2,925	4,000	1,700	4,000	2,500
Capacity factor (%)	85.0	65.0	80.0	80.0	85.0	33.0	43.0	85.0
Heat rate (million Btu/MWh)	8,700	7,000	8,200	9,400	N.A.	N.A.	N.A.	N.A.
Variable operations and maintenance (\$/MWh)	2	2	3	3	7*	0	30	7+27*
Fixed operations and maintenance (\$/kW-year)	45	20	60	60	100	25	33	160
<b>Carbon capture assumptions</b>								
Capital cost (\$/kW)	940	470	450	450	N.A.	N.A.	N.A.	N.A.
Operating cost (\$/MWh)	8	3	3	3	N.A.	N.A.	N.A.	N.A.
Energy penalty to capture carbon dioxide (%)	25.0	13.0	15.0	15.0	N.A.	N.A.	N.A.	N.A.
Ton/MWh carbon dioxide emitted without capture	0.87	0.37	0.82	0.94	N.A.	N.A.	N.A.	N.A.
Ton/MWh carbon dioxide emitted with capture	0.09	0.04	0.09	0.09	N.A.	N.A.	N.A.	N.A.

\*Fuel. IGCC—Integrated gasification combined cycle. MWh—Megawatt-hour. N.A.—Not applicable. PRB—Powder River Basin.

- CO2 transportation (\$6/ton),
- CO2 storage (\$4/ton),
- Market price of gas (\$7/million BTU),
- Market price of Eastern coal (\$1.80/million BTU),
- Powder River Basin (PRB) price of coal (\$1.00/million BTU),
- Average cost of capital 10% (12% for nuclear power), and
- Capital recovery period of 30 years (20 years for wind).

Uncertainty over the capital costs of nuclear and IGCC power plants, given the lack of recent construction experience, are among the shortcomings of this cost comparison. In addition, the cost estimates are generic and don't factor in site-specific issues, such as transmission access and accessibility of rail facilities. Nevertheless, it's instructive to use best available estimates, while also considering the possible variability of costs.

#### ***Cost of power without carbon capture***

The scenario outlined in table 2 represents the status quo with no carbon controls, where pulverized coal and natural gas dominate, no new nuclear or IGCC plants are built, and the buildup of renewables depends on state RPS standards. While IGCC using PRB coal appears to have lower costs than that using eastern coal, mainly due to lower PRB coal prices, PRB coal has a shorter operating track record than eastern coal, a qualitative factor not captured in the numbers. Furthermore, we didn't include subsidies for any of the technologies in this scenario due to the uncertainties concerning the federal loan guarantee program and other potential subsidies.

#### ***Comparing the cost of carbon capture and sequestration***

Nuclear power becomes very economical in the second scenario compared with the absence of carbon controls (see table 3). Exactly how much more economical than IGCC is a key uncertainty since in neither technology have we seen a fixed-price EPC contract signed in recent years. MidAmerican Energy Holdings Co. (A-/Stable/—) recently announced that it received a reasonably firm contractual offer for an IGCC plant in Wyoming that includes carbon capture. The cost of power from the proposed IGCC facility

was between \$110 and \$120 per megawatt-hour (MWh). This includes higher costs to account for site-specific issues, such as the location in Wyoming and higher altitudes.

Natural gas combined cycle (NGCC) technology is competitive but subject to gas price volatility. Wind has lower costs but suffers from low capacity factors and intermittent production. Biomass is economical, but its potential is restricted by limited fuel availability. Solar power appears uneconomical given current technology and utilities are likely to build facilities in only states that specifically support it.

#### ***The capture option versus the buy option***

It is also important to compare the cost of carbon capture and sequestration (CCS) per ton of CO2 and allow for plants to buy carbon credits if it were cheaper than capturing CO2 (see table 4). CCS is substantially cheaper in IGCC units than in traditional coal and natural gas power plants. However, even for IGCC, the cost of CCS likely exceeds \$40 per ton of CO2, a price substantially higher than some of the price caps Congress is considering and than ratepayers may accept.

If the price for carbon credits is only \$10/ton, traditional coal will continue to be the cheapest option, with coal plants simply purchasing the credits needed to meet their emission restrictions. The picture remains pretty similar even with CO2 credits at \$30/ton.

At the outset, in other words, CCS isn't likely to be economically viable, because CO2 credit prices will probably be low. This is due to relatively modest emission reduction requirements, increased use of renewables and energy efficiency policies, and the option of switching fuels from coal to natural gas.

Looking further ahead, however, emission reductions will need to be much steeper to meet climate change targets. Unless utilities add substantial amounts of nuclear capacity, coal plants with CCS will be needed to meet these goals. Carbon credit prices will thus have to be high enough to support CCS. Technology improvements, which are further ahead on the learning curve, and large-scale demand could lower the cost of carbon capture below the \$40/ton that seems to be the going rate today. The parasitic load associated with the capture process will be a key focus area for cost reduction.

### A Closer Look At IGCC, Nuclear, And Wind

Given our projections, IGCC, nuclear, biomass, wind, and solar power seem to be leading candidates to meet the need for electric generation with lower emissions. Several qualitative, technology-specific issues will significantly affect the construction and use of these assets and the credit quality of the companies that build them. (For issues regarding solar and biomass power, see “Solar Power’s Potential Shines Brighter As Technology Advances” published on May 11, 2007 and “Biomass Will Grow In Importance With Caps On CO2” published elsewhere in this book.)

#### IGCC

Coal currently fuels about half of the power in the U.S. and is a primary climate change concern because of its high level of carbon emissions. The global power system can’t do without coal, but it also can’t continue to burn coal in its current form. IGCC and CCS offer a solution, but both have their drawbacks.

While the major IGCC technology suppliers have claimed readiness for some time now and tout capacity factors of 85%, no EPC contractor has yet stepped forward to offer a fixed-price, turnkey contract with liquidated damages for cost, time, and performance. IGCC has about a 25% capital cost disadvantage as well as substantially higher construction and start-up risks compared with traditional pulverized coal units. We expect that the ability to offset at least some of these risks, by passing them on to ratepayers or other risk intermediaries, for example, along with federal support in the form of loan guarantees or tax credits will be key to launching the first few IGCC units. Thereafter, the oper-

ational track record of the initial units will determine the success of the technology. (See “IGCC: Can It Combine The Best Of Coal-Fired And Gas-Fired Generation?” published on RatingsDirect on June 26, 2006).

The legal framework and permitting requirements for CCS, including who would bear responsibility for long-term storage of CO2, are unclear. Lack of clarity on this issue will be seen as a large contingent liability for utilities that manage these storage sites. Storage technology is also undeveloped for longer-term options such as saline aquifers. Extensive use of CCS also requires a network of CO2 pipelines leading to storage sites. This doesn’t exist currently and isn’t even factored into the CCS cost estimates above. New pipelines could add between \$10 and \$20/ton to the cost of CCS. For CCS to succeed, it’s essential that state and federal regulators encourage pipeline development.

#### Nuclear

Significant improvements in operating performance and safety, combined with a lack of carbon emissions, are causing the utility industry to look more favorably on nuclear plants. However, no one has built a nuclear plant in more than 20 years, and the last set of plants were completed with significant delays and cost overruns.

The U.S. Nuclear Regulatory Commission (NRC) has addressed one of the major issues complicating the construction of new nuclear plants, the licensing process. The NRC’s Combined Construction and Operating License (COL) tries to address all siting, permitting, reactor design, and construction issues in one step, including public comment before

Table 2 Cost Of Power Without Carbon Capture

(\$/MWh)	Pulverized coal	Natural gas combined cycle	IGCC Eastern	IGCC PRB	Nuclear	Wind	Solar	Biomass
Plant capital cost	35	13	42	44	69	62	113	36
Plant fuel cost	15	50	14	9	7	—	—	27
Plant operations and maintenance	8	6	12	12	13	9	39	28
Cost of power without carbon capture	58	68	68	65	89	71	151	91

IGCC—Integrated gasification combined cycle. MWh—Megawatt-hour. PRB—Powder River Basin.

the agency issues a COL for each plant. The goal is to address all of the issues that in the past have led to interminable delays and spiraling costs—before utilities commit significant capital. The NRC is also promoting standardization of design and construction methods to ensure a quicker turnaround in the COL process and make additional plants easier and cheaper to build. During the construction process, the NRC will perform inspections (Inspections, Tests, Analyses and Acceptance Criteria, or ITAAC) to ensure compliance with the COL. The COL process, however, is untried and untested, causing some skeptics to wonder how effective it will be.

Even with a COL, no utility will commit to a project as large and risky as a new nuclear plant without assurance of cost recovery. In arriving at debt rating opinions, Standard & Poor's doesn't expect full and unfettered recovery of all requested costs. Rather, we look for a regulatory framework that provides for a fair opportunity to recover prudently incurred costs, even through changing regulatory commissions. Without such a framework, a utility's financial condition may rapidly deteriorate. Regulators may attach various conditions to the recovery and negotiate with the utility how the recovery will occur. Until the plant goes into service, recovery of all or a majority of financing costs in rates, such as construction work in progress, would not only demonstrate regulatory support and a willingness to provide support in the future but also ensure that a utility's cash generation won't suffer.

Construction contracts are another issue. In the past, engineering, procurement, and construction contracts were easy to secure.

However, with increasing raw material costs, a depleted nuclear-specialist workforce, and strong demand for capital projects worldwide, construction costs are increasing rapidly. Designers and engineers are still developing cost estimates for new nuclear plants. All of this can significantly affect utilities, as they may be unable to find EPC contracts and may have to look for other ways to insulate themselves from construction risk and cost overruns.

The final challenge relates to decommissioning and spent nuclear fuel. Although these may not be significant obstacles to building new nuclear facilities, since they're far in the future, they still affect new-plant economics. The Maine Yankee nuclear plant was recently decommissioned on budget and on time. However, the recent experience with Connecticut Yankee indicates that the cost of decommissioning could approach \$1 billion in 2007 dollars. For regulated companies, even if the decommissioning funds are insufficient, we can be reasonably assured that regulators will allow utilities to recover their incremental costs. The bigger challenge is for unregulated generators, who are likely to be required by the NRC to allocate decommissioning funds early in the life of the project to ensure that sufficient funds will be available upon license expiration. Over the long term, spent nuclear fuel storage and handling will be a key issue that will determine the amount of added nuclear capacity in the U.S. (See "Why U.S. Utilities Are Seeing Nuclear Power In A New Light" published on *RatingsDirect* on Jan. 9, 2007.)

Table 3 **Cost Of Carbon Capture And Sequestration (CCS)**

(\$/MWh)	Pulverized coal	Natural gas combined cycle	IGCC Eastern	IGCC PRB	Nuclear	Wind	Solar	Biomass
Carbon dioxide capture capital and O&M	13	9	7	7	—	—	—	—
Carbon dioxide energy penalty	30	12	15	15	—	—	—	—
Carbon dioxide transport and storage	19	7	12	14	—	—	—	—
Cost of CCS per MWh	62	28	34	36	—	—	—	—
Cost of power with CCS	120	96	102	101	89	71	151	91

IGCC—Integrated gasification combined cycle. MWh—Megawatt-hour. O&M—Operations and maintenance. PRB—Powder River Basin.

**Wind**

Wind power is the fastest-growing electric generation sector in the U.S. Installed wind capacity grew to 11,603 MW in 2006 from 9,149 MW in 2005—a 27% increase. Several developments favor wind investments. The high price of natural gas has led utilities to seek fuel diversity and, in some states, RPS have supported wind energy. Wind is emissions free, a tremendous environmental advantage over traditional fossil-fuel generation plants. Wind is relatively inexpensive, can support large plants (over 300 MW), and overall is the most practical of renewable technologies. Developers can also build wind projects in just a few months versus years for coal or natural gas plants.

Despite strong demand for it, though, wind power also has some disadvantages. Most of the U.S. population doesn't live where it's sufficiently windy, so the investment sometimes needs to factor in costly transmission. New models for cost sharing are required for transmission projects, such as one recently proposed by the California Independent System Operator, where each renewable project will only pay for its share of the cost of a trunk line from the resource area to the rest of the grid, with the balance being shared by all transmission users. Compared with standard fossil fuel units, wind power by itself is often uneconomical. To compensate for this, a federal production tax credit (PTC) provides an added incentive. The PTC is now about 2 cents per kilowatt-hour but escalates with inflation. Wind projects that qualify for the PTC earn the credit for the first 10 years of operation. The program is short term, with the current one ending at the end of 2008,

when it will require Congressional approval to keep it going. The PTC provides anywhere from 30% to 50% of the total capital investment, so if Congress' enthusiasm for the program lessens, wind investment may die down.

Wind projects also tend to operate at only 30% to 35% of capacity, a much lower rate than for fossil fuel plants and renewables like biomass and geothermal power. Also, because wind is unpredictable, regions that rely on large wind capacity may need additional generation resources to ensure reliable reserve power. These challenges usually translate directly into more integration costs for wind. In 2006, the Minnesota Public Utilities Commission reported that if in 2020 wind provided 25% of state generation capacity, integration costs would be about \$4.50/MWh. While low, this number excludes additional generation costs to maintain reserve margins. (See "A Look At U.S. Wind Project Risks In A Time Of Growth" published on *RatingsDirect* on Sept. 25, 2006.)

**Potential Winners In Electric Generation Technology To Limit Greenhouse Gases**

Energy efficiency is likely to emerge as a major part of the solution to climate change, while IGCC, nuclear, and natural gas are the key contenders for incremental generation needs. More gas capacity will be built in any scenario, but regulators may try to limit dependence on this volatile fuel. If IGCC and CSS are successfully implemented, it is not only carbon friendly, but also a plentiful domestic resource. Nuclear energy will receive a shot in the arm if the waste disposal issue can be resolved. Biomass is economically viable in a carbon-constrained world,

Table 4 **Cost Of CCS Per Ton Of Carbon Dioxide**

(\$/MWh)	Pulverized coal	Natural gas combined cycle	IGCC Eastern	IGCC PRB	Nuclear	Wind	Solar	Biomass
Cost of CCS per ton of carbon dioxide	80	86	46	41	N.A.	N.A.	N.A.	N.A.
<b>Total cost of power given ability to buy carbon dioxide credits</b>								
Carbon dioxide at \$10/ton	67	72	76	74	89	71	151	91
Carbon dioxide at \$30/ton	84	79	93	93	89	71	151	91

CCS—Carbon capture and sequestration. IGCC—Integrated gasification combined cycle. MWh—Megawatt-hour. N.A.—Not applicable. PRB—Powder River Basin.



especially municipal solid waste plants near large metro areas. The cost drivers are clear, the ultimate outcome remains to be seen.

#### Note

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# Canadian PPP Sector Continues To Pick Up Steam

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The Canadian public-private partnership (PPP) market has grown rapidly during the past three years with numerous projects reaching financial close in several provinces. Given the project pipeline in the provinces of Alberta (AAA/Stable/A-1+), British Columbia (AAA/Stable/A-1+); Ontario (AA/Stable/A-1+); and Quebec (A+/Positive/A-1+), we expect that PPP project financing will pick up even more steam in the next few years.

Early Canadian PPP projects closely matched the framework of the U.K.'s Private Finance Initiative in many respects, including risk allocation features, but many projects recently have implemented contractual modifications to suit local market conditions, as well as meeting government concession grantor objectives. During the period 2004-2006, Standard & Poor's Ratings Services observed varied project payment schemes in the Canadian market, including those with a pure availability basis or partial shadow toll regime to complement a substantial availability payment component. Golden Ears Bridge (Golden Crossing Finance Inc.; SPUR 'BBB') and the Vancouver General Hospital and Anthony Henday Drive transportation projects are examples of the former pure availability payment model, while Kicking Horse Canyon, Bennett Bridge, the Sea to Sky Highway, and the Canada Line projects each have partial shadow toll exposure.

Looking ahead, there appears to be an appetite from sponsors, creditors, and concession grantors for assets with increasing market or volume exposure. This is demonstrated by Quebec's A-25 and A-30 road projects and British Columbia's upcoming large Gateway Project. The combination of traffic volume and multiyear design-build risk will likely relegate such volume risk assets to the low investment-grade space if properly structured.

## Focal Point Of PPP Activity Is In Four Provinces

In the next several years, British Columbia appears to have substantial potential for a mix of availability-based healthcare projects, including long-term care and hospital PPPs, as well as

continued growth in transportation projects that will see some degree of volume risk.

Given Alberta's very robust fiscal position, the province is likely to continue to be selective in its use of PPP asset procurement, primarily related to already well-received transportation projects (Edmonton and Calgary ring roads) and for strategic risk allocation purposes.

Ontario's announced transaction flow under its Alternative Finance and Procurement (AFP) model now exceeds 40 projects, with the initial emphasis for AFP being on hospital projects and, to a lesser extent, courthouses and accommodation projects. The province is procuring these AFP assets under one of two approaches: a traditional long-term concession arrangement (build-finance-operate-maintain scheme, with a mixture of potential design responsibility and varied approaches to facilities management services); or, a shorter term build-finance approach where the government makes a lump sum payment following completion of a hospital asset, for example.

Quebec has announced several private sector mandates for smaller developments such as the Montreal Symphony Orchestra and the rehabilitation of Montreal's Olympic Stadium roof. But Quebec is also pursuing major PPPs in its transportation sector. The A-25 project and the upcoming A-30 project are two very substantial road projects that likely will reach financial close in 2007 and 2008, respectively. There is some uncertainty in the area of hospital PPPs, although discussions continue on two very large hospitals linked to the teaching and research capacities of the Universite de Montreal and McGill University (AA-/Stable/—), both in downtown Montreal.

Two of the Atlantic provinces, New Brunswick (AA-/Stable/A-1+) and Nova Scotia (A+/Stable/A-1+), have also been proponents of the PPP model in past years, with a large road project currently ongoing in New Brunswick, which is being done on the basis of an availability payment scheme.

To date, the provinces, led by British Columbia, have launched most of the PPP

activity in Canada, primarily because health-care and many transportation responsibilities fall within provincial jurisdictions. In addition, with the exception of Alberta, most provincial budgets do not have significant capacity or appetite for major up-front capital spending that would be funded by government borrowing. However, momentum in the sector is likely to accelerate across the country with the federal government of Canada (AAA/Stable/A-1+) poised to identify some national PPP projects.

### Federal Government Sees The PPP Light

The recent federal government budget confirmed that a PPP office will be established at the national level, suggesting that a much broader array and possibly larger scale of PPP projects could be launched in the years to come. Together with this new office, the federal government has announced that it intends to create a national PPP fund of about C\$1.25 billion to be directed to approved projects over the next several years, contributing up to 25% of their costs. Projects that are likely to be given serious consideration in the near future include a new border crossing between Windsor, Ont., and Detroit, Mich., to address the problems of congestion in that key transportation corridor. The government is apparently assessing the suitability of the design-build-finance-operate model for this particular project. In addition to border crossings that are under federal jurisdiction, other potential candidates are ports and portions of the national highway system. Outside of the transportation sector, possible projects could involve federal correctional and defense facilities.

### Funding Options And Rating Trends

The Canadian PPP transactions that have reached financial close to date have generally used one of four forms of debt funding:

- Widely offered debt capital market offerings;
- More narrow private placement offerings with life insurance companies;
- Unrated term bank financing; or
- Rated bank financing, possibly supplemented by a financial guaranty policy (monoline bond insurance).

Sponsor preference, cost of funding differentials, the length of the concession term, and

the potential equity tail, as well as the complexity of the design-build program have influenced the choice of debt funding approaches by project consortiums.

Standard & Poor's has been active in providing ratings on many of these recent PPP projects at the bid stage and at financial close. The public ratings have ranged from the low- to mid-investment-grade categories. There is also the prospect for credit ratings to be assigned to projects that have already been funded (with bank debt, for example) in the event that they are refinanced as sponsors seek to enhance their returns after construction is completed. This enhancement to returns might be achievable through a combination of lower market interest rates at the time of refinancing, tighter credit spreads (due to a perception of a lower risk premium) provided by the markets following construction completion, and higher leverage at the point of refinancing. The project agreements for most endeavors will specify a 50% refinancing gain (with the concession grantor).

### International Interests In Canada And Canadian Investor Interests Abroad

Growth in the Canadian PPP market has led to an influx of foreign sponsors, facilities management providers, and construction companies in the past three years. These players are domiciled mainly in the U.K, Europe, and Australia where the PPP model is well-known, and they have been largely responsible for kick-starting the current surge in Canada's domestic market. However, the domestic banks and their wholly owned investment banking arms have increased their knowledge and capacity in the PPP space in an effort to compete with the foreign banks and global consulting practices, which have thus far been dominating the lending and advisory activities for concession grantors and sponsors. As well, financial guarantee companies (monoline bond insurers) have stepped up to the plate by providing opportunities for guaranteed or "wrapped" debt solutions on domestic projects, contributing to a new form of debt market competition that didn't exist here until 15 months ago. The financial guarantees provided by the monoline bond insurers enhance Standard & Poor's underlying debt ratings on projects to

‘AAA’, equivalent to the insurers’ own credit ratings. In fact, the Vancouver-based Golden Crossing Finance transaction that closed in February 2006 was the first wrapped bank loan in North America. This financial guarantee policy was allowed to be executed despite the fact that monoline bond insurers are not yet licensed to operate in Canada.

The increasing breadth of providers is a positive development. It should supply competitive tension in PPP bid situations and lead to innovations in project design and construction approaches and financing structures. However, at the same time, some hurdles are sure to remain in the Canadian market. The sheer number of projects occurring simultaneously, together with the relative scarcity of large general contractors in Canada, could at some point constrain the market. Also, as the leading construction companies take on additional exposure through an increasing number of projects, their balance-sheet encumbrances could grow alongside the credit supports, such as letters of credit (LOC), that they are being asked to provide to enhance the project’s financial profiles. It is likely that contractors that have taken on significant exposure might be pushing against LOC limits or other balance-sheet ratios, so that less encumbering support features, such as surety instruments, might be considered by construction providers in the future.

Fortunately, there’s no shortage of debt or equity funding for Canadian PPP projects. In fact, a scarcity of domestic projects exists relative to the domestic equity and debt funding capacity dedicated for infrastructure, let alone the international funding capacity that is interested in the same Canadian infrastructure asset base. This would explain why Canada’s large institutional investors, such as the Canada Pension Plan Investment Board, Ontario Teachers Pension Plan Board, Ontario Municipal Employees Retirement System (AAA/Stable/A-1+), and Caisse de Depot et Placement du Quebec (AAA/Stable/A-1+), have all sought international infrastructure investment opportunities. In addition to international diversification interests, there is simply not enough depth in the Canadian market to satisfy these funds’ dedicated asset allocation to the infrastructure space.

### Successful History And Effective Risk Allocation

An important contributor to the growth in the PPP sector in Canada has been governments’ realization that partnering with the private sector is beneficial, especially for the following reasons:

- Procuring capital assets from the private sector results in a faster and more date-certain, fixed-price approach, as compared to traditional capital asset procurement undertaken by government departments.
- Governments can achieve some degree of risk transfer by allocating to the concessionaire key project uncertainties or challenges that have not traditionally been well managed by the public sector, particularly for large-scale capital projects. These risks include general design and scope changes, completion delays, and cost overruns, as well as capital asset maintenance and estimating long-term life cycle costs.

While PPP asset procurement is not a panacea for all government capital, many public sector projects could benefit from private sector expertise. One example is the Vancouver Convention Centre, which is reportedly experiencing material cost overruns midway through construction. The cost struggles of this project highlight the value in having private sector parties bear the risk of construction and asset completion through fixed-price, turn-key, and date-certain contracts—with penalties imposed for not meeting these commitments.

### Canadian PPP Sector Can Build On Solid Global Track Record

In Standard & Poor’s experience, the PPP sector globally has had a very good track record in the past decade or so, distinguished by a lack of defaults of rated projects and the development of an effective risk allocation framework between the concession grantor and private sector partner. Canada’s market participants can continue to draw upon this experience, but also contribute to the growing pool of innovative solutions brought about by the private sector for the delivery of essential public sector assets. Contrary to expectations even two short years ago, the Canadian PPP market is here to stay. ■

# Despite Risks, Global Public-Private Partnership Deals Are On The Upswing

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**G**overnments around the globe have struggled to deliver important public infrastructure investments as well as control costs without reducing services. To meet growing fiscal demands, governments are increasingly interested in forming public-private partnerships (PPP) to improve service levels, control costs, and provide the social and physical infrastructure required by growing populations by leveraging the relative advantages of both public and private participants.

Standard & Poor's Ratings Services' definition of a PPP is any medium- to long-term relationship between the public and private sectors, involving sharing the risks and rewards of multi-sector skills, expertise, and finance to deliver desired policy outcomes. The U.K.'s Private Finance Initiative (PFI) is a subset of PPP that typically involves concessions, or franchises, of public sector assets contracted with the private sector to provide long-term services.

Globally, Standard & Poor's rates more than 100 PPPs with more than 75% in the 'BBB' rating category, and most of the remainder in the 'A' category. To date, the majority of these transactions have occurred in Europe, Australia, and Canada. The U.S. market is still in its infancy, with only a handful of deals in the transportation sector. However, that could be changing. Throughout the U.S., many state governments in search of cash infusions are looking into expanding PPP deals beyond the surface transportation sector to state lotteries and other asset classes that generate stable cash flow.

In the U.K. alone, signed projects have a capital value of about \$87 billion, showing the significant growth of the asset class. "One reason that PPPs and PFIs have evolved in Europe is the recognition that these many projects can be delivered faster and more cost effectively," said Standard & Poor's credit analyst Kurt Forsgren. "It's only now in the U.S. where there's a growing disparity between resources and future investment requirements and other demands on public resources that we're exploring differ-

ent approaches to project delivery, operation, and ownership."

## How PPPs Work

In a typical PPP deal, public and private sector partners enter into a contractual agreement. Most often, these deals involve a government agency contracting with a private partner to renovate, construct, operate, maintain, and/or manage a facility or system, in whole or in part, that provides a public service. Although the government agency may retain ownership of the public facility or system, the private partner generally invests its own capital to design and develop the properties. A private sector consortium forms a special-purpose entity (SPE) to build and maintain the asset.

The consortium usually comprises a building contractor, a maintenance company, and a bank lender. The SPE signs the contract with the government and with subcontractors to build the facility and maintain it. For example, when an SPE finances and constructs a building for a hospital authority, the hospital authority agrees to pay for the maintenance and use of the building for a defined period. The SPE provides housekeeping and other non-medical services, and the hospital provides medical services. At the end of the period, the SPE withdraws, and all services revert to the hospital authority's administration.

Rather than rely on a payment for maintaining the project, PPPs can also share in the revenue economic infrastructure, such as a toll road, generates. Under this model, the SPE operates the key services and gets its return from the income derived from the toll road. Other deals can involve a big payday upfront. Such a venture, although a contractual arrangement, differs from typical service contracting in that the private sector partner usually makes a substantial cash, at-risk, equity investment in the project, and the public sector gains access to new revenue or service delivery capacity without having to pay the private sector partner.

Public purpose debt is debt used to finance a project intended to be of value to the general public. Such debt can include ordinary

government securities, such as general obligation bonds or revenue bonds, as well as qualified private activity bonds. For instance, a state government can use tax revenues to provide capital for investment, with operations run jointly with the private sector or under contract. In other types (notably PFIs), the private sector makes a capital investment on the strength of a contract with government to provide agreed services, such as running state roads or providing social services.

### More U.S. Deals On The Horizon

In the U.S., 25 states have passed statutes permitting PPP projects. Some states, including Virginia and Texas, have clearly led the way with respect to advancing implementation. “Given the needs of fast-growing states in the South and West and the appeal of long-term asset concession leases by established network operators in the Northeast and Midwest states, more of these deals might be on the horizon,” said Mr. Forsgren.

According to Mr. Forsgren, this could have been a breakout year for U.S. transportation PPP transactions that have long been in the planning stages. However, the PPP model is generating healthy discussion and debate in the U.S., both positive and negative, at the local and federal levels. “It appears there will be changes to the PPP landscape in Texas with a potential moratorium on private toll road development for two years that is likely to slow the pace of private investment,” said Mr. Forsgren. “Even so, with a deep pool of global infrastructure funds lining up, PPPs are now part of the dialogue for roadway and related intermodal projects—even in jurisdictions where the legal framework is still undeveloped,” he added.

### The U.K. Leads The Way

Since 1992, the PPP/PFI procurement methodology has had a successful track record in the U.K., bringing to market 700 projects with a combined capital value of about £50 billion (about \$87 billion). These encompass both social infrastructure, such as new hospitals and schools, as well as economic infrastructure, such as transportation projects. As a method of procurement, PPP/PFI has demonstrated better performance than traditional public procurement with more capital projects delivered

on time and to budget. The initial area of focus has been on the issue of construction and bringing the facilities into use. Increasingly, however, there have been growing concerns regarding the challenges that are presented by the operating phase. In particular, the issue of lifecycle risk—that is maintaining the quality of the assets over the 25- to 35-year operating length of the concession—is starting to become an area of concern.

Elsewhere in Europe, PPPs have made less progress, with the notable exception of roads. Partly, this reflects the need for a legal framework for PPPs to develop but also the political will behind adopting the PPP methodology as a means of delivering social infrastructure. However, as central and local governments across Europe continue to face the challenge of delivering sound budgetary performance and new infrastructure assets, the use of the PPP in some form is likely to increase.

### On The Upswing In Canada

During the past three years, the Canadian PPP sector has grown rapidly, with numerous projects reaching financial close in several provinces. Over this same timeframe, growth in the country’s PPP market has led to an influx of foreign sponsors, facilities management providers, and construction companies.

Thus far, the provinces have launched most of the PPP activity in Canada, mainly because health care and many transportation responsibilities fall within provincial jurisdictions. In addition, with the exception of Alberta, most provincial budgets don’t have a significant capacity or appetite for major up-front capital spending that would be funded by government borrowing. Canadian PPP dealings have generally one of four forms of debt funding, including widely offered debt capital market offerings; narrow private placement offerings with life insurance companies; unrated term bank financing; or rated bank financing, possibly supplemented by a financial guaranty policy (monoline bond insurance).

Momentum in the sector is likely to accelerate across the country with the federal government poised to launch some national PPP projects. Canada’s recent budget confirmed that a PPP office will be established at the national level, suggesting that a much broader array and even larger scale of PPP projects could

come on stream in the not-so-distant future. Possible federal-level endeavors include national highways, port facilities, border crossings, and defense and correctional facilities.

### **Growing Down Under**

PPP transaction flow in Australia is strong, dominated by the financier-led model pioneered and exported by ABN AMRO. This model has made Macquarie Bank, Babcock & Brown, Plenary, and Transurban familiar names in North American PPP circles, with all four companies using the Australian-developed technology to help structure their deals. While project structures are heavily based on financial engineering, the primary objective of the PPP model is service delivery rather than engineering or financial outcomes, and successful projects will address key stakeholders' service expectations.

After years of fiscal consolidation, Australian state governments are forecasting rising capital expenditure and debt levels, which coincide with public debate about the adequacy of state infrastructure. Given this trend and the willingness of parties involved to learn from the past, Standard & Poor's expects that PPPs will be an integral part of the states' capital programs, and are indeed likely to thrive in Australia over the next few years.

### **Partnerships Have Risks And Rewards**

PPPs between the public and private sectors involve sharing the risks and rewards of multi-sector skills, expertise, and finance to deliver desired policy outcomes under terms of concession agreement. "PPPs are very complicated deals and it's really a question of whether or not a government wants to give up the control and responsibility of an income bearing asset," said Standard & Poor's credit analyst Colleen Woodell. "Although PPPs provide big cash infusions up front, governments could be giving up potential future income. There are no easy answers, and I think a lot has to do with the asset."

If international experience is any guide, many projects and concessions will try to balance acceptable credit risk and the highest possible level of leverage to achieve the highest possible return to investors. "In the U.S., attracting private capital to advance roadway infrastructure will require both public owners and investors to reconsider the standard approach of development and risk-sharing and, in typical American fashion, borrow and modify what has worked elsewhere to fit the demands of a large and unique market," said Mr. Forsgren. ■

# U.S. Convention Center Hotel Financing And Market Cyclicity: Beyond The Conventional Wisdom

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The U.S. hospitality/lodging industry is currently enjoying a strong market in which occupancy levels and room rates have surpassed their pre-Sept. 11, 2001 peaks, so it's a good time to explore the relationship between the cyclicity in the market and its effect on the capital structure of new convention center hotels. Short-term market conditions are affecting the base case measures that Standard & Poor's Ratings Services uses in determining the capital structure for a long-term debt financing.

One indication of the market's current strength is that the average daily rate (ADR) in the lodging industry for the first half of 2007 rose to \$102.95, a 5.7% increase above the same period last year. Due to the strong growth in ADR, revenue per available room (RevPAR) is 5.5% above last year at \$65.09. However, there's been a slight slowdown in occupancy growth. In the first two quarters of 2007, occupancy was 63.2%, which is 0.2% lower than in 2006. So far this year, the market supply of rooms has outpaced the high demand, causing the drop in occupancy. Room supply increased 1.1% while demand increased 0.9%, according to Smith Travel Research. (*See "Lodging Sector Should See Good RevPAR Growth Into 2008, But Slowing EBITDA Growth" published on Aug. 28, 2007 on RatingsDirect.*)

## How Is The Project Financed?

Market demand is the most important factor in determining a convention center hotel project's capitalization. The demand for the hotel is used in developing base case projections and forms the basis for coming up with a proper mix of debt and equity. Most of these projects are developed jointly through a public/private partnership. In determining the amount of equity in the project, a local government may calculate the project's ROE differently than a private developer. The municipality may accept a lower rate of return on the hotel project than would a private developer because the municipality that owns the convention center may consider the convention center hotel a necessary investment in order to make the municipally owned con-

vention center successful. These factors would influence the hotel owner's willingness and ability to contribute equity to the project.

## Market Conditions Determine Forecasts

A study of market conditions in the region at the time of financing (before construction begins) is a starting point for Standard & Poor's analysis of the projects. We examine the market study completed for each project. The analysis heavily depends on projections for ADR, RevPAR, and occupancy levels that come from the study. If the market study is conducted at the peak of the market, the base RevPAR is higher than if it were completed during a downturn in the region. In addition, most market studies assume the market continues to grow or hold constant, during construction, which takes an average 30 to 36 months to complete. The market could turn during this period. A hotel whose capital structure is based on a growing market could open during a downturn, causing it to open well below the feasibility study projections, and giving it little chance of catching up. Austin Convention Center Enterprises Inc. (ACE), which owns the rated Austin Hilton convention center hotel, faced such conditions. The project financing was completed before the market downturn in 2001, and the hotel opened at the end of 2003 at the bottom of the market. First-year operations were 40% lower than its base case. This didn't affect the rating because we had rated the project assuming the project would not meet its base case, but something lower based on several downside scenarios.

## Total Debt To "Key" Is Key

We found a difference in the leverage levels for our rated projects based on the point in time the project was financed compared with the latest market cycle. The leverage tended to increase as the markets improved. As a rough leverage ratio, we took the total project debt and divided it by number of rooms (or "keys"). ACE originally financed the Austin Hilton in 2001 in a strong market with a debt/key of \$301,000. In a still-



Hotel Project Peer Comparisons						
Hotel project	Opening date	Projected RevPAR (\$)	Market RevPAR (\$)	Projected DSCR 10-year avg. (x)	Debt structure	Security
Austin Convention Center Enterprises Inc.	Dec. 2003	114.32	65.52	1.43	\$165 mil revenue bonds series 2006A (BBB-/Stable); \$95.17 million revenue bonds series 2006B (BB/Stable); \$15 mil revenue bonds series 2006C	Hotel net revenues on a first-, second-, and third-lien basis
Baltimore Hotel Corp.	Aug. 2008	123.96	112.43	1.67	\$247.5 mil convention center hotel senior revenue series 2006A (BBB-/Stable); \$54.2 mil convention center subordinate revenue series 2006B (BB/Stable)	First-lien on the land and hotel project
Denver Convention Center Hotel Authority	Dec. 2005	97.21	69.53	1.7	\$356.7 mil. senior revenue bonds (BBB-/Stable)	Hotel net revenues and fixed contributions from the city of Denver
San Antonio Convention Center Hotel Finance Corp.	Feb. 2008	102.64	104.45	1.91	\$129.93 mil. revenue empowerment zone bonds series 2005A (BBB-/Negative); \$78.216 mil taxable contract revenue bonds series 2005B (BBB-/Negative)	Hotel net revenues, all property owned by the issuer, and city tax revenues pledged

RevPar—Revenue per available room. DSCR—Debt-service coverage ratio.

rebounding market in 2005, the San Antonio Convention Center Hotel Finance Corp.'s transaction resulted in \$208,000 debt/key. As the market strengthened and pre-September 2001 peaks were being surpassed, leverage increased. The Hilton financed by the Baltimore Hotel Corp. has a debt/key of \$398,000. While these examples provide some evidence that hotel leverage increases during upswings in the hospitality sector, other factors, such as the strength of the market and construction costs were also big influences on the project leverage.

### Solid Liquidity Helps In A Downturn

Total project leverage doesn't tell the whole story. A hotel's growth rate will be uneven and will likely experience several downturns during the debt's term. Strong liquidity will help to mitigate a sudden and severe downturn (such as occurred in September 2001) and the ramp-up risk. The projects that had high leverage offset some of this risk by increasing liquidity. Baltimore Hotel Corp.'s high level of debt is adequately supported by a \$25 million guarantee from Hilton Hotels, a debt-service reserve fund in the amount of average annual debt service, and a \$9 million operating reserve, which is equal to almost 10 months' of operating expenses and debt service. The Denver Convention Center Hotel

Authority's 2006 refinancing resulted in \$324,000 debt/key. The project has sound liquidity with \$37.5 million in reserves for debt service and operating expenses funded at closing, which would fund more than six months of operations and annual debt service. The table compares statistics for our rated hotel projects.

### Summing Up

There is some evidence that indicates a trend in which a project's total leverage, as measured by debt per key, increased when the project was financed during an upswing in the lodging and hospitality sector. While the debt per key is an interesting measure of the project's leverage, the most important factor is the demand for the project in its market. Therefore, a hotel with strong demand that is located in a strong market will be able to support a higher level of leverage than one in a weaker market. We use the market study in addition to other factors, including historic trends, to determine the overall demand for the project. We run several downside scenarios that vary from the base case to demonstrate the project's ability to withstand changes in the hospitality and lodging sectors. Our ratings reflect the long-term demand for the facility and assume that investment-grade projects will weather several up and down cycles. ■

# All U.S. Prepaid Natural Gas Transactions Are Created Equal...Or Are They?

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Since the IRS ruled in October 2003 that certain municipal entities could use proceeds of tax-exempt debt to prepay for the future delivery of natural gas and electric power, Standard & Poor's Ratings Services has observed a growing interest in prepay transactions. As more deals have come to market, structural differences have emerged related to the forms of credit enhancement used to insulate bondholders from the credit risks of the municipal participants, early termination payment calculation methodology, liquidity reserves, and contract terms. The structural changes have improved the efficiency of the transactions while still achieving the same credit rating as the gas supplier.

The subtle differences between transactions, even in serial transactions by the same issuer, requires that we thoroughly review each of the contracts and associated agreements to ensure that the structural changes will not affect the credit ratings during the deal's lifespan. Bondholders may bear some risk arising from the structure itself. Although these risks typically do not outweigh the credit risks of the various counterparties in performing their obligations, bondholders should be aware of where even the best of intentions can go wrong.

## How Prepaid Gas Transactions Typically Work

A municipal utility or joint action agency creates a special-purpose entity to issue tax-exempt bonds. Bond proceeds are sent on to a natural gas supplier to prepay for gas on behalf of the entity itself or its members. The gas supplier commits to deliver predetermined quantities of gas according to a schedule that may be fixed or shaped to reflect seasonal demand. Either way, it is important that the structure aligns the retail revenues and debt-service payments. The amount and schedule of the gas is based on the forward prices of gas and a time value of money that is below the gas supplier's current debt cost. Retail revenues come from reselling the gas to the municipal participants that use the natural

gas in a local distribution system or for electric generation. The municipal parties pay the issuer for the gas received at an indexed price minus a fixed discount.

Because the transaction is created with indexed gas prices, the issuer enters into a commodity price swap agreement. The agreement exchanges the indexed-based revenues for fixed payments, which are modestly higher than the issuer's debt-service requirements. The surplus cash flow is accumulated in contingency reserves, and paid to the municipal participants as an annual rebate. If the transaction includes variable-rate debt, the issuer enters into an interest-rate swap to align the fixed payment received from the commodity swap counterparty with the variable obligations associated with the variable rate debt.

Key risk mitigants in a gas prepay transaction are the guarantee of the gas supplier's performance by a highly rated counterparty and financial compensation to the municipal participants if the agreed-on quantity of gas is not delivered. Liquidity reserves, required gas remarketings to other entities in the event of a participant default, and early termination at par under certain circumstances protect the bondholders. These transactions are structured such that bondholders are exposed primarily, but not solely, to the willingness and ability of the gas supplier to meet its obligations under the various transaction documents. As a result, the ratings on these transactions are typically linked to the lowest-rated counterparty in the transaction which is usually the gas supplier.

Regardless of the structure's contractual nature, each municipal participant's economic interest is to receive specified commodity volumes at an indexed price minus a fixed discount. The discount is generated by the positive carry between the cost of the tax-exempt debt and the higher costs of capital associated with a taxable gas supplier.

## Approaches To Credit Enhancement

Prepaid gas transactions contain various forms of credit enhancements to eliminate the

credit risk associated with the municipal participants, and to make bondholders indifferent to the variability of gas prices and interest rates. The transaction's structure is designed to shift almost all of the credit risk to the gas supplier. As such, ratings on these transactions mainly reflect the ratings of the gas suppliers and not those of the underlying municipal participants. The way in which the municipal participants' payment risks are mitigated in individual transactions has changed since the inception of the gas prepayment model. The earliest prepay transactions focused on providing immediate termination at par for a single participant default that the gas supplier would fund and a cash funded liquidity reserve would support any interim debt service. More recently, cash funded reserves have been deemphasized in favor of surety-funded reserves that allow transactions to continue despite a participant default.

For example, as the number of participants in transactions has increased over time, structures have adapted to allow one or even several participants to default without unwinding the entire transaction. This is accomplished through either a surety policy the directly "wraps" the payment obligation of each individual participant or a reserve fund that can provide enough liquidity for a period of time sufficient to find a replacement buyer for the gas if one or more participants default on their payment obligations. In these instances, the transaction would only unwind if the remarketed gas is sold to entities whose "use" as defined in the tax code would endanger the bonds' tax-exempt treatment.

In the preceding scenario, the surety policy is an example of direct credit enhancement that can be used to insulate bondholders from the risk of a single participant, whereas a reserve fund would be an example of indirect

### Rated Gas Prepay Transactions

Issuer	Series	Rating	Issue amount (mil. \$)	Contracted gas volumes (bil. cubic ft.)
American Public Energy Agency	2003A&B	AA+/Stable/A-1+	306.0	83.2
American Public Energy Agency	2005A	AA+/Stable/A-1+	349.8	65.3
Central Plains Energy Project	2007A	AA-/Stable/—	240.3	100.0
Central Plains Energy Project	2007B	AA-/Stable/—	205.9	—
Florida Gas Utility	2006A-1,2,3,4	AA+/Stable/A-1+	694.2	150.0
Main Street Natural Gas Inc.	2006A	AA-/Stable/—	528.3	217.0
Main Street Natural Gas Inc.	2006B	AA-/Stable/—	527.6	—
Main Street Natural Gas Inc.	2007A	AA-(prelim)/Stable/—	300.0	129.0
Municipal Gas Authority of Mississippi	—	AA+/Stable/A-1+	425.0	87.8
Clarksville Natural Gas Acquisition Corp.	2006	AA-/Stable/—	240.1	41.1
Kentucky Public Energy Authority	2006A	AA+/Stable/A-1+	1,031.0	170.4
Roseville Natural Gas Financing Authority	2007A	AA-/Stable/—	197.6	46.0
Tennessee Energy Acquisition Corp	2006A	AA-/Stable/A-1+	1,994.5	510.0
Tennessee Energy Acquisition Corp	2006C	AA-/Stable/—	1,060.2	262.0
Texas Municipal Gas Acquisition and Supply Corp.	2006A	AA-/Stable/—	485.0	441.0
Texas Municipal Gas Acquisition and Supply Corp.	2006B	AA-/Stable/—	1,851.0	—
Northern California Gas Authority No.1	Series A	AA-/Stable/—	88.6	146.0
Northern California Gas Authority No.1	Series B	AA-/Stable/—	668.5	—
SA Energy Acquisition Public Facility Corp.	2007	AA-(prelim)/Stable/—	730.0	146.0
Texas Municipal Gas Acquisition and Supply Corporation II	2007A & B	AA-/Stable/—	1,920.0	354.0
Tennergy Corp. (The)	2007A & B	AA-/Stable/—	2,600.0	570.0

credit enhancement provided by a structural feature of the transaction. The major types of direct and indirect credit enhancement are discussed below along with our view of how these structures can affect bondholders.

### **Direct Credit Enhancement**

#### ***Cash-funded reserves***

The original form of credit enhancement in gas prepay transactions was cash-funded reserves. These reserves would be drawn on if a participant defaulted on paying upcoming debt service and to provide liquidity until a designated termination date is reached. At that time, the gas supplier repays bondholders at par for the outstanding balance of the bonds, plus accrued interest. In these transactions, municipal participants may invest their revenues with a guaranteed investment contract (GIC) provider that offers a fixed yield to enhance the transaction's economics. The return on invested money generates additional internal cash flow that may either provide additional liquidity or may be rebated to the participants as an additional discount. Cash reserves typically contain two or three months' of maximum debt service. Reserve accounts are less common in recent transactions due to the increased cost to the issuer compared with surety bonds or insurance policies.

#### ***Direct insurance wraps of municipal participants***

Similar to the receivables purchase agreement discussed below, some transactions purchased an insurance policy that provides funds to meet payment shortfalls from the municipal participants. In the Tennessee Energy Acquisition Corp. series 2006C transaction, MBIA Insurance Corp. (AAA/Stable/—) issued a \$42 million surety bond to provide liquidity if a municipal participant defaulted. The trustee is required to give the surety provider two days' notice to make funds available for a draw, and the surety bond is sized to provide three months' swap payments at the maximum monthly volume, and operates similar to a debt-service reserve. The risks of a direct insurance wrap of municipal participants are similar to the risks of a cash funded reserve. Specifically, these policies are typically capped at a finite amount that could be breached if gas prices increase substantially

at the time of the payment default.

Furthermore, the rating of the insurer could constrain the transaction's rating if the insurer is downgraded below the rating of the gas supplier. Finally, sometimes the terms of the insurance policy itself can introduce risks that must be closely examined to ensure that there are no circumstances in which the insurer would not be obligated to make payment under the policy.

Surety policies do not typically require the surety issuer to pay on demand. Standard & Poor's ratings of prepay transactions that use surety policies include a review of the surety agreement's written terms that should, at a minimum, contain the following concepts:

- Payment does not depend on a determination of fault or other liability,
- Timely payment of policy claims,
- The insurer's obligation to pay ranks *pari passu* with its other obligations,
- The right to amend or terminate the policy is restricted,
- Holders of rated securities are beneficiaries of the policy, and
- The removal of other conditions for payment.

#### ***Receivables purchase agreements***

One alternative to a cash-funded reserve account is a receivables purchase agreement that eliminates the credit risk of one or more municipal participants, some of which may be unrated or carry ratings that are lower than those of other counterparties. Without some form of credit enhancement, the lower-rated participants would result in an overall lower rating on the transaction because the bondholders rely on all counterparties within a structure to make payments to maintain debt service. To avoid this risk, some transactions require the gas supplier to purchase participant receivables from the issuer, if the issuer does not have enough funds to meet its obligations due to a municipal participant's payment default. The gas supplier must pay the receivables on any defaulted amounts on a specific day sufficient to allow the issuer to meet its financial obligations and avoid a default under the indenture's terms. The receivables purchase agreement effectively transfers the municipal participants' credit risk to the gas supplier.

Standard & Poor's views receivables purchase agreements as being a stronger form of

credit enhancement than a cash funded reserve because it is a more flexible arrangement that will allow the gas supplier to assume the credit risk of some participants while gas is resold to other, nondefaulting municipal entities. This allows the transaction to continue and avoid a mandatory early termination payment. Furthermore, it minimizes the number of credit exposures in a transaction and focuses the structure on the gas supplier's creditworthiness.

In a transaction we rated 'AA-' earlier this year, The Tennergy Corp. may sell participant receivables to the JP Morgan Ventures Energy Corp. (JPMVEC; not rated), the gas supplier, if one or more participants fails to pay for its contracted gas volume. In addition, JPMVEC is required to purchase participant receivables from Tennergy to provide sufficient funds to meet Tennergy's obligations and avoid a termination event. Tennessee Energy Acquisition's series 2006C and Texas Municipal Gas Acquisition and Supply Corp. II's series 2007A and 2007B transactions have similar provisions.

#### **Indirect Credit Enhancement**

In the context of a gas prepayment transaction, liquidity is a form of indirect credit enhancement because it allows for the timely payment of debt service.

Prepay transactions are structured to achieve only 1x debt service coverage. This minimal coverage level results from the exchange of earned amounts under the natural gas supply agreement for a fixed amount of principal and interest paid by the commodity swap provider. Standard & Poor's does not require additional excess cash flow for synthetically structured transactions such as these, because ratings do not rely on the issuer's cash generating capability, but rather on the ability and willingness of each counterparty to meet their obligations under the transaction contracts.

Traditionally, prepay transactions include a debt-service reserve and a working capital reserve, which support the issuer's ability to pay interest and principal as scheduled. The reserves can be funded with cash or take the form of a surety bond or insurance policy. Similar to other forms of credit enhancement, these reserves provide some liquidity if a municipal participant doesn't pay its obligations.

#### **Debt-service reserve**

In a prepay transaction, the debt-service reserve protects the issuer against a participant payment default. This reserve must be sized to fund the principal and interest payments between the date of an early termination event and redemption. In most transactions, this equates to two or three months' of debt service. The size of the debt service will reflect a given transaction's specifics. For example, most prepayment transactions will fund three months' of debt service because the structure contemplates that it would take a maximum of 90 days for a payment fault to be identified, an early termination event to be declared, and an early termination payment paid. Those transactions that have smaller or larger debt-service reserves typically have shorter or longer payment cycles for the participants or provide for cure periods in which a defaulting participant can reestablish its eligibility to participate in the transaction.

Transactions with large debt-service reserves include Main Street Natural Gas Inc. (\$145 million, 14% of par), Natural Gas Acquisition Corp. of Clarksville (\$27 million, 11%), and Central Plains Energy Project (\$21 million, 9%). We have not seen a specific pattern related to larger or smaller debt-service reserves over time indicating the reserve's size remains a significant differentiating factor for these transactions, so long as it can provide enough liquidity to fund debt-service payments before an early termination payment date.

#### **Working capital reserves**

A working capital reserve fund protects the commodity swap provider if participants don't pay the issuer for any delivered gas. In this case, the issuer could fail to meet its obligations to the swap counterparty, because required swap payments are funded from the revenues earned through participant payments. The issuer's inability to make a timely swap payment can result in the transaction being terminated. Without a working capital reserve, the issuer would not be able to pay the swap counterparty if gas prices rise above the swap price of gas and a participant fails to pay the issuer. In most transactions featuring working capital reserves, the issuer has access to a debt-service reserve and, therefore, should be able to meet its next debt-service

## The Top Trends

obligations, but a commodity swap termination would nevertheless result in the transaction's termination. Without a commodity swap, bondholders could face debt payment shortfalls if gas prices declined relative to the notional price of gas around which the transaction is structured.

In some prepaid transactions, the size of the working capital reserve account has been calculated based on the maximum monthly volumes for two or three months at a price that is significantly above the strike price in the commodity swap. In other cases, the price of gas is based on two standard deviations above historical maximum price levels, which exceeded \$30 per million BTU (mmBTU). For example, the working capital reserve in the Northern California Gas Authority No. 1 transaction was sized at \$21 million, based on the maximum three-month expected deliveries at a \$35 per mmBTU gas price. The working capital reserve in the Central Plains Energy Project transaction was sized at about \$11 million, based on the maximum three-month expected deliveries. The working capital reserve represents about 3% and 4%, respectively, of par in these transactions.

In general, the size of working capital reserves is decreasing. Smaller reserves present additional structural risks during rising gas price environments. If working capital reserves are modestly sized and gas prices rise substantially relative to the notional swap price of gas, a participant default could result in a payment shortfall that exceeds the size of the commodity swap reserve. In this instance, it is likely that the commodity swap counterparty could end up with a payment claim against the issuer. As a result, in transactions with smaller reserves or that do not include working capital reserves, it is especially important that any claims by the commodity swap provider be subordinated to debt-service payments. It is also important that the commodity swap provider cannot file a secured first-priority claim against the trust estate pledged to bondholders. Therefore, Standard & Poor's believes that transactions with larger reserve sizes are more insulated from these types of legal risks, especially given the long tenor of these transactions and the expectation of long-term increases in gas prices.

Some transactions have been completed with no or materially smaller working capital reserves. For example, Roseville Natural Gas Financing Authority and Natural Gas Acquisition Corp. of Clarksville do not benefit from working capital reserves. Therefore, when gas prices are high, bondholders may be exposed to more risk if the participant defaults and there is no offsetting credit enhancement that is in place to make sure that obligations due to the swap provider can be satisfied. The smaller working capital reserve sizing is generally not a factor in assigning ratings to these transactions if Standard & Poor's feels that the transaction's legal structure protects bondholders from the risk of any swap counterparty exerting a claim against the trust estate. In transactions with a small or nonexistent working capital reserve, Standard & Poor's requires that any swap counterparty claims be subordinated and unsecured to protect bondholders against these risks. These legal risks are also mitigated if there is swap replacement language that requires the trustee to find a new swap counterparty within a reasonable amount of time or force a mandatory redemption of the bonds.

Transactions with relatively low working capital reserves are Texas Municipal Gas Acquisition and Supply Corp. I (\$7 million, 0.3% of par), Texas Municipal Gas Acquisition and Supply Corp. II (\$11 million, 0.6%), and Public Energy Agency of Kentucky (\$3.5 million, 0.3%).

### **Combined reserves**

Several transactions have combined the debt service and working capital reserves. Examples of transactions with combined reserves are Roseville Natural Gas Financing Authority (\$31 million, 16% of par) and Tennessee Energy Acquisition 2006C (\$42 million, 4%). We do not differentiate the ratings on these transactions as long as there is enough money in the reserve to cover the required payments from the termination date to redemption date for debt service and swap payments.

### **Other sources of liquidity**

Some transactions have included unique sources of liquidity, which provide enough cash to meet debt-service requirements during an early termination event or ensure there are sufficient funds to redeem the outstanding

bonds. The inclusion of these reserves has become less common in recent transactions.

#### **Early termination reserve**

Central Plains Energy Project has a \$4.4 million early termination reserve, and Tennessee Energy Acquisition's \$1.06 billion series 2006C transaction has one with \$12.7 million. The early termination reserve is available to pay bondholders if an early termination event is declared and debt service is due before the bonds' redemption date. This reserve is sized at the maximum difference between the debt-service reserve account and this debt-service payment owed on the bonds over a one-month period. In most transactions, an early termination reserve is not necessary as the debt-service reserve functions in a similar manner.

#### **Subordinate debt funding**

Tennessee Energy Acquisition's series 2006A transaction included the issuance of about \$130 million of unrated subordinated notes. The proceeds of the subordinated debt funded the costs of issuance, capitalized interest, and various reserve accounts. Most transactions have not used this structure because access to surety bonds and other forms of liquidity is readily available and less costly to implement.

#### **Standby bond-repurchase agreements (SBRA)**

Municipal Gas Authority of Mississippi and Public Energy Agency of Kentucky are each structured with an SBRA. The SBRA's are sized to provide 35 days' interest at the maximum rate of 12% based on a 365-day year. These agreements provide liquidity in variable rate transactions as a third-party has agreed to advance funds to the trustee to complete the periodic remarketing process, but do not provide any additional structural support to warrant a higher rating.

#### **Early Termination Payment**

Prepay transactions include various provisions that could trigger an early termination event based on the payment and performance of the counterparties. Over the past few years, Standard & Poor's has rated a number of prepay transactions, which uniquely handle the payment obligations of the various counterparties. In each of these structures, the early

termination payment is sufficient to redeem the outstanding principal plus accrued interest.

Transactions have approached various risks that trigger an early termination in different manners. For example, some transactions have more expansive early termination triggers that encompass a wide range of events in which the gas supplier will be liable for making an early termination payment. More liberal early termination triggers may cover a change in law that results in the gas supplier's delivery or issuer's acceptance of gas under the prepaid contract being deemed unlawful as an event of default, whereas other transactions more carefully limit the liability of gas suppliers to make termination payments only due to a performance default on their own part. In general, more expansively written early termination triggers will give greater support to bondholders, who may rely on repayment by a highly rated counterparty even if tax laws change or other features outside of the transaction participants' direct control change. Of course, these triggers increase the prepayment risk that bondholders bear when investing in these same securities.

In addition to the actual trigger events associated with an early termination, the manner in which the actual early termination amount is calculated will have credit implications for bondholders. The different ways in which these payments are calculated and their effect on credit are described in detail below.

#### **Fixed termination payment**

Transactions that require the gas supplier to pay an amount based on a fixed scheduled to fund an early termination payment tend to entail the most risk for bondholders because these transactions often require various reserve accounts to be fully funded to bridge any shortfall between the specified fixed payment amount owed by the gas supplier and the actual amount that is needed to redeem the outstanding bonds.

Transactions using this structure require all counterparties—the gas supplier, commodity swap counterparty, interest rate swap counterparty, and GIC provider—to perform for the issuer to have sufficient funds to redeem the bonds. As such, transactions using this method of funding the early termination payment entail greater structural risk than those

with a formula-based or full-repayment structure. Some transactions that use this structure are SA Energy Acquisition Public Facility Corp., Central Plains Energy Project, and American Public Energy Agency 2005.

### ***Formula-based termination payment***

Other transactions require the gas supplier to pay an amount equal to the outstanding principal of the bonds plus any accrued interest minus the available reserves to fund an early termination payment. Through this structure, the gas supplier provides extra protection for bondholders because the early termination amount will reflect the total required amount, irrespective of funding levels in reserve accounts making the overall termination at par less dependent on payments from swap counterparties and interest earnings from qualified investments.

In the Tennergy transaction, the gas supplier's termination payment is equal to the outstanding principal plus redemption premiums, accrued interest, any termination costs incurred by the issuer related to interest rate and commodity swaps, and the present value of the unrealized savings, minus the current balances of the debt service and working capital funds. Under this formula-based approach, it is clear that any ancillary costs that could arise related to a termination are explicitly borne by the gas suppliers (including swap termination costs) and shortfalls would not result due to an earlier draw on either the debt service or working capital fund that the cash waterfall had not yet replenished.

### ***Full repayment of outstanding principal and interest by the gas supplier***

A recent proposed transaction requires the gas supplier to pay an amount equal to

the outstanding principal of the bonds plus any accrued interest. After the notes' redemption, the remaining balance in any reserve funds is remitted to the gas supplier. This structure puts all of the performance and credit risk on the gas supplier and eliminates the other counterparties' credit risk.

## **Summing Up**

Although gas prepay transactions are structured to receive the rating of the gas supplier, credit-enhancement mechanisms used to achieve the desired rating differ and present varying degrees of structural risk for bondholders. Given the complexity of these transactions, the relative credit implications of these differences may not always be apparent, but they are nonetheless carefully weighed in the ratings process. For every risk that Standard & Poor's identifies arising from the structure itself, one or more offsetting factors are present to provide reasonable comfort that the structural risks do not ultimately outweigh the credit risks of the primary counterparties. If this were true, assigned ratings would be much lower than even the ratings of the lowest-rated counterparty in the transaction.

Nonetheless, it is worth noting that no transaction is fool-proof. Gas prepayment transactions are structured to withstand a high degree of legal and credit stress, but bondholders are well advised to understand that even the most well structured prepayment transaction has limitations on the type of credit enhancement and protection it affords. The preceding discussion provides some context for where the more subtle pressure points of the structure itself are likely to be found. ■



# Debt Not Imputed To Municipal Utilities In Structured Prepaid Natural Gas Transactions

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Over the past year, Standard & Poor's Ratings Services has assigned ratings to about \$7 billion of municipal prepaid natural gas transactions. In these structured transactions, joint powers authorities (JPA), acting as conduit issuers, have issued debt on behalf of municipal electric and gas distribution utilities for the purpose of prepaying all or a portion of their future gas needs, most often for a period ranging from 10 to 20 years. These financings are accomplished by JPAs borrowing money to make the advance payments for long-term supplies of natural gas. As a result of the prepayment, municipal utilities receive discounted prices for their gas supplies. The level of the savings is tied to the time value of the money received by the supplier as a prepayment.

Standard & Poor's treats suppliers of prepaid natural gas transactions as having borrowed money and incurred debt when they receive a prepayment. Yet, we do not treat the municipal utility gas off-takers as having incurred debt for purposes of calculating their adjusted debt service coverage calculations.

The principal drivers behind our analytical conclusions are the credit-protective covenants provided by the supplier or its guarantor that keep the municipal participants and their bondholders whole. Pursuant to their terms, these structured transactions terminate and the bonds are redeemed if the supplier cannot deliver gas beyond certain threshold periods. We view these covenants as converting the municipal off-takers' contractual obligations into contingent obligations without debt-like attributes.

After a JPA makes a prepayment, the municipal utilities that have committed to take the gas make periodic gas-procurement payments to the JPA as the gas is delivered. The municipalities treat these payments as operating expenses, just as they had treated market or other contracted gas purchases as operating expenses before entering into the prepayment transaction. The municipal utilities' periodic payments service the JPA debt.

In a very limited number of cases, the prepayment translates into a fixed payment per

million BTU (mmBTU) of gas at the municipality level and this payment mirrors debt service on the JPA debt. In most cases, however, swaps are used to provide the municipalities with gas prices that track prevailing market prices and upward and downward movements in those prices. In both the fixed price and variable price transactions, the unit cost of the natural gas to the municipalities is discounted to reflect the economics of the transaction. In those cases where the price of the natural gas is variable and tied to the market, a further swap is required to maintain an alignment between the payments made by the municipalities and the amounts required to pay debt service on the JPA obligations.

The contractual ties between municipal utilities that participate in a gas prepayment and the JPA that has procured the gas might suggest that there are strong similarities between prepayment transactions and the contractual commitments created in connection with the joint development of generation resources by municipalities through JPA structures. However, we make some important distinctions between these two types of financings when evaluating the credit implications for the municipal participants in these transactions.

While Standard & Poor's calculates a fixed-charge coverage to account for municipal utilities' contractual shares of debt service that has funded the joint development of power plants, we do not adjust our fixed-charge coverage calculations to capture the contractual obligations associated with a gas prepayment. We differentiate between these types of financings due to the structural distinctions as well as differences in the certainty of the obligations presented by these types of financings. We do, however, treat the prepayment as a debt obligation of the supplier. We view the supplier as having borrowed money from the JPA and the debt obligation is essentially repayable in gas molecules.

When municipal utilities band together to build electric generation capacity to achieve economies of scale, they typically enter into "hell-or-high-water" contracts that obligate

them to pay a specified percentage of debt service and operating expenses associated with their ownership shares in the plants. Although each municipal participant's share of project debt service is paid to the JPA as an operating expense, this component of operating expenses has debt-service-like attributes because it is an irrevocable fixed obligation that must be paid until the related debt has been retired. By entering into such a contract, it is as though each participating municipality directly financed and built the electric generating facility. Moreover, the participating municipal utilities assume shares of plant operating risks because the obligation to pay project debt service as an operating expense does not abate if the plant is not running. Therefore, we adjust each participating municipality's fixed charge coverage to capture the debt-like nature of this portion of operating expenses. This adjustment is made by removing each participant's share of JPA debt service from its operating expenses in the numerator of the debt service coverage calculation equation and the addition of the share of JPA debt service to the equation's denominator.

While natural gas prepay agreements share some attributes of a JPA power plant financing, Standard & Poor's views these obligations as meaningfully distinguishable from participation in a JPA for power plant financing. Although a contractual obligation, for analytical purposes a prepayment obligation that is contingent on supplier performance is viewed as distinguishable from the debt-like, long-term irrevocable commitments associated with investments in power plants.

Unlike participants in jointly developed generation projects, municipalities that participate in natural gas prepay transactions are shielded from supplier risk and operating risk. To induce municipalities to participate in prepayment transactions, the municipal participants need assurances that the supplier will either perform throughout the duration of the transaction or, alternatively, keep the municipalities whole if the supplier cannot perform so that the municipal off-takers do not find themselves paying twice for quantities of gas. Such assurances are provided by either highly rated counterparties or guarantors of the supply obligation that covenant to

keep the participants whole if the supplier defaults. Typically, these guarantees consist of mechanisms that obligate the counterparty or its guarantor to tender make-whole payments to the municipal off-takers that cover short-term supply disruptions. In the case of longer disruptions that exceed certain specified periods of time, the counterparty or its guarantor becomes obligated to provide the funds necessary for the redemption of the remaining JPA bonds issued to fund the prepayment. The threshold period during which a supplier default may continue before a bond redemption is triggered is calculated with reference to the amount of cash reserves held to cover such contingencies. Bond redemptions must redeem all outstanding bonds. It is the presence of these covenants that have enabled Standard & Poor's to conclude that the conversion of a portion of operating expenses into fixed, long-term contractual obligations does not warrant debt-like treatment when calculating the adjusted financial metrics of a municipal participant that is a party to a natural gas prepayment transaction. It is for this reason that the prepayment transactions are typically rated to the credit quality of the counterparty or its guarantor.

The analytical conclusion that municipalities' financial metrics are not adjusted to reflect participation in a prepayment transaction is further supported by the frequent presence of additional credit protective measures in the prepayment transactions' financing structure. For example, these transactions commonly include a requirement that a remarketing agent be appointed to resell any gas allotted to the off-takers that they are incapable of using from time-to-time. There is evidence from recent prepayment transactions that remarketing is readily accomplished in the very liquid natural gas markets because the prepaid gas is attractively priced as discounted "index minus" gas. Proceeds of any remarketing are applied to the payment of debt service in lieu of the amounts that would have otherwise been derived from the municipal utilities.

Finally, each of the structured prepayment transactions evaluated to date has involved the use of a JPA as a financing vehicle to avoid the addition of debt directly to the off-takers' balance sheets. ■

# U.S. Transportation's PPP Market Continues Down A Long And Winding Road

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This could be a breakout year for many U.S. transportation public-private partnership (PPP) transactions long in the planning stages. Three months into 2007, progress has already been observed on several projects, including the Texas Department of Transportation's (TxDOT) selection of Cintra Concesiones de Infraestructuras de Transporte's \$2.8 billion bid for the 26-mile State Highway 121 and Florida Department of Transportation's (FDOT) receipt of three bids to design, build, finance, and operate the Port of Miami Tunnel. With a deep pool of global infrastructure funds lining up, PPPs (also referred to as "P3s") are now part of the dialogue for roadway and related intermodal projects—even in jurisdictions where the legal framework is still undeveloped.

As project sponsors and other participants are observing, however, the path to financial close can be long and, as recent events have highlighted, rife with obstacles. Users, the general public, and elected officials are increasingly examining the financial details of the concession agreements as well as the broader public policy and political implications of PPPs. This is not surprising, given the relative early stage of development in the U.S. transportation market. As highlighted in our 2005 report titled "Can Public-Private Partnerships Advance U.S. Roadway Infrastructure Development?" we did not expect a single U.S. PPP model or template to develop, leaving project sponsors, concession grantors, regulators, and advisors with the task of negotiating concession agreements and educating stakeholders on a state-by-state, project-by-project basis.

As PPP transactions become more and more popular, questions persist: Will the PPP model be left standing alone as a unique financing, project delivery, and operational model? Or will it be led to the door of broader acceptance by market participants? Standard & Poor's expects the use of PPPs to expand, albeit slowly, both for new capacity-enhancing projects and to leverage existing infrastructure. Though the number of com-

pleted transactions to date is small, we are observing a variety of developments that continue to shape the market. The extent to which they evolve into trends, however, remains to be seen.

## Differing Asset Valuations

Project sponsors are undertaking a variety of asset valuation strategies when developing bids, both for existing and new projects. In the end, however, a lack of comparable assets or benchmarks most often results in the use of the discounted cash flow analysis. For toll projects, this approach ultimately returns to the key value drivers: forecast demand and price elasticity under the envisioned concession scheme. Sponsors, lenders, and often concession grantors rely on a variety of consulting firms that employ complicated traffic modeling techniques to forecast toll revenues. These forecasts, in turn, are folded into assumptions regarding future non-operating revenues, annual maintenance, capital expenditures, and other concession company future obligations.

In terms of tolled assets, we have observed quite a range of both forecast gross revenues and net operating income globally, even when adjusting for several basic assumptions relating to interest rates, inflation, and tolling regime. Of course, minor variances in the early years compound over time and result in different asset valuations by the end of the concession term. Some variances can be explained with differing value of time assumptions, future road network assumptions, tolling strategies, and other model inputs. Even the most sophisticated models, however, cannot capture the inherent roadway system complexities measured in vehicle miles traveled or the preferred industry standard average annual daily traffic. Still, the range of revenue projections for the same asset can be quite disparate and, given the confidentiality and competitiveness of the concession process, there is not sufficient transparency in the market to allow for a full review of bids and those assumptions used to derive them.

Sponsors' revenue forecasts provide an analytical starting point by clearly defining the underlying assumptions for key variables and their interrelationships. This enables us to assess the robustness of model outputs and devise an appropriate program of sensitivity tests to be run through the financial model to arrive at a range of revenue consistent with conservative, long-term growth rates.

### Advancing Legal Framework

While approximately 25 states have passed statutes permitting some form of PPP, several—including Virginia and Texas—have clearly led the way with respect to advancing application of the model. Given the needs of fast-growing states in the South and West—such as Georgia, Florida, Nevada, and Arizona—and the appeal of long-term asset concession leases by established network operators in the Northeast and Midwest states—such as Pennsylvania, New Jersey, and Ohio—we expect the evolution of the legal and contractual arrangements of PPPs to continue. Each iteration is expected to push the limits of what private sponsors view as acceptable risk transfer as it relates to construction, termination, long-term utility costs, noncompete clauses, and key control or oversight provisions embodied in the concession agreement. Given the appeal to investors of transportation infrastructure as an asset class, public owners/operators would appear to be in a strong position to shift risk to sponsors who, in turn, look to lay off risk to construction/joint venture partners, design-build contractors, operators, insurers, lenders, and other participants. We expect to see additional states move toward adopting and approving changes in law allowing them to at least consider PPPs.

Concession terms—which started out at 99 years for Chicago Skyway, 75 years for the Indiana Toll Road, 50 years on the Texas State Highway 121 tolled concession, and 35 years on the Port of Miami Tunnel project—are likely to vary by project, with shorter terms for new greenfield projects and longer terms for existing brownfield assets where maximum value extraction is the desired objective. For example, in 2006, the Virginia Department of Transportation entered into a 99-year lease with Transurban for the Pocahontas Parkway

(bonds rated 'BB-' with a negative outlook prior to being defeased), which was experiencing traffic and revenues below forecasted levels. Overall, we do not expect to see many 99-year leases for new projects or concession leases for major roadway assets.

### Evolving Regulatory And Political Environment

As expected, the PPP model is generating healthy discussion and debate in the U.S. at both the local and federal levels. In addition, despite the prominence of international consortia and investors in the early PPP market, the U.S. toll and surface transportation sector has yet to experience the degree of concern regarding foreign control of infrastructure assets that was seen during last year's Dubai ports controversy. However, the lack of U.S. investors or operators may contribute to the arguments of PPP opponents and delay projects. In addition, the increased discussion surrounding PPPs in the U.S. could have the effect of slowing its application.

At the federal level, the appointment of Mary Peters to U.S. Secretary of Transportation was a step toward advancing private sector participation in expanding infrastructure. Ms. Peters is a strong proponent of PPPs and the former administrator of the Federal Highway Administration. Politically speaking, the advocacy of PPPs has not split down partisan lines. However, with a new majority in Congress, the chairmanship of transportation-related oversight committees has returned to long-time Democrats with a more traditional view of federal government-financed projects. Indeed, many have questioned the U.S. Department of Transportation's (USDOT) role in advocating PPPs. In addition, labor and commercial transport and trucking interests, which generally oppose tolling, have been advancing their viewpoint—along with PPP proponents—to the Congressionally authorized National Surface Transportation Policy and Revenue Commission, a 12-member task force exploring alternatives to replace or supplement the fuel tax as the principal revenue source to support the Highway Trust Fund. We anticipate that PPPs will be further debated and developed in advance of the next Highway Reauthorization Act in 2009.

At the local level, changes in the PPP landscape in Texas are likely as the state legislature considers a number of alternatives, ranging from a two-year moratorium on private equity toll roads to requiring more legislative oversight of TxDOT. What ultimately becomes law remains to be seen, but any modifications to the process that increase time or alter the risk-reward calculus—or, most importantly, inhibit the ability of the operator to increase tolls consistent with the provisions of the concession agreement—could have the effect of slowing or stopping the state's long list of projects exploring PPPs. In the Northeast, Morgan Stanley & Co. has been selected to assist Pennsylvania in evaluating options for funding its transportation needs, including the potential lease of the 172-mile Pennsylvania Turnpike. In New Jersey, Gov. Jon Corzine is considering a variety of options related to leasing the New Jersey Turnpike System, the South Jersey Transportation Authority (Atlantic City Expressway), and other state assets. Florida Gov. Charlie Crist and the state legislature are considering legislation to expand highway development by allowing FDOT to lease its facilities (excluding the Florida Turnpike Enterprise) for up to 75 years. In Virginia, several PPP projects are slowly working their way through the approval process. However, the concession of the existing Dulles Toll Road to a private operator was pre-empted in 2006 when the Metropolitan Washington Airports Authority offered to assume operations and use toll revenues to finance the extension of regional rail to Dulles International Airport.

### Bank Options Versus Bond Options

The option of using insured or uninsured bank loans is proving to be attractive for some project sponsors who typically pursue parallel financing alternatives during the bid phase of PPP projects. Many projects use “mini-perm” bridge loans with medium-term maturities, little or no principal amortization, and bullet payments with refinancing assumptions to fund projects until revenue generation rises to meet forecasts. Mini-perm loans are not intended to be permanent financing; they frequently employ methods such as cash sweeps as incentive to refinance.

These loans are generally unrated, as sponsors and winning consortia prefer not to publicly disclose proprietary funding structures. Given the strong market and investor interest, we expect the bank market to remain a competitive option for projects sponsors.

### Mix Of Funding And Financing Strategies

As states examine projects with economics unlikely to be fully supported by tolls, a variety of funding and financing options are often employed to advance projects. Among these options are partial pledges of federal grant reimbursements; state general fund and dedicated transportation revenue; and payment mechanisms to project sponsors based on availability payments, shadow tolling, or a combination whereby project sponsors are permitted to toll the project and bid on an availability payment stream to the extent necessary. The first major U.S. transportation availability payment project is FDOT's Port of Miami Tunnel. TxDOT has implemented several pass-through or shadow toll agreements with local governments, and plans to enter into agreements with private project sponsors. Missouri is also soliciting bids to rehabilitate and replace and maintain approximately 800 bridges through a payment mechanism based on project completion.

Project credit ratings are typically constrained in the near term by construction risk and a lack of operating history. Standard & Poor's view of availability payments from unrated sources or from a state general fund cannot be determined without a full review of the security provisions, the budgeting and appropriation process, and discussions with state officials regarding the accounting of availability payments and potential concession termination payments. Factoring in these considerations may vary by project and state, and could result in ratings below that of a state's lease rating. Even with possible upside limitations, availability-based projects do have appeal and indeed may be necessary to advance transportation infrastructure investment—particularly for greenfield projects.

### Role Of TIFIA Debt In PPPs

USDOT's credit program authorized under the Transportation Infrastructure Finance and

## The Top Trends

Innovation Act (TIFIA) of 1998 has provided \$3.2 billion in assistance to projects that meet the “projects of national or regional significance” criteria. Most assistance has been in the form of direct loans to projects of public or bankruptcy-remote issuers, including a wide array of infrastructure, such as rail, roadway, bridges, intermodal centers, and ferries. While USDOT intercreditor agreements can accept a junior lien on revenues, its claim on revenues must spring to parity with senior-lien bondholders in the event of a bankruptcy, insolvency, or liquidation of the project obligor.

To date, USDOT has originated one loan to a private sector project sponsor: a \$140 million loan for California’s State Route 125/South Bay Expressway, a 12.5-mile toll road operated by San Diego Expressway Limited Partnership and scheduled to open mid-2007. However, it appears that the additional leverage that can be afforded by a TIFIA program loan may be limited by the extent to which market lenders view a private concession company as more likely to default resulting in the TIFIA lender rising to parity with other senior lenders. This

view is likely to be compounded by leveraged project financial structures and senior lender protections regarding amortization or cash traps that could delay or prevent payment of TIFIA debt service subordinated in the cash flow. Standard & Poor’s will evaluate the specifics of the transaction and final documentation for the purposes of determining the effect TIFIA loan programs will have on project leverage levels and credit quality.

### Related Articles

For more information on PPPs, please see the following articles published on RatingsDirect:

- “Credit FAQ: How Texas Is Addressing Its Transportation Needs With Pass-Through Financing”
- “Global Infrastructure Assets And Highly Leveraged Concessions Raise New Rating Considerations”
- “Public-Private Partnerships Are Gaining Traction In U.S. Transportation”
- “Credit FAQ: Assessing The Credit Quality Of Highly Leveraged Deep-Future Toll-Road Concessions” ■

# Accreting Debt Obligations And The Road To Investment Grade For Infrastructure Concessions

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## Overview

Since the groundbreaking Chicago Skyway transaction in late 2004 (Skyway Concession Company LLOC), Standard & Poor's Ratings Services has observed rapid growth globally in accreting debt and swap structures applied to project finance infrastructure transactions. Infrastructure is one of the hottest asset classes, with private and public pension fund equity and various long-term debt providers significantly funding long-term concessions or infrastructure-asset purchases.

In some transactions we have observed, accreting debt and swap structures have facilitated significant acquisition premiums (or refinancing gains). This is because accreting debt allows the partial deferral of interest payments to reduce debt service early in the concession or provides an additional non-operating source of funds to the project in the form of payments from an accreting swap early in a concession. The cash flow effects of a deferral of interest payments or the addition of swap inflows to operating revenue results in overstated debt service coverage ratios (DSCRs) that, in turn, allow for the tailoring of debt service to meet a project's early-year cash flow deficiency and, in many instances, early outflows in the form of equity distributions. Without these structural features, a highly leveraged project's net cash flows available to service debt early in the concession would not meet debt service obligations under a traditional amortizing or even interest-only debt service profile.

Simple economics of numerous global capital pools pursuing a limited number of concessions or acquisition targets results in predictably high valuation multiples, boosted by financial structures that front-load dividends and returns to equity while risk for debt holders lies toward the end of a concession. As a result, metrics such as enterprise value-to-EBITDA and debt-to-EBITDA, on a current and pro forma basis, have become increasingly aggressive in a relatively short period while investors still assume these to be investment-

grade structures. Given that business risk has not shifted, this could be a challenging assumption. Moreover, the acquisition multiples are considerably higher for many infrastructure financings than investment-grade M&A transactions in other sectors. In the near term, the recent shift to conservatism in credit sentiment by lenders (as demonstrated by stricter covenant requirements, tighter loan underwriting standards, less aggressive structures, etc.), together with a rise in nominal interest rates, could curb the fairly aggressive debt financing structures observed in many recent long-term infrastructure concessions and acquisitions. In the long term, we expect infrastructure assets to maintain their appeal given generally solid business positions and ability to leverage relatively stable cash flows through long-dated concessions—permitting long-term debt maturities.

This report follows “Credit FAQ: Assessing The Credit Quality Of Highly Leveraged Deep-Future Toll-Road Concessions” and “Global Infrastructure Assets And Highly Leveraged Concessions Raise New Rating Considerations.” This article expands upon topics addressed in the previous reports and provides analytical insight to our approach in evaluating accreting debt within project finance transactions.

Overall, Standard & Poor's believes that infrastructure financings for long-term concessions capitalized with accreting debt can achieve investment-grade ratings; however, there are several key factors that will differentiate—in combination with the assets under consideration—investment-grade structures from those exhibiting speculative-grade characteristics. In particular, at the investment-grade level, we place greater emphasis on distribution test multiples, potential cash lock-ups and sweeps, examining the percentage of accretion relative to total debt at transaction inception—with little-to-none for short-term concessions (for example, 20-35 years), limits to additional indebtedness, and emphasize the risk/reward allocation between sponsors and lenders.

## Frequently Asked Questions

Question 1:

### **Does accreting debt increase the probability of default for an infrastructure project?**

Yes and no. In the early years of an accreting debt structure, the probability of default is lower compared with that of a traditional amortizing structure, as the debt service is artificially low. However, toward the middle and end of the concession, when higher accreted debt balances amortize or when bullet payments are due as the risk of refinancing is introduced while performance risk can have increased at an even higher debt burden. At this point, default risk increases significantly.

Compared to an amortizing profile—all else being equal, including the proportion of equity contribution to a project—an accreting debt structure will have weaker credit quality. Accreting debt establishes a more aggressive financial risk profile and defers repayment of debt, often well into the future. The longer the debt repayment profile, the greater the cash flow uncertainty could lead to deterioration in a project's financial risk profile, thereby raising default risk. Moreover, accreting debt and swap structures allow significant early period dividends paid to equity sponsors (before debt repayment) as a result of the excess cash flow produced by the accretion or “deferral” component of the debt structure. This practice and its effect on credit quality are discussed in Question 6.

Even for infrastructure assets with strong business risk profiles, the presence of accreting debt in the capital structure would temper credit quality. Standard & Poor's believes that the more aggressive the financial structure, the less robust the business risk profile; the weaker the legal provisions and the greater the contractual risk allocation to the concessionaire, the weaker the rating on a long-term concession or infrastructure asset will be. In addition to accreting debt's influence on default probability, characteristics of transactions that, in the absence of offsetting credit strengths, are likely to experience weaker debt ratings, include the following:

- A weaker business risk profile. The importance of the project rationale and business profile to credit quality cannot be understated and is discussed more fully in Question 4;

- A shorter concession term and shorter equity tail;
- Notable construction risk without commensurate offsetting third-party credit supports or cost and schedule risk mitigation strategies;
- Annual increases in debt service payments that significantly exceed those in total project revenues;
- Refinancing risk;
- Unhedged currency risk;
- High country risk, including political stability, currency transferability and exchange matters; and
- Weak swap or transaction counterparties.

Question 2:

### **Why is early return to equity (through cash distributions) a concern?**

Project ratings address not only the ability but also the willingness to pay obligations in full and on time. An equity party that had already received a full return on an investment early in the concession would have reduced incentive in resolving issues in times of distress, as preserving the equity return might no longer be a consideration. As such, where an equity party reaped a full return in the early stages of the concession, Standard & Poor's would want to be confident that the sponsors had sufficiently strong incentives to ensure the project would operate successfully throughout the debt's life. In general, we consider that a more closely aligned interest of debt and equity is a project strength.

In addition, the equity participants, through their agents—management—can also make decisions about timing of capital expenditure and other revenue or profit enhancing measures—such as toll increases, which could bring forward returns at the expense of the project's viability.

Question 3:

### **In what asset classes have you observed accreting debt structures?**

Accreting debt structures arise in volume-driven transactions. The assumption in these transactions is that an increasing debt level can be absorbed as usage (traffic, tonnage, and containers, for example) and increases in revenue (usage \* tariff/toll increases) generate higher net cash flows. Assets that lack this characteristic will unlikely see accreting debt



as a long-term funding source.

The breadth of potential infrastructure acquisition and concession interests by private equity and public pension fund sponsors has increased with project finance structures becoming more aggressive and complex. Standard & Poor's has observed a growing universe of potential asset classes to which long-term concessions might apply. Some of those sectors include airports, port and port terminal operators, parking facilities, toll roads and bridges, water and waste water facilities, lotteries, and mass transit projects. Accreting structures are not only found in project and concession financing but in corporate securitizations of the aforementioned sectors as well.

Question 4:

**Why is the business risk profile so important to the credit quality of infrastructure transactions that use accreting debt?**

A project rating is a composite of many factors. To narrow the analysis to two factors—business and financial risks—some straightforward observations can be made. The stronger the business risk profile, the weaker the financial risk profile (including accreting debt and swaps) can be to achieve a certain rating, and vice versa. To gauge the appropriate financial risk at investment grade, the prime focus should be on the underlying business risk. Accordingly, to assess whether at investment grade an accreting debt structure is commensurate, it is important to understand the business risk first, hence the importance of the business risk to the rating.

As we view accreting debt structures to be more aggressive, for a similar rating an accreting transaction would need to have other strengths to compensate for this credit weakness.

The strong business risk profiles and generally robust cash flow streams of infrastructure assets, together with strong covenant packages, compliance with SPE bankruptcy remoteness criteria, and supportive structural features allow infrastructure projects to be more highly leveraged and use accreting debt compared with a corporate entity at the same rating level.

A strong business risk profile for long-term concessions and infrastructure providers

would include a combination of the following characteristics (the listing below does not imply any ranking of relative importance):

- An essential or high-demand service;
- Where user fees are involved, a high degree of demand inelasticity with respect to rate increases;
- Monopoly or near-monopoly characteristics, or, alternatively, few providers in the industry with substantial barriers to entry and limited incentives for competition among these service providers;
- A limited reliance on increases in volume growth rates (for example, market exposure to traffic, parking activity, tonnage, or maritime containers), and aggressive assumptions of price inelasticity to rate or tariff increases to meet base case revenue projections;
- A favorable legal environment and regulatory regime;
- Limited government interference probability, either through public policy changes and/or change-in-law risk;
- A favorable rate-setting regime, although we recognize that it is rarely unfettered and, even then, can face challenges or political contention;
- Strong bargaining power in relation to suppliers and customers;
- Low, contained, or manageable ongoing capital expenditure requirements;
- Strong counterparty arrangements with, for example, contractual offtaker agreements or remittance of payments from a highly rated public sector entity;
- Strong historic track record of the asset. To this end, a project that is exposed to greenfield or start-up operations with no usage history (for example, a complete reliance on independent consultant projections) would be considered to have a weaker business risk profile; and
- Proven technology for construction and major maintenance activities, as applicable.

Question 5:

**Do you differentiate between the forms of debt increase in an infrastructure transaction?**

In our credit evaluation of long-term concessions, we attempt to understand the economic substance and evolving profile of the debt structure: its rise and repayments over time relative to

the business risk profile of the project and the term of the concession. The project debt balance could increase based on a contractually agreed-to schedule. Alternatively, the debt balance could vary based on required cash flows procured from an alternate financing source to meet debt service requirements and equity distribution targets. Finally, the project debt could rise due to a direct contractual link to an inflation index that increases during the term of the debt.

Standard & Poor's has observed several forms of debt instruments that can cause a project's debt to increase early in a concession and result in overstated traditional DSCRs. For comparative purposes, Standard & Poor's will also calculate an adjusted DSCR assuming the accretion is a debt service cash flow item (see Question 10). Types of instruments in which debt could rise include:

- **Capital Appreciation Bonds (CABs)**—These are debt instruments where a portion of the interest due and payable to the creditor is deferred and added (capitalized) to the principal balance according to an agreed debt service schedule between the borrower and lender.
- **Accreting swaps**—These can be used alongside a conventional debt instrument to create the same economic effect as CABs. As the accreting swap counterparty is a debt provider, we expect that the accreting swap will be considered *pari passu* with senior debt obligations under the project financing documents. Although there could be variations on accreting swap use, one form uses a floating-rate (e.g. LIBOR-based) loan. In this case, the project enters into an interest rate swap to convert the floating rate exposure to a fixed basis. Part of the interest obligation on the project's fixed-rate payment to the swap counterparty is deferred and capitalized with the swap principal balance to create the accreting structure. The floating-rate payments from the swap counterparty meet the project's floating (LIBOR) based obligations originally incurred. This synthetically creates the CAB structure described in the first bullet.
- **Accreting swap with embedded loan**—In this instance, the swap payment from the counterparty is a cash inflow for the project rather than an interest payment deferral and floating rate pass-through as noted in the second bullet.

- **Credit facilities**—Ostensibly the same as the third bullet, a credit facility can be used to create the same economic effect as the accreting swap (an embedded loan). The credit facility can provide cash flow to a project in the early years of a concession, bridging debt service obligations that may be higher than cash flow available. The draws can also provide cash flow funding for equity distributions early in the concession. Similar to an embedded loan, this form of financing would likely also rank *pari passu* with project senior debt.
- **Inflation-indexed securities**—Treasury inflation protected securities (TIPS) in the U.S.; capital indexing bonds in Australia; indexed-linked notes in the U.K.; inflation units in Mexico; and real return bonds in Canada are examples of securities that see the principal payment or principal balance (if it is a bullet maturity instrument) and coupon payment adjusted upward based on changes in an inflation index (such as the consumer price index). Projects with revenue streams or rate increase mechanisms strongly linked to inflation benchmarks typically issue these securities. The weaker the revenue link to inflation, the greater the potential deterioration in DSCRs due to a mismatch over time between cash flow available to service debt and the project's debt service obligations. Whether the accreting swap payment is included as income (or a credit facility is provided to the project as an inflow) or a project company's debt and swap repayment schedule allows the partial deferral of interest payments (understating debt service), the economic effect is the same. DSCRs are overstated and less comparable with DSCRs in more traditional amortizing debt structures.

While the form of the project debt increase and its subsequent repayment profile is important, so too is the absolute size of the debt increase relative to the original debt issuance at transaction inception. This is discussed in Question 7.

Question 6:

### **What are the observable effects of accreting debt on a transaction and its potential credit quality?**

The primary effects relate to imposing aggressive financial structures on the asset depen-

dent on long-term revenue growth. In particular, we note the following compared with traditional amortizing or many bullet structures associated with infrastructure financings:

- Growing debt levels. Unlike a conventional debt refinancing for a volume risk asset (which typically occurs when construction has been completed and/or a usage history is known), accreting debt or an accreting swap crystallizes the future debt burden before the project economics and expected revenue growth are known. Unless revenue and EBITDA growth is at least equal to the proportion of debt accretion, DSCRs will narrow and the enterprise value of the project will decline.
- Greater reliance on growth. Accreting debt structures cause an overstatement of DSCRs in the early years of a concession (by the amount of the interest accrual or swap inflow to the project). This allows early-year cash flow deficiency to be managed (relative to expected net revenue) while maintaining dividend payments. Moreover, to the extent the revenue, EBITDA, operating, and capital cost and refinancing assumptions are aggressive, as the accreting debt balance amortizes in the medium-to-long term, long-term DSCRs are at risk of not meeting base case projections.
- Increased flexibility. Deferred-pay mechanisms and non-amortizing structures can inject flexibility into an infrastructure financing structure, especially under more aggressive revenue growth assumptions or during the project's start-up phase. However, these deferability features introduce additional credit risks for senior lenders as debt increases.
- Allocation of risk/reward altered. Significant dividend distributions remitted as a result of the accreting structure's deferral of senior debt payments effectively puts equity ahead of debt in the payment structure. This is a reversal of the traditional role of capital structure priority and funds flow subordination, whereby equity acts as patient capital and a buffer for senior debt during periods of revenue ramp-up or project cash flow weakness and is not seen as earning a notable proportion of its projected return ahead of senior debt. Sponsors have advocated accreting debt

structures by highlighting lengthy concession terms of many infrastructure transactions that provide ample time in later years to repay higher debt, although that same opportunity to earn cash flow returns later in the concession also applies to equity distributions. Nonetheless, combined with solid business positions and inflation-linked revenues streams, sponsors view the risk profile of these assets as low.

In many respects, long-term concessions can be viewed as corporate transactions (perpetual economic ownership of an asset). Generally, corporate entities debt-finance and refinance on an ongoing basis. For projects, we assume that finite debt is issued and repaid along the depreciating asset life. Also, the benefit of covenants in rating corporate type structures is less so than for projects. While the sponsor argument of more corporate style financing of very long-term concessions is reasonable, the rating challenge is that transaction participants cannot have both the benefit of undertaking a corporate-style financing but calling it a project financing by adding structural features that have less value in a corporate finance rating approach.

To the extent that a good portion of equity returns in the early years of a concession is derived from excess cash flow that accreting debt or swap structures produce, rather than outperformance by the project, there are clear benefits and incentives for sponsors to promote financing structures that use accreting debt. Standard & Poor's has observed financial models for infrastructure transactions in which aggressive growth assumptions for revenue, together with the cash flow benefits of using accreting debt (or accreting swaps), results in the original paid-in equity capital being returned to sponsors before any debt repayment occurs. This has appeal to project sponsors but a fundamental credit issue is how the shift in risk to long-term lenders and the enhanced returns to equity sponsors affect credit quality.

Equity risk premiums (the difference between a project's cost of debt and its expected equity return) can provide a quantitative proxy for the relative risk of an entity. The equity risk premiums observed for accreting debt structures in infrastructure financings have been as high as 8%-12%

(800-1200 basis points). This reflects only pretax cash equity yields and excludes additional equity return benefit that might be earned by sponsors through tax deductibility of interest expense and amortization items (capital cost allowance deductions or amortization of goodwill) should economic ownership and tax benefits be conferred to the concessionaire due to the concession's lengthy term. In contrast, regulated utilities, which we rate slightly higher than low investment-grade infrastructure projects with accreting debt, see equity risk premiums above their cost of debt of 300-400 basis points.

A traditional risk-reward relationship between equity and debt capital providers includes equity capital taking more of a project's cash flow risks (such as later-period uncertainty) than senior creditors given the significant risk premium that the project sponsors can earn. The expectation of higher equity returns than fixed-rate debt should incorporate the achievement of base case financial projections and reflect higher risk incurrence by sponsors, thus providing incentive for equity to take a longer view and keep "skin-in-the-game." As noted earlier, to the extent a large proportion of the value is derived in the early years of the concession through accreting instruments, such incentives might be reduced and the interests of equity or sponsors and lenders are not as closely aligned.

### Question 7:

#### **How does Standard & Poor's analyze peak debt accretion and subsequent amortization guidelines for long-term concessions?**

In analyzing transaction structures for mature assets that have used accreting debt or swaps, Standard & Poor's has set out broad principles as to how far into the concession debt can rise; when we would expect a certain proportion of the maximum accreted debt balance to be paid down; and when we would expect final maturity (100% paydown of the maximum accreted debt balance). This amortization principle has varied depending upon the concession's length, the asset's business risk profile, and offsetting structural features that might provide support to the credit risks of debt accretion.

We are likely to view shorter term concessions (e.g., 20-35 year terms) with short-to-

no tail or concessions with significant construction risk, for example, as more speculative unless their debt burden and accretion proportion is considerably lower than an asset with a longer concession term, all else being equal. In many cases, a short-term concession is not likely to exhibit the characteristics that allow for accreting debt and still achieve investment grade.

We have not previously commented on the magnitude of maximum debt accretion relative to the original debt at transaction inception. This will be a function of different asset classes, business profiles, structural protections, and desired rating levels. Our credit analysis also focuses on the physical and economically useful life of an infrastructure asset to which to link amortization and the final maturity of debt (particularly if the asset risks physical or economic obsolescence, substitution, or increasing competition). For this reason, there are no fixed standards for acceptable investment-grade leverage levels, credit ratios, or debt accretion and subsequent amortization guidelines. We assess each credit independently on all these factors, although broad business risk profile distinctions reflect the strength of certain asset classes and the ability to support relative accreting debt burdens. For example, a long-term airport concession, all else being equal, would likely be considered to have a stronger business position than a parking facility concession, which is likely to have greater competition and substitution risks.

The table illustrates project debt accretion proportion and subsequent principal amortization under three different payment profiles. The lines in the graph do not represent any specific project that Standard & Poor's rates, but illustrates the potentially different risk profile of varying debt and maturity structures, as well as the impact the concession term length might have on credit quality.

■ The curve at the bottom of the table represents a traditional 25-year amortizing debt instrument common in the U.S. public finance market that has a predominately interest-only payment profile in the first few years of the concession with full amortization occurring thereafter. This amortization schedule may be used to produce level annual debt service costs or, in concert

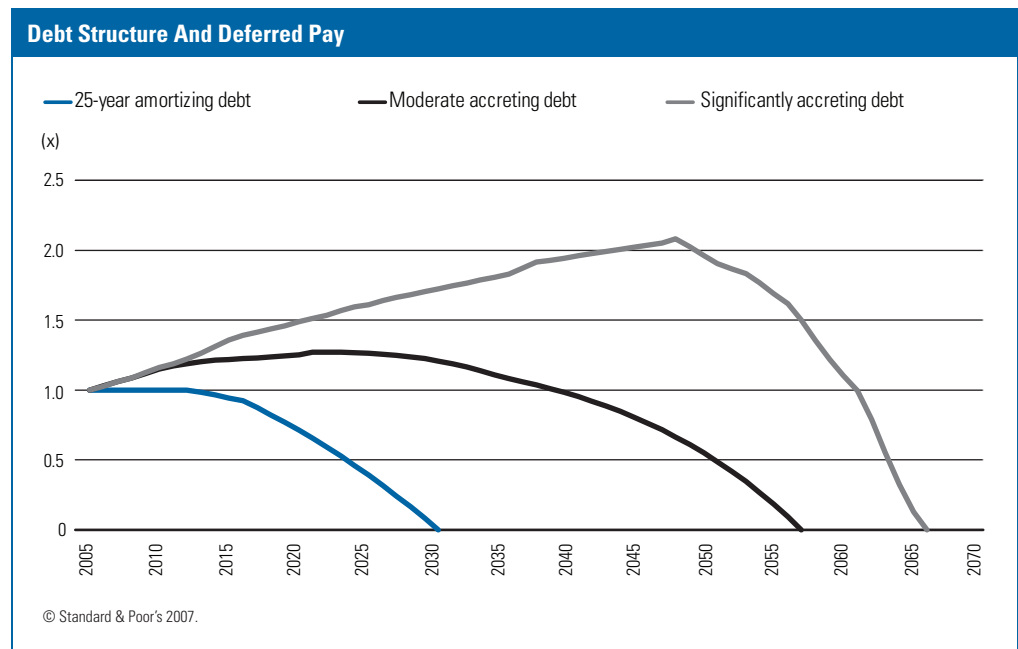
with a capitalized interest period, to manage construction of an asset—for which there could be no revenue receipt until completion. Such a structure might have a modest (to no) equity tail based on a shorter concession.

- The middle curve represents a long-term concession (a term of at least 50 years if there is no equity tail but up to 75 years if there is a 25-year tail). In this senior debt repayment profile, debt accretes to about 25% higher than the original par issuance at or about year 20 and amortizes to zero in the next 30 years.
- The top curve represents a concession that is likely at least 75 years in term, as the senior debt accretes to more than 2x (100%) relative to original par issuance in the first 40 years of the concession and then amortizes rapidly in the next 15-20 years.

Assuming the same asset and business risk profiles and debt-to-capital ratio at transaction inception, with the notable potential differences being variations in concession term, covenants, legal provisions, and debt and maturity structure, Standard & Poor's would likely view the first curve (shaded blue) as the most conservative financial risk profile and

the third (colored gray) as the most aggressive. This is the case given the absence of accretion and the proportion of debt repayment early in the concession for the first scenario and the very high proportion of accretion and the back-ended nature of the repayment profile for the third scenario, which would also likely imply high dividends payable to sponsors during the period of considerable accretion. Standard & Poor's would not view the third scenario as investment-grade regardless of how strong the business risk profile or underlying asset quality. The second curve (colored black) could be investment grade if it had a solid business risk profile, supportive covenants and legal provisions, and a lengthier equity tail—although how close this scenario could get to the credit quality of the first one would be determined by the relative differences of these factors.

In summary, our ratings will incorporate the maximum accretion relative to original par debt issuance, the proportion of back-ended principal repayments and the share of paid-in equity capital returned in the form of dividends referenced in Questions 5 and 6 into our analysis with less aggressive structures generally associated with higher rated concessions.



Question 8:

**How would Standard & Poor's analyze the accretion characteristics and subsequent amortization guidelines for public infrastructure owners and debt issuers?**

These transactions will be evaluated on a case-by-case basis. In the U.S. public finance market, capital appreciation bonds have been employed for many years, often in the start-up toll road sector. Although these structures provide cushion and flexibility during the initial years of toll projects when revenues are still growing, they in fact result in a higher debt burden in later years. This can be problematic for a start-up facility, especially during a restructuring, if net toll revenues fall short of projections and debt service requirements. All things being equal, the ability of a public sector entity to assume accreting debt structures is comparatively better than for projects for several reasons including the ability to pledge revenues from a variety of assets (not just a single project), the lack of a concession term, its long-term interests as the permanent asset owner and the lack of dividend payouts which presumably allows for better liquidity and capital expenditures that improve asset quality and enhance revenues. As such, adherence to our amortization guidelines is not necessary for consideration of investment-grade structures. However, on a relative basis, the financial risk profile of a public sector debt issuer would be viewed as more aggressive and highly leveraged and a weaker credit compared to traditional amortizing debt structures. Additionally, the same fundamental credit concerns regarding shifting long-term risks to lenders exist, although they can be mitigated through the mechanisms discussed in this FAQ including cash sweeps and debt reduction under scenarios when revenue projections fall short of forecasts.

Question 9:

**Do you review ratios and financing assumptions differently when reviewing accreting debt structures?**

No. In addition to ratios and cash flows we examine the capital structure and liquidity as part of the financial analysis. Our approach to the analysis of ratios and financing

assumptions places emphasis on:

- The magnitude of the accretion in the concession's early years along with the schedule and pace of debt repayment;
- Distribution policy based on the accreting debt or swap structure;
- Capital (debt-to-total capital) and debt structure;
- Financing rates, including estimated credit spreads on risk-free reference rates and swap rates;
- Refinancing risk, including market risk for refinanced debt and any exposure to changing interest rates and credit spreads at refunding dates;
- Inflation expectations and linkage to revenue setting ability;
- Volume growth estimates for the assets;
- Revenue projections and assumed growth rates—in particular, for proposed toll-or user-rate increases and the modeled demand elasticity associated with such increases;
- Capital expenditure obligations;
- The relationship between the growth in annual debt service costs for the project and the projected growth in revenue; and
- Operating cost assumptions and forecast synergies or savings through a long-term concession respecting a formerly publicly managed asset.

We believe that the private management of a formerly publicly managed infrastructure asset could present revenue optimization and cost-saving opportunities that might not have historically been a priority for a public sector body that managed operations with rate affordability and a break-even financial position as strategic goals. Public infrastructure owners are currently reevaluating this approach to rate setting in the face of growing capital and maintenance needs, in addition to other fiscal pressures. Nevertheless, despite the financial incentives inherent in an entity with equity sponsors, we consider the reasonableness of the financing and operating assumptions in our analysis.

Tightly defined and higher permitted distribution tests (DSCR-based equity lock-ups) provide some measure of protection for dividend distributions to equity ahead of debt. As part of future accreting debt transactions, Standard & Poor's expects more aggressive

structures will likely necessitate some form of debt repayment through a partial cash sweep mechanism funded from locked up equity proceeds. This provision would be linked to a period of time in which the permitted distribution test has been invoked and locked-up cash proceeds can be redirected for debt repayment. This provides additional incentive to sponsors to avoid equity lock-up altogether, but particularly for a prolonged period, as it might significantly reduce their equity return by the amount of trapped cash that might be permanently redirected to debt reduction through mandatory prepayments.

For investment-grade ratings, Standard & Poor's also expects to see an alignment between cash flows allocated to a project's equity sponsors and its long-term lenders. Among the ratios that we will analyze to guide our approach to better balancing cash flow returns between debt and equity is a dividends payable to EBITDA measure that more closely follows the metrics observed by regulated utilities or other infrastructure companies. Regulated utilities have dividends payable to EBITDA ratios of 15%-25%, whereas a credit such as 407 International Inc. (a 99-year Canadian toll road concession company) has posted dividend-to-EBITDA ratios in the mid-to-high 20% range. For many of the accreting debt concession transactions that we observe, this ratio is considerably higher because of debt accretion and swaps.

Standard & Poor's is reviewing using debt stock ratios (such as debt to EBITDA) and cash distribution measures (such as annual dividend distributions relative to annual project EBITDA) to complement DSCRs, traditional credit metrics, and stress testing scenarios. These ratios will play an increasing role in investment-grade credit metrics for infrastructure concession projects that use accreting debt structures.

Question 10:

**If traditional DSCRs are less meaningful, how do other measures such as Loan Life Coverage Ratios (LLOC) or Project Life Coverage Ratios (PLCR) factor into the analysis?**

Traditional DSCRs are of limited analytical value when a financial risk profile has significant accreting debt or accreting swaps

because the cash flow effects (deferral of interest or non-operational inflows) to the project early in the concession term overstates this ratio. To this end, we estimate the project's cash flow-based DSCR (including the effects of accreting debt or accreting swaps) but also calculate a DSCR profile that would adjust for the effects of accretion and debt capitalization. This is of particular value in the review of the early years of a concession, when accretion features tailor debt repayment to revenue growth assumptions.

In calculating an alternative DSCR, we include in the denominator the project's actual cash-based payment of debt and swap obligations, as well as the capitalized amount that is deferred and added to the project's debt balance. For certain kinds of accreting swap structures, the adjustment removes from the numerator swap inflows payable to the project that achieve the same effect as the interest payment deferral. This adjusted DSCR calculation complements the review of the percent rise in debt (due to accretion) that occurs from the original issuance to the project's maximum peak debt balance (including accrued swap amounts owing).

In calculating the base case DSCRs for accreting debt projects, we include in the numerator operating revenue (excluding interest income, earnings from asset sales, debt or equity proceeds, and insurance proceeds) minus operating and maintenance expenses (including mandatory major maintenance reserve account deposits). The DSCR numerator can also exclude swap payments to the project from the swap counterparty if these payments are viewed as a pass-through to meet the project company's obligation to a debt provider. Drawdowns on an LOC or accreting swap proceeds that achieve the same effect as an interest payment deferral can be an adjustment to the DSCR numerator given their primary cash flow structuring role. In addition to traditional cash interest obligations, which deferral features will understate, the DSCR denominator includes any monoline bond insurance costs and swap costs associated with synthetic debt products.

LLCRs and PLCRs are less relevant to debt ratings, which assess an issuer or debt issue's probability of default; however, these ratios provide important analytical value to our

recovery rating process, in which we assess the recovery of accrued interest and principal outstanding following an unremedied payment default. In addition to being based on projected revenues, LLCRs and PLCRs are generally higher than DSCRs, which typically reflects the equity tail at the end of the concession (when the project debt has been retired.)

During cash flow weakness, LLCRs and PLCRs can remain well above 1x, whereas periodic DSCRs during the same time frame could fall below 1x, requiring draws on liquidity to avoid default. A project could default on its debt obligations, while depending on assumptions of capital structure, discount rate, and revenue growth following the default for the remainder of the concession, the LLCRs and PLCRs (a proxy for recovery) could be greater than 1x (or greater than 100% recovery). For projects with manageable peak accretion and a considerable equity tail, such a solid recovery scenario is quite possible.

Question 11:

**Can security features and structure and protective covenants offset the relative higher risks of an accreting debt structure?**

Protective covenants can strengthen a transaction's credit profile by limiting the ability of the project to incur more debt, acquire dilutive businesses or distribute cash when it performs below base case expectations. No amount of structuring or covenant protection, however, can completely compensate for a weak business risk profile or overly aggressive financial structure.

Standard & Poor's expects the standard structural features or covenants to be considered for a project rating, particularly one that incorporates accreting debt and has a more aggressive financial profile. Where covenants require quantitative limits (such as DSCR-based tests), there is no fixed rule of thumb that can be applied to achieve an investment-grade rating.

Question 12:

**Is the documentary and legal review for an accreting debt or swap structure different from other project finance or PPP ratings?**

No. The legal review across project structures is comparable, and Standard & Poor's expects that transactions using accreting debt will have a robust legal structure. Our docu-

mentation and legal review includes a detailed examination of the concession agreement terms, and its supporting schedules and appendices, which govern the long-term relationship and risk allocation between the concessionaire and the concession grantor. Standard & Poor's legal review will also examine any proposed intercreditor agreement and the covenant package.

Certain jurisdictions benefit from more creditor-friendly legal regimes that can contribute to infrastructure project rating differences. Infrastructure project financings are generally more susceptible to local law exposure than other types of structured financing because of the physical location of the assets and the often essential and politically sensitive nature of the assets. For more information, see "Jurisdiction Matters For Secured Creditors In Insolvency" and "Emerging Market Infrastructure: How Shifting Rules Can Stymie Private Equity."

Question 13:

**Beyond the already stated effects of accretion, how does Standard & Poor's evaluate swap transactions as part of its credit analysis?**

Many project sponsors employ interest rate or currency swap strategies to achieve cost-effective debt financing. These swaps are generally integrated into an overall swap that includes accretion features.

A capital structure that includes both debt and accreting swaps will require a review of the relevant swap documentation and intercreditor agreement. As an accreting swap counterparty is allowing a portion of the project company's interest payable under its swap arrangement to accrue, it is acting as debt provider, and these swap obligations will likely be considered *pari passu* with other debt obligations. It is important to determine if there are cross default provisions on events, such as early swap termination, which could lead to acceleration of the debt obligations.

One potential credit issue is whether or not the transaction is swap-independent. For example, if the swap were to terminate, the issuer would pay or receive a payment to or from the swap counterparty. If the issuer did not receive a payment due to a counterparty default, it might not be able to replace its



swap position at similar rates or terms, so might not be able to perform at previously expected (rated) coverage levels without rate increases or possible rating implications.

For transactions originating in the U.S. with U.S. swap counterparties, Standard & Poor's might undertake a debt derivative profile (DDP) exercise. Although we consider many factors, the DDP scores principally indicate an issuer's potential financial loss from over-the-counter debt derivatives (swaps, caps, and collars) due to collateralization of a transaction or, worse, early termination resulting from credit or economic reasons. We integrate DDPs into rating analyses for swap-independent issuers, and they are one of many financial rating factors.

These credit issues are central to our rating analysis as monoline bond insurance policies might guarantee swap payments due from (but not due to) the issuer. As a highly rated financial guaranty policy should maintain payments to the swap counterparty (should a wrapped project not be able to meet its swap and debt obligations due to poor performance), the project company should not be in default on its side of the swap. Swap renewal, if applicable, and swap counterparty credit quality remain analytical issues, even for monoline wrapped transactions. As a result, Standard & Poor's will examine within a swap transaction the level and minimum credit quality of collateral posting, and replacement requirements should minimum credit rating levels be violated by swap counterparties.

Question 14:

**Given the commitments of monoline bond insurers, how is refinancing risk factored into the credit rating for an accreting debt structure?**

A monoline insurer that provides a guarantee policy for refinancings reduces the market access risk and the spread risk at refinance. Even 'AAA' interest rates and credit spreads vary and in the absence of a hedging strategy, the uncertain future cost of debt refunding could narrow coverage ratios in a stress case. We evaluate the underlying credit quality of a transaction before overlaying and assessing the incremental contribution of credit substitutions such as monoline wraps. Moreover, our view of refinancing risk depends in large part on the expected cash flows of the project at the time of refinancing.

Our starting point is to assume that refinancing risk within an accreting debt structure is manageable in long-dated concessions with a sufficient tail (about 10-30 years). We will examine financial models to understand the assumptions being made about refinancing (such as the interest rate employed) and stress tests will be used to evaluate the sensitivity of transactions to less-favorable interest rate assumptions at refinancing points. The history, record and expectation of local debt markets will have a different weight on emerging markets. Investment-grade structures will typically have secured appropriate hedging arrangements in this regard. A monoline insurer's commitment simply gives additional comfort to any refinancing risk analysis. ■

# The Evolving Landscape For Subordinated Debt In Project Finance

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**E**mboldened by active competition and continued demand for project and infrastructure assets, the landscape for subordinated debt structures in project finance transactions continues to evolve. Indeed, some debt arrangers are pushing new boundaries to structure and fund ambitious greenfield and brownfield asset developments or leveraged acquisitions (*see* “The Changing Face Of Infrastructure Finance: Beware The Acquisition Hybrid,” *published on RatingsDirect on Sept. 7, 2007*).

Notwithstanding the recent upheaval in credit markets, the driving force behind debt structuring is usually simple: lower the after-tax weighted-average cost of capital while providing flexibility to project sponsors and investors and enhancing cash returns on equity. The result is most often higher leverage and added complexity through a mix of senior and subordinated debt—more eloquently referred to as “structural optimization” by debt arrangers.

As employed in project finance for many years, market participants are “tranching” a project’s liability structure into senior debt, subordinated debt, and in more recent years—depending on the window of opportunity—“payment in kind” (PIK) notes (*see* “LBO Equity Hybrids: Too Good To Be True,” *published on RatingsDirect on Aug. 10, 2007*). Importantly from a credit perspective, regardless of the underlying project, the common theme is increased gearing and more complex funding and documentation structures—both which have varying effects on a project’s debt ratings and recovery prospects in terms of the potential level of default and loss given default.

This FAQ will highlight the criteria issues related to analyzing senior and subordinated structures in the context of issue ratings and recovery analysis.

## Frequently Asked Questions

**Q.** *What is project subordinated debt?*

**A.** In its purist and simplest form, a project’s subordinated debt typically ranks behind a project’s senior debt in terms of priority over pre-

default cash flows and security over collateral, and in the event of insolvency behind any enforcement proceeds, assuming there is anything left. In this context, project subordinated debt is used in structures as a form of credit enhancement for senior debt that establishes the distribution of a project’s default and recovery over the life of the financing structure.

Typically, the rights for project subordinated debt are defined under a project’s structural, contractual, and legal framework. This structural framework for projects should incorporate a “ring-fenced” entity, a pre-default cash-flow waterfall, cash lock-up and sweep triggers, a debt-service reserve account, and post-default liquidation processes. Consequently, given the varying characteristics of subordinated debt the default and loss given default of any tranches of project subordinated debt may occur at different time intervals over the term of a transaction’s life cycle.

**Q.** *Why is subordinated debt used in project transactions?*

**A.** Subordination gives project finance transactions the ability to create one or more classes of debt, which can allow access to more debt or alternate investor classes. One of the main objectives of using subordinated debt is to improve a project’s after-tax weighted-average cost of capital through improving the rating on senior debt while segregating credit risk and enhancing the return on equity. At the same time, sponsors of a project often use subordinated debt for tax and accounting reasons, particularly where there may be restrictions in distributing cash from a special-purpose-vehicle structure due to retained accounting losses. Subordinated debt may also be an option explored by debt arrangers if senior-secured financing options have been exhausted or capped out.

**Q.** *Can subordinated debt be treated as equity for analytical purposes?*

**A.** Often project sponsors use subordinated debt as a substitute for equity. Depending on

the underlying project ring-fence structure, security, contractual, and legal framework in each jurisdiction, Standard & Poor's may consider treating subordinated debt as equity for analytical purposes on a case-by-case analysis. Such an analytical scenario may occur if a project's debt: is deeply subordinated within a strongly ring-fenced vehicle with a structural waterfall and distribution triggers; has no rights to call default or accelerate payment; ranks after senior debt under pre-default and post-default cash-flow waterfalls; and matures after senior debt. Like most financing structures, however, the answer will reside in the detail of a particular transaction in its relevant jurisdiction.

**Q.** *What are some of the key types of project subordinated debt?*

**A.** While there are project-specific nuances, in most instances the type and level of subordinated debt has been tailored to the cash flow characteristics of each project. Standard & Poor's has identified a variety of structural, contractual, and legal forms of subordinated debt in project finance transactions:

*Deeply subordinated (pre-and post-default) debt.* A form of deeply subordinated debt is shareholder loans, which display many of the characteristics of equity, and have no rights to call default or rights on enforcement, or calls on the post-default recovery proceeds. This form of subordinated debt is often used in the public-private-partnership (PPP) space as tax-efficient equity for sponsors.

*Residual value subordinated debt.* This debt is structurally reliant on residual or dividend cash flow from another project-financed vehicle with senior-ranking debt and possibly even subordinated debt obligations. These residual cash flows or dividends are usually only available subject to certain debt lock-up tests being achieved at the underlying project funding vehicle. Dividends or residual flows may also be dependent on the ability of a project company to distribute cash flows due to retained accounting losses.

*PIK notes.* Typically, PIK notes are structurally subordinated to senior debt or second-ranking lien debt in a project's pre-default and post-default cash flow waterfall, with coupon payments at the discretion of the

issuer. If coupon payments under the PIK notes are not made in the form of cash distributions, the coupon is usually made whole by the issuance of PIK notes of equivalent value. Unlike true equity, PIK notes usually have a maturity date and at least some rights against the issuer to help ensure repayment. Standard & Poor's will treat PIK notes as debt in calculating credit metrics.

While it may be possible to carve up a project's cash flows to create a subordinated instrument in a number of forms, there is no "free lunch," and at some point the key consideration is how a subordinated debt instrument will or will not affect default or recovery of senior-ranking debt from a credit and legal perspective.

**Q.** *What are the key structural elements considered by Standard & Poor's?*

**A.** In examining a project's liability and capital structure, we are often asked what the main structural and documentation considerations it undertakes to assess how a project's debt is structurally, contractually, or legally subordinated. The objective is relatively simple: if subordinated debt obligations are to provide credit support and collateral to senior rated debt, then subordinated debt must have no rights that could accelerate or cause default or increase the level of loss given default of any senior-ranking debt. Nevertheless, Standard & Poor's will typically review several aspects in any assessment:

*The rights of subordinated debt to call a default or cross default to senior classes of debt.* It is not appropriate that a payment default on a tranche of subordinated debt could cause a default under the senior debt provisions.

*The rights of subordinated debt to accelerate payment while senior debt is outstanding.* Subordinated debt should not have any right to accelerate while senior debt is outstanding.

*Senior debt rights to lock-up or sweep cash flow.* Following any breach of a senior debt cash-flow lock-up trigger or cash-flow sweep trigger, subordinated debt should not be entitled to any cash flow, other than what might be available from reserves that are specifically dedicated to the subordinated debt obligations. Similar to the point above, this should

also not give subordinated debt any rights to call or trigger default or acceleration as a result of a senior lock-up or sweep trigger being breached.

*The pre-default and post-default cash flow waterfall and transaction documentation.*

This is necessary to understand how subordinated debt is structurally and legally subordinated. This would include an understanding of how cash flows are distributed and shared in a transaction's cash flow waterfall.

Typically, subordinated debt should be serviced after payments to operations, senior debt interest and principal, any net hedging settlements, and any senior debt-service reserves and maintenance accounts, which are there to support the senior debt rating.

Likewise, collateral security interests or claims upon liquidation granted to subordinate lenders should rank after senior debt.

*The maturity profile of subordinated debt should be longer dated than senior debt, otherwise it is not truly subordinated.*

*The voting rights of debt participants.* These rights should be limited solely to senior debt participants; subordinated debt should have no rights while senior debt is outstanding.

*Nonpetition language.* This needs to be considered to ensure that no winding-up provisions are allowed while senior debt is outstanding either permanently or for a specified period. Typically, the objective is to ensure that subordinated debt has no right to challenge any enforcement rights or validity in the priority of payments of senior debt holders.

*The events of default and termination events of any interest-rate swaps used to hedge subordinated debt.* These need to be closely examined. Although the majority of subordinated debt is fixed-rate debt, if variable subordinated debt is used and overlaid and mitigated with an interest-rate hedge, the events of default and termination events of the swap would need to be limited so as not to accelerate or cross-default senior debt.

*Subordinated debt rights or remedies in a restructuring, insolvency, or bankruptcy proceeding.* Deeply subordinated debt should not have any such rights or remedies. For beneficial equity treatment, project subordinated debt should only be able to enforce its security and creditor rights unless, and until, senior debt has done so.

**Q.** *What is the analytical framework for project subordinated debt?*

**A.** Some market participants think of the analytical assessment behind rating subordinated debt as one of simply solving a target debt-service cover ratio (DSCR) or simply notching off the senior debt issue rating. But our approach is more sophisticated. No two projects are the same from a business, industry, market, operational, structural, or legal perspective. Certainly, it is fair to say that a senior debt issue rating provides some starting point for the subordinated debt rating. However, in order to make a proper assessment, we assess a project's cash flows to understand where the credit stress points may be relative to the payment structure under the subordinated debt instrument and its exposure horizon. In assessing the ability and willingness of a project's subordinated debt to pay its obligations in full and on time, our analytical framework reviews and measures a number of elements that influence the level of potential default and rating of a subordinated debt tranche:

*The underlying business and industry risk of a project.* This examines the key business and industry economic fundamentals that influence the underlying volatility of a project's operating cash flow.

*A project's financial ratios* (for example, DSCR on a total debt basis [senior and subordinated debt] and segregated subordinated debt basis [after senior debt]). It is important to note that the DSCR should not be viewed in isolation. This is particularly true when a project includes accreting debt structures that can overstate a transaction's DSCR, while also deferring senior debt amortization (see "Accreting Debt Obligations And The Road To Investment Grade For Infrastructure Concessions," published on RatingsDirect on Sept. 5, 2007). As a result, we closely examine all financial ratios, particularly revenue growth assumptions and the components of the coverage ratios that can be overstated by such financing instruments.

*Senior debt cash lock-up triggers, sweep triggers, and reserve limits* (for example, senior debt-service reserve and maintenance reserves). Understanding these triggers and

reserves is a critical part of the analytical framework for subordinated debt, as such lock-up triggers and reserves are for the protection of senior lenders only, and may result in subordinated debt being more susceptible to default, particularly if subordinated debt does not have its own dedicated debt-service or liquidity reserve.

*Sensitivity and break-even analysis on each project is undertaken.* This takes into account the specific cash flow waterfall structure and repayment terms and conditions of senior and subordinated debt. Sensitivity analysis helps demonstrate and highlight potential downside thresholds under which subordinated debt may miss a payment of interest or principal. Stress tests, which are usually in the form of break-even analysis, assist in understanding whether a missed payment is due to any lock-up triggers or other distribution stoppers being breached and stopping cash flowing through to subordinated debt (and any dedicated debt-service reserve running out), or just the fact that there is not enough cash after the senior debt has been serviced irrespective of any distribution trap or stopper. Stress sensitivities are run on revenues, availability, prices, operating costs, capital expenditure, inflation, and refinancing spreads. Typically, the level of stress placed on subordinated debt is reconciled with the overall risk of the project and likelihood of a stress scenario occurring.

*Assessing the level and type of credit enhancement supporting subordinated debt.* Such credit enhancement can take the form of equity, and project cash flows available after senior debt-service and liquidity reserves, usually in the form of dedicated debt-service reserves for the benefit of subordinated debt. If a subordinated debt instrument does not have its own debt-service reserve, it is likely to be more susceptible to default under stressed scenarios.

*Ability for senior debt to raise additional debt or offer security ahead of subordinated debt.* Most projects allow limited other financial indebtedness to be raised and security granted to enhance the rating of senior debt. However, if this right is too broad, it may affect the level of subordination, which may change over time.

**Q.** *What will influence the probability of default on subordinated debt?*

**A.** Apart from a project's underlying operating and business fundamentals, which will be the major influence on the performance of a project, the probability of default of a project's subordinated debt will be influenced typically by:

- The contractual and legal structure of a project, which usually incorporates a pre-default cash flow waterfall, cash lock-up and sweep triggers, a timeframe before cash is released from lock-up, and debt-service reserve accounts for senior debt; and
- The terms and conditions of the underlying subordinated debt and any dedicated liquidity or debt-service reserve allocated for subordinated debt.

Accordingly, key subordinated debt rating considerations include: how likely a project will go into distribution or equity lock-up; how long it will remain there; what happens to the trapped cash once in lock-up; and what type of credit or liquidity support (such as reserves) exist to lower default probability. If a distribution-trap mechanism does not last for an indefinite period, it could be argued that the resumption of debt-service payments on subordinated debt—depending on the project, scenario, and subordinated liquidity reserves—is likely to be certain. The analytical challenge is determining the duration of any under performance. We typically run stress scenarios for each project to analyze how long it would take for a rated tranche of subordinated debt to default under varying scenarios. Nonetheless, any significant deterioration in the performance of a project is likely to magnify the level of potential default on any subordinated debt.

**Q.** *What will affect the recovery of subordinated debt?*

**A.** If a project suffers from poor performance and there is a missed payment of interest or principal on a project's subordinated debt, a major determinant on the recovery prospects of subordinated debt is whether senior debt has also defaulted. If senior debt has not defaulted, it would prevent any recovery action of subordinated debt until senior debt

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is repaid or defaults. If this was to occur, there may be limited or zero recovery for subordinated debt.

Should senior debt default or be repaid, factors that would influence the recovery prospects of subordinated debt include:

- The nature of the default;
- The type of security, collateral, and any first-loss protection;
- The type of security enforcement scenario (liquidation versus selling the project as a going concern);
- Senior debt's ability to influence the recovery for its benefit;
- Macroeconomic conditions and its impact on the value of any collateral;
- The level of any break costs under a hedging or derivative instrument;
- The insolvency or bankruptcy regime in a jurisdiction or country;
- Third-party costs, such as legal and insolvency-related costs;
- The time it takes to emerge from default;
- The length and value of a project's cash-flow tail after the repayment of senior debt; and
- Any other equal-ranking obligations.

As each of these factors can vary considerably from market to market across the globe, so too will the level of recovery for each project's subordinated debt. Consequently, each project needs to be examined on a case-by-case basis.

**Q.** *Why can subordinated debt issues be rated one or more notches below the senior debt rating?*

**A.** As each project's business profile is unique, so too is its financial, contractual, and legal structures. Depending on the unique features of each project, our ratings on project subordinated debt issues have on average ranged up to three notches below the senior debt rating. However, there have been exceptions in both directions, depending on the project and specific structural elements, covenants, and security features. Some credit features that have led to subordinated debt being rated more than one notch below senior debt (and hence more equity-like treatment) have included:

- Severe cash-flow encumbrances on subordinated debt servicing due to senior debt dis-

tribution lock-ups, the timeframe before cash is released from lock-up, and debt-service reserve maintenance;

- No rights or remedies in the event of a default affecting senior debt;
- No cross-acceleration or cross-default mechanisms; and
- Low DSCRs and stress buffers.

Conversely, some credit features that have led to subordinated debt being rated closer to the senior debt rating have included:

- Contingent support from sponsors to mitigate cash-flow encumbrances on subordinated debt servicing;
- Lower probability of reaching equity lock-up, which could occur in a project due to simple services to be delivered, a benign payment mechanism, strong and/or highly rated service providers to whom cost and revenue deduction risk is passed, and considerable third-party support;
- Subordinated debt liquidity support in the form of a dedicated debt-service reserve (up to six months), the ability to capitalize or defer interest, PIK notes, and contingent third-party support;
- Sharing of collateral security enforcement rights with senior lenders; and
- Strong DSCRs and stress buffers.

There are also examples of subordinate debt being rated on par with senior lien obligations. These have occurred in situations where the senior lien debt amounts are very small in relation to the subordinate lien, when a senior lien may be closed, or when the project operates with significant financial margins.

*(For examples of our ratings and related research on project subordinated debt issues, see the following issuers on RatingsDirect: 407 International Inc., Express Pipeline L.P., Reliance Rail Finance Pty Ltd., San Joaquin Hills Transportation Corridor Agency, and Alameda Corridor Transportation Authority.)*

**Q.** *Where to from here for subordinated debt structures?*

**A.** As active competition for project and infrastructure asset continues to move prices higher, market participants will continue to explore subordinated debt funding options and product structures to increase leverage to meet this strong demand. So long as the economic cycle

continues, market participants will continue to push boundaries in debt structuring; however, market participants should remember that debt structuring is not a way to obtain funds at no risk and that project fundamentals rather than financial engineering are the key to investment-grade structures.

So where to go from here? Given the long-term nature of project and infrastructure assets, and the competitive nature of debt arrangers and the risk appetite of investors for long-term assets, the landscape for project subordinated debt will continue to evolve.

Standard & Poor's expects to see variations in subordinated debt products for project and infrastructure transactions.

While cash flows from projects will continue to be carved up to create subordinated debt instruments, at the end of the day there is no "free lunch", and the key credit consideration will remain—what will cause a rated tranche of subordinated debt to default and how will a particular subordinated debt instrument affect the default or recovery of any senior-ranking debt? ■

## Criteria And Commentary

# Updated Project Finance Summary Debt Rating Criteria

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The world of project finance has continued to grow since Standard & Poor's Ratings Services published its last comprehensive rating criteria. Project financing has become increasingly sophisticated and often riskier, with a wider investor base attracting new finance structures and investors across the globe. We have closely followed these developments over the years, extending and revising our criteria from time to time to enable appropriate assessment of project-finance risk originating from new markets, new structures, and new avenues of ownership. Factoring different market circumstances into our analysis remains challenging, but global consistency of our criteria and approach has been our prime objective in responding to these new market developments. The combined magnitude of these criteria additions and changes is not great; it is, rather, more of a rearrangement that better reflects current practice and changes to associated criteria, such as recovery aspects.

Additionally, we want to note that we have revised certain aspects of our internal analytical framework for rating projects, and stress that although we have adopted one significant change—eliminating our scoring approach—no ratings will be affected. We introduced scoring six years ago to facilitate the compare-and-contrast of key project risks across the spectrum of rated projects. The scores, and the criteria on which they were based, represented only guidelines. Scores were never meant to be additive, but nevertheless, many readers understood them as such. Because the scoring caused confusion among some users of our criteria, we decided to remove those suggested scores and focus more on other analytical tools to compare risk across projects. In response to the changing world of project finance and the blurring of boundaries from pure project-finance transactions to hybrid structures, our analysis

has been expanded and now incorporates some corporate analytical practice, to look at a combination of cash-flow measures, capital structure, and liquidity management.

We also have reincorporated our assessment of force majeure risk into our analysis of a project's contractual foundation and technical risk, rather than addressing these as a separate risk category.

The overall criteria framework has not been changed, however, and still provides a very effective framework for analyzing and understanding the risk dynamics of a project transaction.

### Recent Trends

As project finance continues to adjust to the increasingly diverse needs of project sponsors, their lenders, and investors, in many cases the analysis of risk continues to grow in complexity. Despite this growing variety of project-finance application and location, the continuing market desire for non-recourse funding solutions suggests that project finance will remain a robust means of raising infrastructure capital. More aggressive financial structures sometimes blur the boundaries of non-recourse finance both in reality and perception. Also, the greater exposure to market risk has forced many sponsors to seek greater flexibility in project structures to manage cash, take on additional debt, and enter new businesses with few restrictions—which makes some projects look more like corporates.

Projects continue to evolve from their traditional basis of long-term contracted revenue, and now involve a greater exposure to a number of risks. Initial project finance primarily was focused on power markets that had strong contractual bases; but these days, more projects are exposed to the risks of volatile commodity markets or traffic volume exposure, among other types. Strong



global demand for construction and commodities has increased construction risk, even for simple projects.

Fewer projects have been able to secure the more creditor-friendly fixed-price, turnkey, date-certain construction contracts that better protect lenders from construction and completion risk. Term B loan structures—“mini-perms,” with minimal amortizations and risky bullet maturities—have established themselves firmly in the project world, but these capital plans have now been joined by more complex first- and second-lien structures, and more debt within holding company structures, particularly for payment-in-kind instruments that we view essentially as debt.

Many long-term concession projects are maximizing leverage by employing accreting debt structures that enable sponsors to recoup quick equity returns—sometimes before any debt has been repaid—but that can greatly increase lenders’ exposure to default risk in the later years (*see* “Credit FAQ: Accreting Debt Obligations and the Road to Investment Grade for Infrastructure Concession,” *published to RatingsDirect on Sept. 5, 2007*). Private equity has made strong inroads to project lending and ownership—either directly or through managed infrastructure funds. The trend away from ownership by experienced sponsors raises new concerns about ownership and long-term operational performance. Positively, the usage of project finance is growing in part thanks to these new structures. In particular, financing of public-private partnerships (PPPs) has grown significantly over the years, with PPPs often considered to be a lower-risk investment due to the involvement of a public authority or government entity.

Another observation is the increase of insured project finance transactions. Monoline insurance companies providing guarantees for timely-and-full debt servicing in cases of projects being unable to do so has opened different investment opportunities for the financial markets. However, we closely monitor and analyze the underlying risk of these projects to determine the underlying credit quality, as a part of the insured rating exercise.

Finally, the emergence of the Middle East markets as one of the largest global markets of project finance has challenges of its own.

Driven by low default track records and strong government support or sponsorship, these projects have created a class of their own in terms of investors’ perception of risk allocation. Middle East project finance is an area that remains under criteria development while we aim to adequately weigh up the hard facts, such as risk structure and allocation, terms and conditions of project financings in the region, and stated support from governments.

### General Approach

For lenders and other investors, systematic identification, comparison, and contrasting of project risk can be a daunting task, particularly because of the new complexity presented to investors. To assess project-finance risk, Standard & Poor’s continues to use a framework based on the traditional approach that grew out of rating U.S. independent power projects but which has been adapted to cover a growing range of other projects globally, such as more complex transportation schemes, stadiums and arenas, hotels and hospitals, renewable energies, and large oil and gas projects.

Our approach begins with the view that a project is a collection of contracts and agreements among various parties, including lenders, which collectively serves two primary functions. The first is to create an entity that will act on behalf of its sponsors to bring together several unique factors of production or activity to generate cash flow from the sale/provision of a product or service. The second is to provide lenders with the security of payment of interest and principal from the operating entity. Standard & Poor’s analytic framework focuses on the risks of construction and operation of the project, the project’s long-term competitive position, its legal characterization, and its financial performance—in short, all the factors that can affect the project’s ability to earn cash and repay lenders.

### “Project Finance” Defined

A project-finance transaction is a cross between a structured, asset-backed financing and a corporate financing. A project-finance transaction typically is characterized as non-recourse financing of a single asset or portfolio of assets where the lenders can look only

to those specific assets to generate the cash flow needed to service its fixed obligations, chief of which are interest payments and repayment of principal. Lenders' security and collateral is usually solely the project's contracts and physical assets. Lenders typically do not have recourse to the project's owner, and often, through the project's legal structure, project lenders are shielded from a project owner's financial troubles.

Project finance transactions typically are comprised of a group of agreements and contracts between lenders, project sponsors, and other interested parties who combine to create a form of business organization that will issue a finite amount of debt on inception, and will operate in a focused line of business over a finite period. There are many risks that need to be analyzed when rating a project finance transaction; however, the chief focus within Standard & Poor's rating process is the determination of the project's stability of projected cash flow in relation to the projected cash needs of the project. This criteria article addresses the areas on which we focus when conducting analysis, and how this translates into a rating on a project finance transaction as a whole. For each focus area, we gauge the relative importance for the project being rated and the impact that focus area could have on the project's overall cash flow volatility. The process is very systematic, but is tailored to each project rating.

### ***The rating***

Standard & Poor's project debt ratings address default probability—or, put differently, the level of certainty with which lenders can expect to receive timely and full payment of principal and interest according to the terms of the financing documents. Unlike corporate debt, project finance debt is usually the only debt in the capital structure, and typically amortizes to a schedule based on the project's useful life. Importantly, also unlike our corporate ratings, which reflect risk over three to five years, our project debt ratings are assigned to reflect the risk through the debt's tenor. If refinancing risk is present, we incorporate into the rating the ability of the project to repay the debt at maturity solely from the project sources. Our project ratings often factor in construction risk, which in

many cases can be higher than the risk presented by expected operations once the project is completed. In some cases, the construction risk is mitigated by other features, which enables the debt rating to reflect our expectations of long-term post-construction performance. Otherwise, we will rate to the construction risk, but note the potential for ratings to rise once construction is complete.

Another important addition to our project-debt ratings is the recovery rating concept that Standard & Poor's began to assign to secured debt in late 2003. The recovery rating estimates the range of principal that lenders can expect to receive following a default of the project. Our recovery scale is defined in the table. We define the likely default scenario, and then assess recovery using various techniques, such as discounted cash-flow analysis or EBITDA multiples. Or, we will examine the terms and conditions of project assets, such as contracts and concession agreements, for example, to estimate the expected recovery. The added importance of the recovery rating is that recovery can affect the ratings on certain classes of project debt when more than one class of debt is present.

### **Framework for Project Finance Criteria**

Thorough assessment of project cash flows requires systematic analysis of five principal factors:

- Project-level risk,
- Transactional structure,
- Sovereign risk,
- Business and legal institutional development risk, and
- Credit enhancements.

### **Project-Level Risks**

Project-level risk, or the risks inherent to a project's business and within its operating industry, will determine how well a project can sustain ongoing commercial operations throughout the term of the rated debt and, as a consequence, how well the project will be able to service its obligations (financial and operational) on time and in full.

Specifically, we look at a project's:

- Contractual foundation. Operational and financing contracts—such as offtake agreements, concessions, construction arrangements, hedge agreements, loan contracts,

- guarantees—that, along with the physical plant, serve as the basis of the enterprise.
- **Technology, construction, and operations.** Does it have a competitive, proven technology, can construction be performed on time and on budget, and can it operate in a manner defined under the base case?
  - **Resource availability.** Capacity to incorporate “input” resources, such as wind or natural gas.
  - **Competitive-market exposure.** Competitive position against the market in which it will operate.
  - **Counterparty risk.** Risk from relying on suppliers, construction companies, concession grantors, and customers.
  - **Financial performance.** Risks that may affect forecast results, and cash flow variability under likely stress scenarios.

**Contractual foundation**

We analyze a project’s contractual composition to see how well the project is protected from market and operating conditions, how well the various contracted obligations address the project’s operating-risk characteristics, and how the contractual nexus measures up against other project contracts.

The structure of the project should protect stakeholders’ interests through contracts that encourage the parties to complete project construction satisfactorily and to operate the project competently in line with the requirements of the various contracts. The project’s structure also should give stakeholders a right to a portion of the project’s cash flow so that they can service debt, and should provide for the

releasing of cash in the form of equity distributions (dividends or other forms of shareholder payments) in appropriate circumstances. Moreover, higher-rated projects generally give lenders the assurance that project management will align their interests with lenders’ interests; project management should have limited discretion in changing the project’s business or financing activities. Finally, higher-rated projects usually distinguish themselves from lower-rated projects by agreeing to give lenders a first-perfected security interest (or fixed charge, depending on the legal jurisdiction) in all of the project’s assets, contracts, permits, licenses, accounts, and other collateral; in this way the project can either be disposed of in its entirety should the need arise, or the lenders can step in to effectively replace the project’s management and operation so as to generate cash for debt servicing.

As infrastructure assets have become increasingly popular for concessions, not only is the analysis of the strengths and weaknesses of the concession critical, but also the rationale for the concession becomes an essential element of our analysis. Contract analysis focuses on the terms and conditions of each agreement. The analysis also considers the adequacy and strength of each contract in the context of a project’s technology, counterparty credit risk, and the market, among other project characteristics.

*Commercial agreements vs. collateral agreements.* Project-contract analysis falls into two broad categories: commercial agreements and collateral arrangements.

Commercial project contracts analysis is conducted on contracts governing revenue and expenses, such as:

- Power purchase agreements,
- Gas and coal supply contracts,
- Steam sales agreements,
- Liquefied natural gas sales agreements,
- Concession agreements,
- Airport landing-fee agreements,
- Founding business agreement, and
- Any other agreements necessary for the operations of the project.

Collateral agreements typically require analysis of a project’s ownership along with financial and legal structures, such as:

- Credit facilities or loan agreement;
- Indenture;

S&P Recovery Scale		
Recovery rating	Recovery description	Recovery expectations*
1+	Highest expectation, full recovery	100%¶
1	Very high recovery	90%-100%
2	Substantial recovery	70%-90%
3	Meaningful recovery	50%-70%
4	Average recovery	30%-50%
5	Modest recovery	10%-30%
6	Negligible recovery	0%-10%

\*Recovery of principal plus accrued but unpaid interest at the time of default. ¶Very high confidence of full recovery resulting from significant overcollateralization or strong structural features.

- Equity-contribution agreement;
- Mortgage, deed of trust, or similar instrument that grants lenders a first-mortgage lien on real estate and plant;
- Security agreement or a similar instrument that grants lenders a first-mortgage lien on various types of personal property;
- Assignments to lenders of project assets, accounts, and contracts;
- Project-completion guarantees;
- Depositary agreements, which define how the project cash is handled;
- Shareholder agreements;
- Collateral and inter-creditor agreements; and
- Liquidity-support agreements, such as letters of credit (LOC), surety bonds, and targeted insurance policies.

An important objective of our contractual assessment is the understanding of a project's full risk exposure to potential *force majeure* risks, and how the project has mitigated such risk. Project financings rely on asset and counterparty performance, but *force majeure* events can excuse performance by parties when they are confronted with unanticipated events outside their control. A careful analysis of *force majeure* events is critical in a project financing because such events, if not properly recompensed, can severely disrupt the careful allocation of risk on which the financing depends. Floods and earthquakes, civil disturbances, strikes, or changes of law can disrupt a project's operations and devastate its cash flow. In addition, catastrophic mechanical failure due to human error or material failure can be a form of *force majeure* that may excuse a project from its contractual obligations. Despite excusing a project from its supply obligations, the *force majeure* event may still lead to a default depending on the severity of the mishap.

**Technology, construction, and operations**

In part, a project's rating rests on the dependability of a project's design, construction, and operation; if a project fails to achieve completion or to perform as designed, many contractual and other legal remedies may fail to keep lenders economically whole.

The technical risk assessment falls into two categories: construction and operations.

Construction risk relates to:

- Engineering and design,
  - Site plans and permits,
  - Construction, and
  - Testing and commissioning.
- Operations risk relates to:
- Operations and maintenance (O&M) strategy and capability;
  - Expansion if any contemplated;
  - Historical operating record, if any.

Project lenders frequently may not adequately evaluate a project's technical risk when making an investment decision but instead may rely on the reputation of the construction contractor or the project sponsor as a proxy for technical risk, particularly when lending to unrated transactions. The record suggests that such confidence may be misplaced. Standard & Poor's experience with technology, construction, and operations risk on more than 300 project-finance ratings indicates that technical risk is pervasive during the pre-and post-construction phases, while the possibility of sponsors coming to the aid of a troubled project is uncertain. Thus, we place considerable importance on a project's technical evaluation.

We rely on several assessments to complete our technical analysis. One key element is a reputable independent expert's (IE) project evaluation. We examine the IE's report to see if it has the proper scope to reach fundamental conclusions about the project's technology, construction plan, and expected operating results, and then we determine whether these conclusions support the sponsor's and EPC contractor's technical expectations. We supplement our review of the IE's report with meetings with the IE and visits to the site to inspect the project and hold discussions with the project's management and construction contractor or manager. Without an IE review, Standard & Poor's will most likely assign a speculative-grade debt rating to the project, regardless of whether the project is in the pre- or post-construction phase. Finally, we will assess the project's technical risk using the experience gained from examining similar projects.

Another key assessment relates to the potential credit effect of a major equipment failure that could materially reduce cash flow. This analysis goes hand-in-hand with the contractual implications of *force majeure* events, described above, and counterparty risk, described below. If the potential credit risk from such an event is not

mitigated, then a project's rating would be negatively affected. Mitigation could be in the form of business-interruption insurance, cash reserves, and property casualty insurance. The level of mitigation largely depends on the project type—some types of projects, such as pipelines and toll roads—are exposed to low outage risks and thus could achieve favorable ratings with only modest risk mitigation. In contrast, a mechanically complex, site-concentrated project—such as a refinery or biomass plant—can be highly exposed to major-equipment-failure risk, and could require robust features to deal with potential outages that could take months to repair.

#### **Resource availability**

All projects require feedstock to produce output, and we undertake a detailed assessment of a project's ability to obtain sufficient levels. For many projects, the input-supply risk largely hinges on the creditworthiness of the counterparty that is obligated to provide the feedstock, which is discussed below under Counterparty Exposure. Other types of projects, however, such as wind and geothermal power, rely on the type of natural resources of which few third parties are willing to guarantee production. In these cases, we require an understanding of the availability of the natural resource throughout the debt tenor. We use various tools to reach our conclusions, but most important will be the analysis and conclusions of a reputable IE or market consultant on the resource sufficiency throughout the debt tenor. In many cases, such as wind, where the assessment can be highly complex, we may require two surveys to get sufficient comfort. Just as with IE technical reports, a project striving for investment-grade and high speculative-grade ratings will require a strong resource-assessment report. However, given the potential for uncertainty in many resource assessments, stronger ratings are likely to require either more than one IE resource assessment, geographic diversity, or robust liquidity features to meet debt-repayment obligations if the resource does not perform as expected.

#### **Competitive-market exposure**

A project's competitive position within its peer group is a principal credit determinant, even if the project has contractually based

cash flow. Analysis of the competitive market position focuses on the following factors:

- Industry fundamentals,
- Commodity price risk,
- Supply and cost risk,
- Regulatory risk,
- Outlook for demand,
- Foreign exchange exposure,
- The project's source of competitive advantage, and
- Potential for new entrants or disruptive technologies.

Given that many projects produce a commodity such as electricity, ore, oil or gas, or some form of transport, low-cost production relative to the market characterizes many investment-grade ratings. High costs relative to an average market price in the absence of mitigating circumstances will almost always place lenders at risk; but competitive position is only one element of market risk. The demand for a project's output can change over time (seasonality or commodity cycles), and sometimes dramatically, resulting in low clearing prices. The reasons for demand change are many, and usually hard to predict. Any of the following can make a project more or less competitive:

- New products,
- Changing customer priorities,
- Cheaper substitutes,
- Technological change, and
- Global economic and trade developments.

Experience has shown, however, that offtake contracts providing stable revenues or that limit costs, or both, may not be enough to mitigate adverse market situations. As an example, independent power producers in California had to restructure parts of fixed-price offtake agreements when the utilities there came under severe financial pressure in 2000 and 2001. Hence, market risk can potentially take on greater importance than the legal profile of, and security underlying, a project. Conversely, if a project provides a strategic input that has few, if any, substitutes, there will be stronger economic incentives for the purchaser to maintain a viable relationship with the project.

#### **Counterparty exposure**

The strength of a project financing rests on the project's ability to generate stable cash flow as well as on its general contractual framework,

but much of a project's strength comes from contractual participation of outside parties in the establishment and operation of the project structure. This participation raises questions about the strength and reliability of such participants. The traditional counterparties to projects have included raw-material suppliers, principal offtake purchasers, and EPC contractors. Even a sponsor becomes a source of counterparty risk if it provides the equity during construction or after the project has exhausted its debt funding.

Other important counterparties to a project can include:

- Providers of LOCs and surety bonds,
- Parties to interest rate and currency swaps,
- Buyers and sellers of hedging agreements and other derivative products,
- Marketing agents,
- Political risk guarantors, and
- Government entities.

Because projects have taken on increasingly complex structures, a counterparty's failure can put a project's viability at risk.

Standard & Poor's generally will not rate a project higher than the lowest rated entity (e.g., the offtaker) that is crucial to project performance, unless that entity may be easily replaced, notwithstanding its insolvency or failure to perform. Moreover, the transaction rating may also be constrained by a project sponsor's rating if the project is in a jurisdiction in which the sponsor's insolvency may lead to the insolvency of the project, particularly if the sponsor is the sole owner of the project.

During construction, often the project debt rating could be higher than the credit quality of the builder by credit enhancement and where there is an alternate builder available (*see "Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed," published to RatingsDirect on March 30, 2007*).

#### **Financial performance**

Standard & Poor's analysis of a project's financial strength focuses on three main attributes:

- The ability of the project to generate sufficient cash on a consistent basis to pay its debt service obligations in full and on time,
- The capital structure and in particular debt paydown structure, and
- Liquidity.

Projects must withstand numerous financial threats to their ability to generate revenues sufficient to cover operating and maintenance expenses, maintenance expenditures, taxes, insurance, and annual fixed charges of principal and interest, among other expenses. In addition, nonrecurring items must be planned for. Furthermore, some projects may also have to deal with external risk, such as interest rate and foreign-currency volatility, inflation risk, liquidity risk, and funding risk. We factor into our credit evaluation the project's plan to mitigate the potential effects on cash flow that could be caused by these external risks should they arise.

Standard & Poor's relies on debt-service coverage ratios (DSCR) as the primary quantitative measure of a project's financial credit strength. The DSCR is the cash-basis ratio of cash flow available for debt service (CFADS) to interest and mandatory principal obligations. CFADS is calculated strictly by taking cash revenues from operations only and subtracting cash operating expenses, cash taxes needed to maintain ongoing operations, and cash major maintenance costs, but not interest. As an operating cash-flow number, CFADS excludes any cash balances that a project could draw on to service debt, such as the debt-service reserve fund or maintenance reserve fund. To the extent that a project has tax obligations, such as host-country income tax, withholding taxes on dividends, and interest paid overseas, etc., Standard & Poor's treats these taxes as ongoing expenses needed to keep a project operating (*see "Tax Effects on Debt Service Coverage Ratios," published to RatingsDirect on July 27, 2000*).

In our analysis, we examine the financial performance of the project under base-case and numerous stress scenarios. We select our stress scenarios on a project-by-project basis, given that each project faces different risks. We avoid establishing minimum DSCRs for different rating levels because once again, every project has different economic and structural features. However, we do require that investment-grade projects have strong DSCRs—well above 1x—under typical market conditions that we think are probable, to reflect the single-asset nature of the business. Strong projects must show very stable financial performance under a wide range of stress

scenarios. We also note that DSCRs for projects with amortizing debt may not be directly comparable to DSCRs for a project using capital structures that involve a small annual mandatory principal repayment—usually around 1%—coupled with a cash-flow sweep to further reduce principal balances.

*Capital structure.* Standard & Poor's considers a project's capital structure as part of any rating analysis. A project usually combines high leverage with a limited asset life, so the project's ability to repay large amounts of debt within the asset lifetime is a key analytical consideration and one of the primary differences between rating a project and a typical corporate entity. The same holds true for projects that derive their value from a concession, such as a toll road, without which the "project" has no value; these concession-derived project financings likely have very long asset lives that extend well beyond the concession term, but nevertheless the project needs to repay debt before the concession expiration. Projects that rely on cash balances to fund final payments demonstrate weaker creditworthiness.

Refinancing risk associated with bullet maturities typical of corporate or public financings are becoming more common in project-finance transactions. Examples include Term Loan B structures, in which debt is repaid through minimal mandatory amortizations—usually 1% per year—coupled with a debt repayment from a portion of distributable cash flow. While these structures certainly reduce default risk due to lower mandatory principal repayments, they almost always involve a planned refinancing at around seven-to-eight years. In these types of arrangements, our credit analysis determines if the project can refinance debt outstanding at maturity such that it fully amortizes within the remaining asset life on reasonable terms.

The finite useful life of projects also introduces credit risk from an operational standpoint. Given its depreciating characteristics, an aging project may find it more difficult to meet a fixed obligation near the end of its useful life. Thus, for projects in which the useful life is difficult to determine, those structured with a declining debt burden over time are more likely to achieve higher credit ratings than projects those that do not.

Many projects with high leverage seek cap-

ital structures that involve second-lien debt, subordinated debt, and payment-in-kind obligations. These structures and instruments are used to tap different investor markets and buffer the senior-most debt from default risk. These other classes of debt are issued either at the operating project or at the holding company that wholly owns the project. Although such structures can be helpful for senior debt, it obviously is to the detriment of the credit quality of the subordinated debt because in most cases this debt class is inferior to senior lenders' rights to cash flow until senior debt is fully repaid, or to collateral in the event of a bankruptcy.

When looking at the creditworthiness of subordinate debt, the DSCR calculation is not CAFDS to subordinate debt interest and principal, but is, rather, total cash available within the entire project—after payments of all expenses and reserve filling—divided by both senior and subordinate debt service. Such a formula more accurately measures the subordinated payment risk. This differs from the notching applied in corporate ratings, and the actual rating might be lower than the coverage ratio implies, depending on the level of structural lock-up and separation of senior debt.

Another analytical approach for multiple-debt-type structures is to examine the performance of the project with all of the debt on a consolidated basis, and then determine the risk exposure for the different classes of debt based on structural features of the deal and provisions within the financing documents. To the extent that senior debt is advantaged, lesser obligations are penalized.

*Liquidity.* Liquidity is a key part of any analysis, because lenders rely on a single asset for debt repayment, and all assets types have unexpected problems with unforeseen consequences that must be dealt with from time to time.

Liquidity that projects typically have included:

- A debt-service reserve account, to help meet debt obligations if the project cannot generate cash flow due to an unexpected and temporary event. This reserve is typically sized at six months of annual debt service, although amounts can be higher as a result of specific project attributes (e.g., strong seasonality to cash flow, annual debt payments, etc.) The reserve should be cash or an on-demand cash instrument.

However, if the reserve is funded with an LOC, we will factor in the potential for the additional debt burden that would occur if the reserve is tapped to help meet debt obligations. A maintenance reserve account is expected for projects in which capital expenditures are expected to be lumpy or where there is some concern about the technology being employed. Almost all investment-grade projects have such a reserve. We do not establish a minimum funding level for these reserves, but gauge the need based on the findings of the IE's technical evaluation and our experience.

- Look-forward-and-back distribution and lock-up tests to preserve surplus but lower-than-expected cash flows. For investment-grade consideration, a project structure will typically have a minimum of 12 months look forward and look back. The DSCR hurdle that should allow distribution is project dependent. The test ensures cash is retained to meet the project's liquidity needs in times of stress.

### Transactional Structure

Standard & Poor's performs detailed assessment of the project's structural features to determine how they support the project's ability to perform and pay obligations as expected. Key items include assessing if the project is structured to be a single-purpose entity (SPE), how cash flow is managed, and how the insolvency of entities connected to the project (sponsors, affiliates thereof, suppliers, etc.), who are unrated or are rated lowly, could affect project cash flow.

### Special-purpose entities

Projects generally repay debt with a specific revenue stream from a single asset, and since for projects we rate to debt maturity, we need to have confidence that the project will not take on other activities or obligations that are not defined when the rating is assigned. When projects are duly structured as and remain SPEs, we can have more confidence in project performance throughout the debt tenor. If such limitations are absent, we would tend to rate a project more like a corporation, which would typically assume higher credit risk. Standard & Poor's defines a project finance SPE as a limited-purpose

operating entity whose business purposes are confined to:

- Owning the project assets;
- Entering into the project documents (e.g., construction, operating, supply, input and output contracts, etc.);
- Entering into the financing documents (e.g., the bonds; indenture; deeds of mortgage; and security, guarantee, intercreditor, common terms, depositary, and collateral agreements, etc.); and
- Operating the defined project business.

The thrust of this single-purpose restriction is that the rating on the debt obligations represents, in part, an assessment of the creditworthiness of specific business activities and reduces potential external influences on the project.

One requirement of a project finance SPE is that it is restricted from issuing any subsequent debt that is rated lower than its existing debt. The exceptions are where the potential new debt was factored into the initial rating, debt is subordinated in payment, and security to the existing debt does not constitute a claim on the project. A second requirement is that the project should not be permitted to merge or consolidate with any entity rated lower than the rating on the project debt. A third requirement is that the project (as well as the issuer, if different) continues in existence for as long as the rated debt remains outstanding. The final requirement is that the SPE have an anti-filing mechanism in place to hinder an insolvent parent from bringing the project into bankruptcy. In the U.S., this can be achieved by the independent-director mechanism, whereby the SPE provides in its charter documents a specification that a voluntary bankruptcy filing by the SPE requires the consenting vote of the designated independent member of the board of directors (the board generally owing its fiduciary duty to the equity shareholder[s]). The independent director's fiduciary duty, which is also to the lenders, would be to vote against the filing. In other jurisdictions, the same result is achieved by the "golden share" structure, in which the project issues a special class of shares to some independent entity (such as the bond trustee), whose vote is required for a voluntary filing.

The anti-filing mechanism is not designed to allow an insolvent project to continue



operating when it should otherwise be seeking bankruptcy protection. In certain jurisdictions, anti-filing covenants have been enforceable, in which case such a covenant (and an enforceability opinion with no bankruptcy qualification) would suffice. In the U.K. and Australia, where a first “fixed and floating” charge may be granted to the collateral trustee as security for the bonds, the collateral trustee can appoint a receiver to foreclose on and liquidate the collateral without a stay or moratorium, notwithstanding the insolvency of the project debt issuer. In such circumstances, the requirement for an independent director may be waived.

The SPE criteria will apply to the project (and to the issuer if a bifurcated structure is considered), and is designed to ensure that the project remains non-recourse in both directions: by accepting the project’s debt obligations, investors agree that they will not look to the credit of the sponsors, but only to project revenues and collateral for reimbursement; investors, on the other hand, should not be concerned about the credit quality of other entities (whose risk profile was not factored into the rating) affecting project cash flows.

Where the project acts as operator, the analysis will look to the ability of the project to undertake the activities on a stand-alone basis, and any links to external parties.

#### **Cash management**

Nearly all project structures employ an independent trustee to control all cash flow the project generates, based on detailed project documents that define precisely how cash is to be managed. This arrangement helps prevent cash from leaking out of the project prior to the payment of operating expenses, major maintenance, taxes, and debt obligations. In those cases where there is no trustee, the creditworthiness of the project will be linked directly to the cash manager, which is usually the sponsor. Projects seeking investment-grade ratings will have cash-management structures that prevent any distributions to sponsors—including tax payments—unless all expenses are fully paid, reserves are full, and debt-service coverage ratios looking back and forward for a sufficient period are adequate.

#### **Sovereign Risk**

A sovereign government can pose a number of risks to a project. For example, it could restrict the project’s ability to meet its debt obligations by way of currency restrictions; it could interfere with project operations; and, in extreme cases, even nationalize the project. As a general rule, the rating on a project issue will be no higher than the local-currency rating of the project in its host country. For cross-border or foreign-currency-denominated debt, the foreign-currency rating of the country in which the project is located is the key determinant, although in some instances debt may be rated up to transfer and convertibility (T&C) assessments of the country Standard & Poor’s has established. A T&C assessment is the rating associated with the probability of the sovereign restricting access to foreign exchange needed for servicing debt obligations. For most countries, Standard & Poor’s analysis concludes that this risk is less than the risk of sovereign default on foreign-currency obligations; thus, most T&C assessments exceed the sovereign foreign-currency rating. A non-sovereign project can be rated as high as the T&C assessment if its stress-tested operating and financial characteristics support the higher rating.

A sovereign rating indicates a sovereign government’s willingness and ability to service its own obligations on time and in full. The sovereign foreign-currency rating acts as a constraint because the project’s ability to acquire the hard currency needed to service its foreign-currency debt may be affected by acts or policies of the government. For example, in times of economic or political stress, or both, the government may intervene in the settlement process by impeding commercial conversion or transfer mechanisms, or by implementing exchange controls. In some rare instances, a project rating may exceed the sovereign foreign-currency rating if: the project has foreign ownership that is key to its operations; the project can earn hard currency by exporting a commodity with minimal domestic demand, or other risk-mitigating structures exist.

For cross-border deals, however, other forms of government risk could result in project ratings below the T&C rating. A government could interfere with a project by

restricting access to production inputs, revising royalty and tax regimes, limiting access to export facilities, and other means (*see* “Ratings Above The Sovereign: Foreign Currency Rating Criteria Update,” *published to Rating Direct on Nov. 3, 2005*).

### **Business And Legal Institutional Development Risk**

Even though a project’s sponsors and its legal and financial advisors may have structured a project to protect against readily foreseeable contingencies, risks from certain country-specific factors may unavoidably place lenders at concomitant risk. Specifically, risk related to the business and legal institutions needed to enable the project to operate as intended is an important factor. Experience suggests that in some emerging markets, vital business and legal institutions may not exist or may exist only in nascent form. Standard & Poor’s sovereign foreign-currency ratings do not necessarily measure this institutional risk or country risk, and so equating country risk with a sovereign’s credit rating may understate the actual risk the project may face (*See* “Investigating Country Risk And Its Relationship To Sovereign Ratings In Latin America,” *published to RatingsDirect on April 4, 2007*).

In some cases, institutional risk may prevent a project’s rating from reaching the host country’s foreign-currency rating, despite the project’s other strengths. That many infrastructure projects do not directly generate foreign-currency earnings and may not be individually important for the host’s economy may further underscore the risk.

In certain emerging markets, the concepts of property rights and commercial law may be at odds with investors’ experience. In particular, the notion of contract-supported debt is often a novel one. There may, for example, be little or no legal basis for the effective assignment of power-purchase agreements to lenders as collateral, let alone the pledge of a physical plant. Even if lenders can obtain a pledge, it could be difficult for them to exercise their collateral rights in any event. Overall, it is not unusual for legal systems in developing countries to fail to provide the rights and remedies that a project or its creditors typically require for the enforcement of their interests.

### **Credit Enhancement**

Some third parties offer various credit-enhancement products designed to mitigate project-level, sovereign, and currency risks, among other types. Multilateral agencies, such as the Multilateral Investment Guarantee Agency, the International Finance Corp., and the Overseas Private Investment Corp. to name a few, offer various insurance programs to cover both political and commercial risks. Project sponsors can themselves provide some type of support in mitigation of some risks—a commitment that tends to convert a non-recourse financing into a limited-recourse financing.

Unlike financial guarantees provided by monoline insurers, enhancement packages provided by multilateral agencies and others are generally targeted guarantees and not comprehensive for reasons of cost or because such providers are not chartered to provide comprehensive coverage. These enhancement packages cover only specified risks and may not pay a claim until after the project sustains a loss. Since they are not guarantees of full and timely payment on the bonds or notes, we need to evaluate these packages to see if they may enhance ultimate post-default recovery but not prevent a default. Once a project defaults, delays and litigation intrinsic in the claims process may result in lenders waiting years before receiving a payment.

Therefore, our estimation of the timeliness associated with the credit-enhancement mechanism is critical in the rating evaluation. For Standard & Poor’s to give credit value to insurers, the insurer must have a demonstrated history of paying claims on a timely basis. Standard & Poor’s financial enhancement rating for insurers addresses this issue in the case of private insurers (*see* “Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed,” *published to RatingsDirect on March 30, 2007*).

### **Outlook for Project Finance**

Project finance remains a robust vehicle for funding all types of infrastructure across the globe, and its creative financing structures continue to attract different classes of both issuers and investors. Project finance continues to be a chosen financing technique due to a strong global push to add all types of energy

and transportation infrastructure, and to build new or more public-oriented assets, such as stadiums, arenas, hospitals, and schools, just to name a few.

In the Middle East, the continuing development of mega-sized, government-driven energy and real-estate projects is likely to continue for years to come. Related investment in shipping to deliver energy from the region is also enormous.

In the U.S., project finance transactions in the power sector, both for acquisitions but also for new gas-and coal-fired plants and a host of renewable energies, remain very robust. Additionally, development activity of new nuclear power plants, some of which are likely to be undertaken on a project finance basis, is being studied. The U.S. market is also noteworthy for large investments in natural gas prepay deals.

In Europe, project investment in rail and air transportation remains sound, and private finance initiative investment in the U.K. continues to be robust. Its cousin, public-private partnerships lending for transportation and social infrastructure investments in Australia and Canada, has also strengthened.

These favorable trends offset less-favorable developments in other parts of the world, such as in Latin America, where policies in some countries (Venezuela, for example),

have led to nationalization of some project assets and an unfavorable market for further project funding.

Investor attention to project risk is important, especially in light of the relatively easy lending covenants and asset valuations seen in a number of project transactions in recent years.

Standard & Poor's expects that project sponsors and their advisors will continue to develop new project structures and techniques to mitigate the growing list of risks and financing challenges. As investors and sponsors return to emerging markets, particularly as infrastructure investment needs increase, project debt will remain a key source of long-term financings. Moreover, as the march toward privatization and deregulation continues in markets, non-recourse debt will likely continue to help fund these changes. Standard & Poor's framework of project risk analysis anticipates the problems of analyzing these new opportunities, in both capital-debt and bank-loan markets. The framework draws on Standard & Poor's experience in developed and emerging markets and in many sectors of the economy. Hence, the framework is broad enough to address the risks in most sectors that expect to use project finance debt, and to provide investors with a basis with which to compare and contrast project risk. ■

# Ring-Fencing A Subsidiary

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The evolution of structured finance techniques, and their adaptation by corporate credit structures, has expanded the methods by which the credit quality of a subsidiary might be rated higher than the credit quality of the consolidated entity. These methods, colloquially referred to as “ring-fencing,” are described here.

Standard & Poor’s Ratings Services takes the general position that the rating of an otherwise financially healthy, wholly owned subsidiary is constrained by the rating of its weaker parent. The basis for this position is that a weak parent has both the ability and the incentive to siphon assets out of its financially healthy subsidiary and to burden it with liabilities during times of financial stress. The weak parent might also have an economic incentive to filing the subsidiary into bankruptcy—if the parent itself were forced into bankruptcy—regardless of the subsidiary’s “stand-alone” strength. Experience suggests that insolvent corporations will often jointly file with their subsidiaries—even those subsidiaries not themselves experiencing financial difficulty.

Before arriving at the rating of any particular subsidiary, Standard & Poor’s assesses the credit quality of the consolidated entity of which the subsidiary is a part. No rating, *per se*, is assigned to the consolidated entity; rather, the credit-quality assessment is a pro forma measure of the consolidated entity’s general ability to meet its obligations. (See “Consolidated Ratings Methodology” sidebar.)

Issuers and their advisors typically offer two particular devices to justify a ratings separation between the parent/group and the subsidiary: the protective covenant and the nonconsolidation opinion. The problem with these devices is that *by themselves* they do not go far enough in effectively insulating or “ring-fencing” the subsidiary from its parent.

The protective covenant is designed to restrict the shifting of assets and liabilities between parent and subsidiary. The covenant accomplishes this either by outright prohibition of asset transfers and dividend declarations or by subjecting such transfers and dec-

larations to stringent tests. The parent may also offer a so-called “nonpetition” covenant, by which it undertakes not to file the subsidiary into bankruptcy.

Covenants are generally given little weight in the analysis of whether a subsidiary might be rated higher than its parent. Courts will rarely compel an entity to comply with or perform the terms of a covenant. They prefer instead to limit remedies to provable monetary damages in the event of breach of covenant and consequential loss. If a company breaches its financial covenants and thereafter goes into bankruptcy, any proven resulting damages would have to be recovered from the company’s bankruptcy estate, most likely at a relatively low priority. It is, moreover, difficult to draft covenants that will cover every conceivable eventuality.

Standard & Poor’s assumes that management will, in keeping with its responsibilities to shareholders, attempt to devise ways to defeat covenants that are burdensome.

“Nonpetition” covenants are also problematic in that they are unenforceable as a matter of public policy. Although it views nonpetition covenants as an indication (at least, at the time given) of the parent’s disinclination to filing a subsidiary into bankruptcy, Standard & Poor’s measures the likelihood of the performance of any covenant (such as the obligation to pay timely debt service) by the level of the covenantor’s own rating level. Standard & Poor’s views compliance with nonpetition covenants as being, ultimately, more a question of willingness than of ability.

The second device is the offer of a “nonconsolidation” opinion by the parent. Nonconsolidation opinions are common in structured finance. The doctrine of substantive consolidation allows creditors of a bankrupt company to ignore the principles of the “corporate separateness” of parent and subsidiary if:

- The creditors can persuade the court that the parent was using the subsidiary to shelter the parent’s assets; or
- The affairs of the parent and the subsidiary

were so intertwined as to make the two entities essentially indistinguishable.

In appropriate circumstances, the court will “consolidate” the assets of the subsidiary with those of the bankrupt parent, thus allowing the parent’s creditors access to the assets of the subsidiary. A nonconsolidation opinion addresses the degree of likelihood that a court will grant substantive consolidation based on the observance by parent and subsidiary of certain “separateness factors.” Aside from the fact that they are fact-specific, limited in scope, and highly qualified, non-consolidation opinions specifically *do not* address the likelihood of simultaneous bankruptcies of the parent and the subsidiary at the instigation of the parent. Even when a covenant package accompanies a nonconsolidation opinion, therefore, the potential still

exists for a parent to act to the detriment of its subsidiary’s creditors. Exceptions to the weak-parent/strong-subsubsidiary linkage have been made based on particular factual circumstances, such as transactions involving independent finance subsidiaries and regulated entities. Even in such instances, however, there typically remains some linkage. This linkage usually constrains the rating of an otherwise advantaged subsidiary to one full rating category (three “notches”) above the credit quality of the consolidated entity. In cases where a regulated utility is the subsidiary, the three-notch, regulatory-based differential will not often be achieved, since it is only considered when the subsidiary is located in an actively regulated jurisdiction like Oregon, California, or Virginia. Similar examples of ratings that take serious regula-

### Consolidated Ratings Methodology

**B**efore arriving at the rating of any particular subsidiary, Standard & Poor’s analyzes the credit quality of each of the subsidiary’s parents and affiliates in arriving at a view of the credit quality of the consolidated entity. No actual rating is assigned; rather, the credit-quality assessment is a pro forma measure of the consolidated entity’s general ability to meet its obligations. The consolidated approach is prompted by the fact that corporate managements are presumed to allocate assets to achieve the best results for the shareholders of the overall corporation. For rating purposes, that a company actually moves cash around the organization may be less important than its having the ability and economic incentive to do so.

Economic incentive is the most important factor on which to base judgments about the degree of linkage that exists between a parent and subsidiary. Business managers have a primary obligation to serve the interest of their shareholders, and Standard & Poor’s generally assumes that they will act accordingly. If this means infusing cash into a unit that management may once have termed a “stand-alone” subsidiary, or finding a way around covenants to get cash out of a “protected” subsidiary, then management can—on the basis of prior experience and economic incentive—be expected to follow these courses of action. Covenants, support agreements, management assertions, and legal opinions are of secondary importance compared with economic incentive.

Four consequences may result from the facts surrounding a particular parent/subsidiary relationship. If the subsidiary were sufficiently insulated from its parent, and would otherwise merit a higher rating were it a “stand-alone” entity, then the subsidiary’s senior debt would be rated higher than that of the consolidated entity. Second, if the insulation were insufficient or the subsidiary’s stand-alone rating were not sufficiently high, its credit quality could be considered equal to that of the consolidated entity’s, if the subsidiary were of strategic importance to the parent. On the other hand, the credit of the subsidiary may be rated lower than that of the consolidated entity if the subsidiary is a noncore entity, whose parent has no presumptive or “moral” obligation to support it. Fourth, as a result of the “seesaw” effect, if the subsidiary’s credit quality is rated higher than the parent’s because of the effectiveness of the subsidiary’s insulation, the higher rating of a subsidiary’s credit may have negative consequences for the rating of the parent’s credit.

A holding company’s debt is also notched down because it is structurally subordinated to the subsidiary’s debt. This notching reflects not only the inferior recovery prospects for the holding company’s debt in the event of a bankruptcy, but also the fact that the subsidiary’s creditors will rank prior to the interests of the holding company.

tory oversight into account can be found in Australia and the U. K.

The evolution of structured finance techniques, and their adaptation by corporate credit structures, has expanded the methods by which the credit quality of a subsidiary might be rated higher than the credit quality of the consolidated entity. Of course, corporate affiliation can never be totally ignored, even where the parent has adopted a number of these structuring techniques. When business dependencies exist between subsidiary and parent, such techniques may not be respected by the courts. These methods, colloquially referred to as “ring-fencing,” are cropping up in a variety of financing situations, including:

- Acquisition financing (the incurring of debt by a newly formed entity for the purpose of acquiring an existing entity);
- Monetizing a subsidiary’s dividend distributions (the formation by a low-rated parent of an intermediary subsidiary, interposed between the parent and its operating subsidiaries, for the purpose of borrowing funds, the debt service on such loans being derived from dividend streams received from the operating subsidiaries); and
- Corporate spinoffs (the formation by a single, low-rated parent of a new subsidiary, which then incurs debt for the purpose of acquiring a relatively profitable line of business, or assets, from the parent).

### Exceptions To The Rule

Depending on the “stand-alone” strength of the subsidiary, a package of enhancements (including structural features, covenants, and a pledge of collateral) may be effective to raise the rating of the subsidiary a full rating category over the credit quality of the consolidated entity. (See “A Ratings Enhancement Package” sidebar.) If the subsidiary has multiple owners, one or more of which is capable of defending the subsidiary from the acts of a financially stressed or insolvent parent, an even wider rating differential may be merited. The basis for the rating differential is that the package may be viewed as reducing the means—as well as the incentive—of the parent to shift assets from and liabilities to the subsidiary, or to file it into bankruptcy. (The operational nature of the subsidiary’s business distinguishes this

approach from true securitizations in which differentials of three or more ratings categories can be achieved. Securitizations of statistically predictable pools of accounts receivable are, in the view of Standard & Poor’s, fundamentally different from the business and financial issues characteristic of operating entities.)

### Structure

As noted above, parent/subsidiary linkage is prompted, in part, by two concerns:

- That a healthy subsidiary’s assets may be consolidated with those of its insolvent parent; and
- That the parent will have the ability to cause the subsidiary to file itself into bankruptcy, despite the fact that the subsidiary is not itself experiencing financial difficulty. Ensuring that the subsidiary is a limited-purpose operating entity, somewhat similar to the “special purpose entity” (SPE) found in a securitization, may mitigate this bankruptcy risk.

While the SPE is, strictly speaking, a creature of securitization, its operating asset analogues are found in the limited-purpose operating entities employed in industrial-based or project-financed transactions. In the context of a “ring-fenced” transaction, Standard & Poor’s expects that such limited-purpose entity will:

- Be “single-purpose”;
- Incur no additional debt (beyond that sized into the rating and necessary for routine business purposes, such as trade debt and ordinary working-capital facilities to prestate levels);
- Not merge or consolidate with a lower-rated entity;
- Not dissolve; and
- Have an “independent director.”

In the context of a “ring-fenced” transaction, the operative feature is the independent director.

Absent any stipulation to the contrary, a company’s directors have a fiduciary duty to its shareholders. The fiduciary duties of the subsidiary’s directors are understood to include the execution of the parent’s instructions, including an order to file the subsidiary into bankruptcy *voluntarily*. (A financially healthy subsidiary should not properly be *involuntarily* filed by the parent, since the

subsidiary would be able to pay its debts as they become due.)

To ensure that this duty is fulfilled properly, the charter documents of the SPE require the affirmative vote of the independent director, an individual with no tie or relationship to the parent, as a prerequisite to the SPE's voluntarily filing itself into bankruptcy. The charter documents of the SPE require the independent director to take into account the interests of the creditors of the subsidiary (including the holders of the rated debt), in addition to the interests of the shareholding parent, when deciding to file. The creditors of the subsidiary would almost certainly be prejudiced by such a filing.

As is the case in true securitizations, the SPE is most effective when paired with a non-consolidation opinion. The combination of the SPE structure and the nonconsolidation opinion *may* provide some comfort that the parent and its potentially more highly rated subsidiary are adequately distanced from each other, thus justifying the existence of a rating differential between the credit quality of the subsidiary and the credit quality of the consolidated entity. Nevertheless, structural separation alone may simply elevate form over substance when the subsidiary has significant operating and business dependencies on the parent (and vice versa). Consequently, the advantages of structural separation may be lost if such dependencies exist.

An additional structural protection is the use by the subsidiary of a "lockbox" mechanism, whereby accounts receivable owed to

the subsidiary are deposited by its customers directly into a bank account controlled by, and in the name of, the security trustee or collateral agent for the rated debt. The trustee or agent then allocates the cash according to a distribution mechanism designed to:

- Pay the costs of the subsidiary's operations;
- Settle administrative expenses; and
- Pay debt service while segregating cash from the direction and control of, and potential interference by, the lower-rated parent.

#### **Covenants**

Together with structural (or regulatory) and collateral provisions, a tightly drafted covenant package is important in preserving the financial well-being and autonomy of the subsidiary. These covenants may include (but are not limited to):

- Dividend tests;
- Negative pledges;
- Nonpetition covenants;
- Prohibitions against creating new entities; and
- Restrictions on asset transfer and intercompany advances.

In structures where the subsidiary has affiliates, covenants prohibiting any intercorporate dealings whatsoever (even when subject to "arm's-length" tests) may be desirable because of the potential for abuse.

#### **Collateral**

If the debt is fully secured by a pledge of all or substantially all of the assets of the sub-

### **A Ratings Enhancement Package**

In appropriate circumstances, a ratings enhancement package may be sufficient to notch the rating of the subsidiary above the credit quality of the consolidated entity. Such a package of enhancements should include:

- Structure (SPE, or special-purpose entity; "limited-purpose operating entity"; collateral-agent control of cash);
- Covenants; and
- Pledging of collateral.

However, the extent of such differential will rarely approach that found in a true securitization (in which differentials of three or more ratings categories can be achieved) because of the operational nature of the subsidiary's business.

Multiple ownership of the subsidiary may, in appropriate circumstances, allow the rating of the subsidiary to be raised above the rating of either parent to the level of the subsidiary's "stand-alone" rating.

subsidiary, the parent, in principle, has less freedom to deal with the assets of the subsidiary and, therefore, a reduced incentive to file the subsidiary into bankruptcy. The security usually takes the form of a subsidiary's general pledge of its assets to the collateral agent or security trustee, and a parent's pledge of its ownership interest, e.g., membership (LLC), partnership, (LP) or share (corporation interest) in the subsidiary as security for payment.

In support of the pledge, Standard & Poor's will request that the parent and the subsidiary provide evidence of the pledge, including, for example, in the case of real property, title insurance showing the interest of the collateral agent or security trustee and a legal opinion (addressed to Standard & Poor's) stating that the collateral agent or security trustee has a first perfected security interest in all other collateral in which a security interest can be perfected, either by possession or filing, or at common law. If the subsidiary is unwilling or unable to pledge its assets, reduced credit may be given for the parent's pledge of its ownership interest in the subsidiary.

### ***Regulatory supervision***

Transactions involving electric, water, natural gas, and telephone utilities may be subject to regulatory supervision. In the context of the weak-parent/strong-subsidiary linkage, the utility usually represents the strong subsidiary. Regulatory approval, influence, or mandate may well have a positive effect on credit quality. The effect of regulation is felt minimally when the subsidiary must secure regulatory approval to sell debt or dividend cash to the parent. Depending on particular circumstances, the rating differential created by such regulatory environment may be compounded by a package of structure, covenants, and collateral.

### ***Multiple ownership***

In circumstances where the subsidiary is controlled by at least two parents, or is the sub-

ject of a joint venture, the insolvency or financial difficulty of a particular venturer is less likely to have consequences for the credit quality of the subsidiary. The measure of control that a particular parent can exercise is usually related to the size of its ownership interest and the extent of its legal rights in the subsidiary. For this reason, the percentage of ownership is significant, but the identity and nature of any other owner is equally important in assessing its capabilities for effectively blocking an attempt by a co-owner to file the subsidiary. In general, where two or more parents are motivated and able to prevent each other from harming the credit quality of the subsidiary, the rating of the credit quality of the subsidiary may be higher than that of any parent's, if justified on a "stand-alone" basis. Moreover, the subsidiary may depend more heavily on one particular parent, in which case the subsidiary's rating may be affected by the dependency.

## **Conclusion**

In the U. S., there are a number of more or less traditional ways in which the credit quality of a subsidiary might be rated higher than the credit quality of its parent entity. In common-law jurisdictions such as the United Kingdom and Australia, there may be greater potential for differentiation. In all cases, the "package" of distancing mechanisms that serves as the basis for the rating differentiation should be an extensive one. Nevertheless, ratings benefits accruing to the subsidiary through the methods described above may come at a price: To the extent that the credit-quality rating of the subsidiary is elevated above the credit quality of the consolidated entity, the rating of the consolidated entity may be reduced. Finally, it cannot be overemphasized that the differentials achieved by true securitization will seldom be possible in a corporate transaction because of "single-asset" or enterprise risk, regardless of the structural and other features incorporated into the transaction. ■



# Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed

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**C**redit enhancements are provided in projects to deliver timely and certain liquidity support for project-critical cash flows and activities. To help mitigate construction risks, new forms of credit enhancements have emerged—from liquidity support during construction or operations, to contributions of debt and equity. This article reviews the traditional support mechanisms used in project finance and public-private partnership (PPP) transactions, and explores the principles under which new alternate support mechanisms may be recognized as acceptable forms of credit enhancement.

## The Limitations Of Liquidated Damages

A project may, from time to time, need cash to cover the expense of replacing an insolvent or failing construction or operating company to cover the cash costs of delays or cost overruns. Although liquidated damages (LD) provide an important incentive in a construction contract, LDs often do not provide a timely cash equivalent that is certain in amount. The cash equivalent is required to ensure that the project generates sufficient cash to fulfill its debt-service obligations and leave creditor positions unaffected by any underperformance in construction. LDs have a history of being disputed. Consequently, without some form of immediate accessible liquidity, LDs cannot be relied upon by issuers of project finance debt for the timely payment of principal and interest if an unplanned event occurs during construction.

## Other Forms Of Liquidity Support Increasingly Explored

Traditionally, letters of credit (LOC) have been the main instrument used by issuers to provide payment certainty in such adverse circumstances. However, alternate approaches to credit enhancement and liquidity support are increasingly being explored. Naturally, there has been an ongoing effort to reduce the cost of financing in structuring projects—for example, through delaying the contribution of cash (equity and debt), through con-

tributions or progressive draw-downs, and more recently by using cheaper alternative forms of credit support than LOC.

Another driver of alternative forms of credit enhancement and liquidity has been a desire to improve the overall construction package to mitigate the fact that the builder may be rated lower than the target project rating. An adequate third-party construction liquidity package can mitigate the potentially constraining factor of weak construction counterparty risk. Unlike many traditional projects, most PPPs typically enjoy a well-advanced design and often the availability of alternate contractors who have the ability to complete construction, thus possibly preventing default. Ultimately, the size of construction credit enhancement will be a function of the underlying construction complexity, any specific construction risks, contract structure, and the availability of alternative contractors and liquidity to support the delays and costs incurred through replacing a contractor.

It is timely, therefore, to review Standard & Poor's Ratings Services' approach to credit enhancement for project finance and PPP transactions.

Standard & Poor's has long taken the position that an unconditional and irrevocable LOC that is payable on demand (legally and practically) and issued by an appropriately rated bank can be treated as timely credit support for transactions rated at or below the rating of the LOC provider. Consequently, the LOC has become the benchmark against which other forms of credit enhancement are measured.

To match the LOC benchmark for assigning rating benefit, other forms of credit enhancement/liquidity instruments must:

- Have unambiguous terms and conditions that obligate the provider to pay promptly, without limitation, a certain sum of money if a particular circumstance occurs;
- Be granted in a legal environment that has a demonstrable history of enforcing instruments of its type; and
- Be granted by a provider that has a demonstrated willingness and ability to pay in

accordance with the instrument's terms. It is important that the provider demonstrates a willingness to make timely, rather than eventual, payment. Consequently, Standard & Poor's expects the provider to be an appropriately rated liquidity provider—a bank or an insurance company—that complies with Standard & Poor's Financial Enhancement Rating (FER) ratings and has the capacity to pay without delay.

### **Instrument Should Provide A Certain Cash Equivalent When Needed**

Standard & Poor's uses a principle-based approach to evaluate the certainty and timeliness characteristics of each proposed credit enhancement instrument, and considers that, at a minimum, they should contain the following concepts:

- The instrument should contain explicit and unambiguous undertakings consistent with irrevocable and unconditional direct and primary financial obligations of prompt and full payment;
- The terms and conditions of the instrument should permit a draw at the project's discretion;
- The governing law of the instrument should be in a jurisdiction where speedy enforcement is available, and the jurisdiction should be willing to speedily enforce payment;
- The instrument provider should waive all defenses to payment;
- The instrument provider should waive its right to amend the instrument without paying it out fully, and must not be able to terminate the instrument;
- The instrument should specify that, as appropriate, the project or the holders of rated securities are beneficiaries of the instrument; and
- The funds drawn can be used to rectify the expected problem.

As part of the evaluation, Standard & Poor's will analyze the following:

- "Events of default" and "remedies" provisions of the construction contract for which the credit enhancement is written;
- Payment in contractor insolvency;
- Proof of loss and proof of liability;
- Expiration of the instrument; and
- Mechanics of enforcement.

In practice, there have been instances of LOCs becoming subject to injunction or delayed through other legal action. Standard & Poor's rating analysis should conclude that the "pay first, appeal later" regime on which liquidity support is premised is not undermined by some other provision.

Adjudication bonds are increasingly used as a credit-enhancement feature in U.K. PPP and private finance initiative (PFI) projects. These bonds are often provided to support the obligations of contractors who are unrated and unlikely to be investment grade. Although the precise terms and conditions of these bonds vary instrument by instrument, the key credit concern is the lack of timely payment. While supported by legislation, the time lag in payment—which is largely a result of the need to prove a valid claim—could extend beyond the expected 28-day time frame by anything up to three months, even in a non-adversarial scenario. This time lag prevents the use of adjudication bonds as adequate financial enhancement if no short-term liquidity is available. However, some bonds have been structured to provide an "on-demand" element of support that fast-tracks the adjudication payment in certain circumstances, such as contractor insolvency, while retaining the full adjudication process for the remainder of the bond.

Clearly, if Standard & Poor's judges that the requirement for cash can easily be accommodated within the time frame for adjudication, then an adjudication bond may be recognized as valuable credit support. Unfortunately, even in the U.K., where there is some limited history to support adjudication bonds as liquidity instruments, Standard & Poor's view is that, to date, such history is insufficient to give the degree of certainty required for its rating analysis at the investment-grade level without other mitigating features that reduce the risk, such as having an investment-grade contractor. Outside the U.K., the lack of specific legislation and a history of enforcement mean such instruments will have limited value in ratings analysis.

Early Australian PPP projects benefited from an LOC covering 100% of construction, thus linking the construction risk to that of the LOC provider. In some later deals, however, this was replaced by a "limited use" LOC.

Typically, because of the limited circumstances or use for which they are available, these limited use LOC are generally not given much weight as credit enhancement for rating purposes. A new limited use instrument has recently emerged that is drawn to “top up” any shortfall between the termination payout by the State and outstanding debt. This limited use LOC enhances recovery during construction, but doesn’t prevent default risk. It also expires upon completion of construction, and as such provides no support to recovery or default risk during operations.

#### **Liquidity Provider Should Be Appropriately Rated And Be Able And Willing To Provide Liquidity**

The provider of liquidity should be a bank, usually with a minimum rating above the project rating. If the counterparty is downgraded, it either has to be replaced with a suitably rated counterparty, find a suitably rated guarantor, or post collateral in a market-standard manner. Depending on the structure, higher counterparty ratings may be required due to the potential for decreased liquidity if the counterparty needs to be replaced. The applicable counterparty-rating threshold should be defined in the bond documents as the minimum rating for an eligible provider, with appropriate trigger mechanisms for replacement, collateralization, or termination.

Insurance companies, unlike banks, are generally not liquidity providers, but may be acceptable if they comply with a Standard & Poor’s FER, which was created to address investors’ concerns about an insurer’s willingness and capacity to pay on a timely basis. Standard & Poor’s believes that surety policies provided by insurers may offer an adequate alternative to LOCs, provided the issuer of the surety policy has clearly indicated its willingness to pay policy claims on a timely basis, and where the surety provider’s rating is sufficient to support the rating on the transaction. Standard & Poor’s criteria for an FER require written acknowledgement from the insurer’s management that it has disclosed all information material to the insurance commitment and that it will, as a matter of policy, honor claims on a pay-first timely basis without regard to potential defenses. The purpose of the two-part review is to have the credit-enhancement insurance policy state clearly that it

will operate in a similar way to a financial guaranty while having management certify that as a business matter it will pay policy claims or face ratings consequences.

Issuers of credit enhancements also need the capacity to pay on demand. If the LOC bank or surety provider is a foreign-domiciled entity, it should make ancillary arrangements between the provider and an appropriately rated domestic liquidity provider to provide sufficient liquidity to support timely payment of the guaranteed obligations in full and without deductions on account of tax. Even in cases where there is a domestic funding base, if the project is required to lodge its demand in a place removed from the location of the project, this may burden the payment mechanism with additional delays and undermine the timely nature of the support.

#### **Letters Of Credit Are Still Best For Some Enhancements**

LOCs are used in project finance transactions to support the obligation of a sponsor to infuse capital into the project during the construction phase instead of at financial closing. At the same time, LOCs may be used as a substitute for funding project-reserve accounts, such as a debt-service reserve fund. It is not currently envisaged that surety or adjudication bonds are adequate substitutes for LOC in these applications. While banks and insurers with an FER may be acceptable liquidity providers, pension funds or corporates do not have a track record of paying now and disputing later. As such, pension funds and corporates are not considered suitable alternative providers, notwithstanding their credit quality.

In rated transactions, if the rating relies on an LOC or demand instrument, Standard & Poor’s requests a certificate or representation that there are no provisions in the construction contract that would allow for the grant of a temporary restraining order or injunction in respect of a draw under the LOC. Surety providers, by contrast, often require both proof of liability and evidence of loss, and it is from such proof requirements that much litigation stems. This is why performance sureties have not been traditionally fully accepted as a form of liquidity.

### **Contractor-Supplied Support Is Still A Credit Positive**

The payment and performance obligations for an unrated builder may be supported by a guarantee running from a rated parent. As neither the parent nor the unrated construction company subsidiary typically provides liquidity, and as construction companies have a history of arguing first and paying later, even a highly rated parent may not be considered an adequate source of liquidity.

Retention of a disputed amount of LDs can go some way to providing liquidity, but can lead to an acrimonious relationship rather than a co-operative one and, as they are funded pro-

gressively, may not be sufficient to compensate the project for the early insolvency of the builder. LDs can also put pressure on a builder and, hence, accelerate a potential insolvency.

Contractor-provided sureties and LOCs are seen as better than project-supplied instruments. As construction companies reduce the extent of their credit support, transaction structures are forced to look for support elsewhere to mitigate construction risk. Although alternative credit support protects transaction cash flow, if these mechanisms are drawn upon, it will increase the debt of the issuer and lead to predictable credit consequences. ■

# Recovery Ratings For Project Finance Transactions

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This article describes Standard & Poor's Ratings Services methodology for assigning recovery ratings to project-finance loans. Issue-specific recovery ratings are increasingly important for project lenders and borrowers as they help quantify a project's loss-given-default (LGD), which is an important component in calculating bank capital requirements (for bank lenders), market liquidity, and loan pricing.

In late 2004, Standard & Poor's published criteria describing its recovery rating methodology for secured corporate debt. Those criteria described how recovery ratings use a new scale ranging from '1+' (reflecting the highest expectation of recovery of principal) through to '5' (reflecting negligible recovery of principal).

Recovery ratings do not blend default risk and recovery given default, as conventional issue ratings do. Rather, they express only an opinion of an issue's recovery prospects. Each rating category corresponds to a specific range of recovery values (*see table 1*).

Corporate recovery ratings were an extension of earlier criteria that allowed for "notching up" of ratings on certain debt obligations. These criteria stated that if a particular obligation had reasonable prospects for full recovery, given a default, it could be rated above the corporate credit rating on the borrower. In many cases, higher recovery ratings are warranted through a legally effective pledge of collateral security that secures the borrowing.

A project finance transaction generally provides lenders with full security. Project financing focuses on a special purpose entity (SPE) whose capital structure is created for the purpose of acquiring, financing, and operating the project facility. All of the assets of the SPE, as well as its ownership interests, are pledged to lenders. The SPE has a single business purpose, is limited in the amount of debt that it can issue, and has various other restrictions imposed on it as a condition of its borrowing. In return, lenders agree to look solely to the project cash flows and assets in satisfaction of their debt. These facts make project financing eminently suitable for recovery analysis with the proviso that the

pledge mechanism is subject to creditors' rights laws (that is, bankruptcy regimes). These regimes vary from country to country with some being "creditor friendly" and others being "debtor friendly," while some are virtually nonexistent. Well-secured project debt that is subject to the U.S. Bankruptcy Code generally receives a higher rating than would an unsecured loan. On the other hand, no consideration is given for security in many countries such as China, where property rights and their enforcement are in a nascent state, which makes the bankruptcy process virtually unpredictable.

## Project Finance Recovery Rating Methodology

Assigning a recovery rating to a project loan consists of analyzing the project's default risk and, secondly, analyzing whether cash from the project—postdefault, whether derived from operations or from an asset sale—is sufficient to repay lenders' principal. The likelihood of default, of course, is irrelevant to a recovery analysis. It is not beyond the realm of possibility for a low probability of default to coexist with a weak recovery in default. Nevertheless, the circumstances of a potential default are germane to the recovery outcome. Thus, comprehending the default scenario is part of every analysis.

As part of its rating process, Standard & Poor's also analyzes the project's legal structure and the collateral pledged to secure the project loans. The recovery risk profile is established by assessing the project collateral and subjecting the collateral values to stress analysis under different postdefault scenarios. High collateral coverage levels can increase confidence that pledged assets will cover the secured debt, even under adverse conditions (although greater levels of collateral obviously do not entitle a creditor to any more than the amount of the claim).

## Default scenarios

The analysis of recovery prospects for secured project debt—which underpins the assign-

ment of both conventional issue ratings and recovery ratings—focuses exclusively on the economic value of the project in the postdefault scenario. The current value of the project—even if stressed for various economic and technical operating contingencies—is not relevant. The only meaningful stress scenario is the one consistent with the default. This is true whatever method is used to appraise the project’s value, be it discounted cash flow of the enterprise or some other approach.

For recovery ratings for corporate loans, comprehending the default scenario is perhaps the most challenging aspect of LGD analysis. For rated projects, however, predicting the cause of default is sometimes easier. Projects fail, or suffer downgrades, for various reasons. They can nevertheless be grouped under various headings: vulnerability to counterparty credit downgrades, sovereign risk, technical risk, competitive exposure, exposure to weak parents or sponsors, and poor financial performance. In the great majority of cases, these factors exacerbate the fundamental problem: an overly-ambitious borrowing program that so burdens the project that it has little room to maneuver around a structural dependency or other weakness. In rare cases (and in only a few low-rated projects), the default issue lies with a fundamental misjudgement about the economic or technical (or both) viability of the project. In the first instance, a financial restructuring will often restore the project to viability. In the latter, the inability of the project ever to meet its obligations not only precludes any meaningful recovery, but may also expose the lender to clean-up or remediate

costs where the equity in the project has long since vanished.

**Availability of collateral**

It is the nature of project financing to have all project collateral pledged as security for the project loan. From the earliest days of project and infrastructure finance ratings, Standard & Poor’s has insisted that rated project financings—regardless of the rating on the project—(or in the case of a multi-tranched debt structure for senior debt) have a first-priority lien on all project assets: receivables, inventory, trademarks, patents, plants, property, equipment, and a pledge by the project SPE’s owners of the SPE’s subsidiary stock. In effect, project lenders have the entire enterprise as collateral, including everything needed to ensure operations continue as smoothly as possible in case lenders take possession. Furthermore, Standard & Poor’s assumption is that the whole is usually worth more than the sum of its parts, as long as the business enterprise continues as a going concern. That quality in and of itself tends to support, all else being equal, strong recoveries because it greatly facilitates a creditor’s ability to take over operations with minimal, if any, disruption to revenues. Indeed, a project’s financing documentation typically anticipates the potential situation in which lenders take control of a project, thereby eliminating much of the enterprise value destruction that often accompanies a corporate bankruptcy due to a multitude of competing claims. That one class (or perhaps two or three at most) of secured-lender exits helps ensure that lenders’ interests will be aligned with each other, which should facilitate a project restructuring—which is another factor that should help preserve enterprise value.

In theory, project creditors might find it difficult to foreclose and seize the collateral, as they are likely to be thwarted by a bankruptcy filing by the project SPE. In the U.S., at least, a bankruptcy filing imposes a stay on a creditor’s right to the collateral during what is often a long and tortuous reorganization process. Moreover, the U.S. bankruptcy judge often has wide discretion (although seldom exercised) to substitute collateral. Indeed, project bankruptcies never result in liquidation: the SPE is usually reorganized. The decision of whether to

Table 1 **S&P Recovery Scale**

Recovery rating	Recovery description	Recovery expectations*
1+	Highest expectation, full recovery	100%¶
1	Very high recovery	90%-100%
2	Substantial recovery	70%-90%
3	Meaningful recovery	50%-70%
4	Average recovery	30%-50%
5	Modest recovery	10%-30%
6	Negligible recovery	0%-10%

\*Recovery of principal plus accrued but unpaid interest at the time of default. ¶Very high confidence of full recovery resulting from significant overcollateralization or strong structural features.

reorganize is influenced by a myriad of factors, including the legal system, industry trends, perceived long-term viability of the business, and regulatory or political considerations. The form the reorganization takes, including the resolution of creditors' claims, is the result of a negotiated process worked out before or after an actual bankruptcy filing.

Theoretical bankruptcy filing proceeding notwithstanding, in practice, Standard & Poor's has observed that when a project-financed enterprise faces an insolvency situation, the sponsors frequently turn the project over to the lenders, especially when the enterprise is not a viable going concern. In the U.S. many banks currently own many failed merchant power plants that fell into insolvency as a result of the collapse of the merchant power market. A similar situation exists in the U.K., where merchant plants and others—most markedly the largest coal fired power plant in Europe, Drax—are also owned by its financiers.

### Valuation Methodologies

As noted above, Standard & Poor's considers whether default is likely because of factors unrelated to the business position of the project or a fundamental deterioration in the underlying project viability. Thus, if project basics are sound but a default occurred nevertheless for other reasons, a restructuring of the project's capital structure, renegotiation of certain contracts, the replacement of non-performing transaction parties, or other solution might allow the project to return to profitability. If the project basics are sound, and the project SPE is capable of performing, a "project value analysis" (similar to an "enterprise value analysis" for a corporate loan) is performed. On the other hand, when the project's viability is seriously at issue, a "liquidation analysis" might be a more appropriate method of determining the value of the assets constituting the collateral. Again, any value might potentially be qualified by clean up or remediation expenses to be borne by lenders under relevant lender-liability laws. The two approaches are described below.

#### **Project value analysis**

Where project value analysis is appropriate because of the continuing viability of the pro-

ject, a discounted cash flow (DCF) approach is employed. The DCF approach is based on a financial model incorporating historical operating data and forecast cash flow over a discrete period that lasts until the originally scheduled final maturity date. The cash flows during a discrete period will be stressed to reflect the most likely default scenario. The adjusted cash flows are discounted back to the present value at the point of default using a discount rate that reflects our assessment of the risk of the enterprise, to arrive at a project value.

One of the advantages of assessing project-finance recovery values using the DCF approach, compared with calculating recoveries for corporate entities, is that most projects produce a single commodity or provide one primary service—such as electricity or transport along a toll road. Typically a more easily observable demand and price exists for the product and its inputs as opposed to a company that may manufacture hundreds, if not thousands, of products across multiple sites. Moreover, it is very likely that the project will never cease operations, which would eliminate the need to make assumptions about how and when the enterprise will resume operations and at what cost. Indeed, if a project has a long-term contract, that contract might very well likely survive the bankruptcy or default process intact. Although projects by their nature have finite lives and the recovery is based on the level of rated debt, the value of the cash flows may extend beyond the term of the debt, particularly in the case of bullet maturities.

#### **Liquidation approach**

The liquidation approach is applied when the project is not considered to be a going concern or where the transaction is only partially secured. Value assumptions are based on the concept of an orderly liquidation of assets under a forced sale. Important considerations include the type and amount of collateral, whether its value is objectively verifiable and likely to hold up during various postdefault scenarios, and any legal issues related to perfecting and enforcing the security interest. The analytical starting point is the assets' current value. For projects this may be difficult to establish.

Corporate borrowers often have peers, but projects tend to be unique and might lack any reference to establish a market value. Clearly any objective valuation of the project assets will support a more accurate estimate of a project recovery under a liquidation approach. For example, a project might have little future enterprise value but may be located on valuable real estate, which—if available for alternative usage—supports recovery. The assets’ potential to retain value over time is critical. Collateral is, therefore, judged according to volatility, liquidity, and its special-purpose nature.

### The Recovery Rating

In arriving at its collateral valuation, Standard & Poor’s determines the project’s “ultimate recovery” of principal assuming that the bankruptcy or administration process fully plays out. We do not determine ultimate recovery on the basis of, for example, what a defaulted loan might sell for at a fire sale or distressed loan price. This approach is different from that applied to some collateralized debt obligation (CDO) structures, where the focus may be on liquidation values shortly after default—generally “distressed market” prices that are often lower than the ultimate recovery. Standard & Poor’s ultimate recovery calculation, therefore, is the net amount after deduction of administration and related direct costs of bankruptcy, or restructuring

and workout costs (which can significant), costs of resolution of any contingent liabilities, and any prior-ranking claims (for example: taxes, environmental claims, and state law liens).

It should also be noted that Standard & Poor’s uses the nominal value of recovery, rather than a discounted value, at the time of default. We consider it appropriate to use nominal recovery rates because the selection of a discount rate and the assumption of a time to recovery are subjective considerations best applied by individual investors. Of course, these nominal recovery rates can differ widely across the globe.

### Project capitalization and structural factors

Recovery ratings take into account various other factors, such as structural features of the transaction and the applicable insolvency laws applying to the project. For example, a sound security structure in a creditor friendly environment might indicate a higher probability of successful recovery.

*Project capitalization.* A project’s capital structure is a factor in the recovery rating. Project loans have traditionally not been tranching because of a project’s “single-asset” risk. Tranching, however, may be relevant in certain circumstances and is increasingly becoming a feature of project financing.

Lower-priority tranches generally benefit the higher tranches as they protect them by absorbing certain potential losses. The relative position of the tranche within the capital structure and amount of prior claims are also factored in when calculating a project’s recovery rating. In evaluating a tranching debt structure, Standard & Poor’s assumes that any debt-service reserve accounts are not available.

In evaluating a project’s capital structure, Standard & Poor’s considers:

- Equity contributions;
- Junior debt and other subordination;
- Contingent equity;
- Whether the composition of the stakeholder group makes it likely that the business will be restructured;
- Debt-service schedule;
- Intercreditor agreement terms, especially the rights of senior lenders in relation to subordinated debt providers;
- Payment blockage mechanisms;

Table 2 Assessment Criteria For Ranking European Insolvency Regimes

(Ranking*)	U.K.	France	Germany	Italy	Spain	The Netherlands
Ability to access assets within a corporate group	4	1	4	1	2	4
Ability to take and retain security over all or most assets within a corporate group	4	2	3	3	2	4
Ability to commence and/or retain control over the insolvency process	3¶	1	3	2	2	4
Ability to enforce security and achieve realizations within a reasonable timescale	3¶	2	3	2	2	4
Overall ranking on creditors’ rights	4	2	3	2	2	4

\*Where 4 is strong and 1 is weak. ¶Rankings are preliminary, pending further evaluation of the effects of the Enterprise Act 2002.



- Acceleration rights; and
- The voting majority required to initiate enforcement proceedings.

Any obligations under hedges and swaps are also considered.

*Project security.* In evaluating the sufficiency of project collateral, Standard & Poor's also considers the completeness of the security package, enforceability of guarantees, and the location of the collateral. This latter factor is important as projects in creditor-friendly jurisdictions are assumed, all other things being equal, to have greater ability to enforce and realize security on a timely basis. If the operations of a company are widely dispersed or are located predominantly in debtor-unfriendly jurisdictions, the analysis might change.

*Jurisdictional considerations.* Access to collateral and the timing of its realization largely depends on how the relevant legal regime resolves bankruptcies. Creditor rights vary greatly, depending on the country. Standard & Poor's has published reports on the security

and insolvency regimes of the U.K., France, and Germany, and plans to publish further reports on Spain, Italy, and The Netherlands later this year. The U.S. bankruptcy regime, with its emphasis on reorganization, has also received considerable coverage.

In creditor-friendly jurisdictions such as the U.K. and Germany, lenders can usually exercise their rights to attach and liquidate collateral before there is a significant deterioration in value. Conversely, in countries like France and Italy, bankruptcy courts can prevent creditors from taking any action to enforce their rights to collateral during the legal process, exposing them to greater risks. Furthermore, other considerations such as the extent to which the courts set aside security provided during "hardening" or "preference" periods; the strength of the rights and protections available to secured creditors when exercising their security rights during insolvency or a moratorium; or control of proceedings might also affect the analysis. ■

# Standard & Poor's Methodology For Setting The Capital Charge On Project Finance Transactions

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In recent years, project debt issuers worldwide have increasingly been using financial guarantee insurance provided by monoline insurers, also referred to as monoline wraps. A key element in the process of the monoline wrap is the capital charge Standard & Poor's assigns. This capital charge is important for determining the capital adequacy of, and ultimately the rating on, the monoline insurers. This article aims to make transparent the way Standard & Poor's determines each project's capital charge and supersedes the capital charges listed in our *Global Bond Insurance* criteria book, which are no longer valid for project finance transactions.

A monoline wrap provides an "unconditional and irrevocable" financial guarantee from the insurer to pay all or a certain portion of a project's scheduled principal and interest on time and in full to debt providers if the project is unable to do so. The project debt guaranteed by the monoline is assigned a higher rating than the project's underlying rating. This higher rating is equalized with the financial strength rating on the monoline. The underlying project debt rating, which Standard & Poor's assigns to each wrapped project, is generally lower, reflecting the project's real underlying business and financial risks. As a result of providing the guarantee, monolines are exposed to the underlying risk of the project. This determines their portfolio risk and the charge to capital.

Each project finance transaction is unique, both in terms of risks and structural features, and so is the capital charge. Consequently, Standard & Poor's uses the same methodology for every monoline insured project to calculate the applicable capital charge.

Capital charges have been assigned by Standard & Poor's since the mid 1980s but have been adjusted over time to reflect credit conditions and market trends.

## Defining The Capital Charge

Capital charge is the theoretical loss based on a worst-case economic environment, i.e., an economic depression case. The capital charge

is expressed as a product of:

- Likelihood of default by the issuer (i.e., default risk or frequency); and
- Severity of default measured in terms of loss in asset value recovery.

Capital charge = Default frequency X loss under a worst-case default

The default risk is equivalent to Standard & Poor's default probability at a given rating. It does not vary between different projects that have been assigned the same rating. The severity factor is transaction specific, however, because each project has a unique combination of asset-related risks and contractual, financing, and legal issues. Consequently, the capital charge varies across asset classes and primarily reflects differences in the recovery potential.

Once the two factors have been determined, the capital charge for issues is a percentage of par value.

Standard & Poor's applies the same capital charge across an entire rating category. Issues rated 'A', 'A+', and 'A-', for example, have the same capital charge. Once a capital charge has been assigned, Standard & Poor's reviews it regularly as part of its surveillance.

Furthermore, the same capital charge is used for all the insurers involved in that project, irrespective of which insurer provides the wrap. This is because the transaction default frequency and severity measure reflect the project risks and are independent of the insurance company that insures the project debt.

The process of estimating capital charges can be complex and involve reasoning and modeling. Empirical data on new asset classes or new financing types, for example, is not always available or useful. Estimating loss-given default can also be complex in countries where the creditor regime has not been tested or the enforcement of security is complex and lengthy.

The fundamental approach to calculating the capital charge for project debt is generally the same as that adopted for corporates.

Nevertheless, the financing and structural aspects of a project can demand subjective judgment of recovery potential, and therefore the capital charge. Even so, similar transactions under a similar creditor regime are often likely to provide a good benchmark for a new transaction.

**Prerequisites**

Assigning an underlying rating to the project is a required step toward enabling the calculation of the capital charge. The underlying rating is determined in the same way as an unwrapped project debt rating and is based on the same criteria. The underlying rating is determined irrespective of whether the monoline guarantee applies to all the project debt or only a portion of it.

Standard & Poor's relies only on in-house determinations of default frequency and recovery estimates. Ratings and recovery values estimated by other rating agencies or professional bodies are not used as reference points for assigning the capital charge. The in-house data enable Standard & Poor's to maintain consistency across various jurisdictions, transactions, and operating environments.

**Calculating The Capital Charge**

**Default frequency**

The default frequency for a given rating is determined using Standard & Poor's corporate default study. The default study identifies the highest historical default rates across various sectors by rating category over a period of years. The leading global economies, the U.S. and Europe, have not, over the past 15 years, represented a worst-case depression-like scenario, and so the default rates are grossed up to what Standard & Poor's believes to be worst-case levels. Through simulations of such scenarios across various sec-

tors, Standard & Poor's calculates worst-case default frequency for long-term risks across the rating categories (*see table*).

**Loss-given default**

Loss-given default is unique for each project, for the reasons given above in "Defining The Capital Charge." It can differ between two assets in the same sector and jurisdiction. There can also be different degrees of confidence regarding recovery. Subjective judgments are critical for deciding how to stress collateral values in hypothetical post-default scenarios, but market trends can supplement theoretical estimates. For the purposes of assigning a capital charge, Standard & Poor's currently assumes a maximum recovery of 90%.

*Example.* This example gives an illustration of how the capital charge on a project rated 'A' is determined. The steps are: to determine the 'A' underlying rating on the project; read the default frequency from the table above; estimate the loss-given default; and finally determine the capital charge.

- The project's underlying rating is 'A'.
- The default frequency for the 'A' rating category is 7.1%.
- The estimated asset recovery value is 60%.
- The loss-given default is 40% (100% minus 60%).
- The capital charge is 7.1% multiplied by 40%: 2.84% of par value.

**Cross-border issuance**

Projects located in one country often raise debt in another market. Such situations give rise to sovereign-related risks that could affect the ability and willingness of the entity to service its foreign currency debt. In the past, we adjusted capital charges to reflect these risks. Effective this year, however, our methodology for calculating capital charges for project cross-border issuance has been revised.

Based on evidence that sovereigns under political and economic stress are less often restricting nonsovereign entities' access to the foreign exchange needed for debt service, cross-border transactions (even without structural sovereign risk mitigation features) can be rated above the sovereign foreign currency rating, up to the "Transfer and Convertibility Risk Assessment" for the relevant sovereign jurisdiction. Project ratings incorporate all

Worst-Case Default Frequency	
Rating category	Worst-case default frequency (%)
AA	5.9
A	7.1
BBB	14.8
BB	55.4

transfer and convertibility risk and other relevant country risks. Furthermore, many cross-border project finance transactions contain significant additional structural mitigants for direct sovereign interference risk, which make an additional “sovereign risk” adjustment to the capital charge unnecessary.

Our new methodology for setting the capital charge for cross-border project finance transactions is therefore based on the default rate associated with the transaction’s foreign currency rating and severity of loss-given default. The latter will continue to be an analytical assessment based on the unique characteristics of each individual transaction analyzed by Standard & Poor’s.

### **Surveillance Of The Capital Charge**

The capital charge is dynamic and all projects that have a monoline wrap have been surveilled since 2005. This surveillance enables an adjustment to the capital charge if the underlying project’s default risk or recovery prospects improve or worsen.

### **The Capital Charge And New Ratings**

Project debt issuers and monoline insurers are encouraged to begin dialogue with Standard & Poor’s at an early stage in the project-financing process to help avoid any

surprises later on. Early dialogue is particularly important because most projects are rated at the lower end of the rating scale, where the capital charge is substantially higher and can affect the premium payable to the monoline. Borderline differences in rating outcome can have a substantial impact on the applicable capital charge.

Standard & Poor’s is often asked by monoline insurers to give indicative capital charges, sometimes even before the rating process is initiated. We provide this indication based on estimated default risk and recovery levels. Only once the rating (default risk) has been assigned to a project and the recovery rate determined is the final capital charge calculated. The final capital charge can therefore differ from the indicative one, as the latter is based on estimates and on very limited information.

### **Note**

Related criteria, including the *Global Bond Insurance* criteria book, are available to subscribers of RatingsDirect, the real-time Web-based source for Standard & Poor’s credit ratings, research, and risk analysis, at [www.ratingsdirect.com](http://www.ratingsdirect.com). Criteria can also be found on our public Web site at [www.standardandpoors.com](http://www.standardandpoors.com). ■

# Standard & Poor's Methodology For Imputing Debt For U.S. Utilities' Power Purchase Agreements

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For many years, Standard & Poor's Ratings Services has viewed power supply agreements (PPA) in the U.S. utility sector as creating fixed, debt-like financial obligations that represent substitutes for debt-financed capital investments in generation capacity. In a sense, a utility that has entered into a PPA has contracted with a supplier to make the financial investment on its behalf. Consequently, PPA fixed obligations, in the form of capacity payments, merit inclusion in a utility's financial metrics as though they are part of a utility's permanent capital structure and are incorporated in our assessment of a utility's creditworthiness.

We adjust utilities' financial metrics, incorporating PPA fixed obligations, so that we can compare companies that finance and build generation capacity and those that purchase capacity to satisfy customer needs. The analytical goal of our financial adjustments for PPAs is to reflect fixed obligations in a way that depicts the credit exposure that is added by PPAs. That said, PPAs also benefit utilities that enter into contracts with suppliers because PPAs will typically shift various risks to the suppliers, such as construction risk and most of the operating risk. PPAs can also provide utilities with asset diversity that might not have been achievable through self-build. The principal risk borne by a utility that relies on PPAs is the recovery of the financial obligation in rates.

## The Mechanics Of PPA Debt Imputation

A starting point for calculating the debt to be imputed for PPA-related fixed obligations can be found among the "commitments and contingencies" in the notes to a utility's financial statements. We calculate a net present value (NPV) of the stream of the outstanding contracts' capacity payments reported in the financial statements as the foundation of our financial adjustments.

The notes to the financial statements enumerate capacity payments for the five years succeeding the annual report and a "thereafter" period. While we have access to proprietary forecasts that show the detail under-

lying the costs that are amalgamated beyond the five-year horizon, others, for purposes of calculating an NPV, can divide the amount reported as "thereafter" by the average of the capacity payments in the preceding five years to derive an approximate tenor of the amounts combined as the sum of the obligations beyond the fifth year.

In calculating debt equivalents, we also include new contracts that will commence during the forecast period. Such contracts aren't reflected in the notes to the financial statements, but relevant information regarding these contracts are provided to us on a confidential basis. If a contract has been executed but the energy will not flow until some later period, we won't impute debt for that contract until the year that energy deliveries begin under the contract if the contract represents incremental capacity. However, to the extent that the contract will simply replace an expiring contract, we will impute debt as though the future contract is a continuation of the existing contract.

We calculate the NPV of capacity payments using a discount rate equivalent to the company's average cost of debt, net of securitization debt. Once we arrive at the NPV, we apply a risk factor, as is discussed below, to reflect the benefits of regulatory or legislative cost recovery mechanisms.

Balance-sheet debt is increased by the risk-factor-adjusted NPV of the stream of capacity payments. We derive an adjusted debt-to-capitalization ratio by adding the adjusted NPV to both the numerator and the denominator of that ratio.

We calculate an implied interest expense for the imputed debt by multiplying the same utility average cost of debt used as the discount rate in the NPV calculation by the amount of imputed debt. The adjusted FFO-to-interest expense ratio is calculated by adding the implied interest expense to both the numerator and denominator of the equation. We also add implied depreciation to the equation's numerator. We calculate the adjusted FFO-to-total-debt ratio by

adding imputed debt to the equation's denominator and an implied depreciation expense to its numerator.

Our adjusted cash flow credit metrics include a depreciation expense adjustment to FFO. This adjustment represents a vehicle for capturing the ownership-like attributes of the contracted asset and tempers the effects of imputation on the cash flow ratios. We derive the depreciation expense adjustment by multiplying the relevant year's capacity payment obligation by the risk factor and then subtracting the implied PPA-related interest expense for that year from the product of the risk factor times the scheduled capacity payment.

### **Risk Factors**

The NPVs that Standard & Poor's calculates to adjust reported financial metrics to capture PPA capacity payments are multiplied by risk factors. These risk factors typically range between 0% to 50%, but can be as high as 100%. Risk factors are inversely related to the strength and availability of regulatory or legislative vehicles for the recovery of the capacity costs associated with power supply arrangements. The strongest recovery mechanisms translate into the smallest risk factors. A 100% risk factor would signify that all risk related to contractual obligations rests on the company with no mitigating regulatory or legislative support.

For example, an unregulated energy company that has entered into a tolling arrangement with a third-party supplier would be assigned a 100% risk factor. Conversely, a 0% risk factor indicates that the burden of the contractual payments rests solely with ratepayers. This type of arrangement is frequently found among regulated utilities that act as conduits for the delivery of a third party's electricity and essentially deliver power, collect charges, and remit revenues to the suppliers. These utilities have typically been directed to sell all their generation assets, are barred from developing new generation assets, and the power supplied to their customers is sourced through a state auction or third parties, leaving the utilities to act as intermediaries between retail customers and the electricity suppliers.

Intermediate degrees of recovery risk are presented by a number of regulatory and

legislative mechanisms. For example, some regulators use a utility's rate case to establish base rates that provide for the recovery of the fixed costs created by PPAs. Although we see this type of mechanism as generally supportive of credit quality, the fact remains that the utility will need to litigate the right to recover costs and the prudence of PPA capacity payments in successive rate cases to ensure ongoing recovery of its fixed costs. For such a PPA, we employ a 50% risk factor. In cases where a regulator has established a power cost adjustment mechanism that recovers all prudent PPA costs, we employ a risk factor of 25% because the recovery hurdle is lower than it is for a utility that must litigate time and again its right to recover costs.

We recognize that there are certain jurisdictions that have true-up mechanisms that are more favorable and frequent than the review of base rates, but still don't amount to pure pass-through mechanisms. Some of these mechanisms are triggered when certain financial thresholds are met or after prescribed periods of time have passed. In these instances, in calculating adjusted ratios, we will employ a risk factor between the revised 25% risk factors for utilities with power cost adjustment mechanisms and 50%.

Finally, we view legislatively created cost recovery mechanisms as longer lasting and more resilient to change than regulatory cost recovery vehicles. Consequently, such mechanisms lead to risk factors between 0% and 15%, depending on the legislative provisions for cost recovery and the supply function borne by the utility. Legislative guarantees of complete and timely recovery of costs are particularly important to achieving the lowest risk factors.

### **Illustration Of The PPA Adjustment Methodology**

The calculations of the debt equivalents, implied interest expense, depreciation expense, and adjusted financial metrics, using risk factors, are illustrated in the table on the next page.

### **Short-Term Contracts**

Standard & Poor's has abandoned its historical practice of not imputing debt for contracts with terms of three years or less. However, we

understand that there are some utilities that use short-term PPAs of approximately one year or less as gap fillers pending the construction of new capacity. To the extent that such short-term supply arrangements represent a nominal percentage of demand and serve the purposes described above, we will neither impute debt for such contracts nor provide evergreen treatment to such contracts.

**Evergreen Treatment**

The NPV of the fixed obligations associated with a portfolio of short-term or intermediate-term contracts can lead to distortions in a utility's financial profile relative to the NPV of the fixed obligations of a utility with a portfolio of PPAs that is made up of longer-term commitments. Where there is the poten-

tial for such distortions, rating committees will consider evergreen treatment of existing PPA obligations as a scenario for inclusion in the rating analysis. Evergreen treatment extends the tenor of short-and intermediate-term contracts to reflect the long-term obligation of electric utilities to meet their customers' demand for electricity.

While we have concluded that there is a limited pool of utilities whose portfolios of existing and projected PPAs don't meaningfully correspond to long-term load serving obligations, we will nevertheless apply evergreen treatment in those cases where the portfolio of existing and projected PPAs is inconsistent with long-term load-serving obligations. A blanket application of evergreen treatment is not warranted.

<b>Example Of Power-Purchase Agreement Adjustment</b>							
<b>(\$000s)</b>	<b>Assumption</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Thereafter</b>
Cash from operations	2,000,000						
Funds from operations	1,500,000						
Interest expense	444,000						
<b>Directly issued debt</b>							
Short-term debt	600,000						
Long-term due within one year	300,000						
Long-term debt	6,500,000						
Shareholder's Equity	6,000,000						
Fixed capacity commitments	600,000	600,000	600,000	600,000	600,000	600,000	4,200,000*
<b>NPV of fixed capacity commitments</b>							
Using a 6.0% discount rate	5,030,306						
Application of an assumed 25% risk factor	1,257,577						
Implied interest expense¶	75,455						
Implied depreciation expense	74,545						
<b>Unadjusted ratios</b>							
FFO to interest (x)	4.4						
FFO to total Debt (%)	20.0						
Debt to capitalization (%)	55.0						
<b>Ratios adjusted for debt imputation</b>							
FFO to interest (x)§	4.0						
FFO to total debt (%)**	18.0						
Debt to capitalization (%)¶¶	59.0						

\*Thereafter approximate years: 7. ¶The current year's implied interest is subtracted from the product of the risk factor multiplied by the current year's capacity payment. §Adds implied interest to the numerator and denominator and adds implied depreciation to FFO. \*\*Adds implied depreciation expense to FFO and implied debt to reported debt. ¶¶Adds implied debt to both the numerator and the denominator. FFO—Funds from operations. NPV—Net present value.

To provide evergreen treatment, Standard & Poor's starts by looking at the tenor of outstanding PPAs. Others can look to the "commitments and contingencies" in the notes to a utility's financial statements to derive an approximate tenor of the contracts. If we conclude that the duration of PPAs is short relative to our targeted tenor, we would then add capacity payments until the targeted tenor is achieved. Based on our analysis of several companies, we have determined that the evergreen extension of the tenor of existing contracts and anticipated contracts should extend contracts to a common length of about 12 years.

The price for the capacity that we add will be derived from new peaker entry economics. We use empirical data to establish the cost of developing new peaking capacity and reflect regional differences in our analysis. The cost of new capacity is translated into a dollars per kilowatt-year figure using a weighted average cost of capital for the utility and a proxy capital recovery period.

#### **Analytical Treatment Of Contracts With All-In Energy Prices**

The pricing for some PPA contracts is stated as a single, all-in energy price. Standard & Poor's considers an implied capacity price that funds the recovery of the supplier's capital investment to be subsumed within the all-in energy price. Consequently, we use a proxy capacity charge, stated in \$/kW, to calculate an implied capacity payment associated with the PPA. The \$/kW figure is multiplied by the number of kilowatts under contract. In cases of resources such as wind power that exhibit very low capacity factors, we will adjust the kilowatts under contract to reflect the anticipated capacity factor that the resource is expected to achieve.

We derive the proxy cost of capacity using empirical data evidencing the cost of developing new peaking capacity. We will reflect regional differences in our analysis. The cost of new capacity is translated into a \$/kW figure using a weighted average cost of capital and a proxy capital recovery period. This number will be updated from time to time to reflect prevailing costs for the development and financing of the marginal unit, a combustion turbine.

#### **Transmission Arrangements**

In recent years, some utilities have entered into long-term transmission contracts in lieu of building generation. In some cases, these contracts provide access to specific power plants, while other transmission arrangements provide access to competitive wholesale electricity markets. We have concluded that these types of transmission arrangements represent extensions of the power plants to which they are connected or the markets that they serve. Irrespective of whether these transmission lines are integral to the delivery of power from a specific plant or are conduits to wholesale markets, we view these arrangements as exhibiting very strong parallels to PPAs as a substitute for investment in power plants. Consequently, we will impute debt for the fixed costs associated with long-term transmission contracts.

#### **PPAs Treated As Leases**

Several utilities have reported that their accountants dictate that certain PPAs need to be treated as leases for accounting purposes due to the tenor of the PPA or the residual value of the asset upon the PPA's expiration. We have consistently taken the position that companies should identify those capacity charges that are subject to operating lease treatment in the financial statements so that we can accord PPA treatment to those obligations, in lieu of lease treatment. That is, PPAs that receive operating lease treatment for accounting purposes won't be subject to a 100% risk factor for analytical purposes as though they were leases. Rather, the NPV of the stream of capacity payments associated with these PPAs will be reduced by the risk factor that is applied to the utility's other PPA commitments. PPAs that are treated as capital leases for accounting purposes will not receive PPA treatment because capital lease treatment indicates that the plant under contract economically "belongs" to the utility.

#### **Evaluating The Effect Of PPAs**

Though history is on the side of full cost recovery, PPAs nevertheless add financial obligations that heighten financial risk. Yet, we apply risk factors that reduce debt imputation to recognize that utilities that rely on PPAs transfer significant risks to ratepayers and suppliers. ■



# Summary Reference

## Abengoa Bioenergy of Nebraska LLC

**Sector:** Oil and gas

**Location:** Nebraska, U.S.

**Debt amount:** \$90 mil sr secd term bank ln due 2013

**Rating/Outlook:** B-/Watch Pos

**Description:** Abengoa has built and is operating a new 88 million gallon per year dry-mill ethanol plant located in Ravenna, Neb. The project faced long delays in construction, and achieved substantial completion six months behind schedule.

## The AES Corp.

**Sector:** Power

**Location:** Virginia, U.S.

**Issuer Credit Rating:** BB-/Stable/—

**Description:** AES's assets are diversified across 25 countries in North America, Latin America, Europe, Africa, the Middle East, and Asia. The company owns its projects indirectly through individual project subsidiaries. The company invests in various lines of business, included competitive supply, contract generation, and integrated utilities.

## AES Dominicana Energia Finance S.A.

**Sector:** Power

**Location:** Dominican Republic

**Debt amount:** \$160 mil 11% sr nts due Dec 2015

**Rating/Outlook:** B-/Stable

**Description:** AES Dominicana is a special-purpose financing entity that issued the bonds and on-lent the funds through an intermediate bank to AES Andres B.V., which in turn used the funds to repay a loan facility and for other corporate purposes. AES Dominicana manages two of The AES Corp.'s wholly owned generating facilities, Andres and DPP, representing 540 MW of electric generating capacity.

## AES Eastern Energy L.P.

**Sector:** Power

**Location:** New York, U.S.

**Debt amount:** \$550 mil pass thru certificates ser 1999

\$75 mil car rate revolv credit fac bank ln due Jan 2008

**Rating/Outlook:** BB+/Stable

**Description:** AES Eastern Energy owns and operates four merchant coal-fired generating plants, representing 1,268 MW of electric generating capacity. The AES Corp. owns 100% of the project.

## AES Ironwood LLC

**Sector:** Power

**Location:** Pennsylvania, U.S.

**Debt amount:** \$308.5 mil 8.857% sr secd bonds due Nov 2025

**Rating/Outlook:** B+/Stable

**Description:** AES Ironwood is a 705 MW combined-cycle, natural gas-fired generating station. The project sells capacity and energy to Williams Power Co. Inc., a subsidiary of The Williams Companies Inc., under a 20-year power purchase agreement. These tolls are currently in the process of being sold to Bear Stearns Energy.

## AES Red Oak LLC

**Sector:** Power

**Location:** New Jersey, U.S.

**Debt amount:** \$224 mil 8.54% sr secd bonds due Nov 2019

\$160 mil 9.2% sr secd bonds due Nov 2029

**Rating/Outlook:** B+/Stable

**Description:** AES Red Oak is an 830 MW combined-cycle, natural gas-fired generating station that sells power to the Williams Power Company Inc. under a 20-year power purchase agreement. These tolls are currently in the process of being sold to Bear Stearns Energy.

### **Ajman Sewerage (Private) Co. Ltd.**

**Sector:** Other

**Location:** United Arab Emirates

**Debt amount:** \$100 mil sr secd bank ln due Jan 2026 (Guarantor: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The Ajman Sewerage project is building a sewerage system and sewerage treatment plant for the emirate of Ajman in the United Arab Emirates. The project is a build-operate-transfer scheme to produce clean water, which will be used for irrigation. Ajman is a small emirate located to the east of Dubai.

### **Alinta Co-Generation (Pinjarra) Pty. Ltd.**

**Sector:** Power

**Location:** Australia

**Debt amount:** A\$118 mil project finance bank ln due June 2015 (Guarantor: Alinta Electricity Trading Pty. Ltd.)

A\$118 mil project finance bank ln due June 2015 (Guarantor: Alinta Electricity Trading Pty. Ltd.)

**Rating/Outlook:** BBB/Watch Neg

**Description:** The funds were used to build a 140 MW cogeneration unit at Alcoa of Australia's Pinjarra alumina refinery. Alcoa of Australia uses all the steam output in its refinery, and Alinta sells the electricity direct to contestable customers in the Western Australian market.

### **Alliance Pipeline L.P.**

**Sector:** Pipelines

**Location:** Canada

**Debt amount:** C\$300 mil 7.23 sr notes due June 2015

C\$300 mil 5.546% sr notes due Dec 2023

C\$350 mil 7.217% sr secd notes due Dec 2025

C\$400 mil 6.76% sr notes due Dec 2025

C\$450 mil 7.181% sr notes ser A due Dec 2025

**Rating/Outlook:** BBB+/Stable

**Description:** Owned by Fort Chicago Energy Partners L.P. and Enbridge Income Fund, Alliance L.P. owns the Canadian portion of a 1,875-mile natural gas pipeline project, with associated laterals, which extend from the Western Canada Sedimentary Basin in north-eastern British Columbia and northwestern Alberta to the Chicago Market Hub. The system delivers 1.325 billion cubic feet (bcf) of natural gas per day on a firm basis, with additional authorized overrun service volumes of about 20%.

### **Alliance Pipeline Limited Partnership**

**Sector:** Pipelines

**Location:** U.S.

**Debt amount:** US\$200 mil 7.877% notes due Dec 2025

US\$300 mil 4.591% sr secd notes due Dec 2025

US\$300 mil 7.77% sr notes due June 2015

US\$350 mil 6.996% notes due Dec 2019

**Rating/Outlook:** BBB+/Stable

**Description:** Owned by Fort Chicago Energy Partners L.P. and Enbridge Inc, Alliance Pipeline Limited Partnership owns the U.S. portion of a 1,875-mile natural gas pipeline project, with associated laterals, which extend from the Western Canada Sedimentary Basin in northeastern British Columbia and northwestern Alberta to the Chicago Market Hub. The system delivers 1.325 bcf of natural gas per day on a firm basis, with additional authorized overrun service volumes of about 20%.

### Alpha Schools (Highland) Project PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £60 mil fxd rate sr secd EIB bank ln due 2035 (Guarantor: Ambac Assurance UK Ltd.)

£81.8 mil fxd rate gtd sr secd bnds (plus £17 mil variation bnds) due Jan 2036 (Guarantor: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The funds are being used to finance the design and construction of new school facilities for the Highland Council in Scotland. The project company, Alpha Schools, is responsible for building and providing the maintenance for certain noneducational support services to the 11 new schools under a 31-year project agreement.

### Alte Liebe 1 Ltd.

**Sector:** Power

**Location:** Germany

**Debt amount:** €102 mil 4.7% bnds due Dec 2025 (Bond insurance provider: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** Alte Liebe is a special-purpose vehicle that raised funds for the Alte Liebe wind power transaction that consists of eight wind farms with a capacity of 142 MW.

### Ashmore Energy International

**Sector:** Power-Developer

**Location:** Latin America, Europe, Asia

**Debt amount:** \$105 mil synthetic revolving credit fac bank ln due March 2012 (Co-issuer: AEI Finance Holding LLC)

\$1 bil first lien term loan bank ln due March 2014 (Co-issuer: AEI Finance Holding LLC)

\$395 mil first lien revov redit fac bank ln due March 2012 (Co-issuer: AEI Finance Holding LLC)

**Rating/Outlook:** B+/Stable

**Description:** Ashmore Energy International (AEI) has ownership interests in and managerial responsibilities for 19 energy assets in 14 countries. AEI's investment companies serve about 8 million customers through about 37,000 kilometers (km) of gas and liquids pipelines, about 120,000 km of electric transmission and distribution lines, and about 1,900 MW of generating capacity.

### Aspire Defence Finance PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £884.075 mil bnds ser B due March 2040 (Guarantor: MBIA UK Insurance Ltd.)

£884.075 mil nts ser A due March 2040 (Guarantor: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA (prelim), BBB-(SPUR)/Stable

**Description:** The funds will be used by Aspire Defence Ltd. to design, build, finance, and operate new living and working accommodation for the U.K. Ministry of Defence, and provide support and estate-management services under a 35-year project agreement.

### **Astoria Generating Co. Acquisitions LLC**

**Sector:** Power

**Location:** New York, U.S.

**Debt amount:** \$430 mil first lien term loan B bank ln

\$100 mil first lien working capital fac bank ln

**Rating/Outlook:** BB-/Stable

**Debt amount:** \$300 mil second lien term loan C bank ln

**Rating/Outlook:** B/Stable

**Description:** Astoria Gen owns three separate sites with generating assets: Astoria, a 1,230 MW natural gas/fuel oil-fired plant in Astoria, Queens, N.Y. and the Gowanus and Narrows sites (818 MW), two barge-mounted facilities using combustion turbines for peaking capacity in Brooklyn, N.Y.

### **Austin Convention Center Enterprises Inc.**

**Sector:** Other

**Location:** Texas, U.S.

**Debt amount:** \$165 mil conv ctr hotel 1<sup>st</sup> tier rev bnds ser 2006A due Jan 2034; \$95.17 mil conv ctr hotel 2nd-tier rev rfdg bonds ser 2006B due Jan 2034 (obligor: Austin Convention Center Enterprises Inc.)

**Rating/Outlook:** AAA insured, BBB-(SPUR)/Stable; BB/Stable

**Description:** Proceeds of the bonds were used to build an 800-room convention center headquarters hotel in Austin, Texas, which opened in Dec 2003. The hotel is owned by ACE, a nonprofit public facilities corporation created and organized by the City of Austin. It is managed by Hilton Hotels Corp. and is operating under the Hilton name.

### **Autoban - Concessionaria do Sistema Anhanguera Bandeirantes**

**Sector:** Transport

**Location:** Brazil

**Debt amount:** BRL510 mil deb ser 3 due 2104

**Rating/Outlook:** brAA/Stable

**Description:** Autoban is a 316.76 kilometer road system located in the key state of Sao Paulo, Brazil. It is one of the most important road systems in Brazil and one of its busiest transportation corridors, linking the state's exporting agribusinesses to the main road that connects to the port in Santos. It is the main corridor for transporting industrial products from surrounding areas to other states in the country. The road averages about 300,000 vehicles per day.

### **Autolink Concessionaires (M6) PLC**

**Sector:** Transport

**Location:** U.K.

**Debt amount:** £124.8 mil 8.39% sr bnds ser A1 due June 2022 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB+(SPUR)/Stable

**Description:** Autolink, which is owned by Autolink Holdings (M6) Ltd., owns and operates the M6 motorway project. Autolink used the bond proceeds to fund the construction and upgrade of the A74 highway in south Scotland to "motorway" (M6) standard, under a 30-year design, build, finance, and operate concession. Having completed its highway construction obligations in 1999, Autolink now focuses on the operation and maintenance of the 90 km road.

### **Autopista Monterrey-Cadereyta**

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP2.25 bil 5.7% mid-term nts due Dec 2029 (Guarantor: MBIA Insurance Corp.)

**Rating/Outlook:** AAA/Stable, mxAAA/Stable

**Description:** Autopista Monterrey-Cadereyta, a 30-kilometer long toll road in the State of Nuevo Leon, connects the cities of Monterrey and Cadereyta. The road was built with an investment of MxP60 million and started operations in 1988. It has two main toll plazas (Guadalupe and Cadereyta) and three collection booths per transit direction.

### Autopista Cardel-Veracruz

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP\$700 million 7.95% cert of part ser VCZ03U due Nov 2014

**Rating/Outlook:** mxAAA/Stable

**Description:** Autopista Cardel-Veracruz is a toll road that connects the Gulf of Mexico's major port, Veracruz, to the city of Cardel. The toll road has two toll plazas: la Antigua (27 km segment with four lanes) and San Julian (8 km section).

### Autopistas de Chihuahua

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP1.4 bil 7.5% med-term nts ser CHIHCB02U due Nov 2012

MxP1.1 bil 7.5% ser CHIHCB02-2U med-term nts due Nov 2012

MxP2.5 bil sr unsecd med-term note prog Nov 2002

**Rating/Outlook:** mxAA+/Stable

**Description:** Autopistas de Chihuahua is a pool of toll roads that is 510 km long and consists of 224 km of Chihuahua's federal concessions and 285.5 km of state toll roads.

### Autopista del Maipo Sociedad Concesionaria S.A.

**Sector:** Transport

**Location:** Chile

**Debt amount:** US\$421 mil 7.373% due June 2022 (Bond insurance provider: MBIA Insurance Corp.)

**Rating/Outlook:** AAA/Stable

**Description:** Cintra Chile, a subsidiary of Cintra Spain, operates Autopista del Maipo, a 192 km toll road that is part of the current Ruta 5. The concession runs from the city of Santiago north to the city of Talca.

### Autovia del Camino S.A.

**Sector:** Transport

**Location:** Spain

**Debt amount:** €135 mil sr secd commercial bank ln due 2030 (Bond insurance provider: XL Capital Assurance (U.K.) Ltd.)

€175 mil sr secd EIB bank ln due 2029 (Bond insurance provider: XL Capital Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA(prelim), BBB(SPUR)/Stable

**Debt amount:** €175 mil sr secd EIB amortizing bank ln due 2027 (Guarantor: XL Capital Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA

**Description:** The Navarre regional government granted a 30-year concession to Autovia del Camino to design, build, and operate under a shadow toll regime a 70km road linking the cities of Pamplona and Logrono. The proceeds of the bonds were used to fund the road's construction.

### Aventine Renewable Energy Holdings Inc.

**Sector:** Oil and gas

**Location:** Illinois, U.S.

**Debt amount:** \$160 mil fltg rt sr secd nts due Dec 2011

**Rating/Outlook:** B+/Stable

**Debt amount:** \$300 mil 10% sr unsecd nts due April 2014

**Rating/Outlook:** B-/Stable

**Description:** Aventine has three facilities that account for its nameplate production: a dry-mill facility in Aurora, Neb. with a total capacity of 50 million gallons per year (mmgpy), a wet-mill facility in Pekin, Ill. with a 100 mmgpy of ethanol, and the recently completed dry-mill facility, also in Pekin, with 57 mmgpy capacity. Funds will be used for the expansion of 226 mmgpy capacity at two locations of 113 mmgpy each. One expansion will be at the Aurora, Neb. site and the other at Mt. Vernon, Ind.

### **Baesca-Energetica Barra Grande S.A.**

**Sector:** Power

**Location:** Brazil

**Debt amount:** BRL180 mil deb ser 1 and 2 due June 2016 (Guarantors: ALCOA Aluminio S.A., CPFL Energia S.A., and Camargo Correa Group)

**Rating/Outlook:** brAA/CW Negative

**Description:** Hidrelétrica Barra Grande is a hydropower plant on the Pelotas River in Brazil's southern region along the border of the states of Rio Grande do Sul and Santa Catarina. The plant has an installed capacity of 690 MW, and it started operations in Dec 2005. In 2001, the federal government, through the electric sector regulatory body Agência Nacional de Energia Elétrica, granted to Baesa the 35-year concession right to build and operate the Hidrelétrica Barra Grande project (up to Aug 2036), after which Baesa should return the assets to the federal government or ask for a concession extension for another 35 years.

### **Baltimore Hotel Corp.**

**Sector:** Other

**Location:** Maryland, U.S.

**Debt amount:** \$247.5 mil conv ctr hotel rev bnds sr ser 2006A due Sept 2012-2028, 2030, 2032, 2036 (Bond insurance provider: XL Capital Assurance)

**Rating/Outlook:** AAA insured, BBB-(SPUR)/Stable

**Debt amount:** \$53.44 mil sub rev bnds (Baltimore Hotel Corp.) ser 2006-B due Sept 2016, 2039

**Rating/Outlook:** AAA, BBB-/Stable

**Description:** The series 2006 bonds are being used to build a 756-room Hilton hotel in downtown Baltimore's inner harbor area, overlooking the Camden Yards baseball park and connected to the Baltimore Convention Center by a pedestrian bridge. The hotel will also include a 567-space parking garage. The hotel is expected to open in Aug 2008.

### **BBI (DBCT) Finance Pty. Ltd.**

**Sector:** Other

**Location:** Australia

**Debt amount:** A\$295 mil bank ln due Oct 2011

A\$200 mil fltg rate bnds due Dec 2022 (Bond insurance provider: FGIC UK Ltd.)

A\$350 mil fltg rate nts due Sept 2016 (Bond insurance provider: XL Capital Assurance Inc.)

A\$230 mil fltg rate nts due Sept 2021 (Bond insurance provider: XL Capital Assurance Inc.)

A\$100 mil fltg rate nts due Sept 2026 (Bond insurance provider: XL Capital Assurance Inc.)

**Rating/Outlook:** AAA/Stable

**Description:** The transaction provides finance for the Dalrymple Bay Coal Terminal, a well-established facility that is a critical and strategic part of the export-coal supply chain in Queensland's Bowen Basin Region. The terminal is currently undergoing the first phase of a three-phase expansion program that will ultimately take capacity from 60 to 80 million metric tons per year.

### **Bicent Power LLC**

**Sector:** Power

**Location:** Maryland, U.S.

**Debt amount:** \$120 mil sr secd 1st lien LOC bank ln due 2014

\$30 mil sr secd 1st lien revolv bank ln due 2014

\$330 mil sr secd 1st lien term bank ln due 2014

**Rating/Outlook:** BB-/Stable

**Debt amount:** \$130 mil sr secd 2nd lien term bank ln due 2014

**Rating/Outlook:** B-/Stable

**Description:** Bicent Power is a special-purpose, bankruptcy-remote operating company formed to acquire independent power producer Centennial Power Inc. and power plant operations and construction firm, Colorado Energy Management LLC (CEM). Centennial Power owns a power generation portfolio consisting of one coal facility (120 MW), one wind project (67 MW), and four gas-fired projects (416 MW) at five sites in Montana, California, Colorado, and Georgia. Lafayette, Col.-based CEM is a contract operations and construction company with operation and maintenance contracts with all four of Centennial Power's wholly owned thermal projects as well as with two other projects owned by third parties.

### **Bina-Istra d.d.**

**Sector:** Transport

**Location:** Croatia

**Debt amount:** €210 mil 8% callable bonds due Dec 2022

**Rating/Outlook:** BBB-/Stable

**Description:** Bina-Istra is the concession company that financed, designed, built and operates Phase 1B of the Istrian Motorway Project, a 145 km tolled motorway on the Istrian Peninsula in the Republic of Croatia. Phase 1B consists of three subphases, the first two of which were opened to traffic in June 2005. The third subphase was opened to traffic in Dec 2006. Bina-Istra has a concession agreement that expires in 2027.

### **Blue Water Bridge Authority**

**Sector:** Transport

**Location:** Ontario, Canada

**Debt amount:** C\$110 mil 6.41% amort rev bonds ser 2002-1 due July 2027

**Rating/Outlook:** AA-/Stable

**Description:** The Blue Water Bridge Authority is a federal nonguaranteed Crown corporation established in 1964 under the authority of the Blue Water Bridge Authority Act to operate and maintain the Canadian portion of the two-span Blue Water Bridge linking Sarnia, Ont., to Port Huron, Mich.

### **Borger Energy Associates L.P.**

**Sector:** Power

**Location:** Texas, U.S.

**Debt amount:** \$117 mil 1st mortgage bonds due 2022

**Rating/Outlook:** B+/Positive

**Description:** Borger is a 230 MW gas-fired cogeneration qualifying facility project that sells energy and capacity to Southwestern Public Service Co., a subsidiary of Xcel Energy Inc., under a 25-year power purchase agreement.

### **Boston Generating LLC**

**Sector:** Power

**Location:** Massachusetts, U.S.

**Debt amount:** \$370 mil sr 1st priority secd term bank ln

\$30 mil sr 1st priority secd LOC fac bank ln  
\$70 mil 1st priority secd synthetic working capital bank ln

\$30 mil sr 1st priority secd synthetic debt service reserved fac bank ln

**Rating/Outlook:** B/Stable

**Description:** Boston Gen owns three operating subsidiaries: Mystic Station, a 573 MW two-unit, dual-fired, power generating facility in Everett, Mass.; Mystic Development LLC with two 801 MW natural gas-fired combined-cycle facilities adjacent to the Mystic Station; and Fore River Development LLC, an 801 MW natural gas-fired combined-cycle plant in North Weymouth, Mass.

### **Broadcast Australia Finance Pty. Ltd.**

**Sector:** Other

**Location:** Australia

**Debt amount:** A\$190 mil bank ln due Jan 2011

**Rating/Outlook:** BBB/Stable

**Debt amount:** A\$450 mil fltg rate med-term nts due July 2019 (Bond Insurance Provider: Ambac Assurance Corp.)

\$A250 mil fltg rate med-term nts due July 2009 (Bond Insurance Provider: Ambac Assurance Corp.)

A\$150 mil fltg rate med-term nts due July 2012 (Bond Insurance Provider: Ambac Assurance Corp.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** Broadcast Australia is Australia's largest independent terrestrial broadcast transmission service provider. The company owns key radio and television transmission infrastructure covering 99% of Australia's population and provides fully managed transmission services for the government-owned broadcasters ABC and SBS nationally.

### **Brooklyn Navy Yard Cogeneration Partners L.P.**

**Sector:** Power

**Location:** New York, U.S.

**Debt amount:** \$100 mil 7.42% taxable debt secd bonds due Dec 2020

**Rating/Outlook:** BBB-/Negative

**Description:** Brooklyn Navy Yard Cogeneration is a 286 MW natural gas-fired cogeneration facility in Brooklyn, N.Y. that sells electricity and steam to Consolidated Edison Co. of New York Inc. The project represents an important power and steam generating resource and contributes about 13% of Con Ed's annual steam requirements and 6% of the utility's electricity.

### **California Petroleum Transport Corp.**

**Sector:** Transport

**Location:** California, U.S.

**Debt amount:** \$117.9 mil 8.52% first pfd mortgage notes due April 2015

**Rating/Outlook:** A-/Stable

**Description:** Three Suezmax oil vessels, owned indirectly by Frontline Ltd., operate under long-term charter to Chevron for 20 years. A fourth, single-hulled vessel previously chartered with Chevron is now chartered by a Frontline subsidiary for two years ending in April 2008.

### **Calpine Construction Finance Co. L.P.**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$415 mil fltg rate 2nd prior sr secd notes due Aug 2011

\$385 mil 1st prior secd instl term loan bank loan due 2009

**Rating/Outlook:** CCC+/Stable

**Description:** Calpine Construction Finance, a subsidiary of Calpine Corp., owns seven geographically diverse merchant natural gas combined-cycle generating plants with a capacity of 3,937 MW.



## Calpine Generating Co. LLC

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$600 mil fltg rate 1st priority  
secd term loan B bank ln due 2009

\$235 mil fltg rate 1st priority secd nts due  
April 2009

\$100 mil fltg rate 2nd priority secd term loan  
B bank ln due 2010

\$640 mil fltg rt 2nd priority secd nts due  
April 2009

\$150 mil 11.5% 3rd priority secd nts due  
April 2011

\$680 mil fltg rate 3rd priority secd nts due  
April 2011

**Rating/Outlook:** D/Watch Neg

**Description:** Calpine Corp. subsidiary, Calpine Generating (CalGen), owns and operates a geographically diverse portfolio of 14 gas-fired power plants operating in six different energy markets. CalGen owns and controls 9,820 MW of nominal capacity, of which 8,837 MW is base load and 983 MW is peaking capacity. CalGen owns 100% of all of the plant assets. With the completion of the Pastoria facility on May 5, 2005, all 14 facilities have reached commercial operation.

## Capital Hospitals (Issuer) PLC-Barts

**Sector:** Other

**Location:** U.K.

**Debt amount:** £250 mil EIB index-linked sr  
secd gtd bank ln due March 2041

(Guarantor: Ambac Assurance UK Ltd.,  
Financial Security Assurance (U.K.) Ltd.)

£1.03 bil sr secd gtd bnds due Sept 2046  
(Guarantor: Ambac Assurance UK Ltd.,  
Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA (prelim),  
BBB-(SPUR)/Stable

**Description:** The funds will be used to finance the design, construction, refurbishment, and operation of two inner London hospital sites, the Royal London Hospital and St. Bartholomew's Hospital. The hospitals have a total of 990 beds and both will remain operational throughout construction.

## Carbon County Industrial Development Authority (Panther Creek Partners)

**Sector:** Power

**Location:** Pennsylvania, U.S.

**Debt amount:** \$165 mil 6.7% tax-exempt  
resource recovery revenue refunding bonds  
ser 2000 due May 2012

**Rating/Outlook:** BBB-/Stable

**Description:** Panther Creek is an 86 MW anthracite waste coal-fired power-producing qualifying facility that sells power to Metropolitan Edison Co. under a 20-year fixed-price, must-take purchase-power agreement. Constellation Energy Group and El Paso Corp. equally own the project.

## Carretera Viaducto La Venta-Punta Diamante

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP215 million

**Rating/Outlook:** mxAA/Stable

**Description:** The toll road, located in Guerrero state, is 21 km long with four lanes (two each way). It has two toll plazas and four bridges. It has been operating since Feb 1993.

## Carreteras de Cuota Puebla

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP520 million 6.4% debt  
certificates ser ATLIXCB 04U due 2019  
(MxP275 mil guarantee by Banobras)

**Rating/Outlook:** mxAAA/Stable

**Description:** The Atlixcayotl toll road runs for 18 km between Atlixco and Puebla City in the State of Puebla. The toll road has two lanes in each direction and only one toll plaza near Puebla City. It has five booths, two in each direction plus one bidirectional booth.

### **Carreteras Ecatepec-Piramides y Armeria-Manzanillo**

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP1.94 bil 4.95% med-term nts ser ARMEC03U due May 2015 (Guarantor: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, BBB-(SPUR), mxAAA /Stable

**Description:** The Armeria-Manzanillo toll road is a 47 km highway in the State of Colima, and the Ecatepec-Piramides toll road is a 22.2 km highway located on Mexico City's northeast border.

### **Catalyst Healthcare (Manchester) Financing PLC**

**Sector:** Other

**Location:** U.K.

**Debt amount:** £175 mil EIB sr secd bank ln due Sept 2037 (Bond insurance provider: Ambac Assurance UK Ltd.)

£218.05 mil var rate due Sept 2040 (Bond insurance provider: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Negative

**Description:** The debt is being used to finance the design and construction of new and refurbished facilities for the U.K.-based Central Manchester and Manchester Children's University Hospitals National Health Service Trust. The project company, Catalyst Healthcare (Manchester) Ltd., has responsibility for providing maintenance and certain nonclinical services under a 38-year project agreement, including a 4.5-year construction program.

### **Catalyst Healthcare (Romford) Financing PLC**

**Sector:** Other

**Location:** U.K.

**Debt amount:** £100 mil EIB bank ln due Sept 2034 (Guarantor: Financial Security Assurance (UK) Ltd.)

£128.4 mil 2.984% bnds due Sept 2038 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** Catalyst is a project that is designing, building, and financing a new 859-bed acute care hospital in the London borough of Havering. Construction was completed in Oct 2006. Catalyst provides nonclinical services to the hospital and supplies, transfers, and maintains medical equipment service under a 36-year project agreement.

### **CE Casecnan Energy and Water Co. Inc.**

**Sector:** Power

**Location:** Philippines

US\$171.5 mil 11.95% sr secd notes ser B due Nov 2010

**Rating/Outlook:** BB-/Stable

**Description:** CE Casecnan Energy and Water, which is 85%-owned by MidAmerican Energy Holdings Co., is a combination water and 150 MW hydroelectric power project on the island of Luzon in the Philippines. The project sells power and water to the state-owned National Irrigation Administration.

### **Cedar Brakes I LLC**

**Sector:** Power

**Location:** New Jersey, U.S.

**Debt amount:** \$270.6 mil 8.5% (exchange offer) sr secd bnds due Feb 2014

**Rating/Outlook:** BBB-/Stable

**Description:** The project obtains electricity from El Paso Merchant Energy L.P. (EPM) under power-purchase agreements and then sells electric energy and capacity to Public Service Electric & Gas Co. under a long-term power purchase agreement. El Paso Corp. unconditionally guarantees EPM's obligations under the mirror power-purchase agreement between EPM and Cedar Brakes I.

### **Cedar Brakes II LLC**

**Sector:** Power

**Location:** New Jersey, U.S.

**Debt amount:** \$362.2 mil 9.875% (exchange offer) sr secd bnds due Sept 2013

**Rating/Outlook:** BBB-/Stable

**Description:** See Cedar Brakes I LLC.

### **CE Generation LLC**

**Sector:** Power

**Location:** Delaware, U.S.

**Debt amount:** \$400 mil 7.416% bonds due Dec 2018

**Rating/Outlook:** BB+/Stable

**Description:** The CE Generation project portfolio consists of 13 gas-fired and geothermal power projects with a total capacity of about 817 MW. Southern California Edison Co. purchases most of the power. MidAmerican Energy Holdings Co. and TransAlta Corp are equal owners.

### **Centragas-Transportadora de Gas de la Region Central de Enron Development & Cia. S.C.A.**

**Sector:** Pipelines

**Location:** Colombia

**Debt amount:** US\$172 mil 10.65% sr secd notes due 2010

**Rating/Outlook:** BB+/Stable

**Description:** Centragas operates a 578 km natural gas pipeline that runs from Ballena to Barrancabermeja, Colombia, and is a special-purpose entity of Arctas Capital and Paragon Assets that owns and operates a natural gas pipeline that it will eventually transfer to Transportadora de Gas del Interior S.A. E.S.P.

### **Central Nottinghamshire Hospitals PLC**

**Sector:** Other

**Location:** U.K.

**Debt amount:** £351.9 mil 1.8768% index-linked gtd secd bnd issue due Sept 2042 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The funds will be used to finance the design, construction, and maintenance of hospital facilities at three sites for the Sherwood Forest Hospitals NHS Trust and Mansfield District Primary Care Trust, under a 37.4-year private finance initiative concession agreement.

### **Central Valley Financing Authority**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$101.125 mil (Carson Ice-Generation project) bonds ser 1998 due July 2020 (Bond insurance provider: MBIA Insurance Corp.)

**Rating/Outlook:** AAA/Stable

**Description:** The 57 MW gas-fired combined cycle plant and a 42 MW gas-fired simple-cycle peaking plant project sell power to Sacramento Municipal Utility District under a tolling arrangement.

### Channel Link Enterprises Finance PLC

**Sector:** Transport

**Location:** U.K./France

**Debt amount:** £750 mil sec'd floating-rate nts due June 2042

€367 mil sec'd floating-rate nts due June 2041

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Debt amount:** £400 mil 6.34% sec'd nts due June 2046

€645 mil 5.89% sec'd nts due June 2041

£525 mil index-linked sec'd nts due 2050

€1.113 bil index-linked sec'd nts due 2050

**Description:** This transaction represents Eurotunnel S.A.'s refinancing plan. The refinancing reduces Eurotunnel's debt outstanding to £2.84 billion from £6.20 billion. Eurotunnel operates the Channel Tunnel between the U.K. and France under a concession granted by the U.K. and French governments until 2086. Eurotunnel's main activities consist of running its own shuttle services and renting out 50% of the tunnel's capacity to railway operators.

### Choctaw Generation L.P.

**Sector:** Power

**Location:** Mississippi, U.S.

**Debt amount:** \$236 mil 9.5% pass-thru ser B due June 2023

\$95 mil 8.368% pass-thru ser A due June 2023

**Rating/Outlook:** BBB-/Negative

**Description:** This 440 MW coal-fired plant sells power to the Tennessee Valley Authority network under a long-term power purchase and operating agreement. Tractebel Power Inc. owns 100% of Choctaw.

### Coffeyville Resources LLC

**Sector:** Oil and gas

**Location:** Kansas, U.S.

**Debt amount:** \$775 mil term B bank ln due Dec 2013

\$150 mil LOC facility bank ln due July 2010

\$150 mil revolving facility bank ln due Dec 2012

**Rating/Outlook:** B-/Watch Neg

**Description:** Coffeyville Resources LLC is a midsize, 100,000 barrel per day independent refiner in Coffeyville, Kan. In addition to the refinery, Coffeyville has an adjacent nitrogen fertilizer plant with a current annual capacity of 410,000 tons of ammonia and 655,000 tons of urea ammonium nitrate.

### Cogentrix Energy Inc.

**Sector:** Power

**Location:** North Carolina, U.S.

**Issuer Credit Rating:** BB-/Stable

**Debt amount:** \$355 mil 8.75% sr nts due Oct 2008 (Guarantor: Goldman, Sachs & Co.)

**Rating/Outlook:** A+/Stable/—

**Debt amount:** \$50 mil revolv credit fac bank ln due 2010

\$700 mil term B bank ln due 2012

**Rating/Outlook:** BB+/Stable

**Description:** Cogentrix owns and operates 21 electric generating facilities, located mostly throughout the U.S., with one asset in the Dominican Republic. Cogentrix's net ownership in these plants totals 4,000 MW. All of the cash flow from these projects is 100% contractual.

### Coletto Creek Power L.P.

**Sector:** Power

**Location:** Texas, U.S.

**Debt amount:** \$735 mil 7-year 1st lien term fac bank ln due 2013

\$60 mil working capital revolv credit fac bank ln due 2011

\$170 mil synthetic LOC fac bank ln due 2013

**Rating/Outlook:** B+/Stable

**Description:** Coletto Creek Power used the loans' proceeds to purchase the 632 MW coal-fired Coletto Creek plant in the Electric Reliability Council of Texas region from Coletto Creek WLE L.P. The plant will be Coletto Power's sole asset.

### Colowyo Coal Funding Corp.

**Sector:** Mining

**Location:** Wyoming, U.S.

**Debt amount:** \$192.8 mil coal contract rec bonds due Nov 2016

**Rating/Outlook:** BB/Negative

**Description:** The Colowyo transaction securitizes the coal production payments generated from three coal sales contracts between the Colowyo coal mine in Colorado and six electric utility coal purchasers: Tri-State Generation & Transmission Assoc., Salt River Project Agricultural Improvement and Power District, PacifiCorp, Platte River Power Authority, Public Service Co. of Colorado, and the city of Colorado Springs. The contract with Colorado Springs expired at the end of 2004.

### Colver Power Project (Pennsylvania Economic Development Authority)

**Sector:** Power

**Location:** Pennsylvania, U.S.

**Debt amount:** \$169 mil sr resource recovery bonds ser 2005F due 2018 (Bond insurance provider: Ambac Assurance Corp.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** Colver is a 111 MW generation facility that uses bituminous coal waste as fuel in a pyroflow circulating fluidized-bed boiler. The project sells power to a subsidiary of FirstEnergy Corp.

### Compania de Desarrollo Aeropuerto El Dorado S.A. (CODAD)

**Sector:** Transport

**Location:** Colombia

**Debt amount:** US\$116 mil 10.19% notes due May 2011

**Rating/Outlook:** BB+/Stable

**Description:** CODAD won a concession contract from the Republic of Colombia's AEROCIVIL, the operator of Colombian airports, to build and maintain a second runway, which opened in June 1998, at the El Dorado airport in Bogotá through 2015.

### Concesionaria Zonalta S.A. de C.V.

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP1.6 bil cert of debt due 2032

**Rating/Outlook:** mxAA/Stable

**Description:** The Santa Ana–Altar toll road is a 73 km highway with four lanes (two each way) and one tollbooth, located in the State of Sonora. The toll road is part of a larger system that crosses the state from the center to the western part of the state connecting Sonora with the state of Baja California.

### Confederated Tribes of the Warm Springs Reservation

**Sector:** Power

**Location:** Oregon, U.S.

**Debt amount:** \$50 mil hydroelec adj rate rev bonds (taxable auc rate secs) ser 2003 due Feb 2033

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The Confederated Tribes of the Warm Springs Reservation of Oregon acquired a 33% share (about 143 MW) of the Pelton-Round Butte project through the issuance of 30-year amortizing debt in Oct 2003. Portland General Electric owns 66.67% of the project and has a 50-year agreement to buy 100% of the project's output.

### Conproca S.A. de C.V.

**Sector:** Oil and gas

**Location:** Mexico

**Debt amount:** US\$370.3 mil 12% sr sec'd bonds due June 2010

**Rating/Outlook:** BBB/Stable

**Description:** Conproca is a Mexican special-purpose entity integrated by Siemens AG and SK Engineering & Construction Co. Ltd. that entered into a contract with the Mexican state-owned oil company, PEMEX, to develop, finance, and oversee the construction of the Cadereyta refinery.

### Consort Healthcare (Birmingham) Funding PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £25 mil sr sec'd EIB fxd rate variation fac bank ln due 2039 (Guarantor: Financial Guaranty Insurance Co.)

£225 mil sr sec'd EIB index-linked bank ln due 2039 (Guarantor: Financial Guaranty Insurance Co.)

£400 mil index-linked bnds due 2044 (Guarantor: FGIC UK Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The proceeds of the bonds and loan will be used to finance the design, construction, refurbishment, and operation of various health care facilities for the University Hospital Birmingham Foundation Trust and Birmingham and Solihull Mental Health Trust under a project agreement with a term of 40 years and two months, under a U.K. government private finance initiative program.

### Consort Healthcare (Mid Yorkshire) Funding PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £150 mil sr sec'd index-linked EIRD bank ln due June 2040 (Guarantor: Financial Guaranty Insurance Co.)

£221.2 mil 2.055% index-linked gtd sr sec'd bnds due June 2041 (Guarantor: FGIC UK Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The proceeds of the bonds will be on-lent to Consort Healthcare (Mid Yorkshire) Ltd. (ProjectCo.) to be used in financing the design, construction, refurbishment, and operation of two U.K. National Health Service health care facilities, Pinderfields General Hospital and Pontefract General Infirmary, for The Mid Yorkshire Hospitals NHS Trust under a 35-year project agreement as part of a U.K. government private-finance initiative program.

### Constructora Internacional de Infraestructura (CIISA)

**Sector:** Power

**Location:** Mexico

**Debt amount:** US\$452.4 mil syndicated bank facility due 2007

US\$230 mil bonds due May 2008

**Rating/Outlook:** BBB/Stable

**Description:** The CIISA project contemplates the construction of a hydroelectric generation facility with 750 MW capacity. Construction started April 2003 and as of Jan. 15, 2007, construction works reached about 94% completion. Comision Federal de Electricidad will purchase the power when the project achieves commercial operation.

### **Cordova Funding Corp.**

**Sector:** Power

**Location:** Illinois, U.S.

**Debt amount:** \$225 mil sr secd bnds ser A due 2019 (Guarantor: Cordova Energy Co. LLC)

**Rating/Outlook:** BB/Stable

**Description:** Cordova Funding is the funding vehicle that issued the rated debt and subsequently loaned the proceeds to its affiliate, Cordova Energy Company LLC, which is wholly owned by MidAmerican Energy Holdings Co. Cordova completed the 537 MW natural gas-fired, combined-cycle power plant in Rock Island County, Ill., in June 2001.

### **Corredor Sur (ICA Panama)**

**Sector:** Transport

**Location:** Panama

**Debt amount:** \$150 mil bnds due 2025

**Rating/Outlook:** BBB-/Stable

**Description:** Corredor Sur is a 19.8 km urban toll road that connects Panama City's downtown area with Tocumen International Airport. In 1995, the Panamanian government awarded ICA Panama a 30-year concession to build, maintain, and operate the toll road. ICA Panama's parent company is ICATECH Corp., which is in turn wholly owned by Empresas ICA S.A. de C.V., the largest engineering and construction company in Mexico, with significant experience in building, operating, and managing infrastructure facilities.

### **CountyRoute (A130) PLC**

**Sector:** Transport

**Location:** U.K.

**Debt amount:** £88 mil sr secd bank ln due 2024

**Rating/Outlook:** BBB/Stable

**Debt amount:** £5.5 mil sub secd mezzanine bank ln due 2024

**Rating/Outlook:** BB/Stable

**Description:** CountyRoute is a special-purpose, bankruptcy-remote entity indirectly wholly owned by Laing Investments Ltd. In Oct 1999, Essex County Council awarded CountyRoute a 30-year concession to design, build, finance, and operate the 15 km A130 shadow toll road. Construction has been completed successfully and the A130 was opened in two sections in 2002-2003.

### **Covanta Energy Corp.**

**Sector:** Power

**Location:** New Jersey, U.S.

**Debt amount:** \$650 mil term fac bank ln due 2014 (Guarantor: Covanta Holding Corp.)

\$320 mil funded letters of credit bank ln due 2014 (Guarantor: Covanta Holding Corp.)

\$300 mil revolving credit fac bank ln due 2013 (Guarantor: Covanta Holding Corp.)

**Rating/Outlook:** BB/Stable

**Description:** Covanta is the largest U.S. operator of waste-to-energy facilities processing about 10 million tons per year of waste and focusing on government-sponsored projects under long-term contracts. Covanta also has small independent power producers and water businesses and an international business made up of projects in China, the Philippines, Bangladesh, India, Italy, and Costa Rica.

### **Covanta Holding Corp.**

**Sector:** Power

**Location:** New Jersey, U.S.

**Debt amount:** \$325 mil 1% sr deb convertible due Feb 2027

**Rating/Outlook:** B/Stable

**Description:** See Covana Energy Corp.

### **Coventry & Rugby Hospital Co. PLC (CRM)**

**Sector:** Other

**Location:** U.K.

**Debt amount:** £407.2 mil var rate bonds due June 2040 (Guarantor: MBIA Assurance S.A.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** CRM, which is owned by Skanska BOT U.K. Ltd. (25%) and Innisfree Nominees Ltd. (75%), will design, construct, equip, and maintain a 1,212-bed acute hospital, a 130-bed mental health unit, and a clinical sciences building on the Walsgrave site of University Hospitals Coventry and Warwickshire National Health Service Trust and Coventry Primary Care Trust, in Coventry, U.K. After completion in 2007, CRH will provide facilities management services and lifecycle replacement for 35 years.

### **CRC Breeze Finance S.A. (Breeze Two Transaction)**

**Sector:** Power

**Location:** Germany, France

**Debt amount:** €300 mil 5.29% Class A amortizing nts due May 2026

**Rating/Outlook:** BBB/Stable

**Debt amount:** €50 mil 6.11% Class B sub nts due May 2026

**Rating/Outlook:** BB+/Stable

**Description:** Breeze Finance used the proceeds to make a loan to Breeze Two Energy GmbH & Co. and Eoliennes Sûroit SNC. Breeze Two and Eoliennes Sûroit were formed to acquire, build, own, and operate a portfolio of 39 wind farms with a nameplate capacity of 303.8 MW in Germany (Breeze Two) and 27.05 MW capacity in France (Eoliennes Sûroit).

### **Crockett Cogeneration, a California Limited Partnership**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$295 mil 5.869% sr secd nts due March 2025

**Rating/Outlook:** BBB-/Stable

**Description:** Crockett is a 240 MW natural gas-fired cogeneration qualifying facility that sells power to Pacific Gas and Electric Co. under the terms of a power-purchase agreement that expires in 2026 and steam under the terms of a sales agreement that also expires in 2026.

### **Darwin Cove Convention Centre Pty. Ltd.**

**Sector:** Other

**Location:** Australia

**Debt amount:** A\$45.56 mil amortizing nominal annuity bnds due Jan 2033

A\$45.56 mil amortizing CPI linked bnds due Jan 2033

**Rating/Outlook:** A-/Stable

**Description:** Darwin Cove Convention Centre Pty. Ltd.'s (DCCC) senior secured annuity bonds were purchased by Rembrandt Australia Trust 2007-1, repackaged, and on-sold as 'AAA' rated notes with the benefit of a credit wrap provided by Financial Guarantee Insurance Co. (AAA/Stable/—). DCCC has the concession to design, build, and operate a convention centre in Darwin for the Northern Territory of Australia. Almost all project revenue comes from a strong counterparty in the Northern Territory government. Honeywell Ltd. will provide facilities management services, backed by a \$10 million parent guarantee. Construction risk is fully wrapped by ABN AMRO.



### **DBNGP Finance Co. Pty Ltd.**

**Sector:** Pipeline

**Location:** Australia

**Debt amount:** A\$25 mil working capital fac due Oct 2006

Au\$380 mil tranche A syndicated fac due Oct 2007

Au\$350 mil capital expenditures fac due Oct 2007

Au\$500 mil tranche B syndicated fac due Oct 2009

**Rating/Outlook:** BBB/Stable

**Description:** The Dampier-to-Bunbury Natural Gas Pipeline (DBNGP) is Western Australia's key gas-transmission pipeline, connecting the extensive gas fields located offshore in the North West Shelf with the population centers and industry in the southwest of the state. DBNGP is 1,530 km long and consists of 10 compressor stations, 12 laterals, and a maximum average T1 capacity of about 550 terrajoules per day. DBNGP Trust has 100% ownership and guarantees the senior secured debt of DBNGP Finance Co. Pty Ltd.

### **Deer Park Refining L.P.**

**Sector:** Oil and gas

**Location:** Texas, U.S.

**Debt amount:** \$400 mil 6.47% sr notes due Dec 2008

**Rating/Outlook:** A/Stable

**Description:** Shell Oil Co. and PMI Norteamerica S.A. de C.V., a subsidiary of Petroleos Mexicanos, formed Deer Park Refining L.P. to own, operate, and upgrade the fuel refinery portion of Shell Oil's 1,600-acre integrated refinery and petrochemical facility in Deer Park, Texas. The refinery's crude processing capacity is 340,000 barrels per day (bpd), and its coking capacity is 88,000 bpd.

### **Delek & Avner, Yam Thethys Ltd.**

**Sector:** Oil and gas

**Location:** Israel

**Debt amount:** \$275 mil nts due Aug 2013

**Rating/Outlook:** BBB-/Stable

**Description:** The Israel-incorporated issuer's sole purpose is to issue the notes and lend the proceeds to three entities: Delek Drilling, Delek Investments, and Avner Oil (collectively the Delek Sponsors). The Delek Sponsors are all directly or indirectly held by the Israeli Delek Group Ltd. Along with a subsidiary of U.S.-based exploration and production company Noble Energy, Noble Energy Mediterranean Ltd., the joint venture owns and operates a gas production facility off the coast of Israel.

### **Denver Convention Center Hotel Authority**

**Sector:** Other

**Location:** Colorado, U.S.

**Debt amount:** \$356.7 mil convention ctr hotel sr rev rfdg bnds ser 2006A due Dec 2035

**Rating/Outlook:** AAA insured, BBB-(SPUR/Stable)

**Description:** The project is a 1,100-room headquarter hotel adjacent to the Colorado Convention Center located in downtown Denver, Colo. The hotel opened in Jan 2006. The full-service hotel has 75,000 square feet of meeting space but serves as the primary convention center hotel.

### **Discovery Education PLC**

**Sector:** Other

**Location:** Scotland

**Debt amount:** £103.8 mil 1.948% index-linked bnds incl £17 mil variation bnds due March 2037 (Guarantor: Ambac Assurance U.K. Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** Discovery Education PLC will use bond proceeds to fund the construction of six primary schools and two secondary schools on eight sites in the city of Dundee, in Scotland, under a 30-year private finance initiative agreement made with the Council on Feb. 19, 2007. Discovery Education will also provide specified hard and soft facilities management services at each of the schools.

### **DTE Energy Center LLC**

**Sector:** Power

**Location:** Michigan, U.S.

**Debt amount:** \$244 mil 7.458% sr sec'd bonds due 2024

**Rating/Outlook:** BBB/Watch Neg

**Description:** Bond proceeds were used to finance the purchase of a portfolio of utility assets from an affiliate of DaimlerChrysler AG. Concurrent with the purchase, the project entered into eight substantially similar utility services agreements with an affiliate of DaimlerChrysler, Utility Assets LLC, under which it provides utility support services at certain of DaimlerChrysler's North American manufacturing facilities.

### **East Coast Power LLC**

**Sector:** Power

**Location:** New Jersey, U.S.

**Debt amount:** \$193.5 mil 6.737% sr sec'd notes due March 2008

\$248 mil 7.536% sr sec'd notes due June 2017

\$184 mil 7.066% sr sec'd notes due March 2012

**Rating/Outlook:** BBB-/Stable

**Description:** East Coast Power owns interests in two gas-fired, combined-cycle cogeneration facilities in Linden, N.J. with aggregate capacity of 940 MW. The plant provides up to 645 MW to Consolidated Edison under a dispatchable power sales agreement.

### **Ecovias - Concessionaria Ecovias do Imigrantes S.A.**

**Sector:** Transport

**Location:** Brazil

**Debt amount:** BRL425 mil deb ser 3 due 2014

**Rating/Outlook:** brAA-/Stable

**Description:** Ecovias is a 176.8 km road system in the key state of São Paulo. It is one of the most important road systems in Brazil and one of the busiest commercial and tourist transportation corridors, linking the main industrial areas in the São Paulo Metropolitan Region to the largest port in Latin America, Santos. An average 30 million vehicles use the road annually.

### **Edison Mission Energy**

**Sector:** Power

**Location:** California, U.S.

**Issuer Credit Rating:** BB-/Stable

**Description:** Edison Mission Energy is an indirect, wholly owned subsidiary of Edison International. The company is an independent power producer with an ownership or leasehold interest in 20 operations power plants, of which the company's share of capacity was 9,407 MW as of May 2006.

### **Edison Mission Energy Funding Corp. (Big 4)**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$190 mil 7.33% bonds ser B due Sept 2008

**Rating/Outlook:** BB-/Stable

**Description:** Edison Mission Energy Funding is a funding vehicle that monetized the dividends from four gas-fired, cogeneration projects with a total capacity of 1,210 MW. Through the guarantors, Edison Mission Energy owns about 50% of the total capacity, or about 601 MW net.

### **Education Support (Enfield) Ltd. (ESL)**

**Sector:** Other

**Location:** U.K.

**Debt amount:** £17.86 mil fltg rate sr sec'd bank ln due Sept 2024

**Rating/Outlook:** A/Stable

**Description:** In March 1999, ESL entered into a 26.5-year project agreement with the London Borough of Enfield to design and build a secondary school with 1,290 student places and provide support services once completed. Construction was completed in Aug 2000, after which ESL began to provide facilities management services.

### **Elwood Energy LLC**

**Sector:** Power

**Location:** Illinois, U.S.

**Debt amount:** \$402 mil 8.159% sr sec'd bnds due July 2026

**Rating/Outlook:** BB+/Stable

**Description:** Elwood, a 1,409 MW merchant peaking power plant, sells power into the Reliability First Network, part of PJM, and is fully contracted through 2012 and partially through 2017. Elwood is owned by indirect subsidiaries of Dominion Resources Inc. (50%), J-Power North America Holdings Co. Ltd. (49.9%), and Peoples Energy Corp. (0.1%).

### **Entegra TC LLC**

**Sector:** Power

**Location:** Florida, U.S.

**Debt Amount:** \$30 mil 2nd lien sr sec'd revol' bank ln due 2012

\$450 mil 2nd lien sr sec'd term bank ln due 2014

**Rating:** B+/Stable

**Description:** Entegra owns two primary subsidiaries (Gila River Power L.P. and Union Power Partners L.P.), which own generation assets and guarantee the loans. Gila River is a 2,146 MW combined-cycle gas-turbine (CCGT) plant located at Gila Bend in Maricopa County, Ariz., that dispatches in the Arizona-New Mexico-South Nevada subregion of the Western Electricity Coordinating Council. Union is a 2,152 MW CCGT plant near El Dorado, Ark, that dispatches in the Entergy subregion of the Southeastern Electric Reliability Council.

### **ESI Tractebel Acquisition Corp.**

**Sector:** Power

**Location:** New Jersey/Massachusetts, U.S.

**Debt amount:** \$194 mil 7.99% sr sec'd bnds due Dec 2011

**Rating/Outlook:** BB/Stable

**Description:** ESI Tractebel is a project portfolio consisting of two cogeneration projects, Northeast Energy Associates (NEA) in Massachusetts generating 290 MW, and North Jersey Energy Associates (NJEA) in N.J. generating 275 MW. NEA sells electricity under five power-purchase agreements to Boston Edison Co., Commonwealth Electric Co., and New England Power Co. NJEA sells electricity under a single power purchase agreement to Jersey Central Power & Light Co. The project is 50%-owned by ESI Northeast Energy Acquisition Funding, a subsidiary of FPL Group, and 50% by Tractebel Power Inc.

### **ESI Tractebel Funding Corp.**

**Sector:** Power

**Location:** New Jersey/Massachusetts, U.S.

**Debt amount:** \$201 mil 9.32% sr sec'd nts due 2007

\$100 mil 9.77% sr sec'd nts due 2010

**Rating/Outlook:** BBB-/Stable

**Description:** See ESI Tractebel Acquisition Corp.

### **Excel Paralubes Funding Corp.**

**Sector:** Oil and gas

**Location:** Louisiana, U.S.

**Debt amount:** \$187 mil 7.125% sr notes due Nov 2011

\$250 mil 7.43% bonds due 2015

**Rating/Outlook:** A-/Stable

**Description:** Excel Paralubes is a 22,200 barrels per day lube base oil facility located adjacent to ConocoPhillips' Lake Charles, La., refinery. Excel Paralubes is owned by 50% general partners ConocoPhillips and FHR Lubricants LLC, which is an indirect wholly owned subsidiary of Koch Industries LLC.

### Exchequer Partnership PLC (No.1)

**Sector:** Other

**Location:** U.K.

**Debt amount:** £127.79 mil 3.582% index-linked bnds due Dec 2035 (Bond insurance provider: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA

**Description:** Under a U.K. government private finance initiative, the bond proceeds from Exchequer Partnership No.1 have been used to successfully complete the refurbishment of about 50% of the Grade II listed government offices in Great George Street (GOGGS) in 2002. The refurbished part of the building is now occupied by Her Majesty's Treasury (HMT) civil servants. Since July 2002, the Partnership has been providing services—including cleaning, catering, and security—to HMT. The remaining 50% of GOGGS has been refurbished by another project company under the private finance initiative, Exchequer Partnership (No.2).

### Exchequer Partnership PLC (No.2)

**Sector:** Other

**Location:** U.K.

**Debt amount:** £166 mil 5.396% bnds due July 2036 (Bond insurance provider: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB+(SPUR)/Stable

**Description:** See Exchequer Partnership PLC (No.1).

### Express Pipeline L.P.

**Sector:** Pipelines

**Location:** U.S. and Canada

**Debt amount:** US\$150 mil 6.47% sr sec'd nts due Dec 2011 (Guarantor: Platte Pipe Line Co., Sponsor: TransCanada Pipelines Ltd.)

**Rating/Outlook:** A-/Stable

**Debt amount:** US\$250 mil 7.39% sub sec'd nts due Dec 2017 (Guarantor: Platte Pipe Line Co., Sponsor: TransCanada PipeLines Ltd.)

**Rating/Outlook:** BBB-/Stable

**Description:** Express Pipeline is a 1,717-mile, batch-mode, crude-oil pipeline system runs from Hardisty, Alta., to Casper, Wyo., on the Express pipeline system, and then from Casper, Wyo., to Wood River, Ill., on the refurbished Platte pipeline system. A consortium of Kinder Morgan Inc.'s subsidiary Terasen Inc., Borealis Infrastructure Management Inc., acting on behalf of Ontario Municipal Employees Retirement System, and Ontario Teachers' Pension Plan equally hold one-third interest in the project.

### Fideicomiso Petacalco

**Sector:** Power

**Location:** Mexico

**Debt amount:** US\$308.9 mil 10.16% sr sec'd notes due Dec 2009

**Rating/Outlook:** BBB/Stable

**Description:** Petacalco is dual-fuel station that generates power from coal and fuel oil. The terminal of Lazaro Cardenas Industrial Port provides coal unloading, storage, mixing, and delivery services (through a conveyor system) to Comision Federal de Electricidad's 2,100 MW base load Petacalco power station.

### FirstLight Hydro Generating Co.

**Sector:** Power

**Location:** Connecticut, U.S.

**Debt amount:** \$320 mil sr sec'd bnds ser B due Oct 2026

**Rating/Outlook:** BB-/Stable

**Description:** See FirstLight Power Resources Inc.

## FirstLight Power Resources Inc.

**Sector:** Power

**Location:** Connecticut, U.S.

**Debt amount:** \$70 mil 1st lien revolv credit fac bank ln due Nov 2011

\$550 mil 1st lien term bank ln due Nov 2013

\$65 mil letter of credit fac bank ln due Nov 2013

**Rating/Outlook:** BB-/Stable

**Debt amount:** \$170 mil 2<sup>nd</sup> lien term bank ln due May 2014

**Rating/Outlook:** B-/Stable

**Description:** FirstLight Power is a wholly owned subsidiary of FirstLight Power Resources Holdings Inc., which, in turn, is owned by Energy Capital Partners I LP. FirstLight Power owns several subsidiaries: FirstLight Hydro Generating Co, FirstLight Power Resources Services LLC, FirstLight Power Resources Management LLC, and Mt Tom Generating Co LLC (Mt. Tom). FirstLight Hydro and Mt. Tom will own the generation assets. FirstLight Hydro will own a portfolio of almost 1,300 MW of generation assets and firm capacity in Connecticut and Massachusetts. These assets consist of two pumped storage facilities (1,109 MW), 11 conventional hydro stations (166 MW), and a gas turbine peaking unit (21 MW). Mt. Tom will own a coal-fired steam electric facility (146 MW) in western Massachusetts.

## FMG Finance Pty Ltd.

**Sector:** Other

**Location:** Australia

**Debt amount:** \$320 mil 10% nts due Sept 2013 (Guarantors: Fortescue Metals Group Ltd., Pilbara Infrastructure Pty. Ltd. (The), Pilbara Mining Alliance Pty. Ltd.)

\$1.08 bil 10.625% nts due Sept 2016 (Guarantors: Fortescue Metals Group Ltd., Pilbara Infrastructure Pty. Ltd. (The), Pilbara Mining Alliance Pty. Ltd.)

\$250 mil fltg rate nts due Sept 2011 (Guarantors: Fortescue Metals Group Ltd., Pilbara Infrastructure Pty. Ltd. (The), Pilbara Mining Alliance Pty. Ltd.)

€315 mil 9.75% sr secd nts due Sept 2013 (Guarantors: Fortescue Metals Group Ltd., Pilbara Infrastructure Pty. Ltd. (The), Pilbara Mining Alliance Pty. Ltd.)

**Rating/Outlook:** BB-/Watch Neg

**Description:** Note proceeds are being used to fund construction of a greenfield iron ore operation and associated infrastructure, including rail and port facilities in the Pilbara region of Western Australia. The project development involves the construction and operation of two iron ore mines (Cloud Break and Christmas Creek), producing an initial targeted 45 million tonnes per year, and construction and operation of rail and port facilities to transport and load the iron ore for shipment to customers in Asia.

### **FPL Energy American Wind LLC (American Wind)**

**Sector:** Power

**Location:** U.S.

**Debt amount:** \$380 mil sr sec'd notes due June 2023

**Rating/Outlook:** BBB-/Stable

**Description:** Seven wind power projects located in six states make up this project portfolio. Each project sells power to investment-grade offtakers under long-term contracts that provide revenues for energy production only. American Wind is indirectly owned by FPL Energy LLC, which is indirectly owned by FPL Group Inc.

### **FPL Energy Caithness Funding Corp.**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$150 mil 7.645% sr sec'd bnds due Dec 2018

**Rating/Outlook:** BBB-/Stable

**Description:** Two 80 MW net solar electricity-generating stations located in the Mojave Desert, Calif., sell power under standard offer no. 2 power purchase agreements with Southern California Edison Co. Indirect, wholly owned subsidiaries of FPL Energy LLC and Caithness Energy LLC own the project.

### **FPL Energy National Wind LLC**

**Sector:** Power

**Location:** U.S.

**Debt amount:** \$365 mil 5.608% sr sec'd bnds due March 2024

**Rating/Outlook:** BBB-/Stable

**Description:** National Wind is a portfolio of nine wind projects totaling 533.6 MW that operate at eight U.S. locations. National Wind is indirectly owned by FPL Energy LLC, which is indirectly owned by FPL Group Inc.

### **FPL Energy National Wind Portfolio LLC**

**Sector:** Power

**Location:** U.S.

**Debt amount:** \$100 mil 6.125% sr sec'd bnds due March 2019

**Rating/Outlook:** BB-/Stable

**Description:** See FPL Energy National Wind LLC, which distributes cash to FPL Energy National Wind Portfolio.

### **FPL Energy Wind Funding LLC**

**Sector:** Power

**Location:** U.S.

**Debt amount:** \$125 mil 6.876% sr sec'd bonds due June 2017

**Rating/Outlook:** BB-/Stable

**Description:** See FPL Energy American Wind, which distributes cash to FPL Energy Wind Funding.

### **FPL Virginia Funding Corp. (Doswell)**

**Sector:** Power

**Location:** Virginia, U.S.

**Debt amount:** \$435 mil 7.52% bonds due June 2019

**Rating/Outlook:** BBB-/Stable

**Description:** Doswell is a 708 MW four-unit, gas-fired, combined-cycle power and 171 MW peaking unit complex that sells power and energy under a long-term power purchase agreement to Virginia Electric & Power Co. The project is 100% owned by FPL Energy LLC, a wholly owned subsidiary of FPL Group Inc.

### **Gilroy Energy Center LLC**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$301.658 mil 4% sr sec'd nts due Aug 2011 (Bond insurance provider: Ambac Assurance Corp.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** Gilroy Energy owns and operates nine peaking power projects that came on line between Jan 2002 and May 2003. Gilroy Energy consists of 11 LM6000 gas turbines in different locations with a total capacity of 525 MW.

### **Golden Crossing Finance Inc.**

**Sector:** Transport

**Location:** Canada

**Debt amount:** C\$928.4 mil sr sec'd bank ln due March 2041 (Bond insurance providers: Ambac Assurance Corp.; XL Capital Assurance Inc.)

**Rating/Outlook:** AAA, BBB(SPUR)

**Description:** Golden Crossing Group will use net debt proceeds alongside the equity contribution to finance its design-build-finance-operate obligations to the Greater Vancouver Transportation Authority or TransLink for the Golden Ears Bridge (GEB) project. The GEB will connect the Township of Langley and the City of Surrey to the District of Maple Ridge and the District of Pitt Meadows, and the facility is planned to include about 13 km of new and upgraded roads and structures.

### **Golden State Petroleum Transport Corp.**

**Sector:** Other (deep sea foreign transportation of freight)

**Location:** Global

**Debt amount:** US\$127.1 mil 8.04% first pf'd mtg notes due Feb 2019

**Rating/Outlook:** BB+/Stable

**Description:** Golden State owns and operates two very large crude carriers that Chevron Transport Corp. charters under 18-year charters. Each 300,000 dead-weight-ton double-hulled tanker can carry 2 million barrels of crude oil. Frontline Ltd., a publicly listed Bermuda company, owns and manages the Golden State vessel-owning companies.

### **Green Country Energy LLC**

**Sector:** Power

**Location:** Oklahoma, U.S.

**Debt amount:** \$319 mil 7.21% sr sec'd notes due 2024

**Rating/Outlook:** BBB-/Stable

**Description:** Green Country is a 810 MW, natural gas-fired, combined-cycle plant located in Jenks, Okla. that sells power to Exelon Corp. under a long-term dependable capacity conversion services agreement. Green Country is in the process of being sold to J. Power USA Generation L.P., a joint venture between John Hancock Life Insurance Co. and J-Power USA Investment Co., Ltd.

### **GWF Energy LLC**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$226 mil 6.1% sr sec'd notes due Dec 2011

**Rating/Outlook:** BBB-/Stable

**Description:** GWF operates and maintains three peaking power plants in California, which have six units generating a total of 362 MW. GWF sells capacity and energy to the California Dept. of Water Resources under a master power purchase agreement. PSEG Global LLC, a wholly owned subsidiary of PSEG Energy Holdings Inc., owns 76% of the membership interests in the project, and Harbinger Independent Power Fund II LLC owns 24%.

### Healthcare Support (Newcastle) Finance PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £115 mil sr sec'd EIB bank ln due March 2038 (Bond insurance provider: XL Capital Assurance (U.K.) Ltd.)

£197.82 mil 2.187% sr sec'd bnds due Sept 2041 (Bond insurance provider: XL Capital Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The funds are being used to finance the design and construction of new facilities for the U.K.-based Newcastle Upon Tyne Hospitals National Health Service Trust. The project company, Healthcare Support (Newcastle) Ltd., will also provide maintenance and certain nonclinical services under a 38-year project agreement.

### Healthcare Support (North Staffs) Finance PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £154.59 mil sr sec'd index linked EIB bank ln due March 2039 (Guarantor: MBIA U.K. Insurance Ltd.)

£190.2 mil 2.067% index-linked gtd (incl £33 mil variation bnds) sr sec'd bnds due Feb 2043 (Guarantor: MBIA U.K. Insurance Ltd.)

**Rating/Outlook:** AAA (prelim), BBB-(SPUR)/Stable

**Description:** Healthcare Support (North Staffs) Ltd. will use the proceeds of the bonds and loan to finance the design, construction, and operation of health care facilities for the University Hospital of North Staffordshire NHS Trust and the Stoke on Trent Primary Care Trust under a project agreement with a term of 37 years and three months, under a U.K. government private finance initiative program. The project entails the design, development, and financing of a hub and spoke ward—resulting in an additional 540 beds, making a total of 1,000 bed facilities—and a diagnostic treatment center at the existing City General site. It also involves the construction of a 160-bed medical facility at Haywood through the construction of new facilities.

### Health Management (Carlisle) PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £75.8 mil 7.181% notes due Sept 2027 (Bond insurance provider: MBIA Assurance S.A.)

**Rating/Outlook:** AAA/Stable

**Description:** Health Management Carlisle (HMC) is a 474-bed district general hospital built for Carlisle Hospitals National Health Service Trust under the U.K. government's private finance initiative. Under a 45-year project agreement, HMC will provide maintenance and certain nonclinical facilities management services to Carlisle Trust. AMEC PLC and Building & Property Ltd. own HMC.

### Highway 407 International Inc.

**Sector:** Transport

**Location:** Ontario, Canada

**Corporate credit rating:** A/Stable/—

**Debt amount:** C\$4.127 bil sr sec'd debt

**Rating/Outlook:** A/Stable

**Debt amount:** C\$779.5 mil sub debt

**Rating/Outlook:** BBB/Stable

**Description:** 407 International is the sole shareholder, operator, and manager of the 407 express toll route, which is owned by a consortium that consists of the Canadian subsidiary of Cintra Concesiones de Infraestructuras de Transporte (co-owned by Grupo Ferrovial and Macquarie Infrastructure Group) and SNC-Lavalin Inc. The project is an all-electronic, open-access toll highway that extends 108 km east-west and is located just north of Toronto.



### Highway Management (City) Finance PLC

**Sector:** Transport

**Location:** U.K.

**Debt amount:** £61.4 mil sr secd EIB bank ln due 2034 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

£61.7 mil 1.609% bnds due Feb 2036 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The funds are financing the design, construction, operation, and maintenance of four complementary highway improvement schemes to the west of Belfast, in Northern Ireland. Together, these schemes represent Roads Service DBFO Package 1, the first of two DBFO highway initiatives to be advanced in the province by Roads Service, an executive agency of the Northern Ireland Department for Regional Development.

### Homer City Funding LLC

**Sector:** Power

**Location:** Pennsylvania, U.S.

**Debt amount:** \$300 mil 8.137% sr secd bonds due Oct 2019

\$575 mil 8.734% sr secd bonds due Oct 2026

**Rating/Outlook:** BB/Stable

**Description:** Homer City is a funding vehicle for the 1,884 MW, coal-fired Homer City plant, which is leased from a unit of General Electric Co. Edison Mission Energy indirectly owns Homer City.

### Hong Kong Link 2004 Ltd.

**Sector:** Transport

**Location:** Hong Kong

**Debt amount:** HK\$790 mil 4.28% tranche C nts due May 2011

HK\$800 mil 3.6% tranche B nts due May 2009

HK\$3.08 bil var rate Class A2 nts due May 2016

**Rating/Outlook:** AA/Positive

**Description:** The government raised HK\$6 billion by securitizing the future net revenue from its existing tolled facilities over a maximum period of 12 years. These six tolled facilities are vital to Hong Kong's transport network. Except for the Lantau Link, all of them have more than 10 years of operating history and have shown a stable traffic pattern over the past few years.

### Hovensa LLC

**Sector:** Oil and gas

**Location:** St. Croix, Virgin Islands

**Debt amount:** \$400 mil revolv bank ln due 2011 and obligor on \$356 million bonds issued by U.S. Virgin Islands and the Virgin Islands Public Finance Authority

**Rating/Outlook:** BBB/Stable

**Description:** Hovensa is a crude oil refinery that is 50% owned by a wholly owned subsidiary of Amerada Hess Corp. and 50% by a wholly owned subsidiary of Petroleos de Venezuela S.A.

### Indiantown Cogeneration Funding Corp./Indiantown Cogen L.P.

**Sector:** Power

**Location:** Florida, U.S.

**Debt amount:** \$505 mil taxable (Indiantown Cogeneration Project) 1st mtg bnd due Dec 2020

**Rating/Outlook:** BB+/Watch Neg

**Description:** The project, which is 100% owned by Indiantown Cogeneration L.P., is a 330 MW, pulverized coal-fired cogeneration facility located in Martin County, Fla. Florida Power & Light Co. purchases the power under a long-term power purchase agreement.

### Independence County Hydroelectric

**Sector:** Power

**Location:** Arkansas, U.S.

**Debt amount:** \$29.3 mil power rev bnds due 2028 (Guarantor: ACA Financial Guaranty Corp.)

**Rating/Outlook:** A, BB+(SPUR)/Stable

**Description:** Independence County Hydroelectric is an 11.1 MW hydroelectric project consisting of three run-of-river hydroelectric power generation facilities, to be installed in existing lock and dam structures on the White River. The project has a must-take power purchase agreement with the City of Clarksville, Ark. for 32 years. Independence County has used the proceeds of the bond offering to build the facility, which is under construction.

### InspirED Education (South Lankshire) PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £352.25 mil 2.0854% index-linked bnds due Sept 2038 (Guarantor: XL Capital Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The funds are being used to design, build, finance, and operate a range of facilities to support the South Lanarkshire Secondary Schools project, under a U.K. government private-finance initiative. The scope of the project consists of 17 project facilities, encompassing 19 secondary schools in the Lanarkshire region of Scotland (two of which are refurbishment projects only). The project will operate under a 33-year concession, ending Aug. 31, 2039. The construction period has three phases, which are scheduled for completion in the second halves of 2007, 2008, and 2009, respectively.

### Integrated Accommodation Services PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £406.9 mil 6.48% sec'd bonds due March 2029 (Bond insurance provider: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, A(SPUR)/Stable

**Description:** Under the private finance initiative, this project financed the design and construction of the new government communications headquarters accommodation facilities for the U.K. Secretary of State for the Foreign and Commonwealth Office. Integrated Accommodation Services will also provide certain facilities management and maintenance services under a 30-year project agreement. The facility has been operational since Oct 2003.

### **International Power PLC**

**Sector:** Power

**Location:** U.K.

**Issuer Credit Rating:** BB-/Positive/—

**Description:** International Power has generation assets in five geographical areas, Europe, North America, Asia, Australia, and the Middle East, consisting mainly of hydro, coal, and gas-fired generation. In addition, the company retains interests in heat capacity, desalination, and a gas pipeline.

### **Itá Energética S.A.**

**Sector:** Power

**Location:** Brazil

**Debt amount:** BrR168 mil debs

**Rating/Outlook:** brA/Stable

**Description:** Itá is an independent power producer that, jointly with Tractebel Energia S.A., has the concession until 2030 to exploit the Itá Hydroelectric plant with a nominal capacity of 1,450 MW. Itá's sponsors, Tractebel (48.75% stake), Companhia Siderúrgica Nacional (48.75%), and Cia de Cimento Itambé (2.50%), are also the power offtakers of its energy output until the end of concession.

### **Itapebi Geração de Energia S.A.**

**Sector:** Power

**Location:** Bahia, Brazil

**Debt amount:** BrR242.9 mil deb due 2017

**Rating/Outlook:** brAA-/Stable

**Description:** Itapebi is a 450MW hydroelectric power plant, located in the south of the state of Bahia. In 1999, the company granted a 35-year concession to build and operate the power plant. It has a 14-year power purchase agreement) with sister company Coelba for its total assured energy of 1,721 GWh.

### **Juniper Generation LLC**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$206 mil 5.04% sr seed nts due Dec 2014

**Rating/Outlook:** BBB-/Stable

**Description:** Juniper Generation is a holding company that owns interests in a portfolio of 10 cogeneration facilities with a combined capacity of 661 MW. Nine of the projects sell power to Pacific Gas & Electric Co., and one sells power to Southern California Edison Co.

### **Kern River Funding Corp.**

**Sector:** Pipelines

**Location:** Texas, U.S.

**Debt amount:** \$830 mil 4.9% sr seed notes due April 2018

\$486 mil 6.676% sr notes due July 2016

**Rating/Outlook:** A-/Watch Neg

**Description:** Kern River is the funding vehicle for Kern River Gas Transmission Co., the general partnership that owns and operates a 1,678-mile, interstate natural-gas pipeline from Opal, Wyo., to Bakersfield, Calif.

### **KGen LLC**

**Sector:** Power

**Location:** Georgia, U.S.

**Debt amount:** \$200 mil term B bank ln due 2014

\$120 mil synthetic loc fac bank ln due 2014

\$80 mil revolv cred fac bank ln due 2012

**Rating/Outlook:** BB/Stable

**Description:** KGen generates cash flow through ownership of five natural gas-fired power plants totaling 3,030 MW in the southeastern U.S.

### **Kincaid Generating LLC**

**Sector:** Power

**Location:** Chicago, U.S.

**Debt amount:** \$265 mil 7.33% sr secd bonds due June 2020

**Rating/Outlook:** BBB-/Stable

**Description:** Kincaid is a 1,108 MW coal-fired plant that is owned by Dominion Energy Inc., a wholly owned subsidiary of Dominion Resources Inc., and Dominion Kincaid Inc., a wholly owned subsidiary of Dominion Energy. Exelon Corp. purchases capacity and associated electric energy from the facility under a power purchase agreement with an original term of 15 years beginning Feb 1998. After the 15 years, Kincaid will convert to a merchant power plant.

### **Kiowa Power Partners LLC**

**Sector:** Power

**Location:** Oklahoma, U.S.

**Debt amount:** \$281 mil 5.737% sr secd bnds due March 2021

\$361 mil 4.811% sr secd bnds due Dec 2013

**Rating/Outlook:** BBB-/Stable

**Description:** Kiowa used the bond proceeds to provide long-term financing for its 1,220 MW, combined-cycle, gas-fired power plant. The project sells capacity and energy under an 18-year electricity manufacturing agreement with Coral Power LLC.

### **La Paloma Generating Co. LLC**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$40 mil 1st lien synthetic LC fac bank ln

\$65 mil 1st lien sr secd working cap fac bank ln

\$244 mil 1st lien term B bank ln due 2012

\$21 mil delayed draw 1st lien term B bank ln due 2012

**Rating/Outlook:** BB-/Negative

**Debt amount:** \$155 mil 2nd lien term C bank ln due 2013

**Rating/Outlook:** B-/Negative

**Description:** La Paloma Generating used about \$583 million of loan proceeds and third-party equity infusions to acquire a 1,022 MW combined-cycle, natural gas-fired power plant near McKittrick, Calif. The plant has been in service since March 2003. The project's owner, Complete Energy Holdings LLC, announced that it sold its interest in the project to a wholly-owned subsidiary of KGen Power Corp. in June 2007.

### **Lane Cove Tunnel Finance Co.**

**Sector:** Transport

**Location:** Australia

**Debt amount:** A\$1.14 bil gtd secured bonds due 2013–2028 (Bond insurance provider: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** This project consists of the construction, operation, and maintenance of the Lane Cove Tunnel project and associated road works in Sydney under an approximately 33-year project deed with the Roads and Traffic Authority of the New South Wales government.

### Libramiento de Matehuala

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP550 mil 5% med-term nts due Dec 2032 (Guarantor: XL Capital Assurance Inc.)

**Rating/Outlook:** AAA, mxAAA/Stable

**Description:** Matehuala's bypass is located in the main freight transportation corridor of Mexico in the State of San Luis Potosi. The 14.2 km bypass is part of the San Luis Potosi-Salttillo highway. Construction of the bypass began in Oct 2003 and was opened in Nov 2004.

### Libramiento Plan del Rio

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP320 mil 7% sr debt certificates due 2020

**Rating/Outlook:** mxAAA/Stable

**Debt amount:** MxP180 mil 10% sub debt certificates due 2030

**Rating/Outlook:** mxBBB/Stable

**Description:** Plan del Rio bypass is located in the State of Veracruz. It is 12.97 km long and connects the Gulf of Mexico's major port (Veracruz) with the city of Xalapa. This bypass concludes the four-lane toll road from the port to the city. It opened in June 2004.

### Lombard Public Facilities Corp.

**Sector:** Other

**Location:** Illinois, U.S.

**Debt amount:** \$54 mil conference ctr & hotel first tier rev bnds ser 2005A-2 due Jan 2036 (Bond insurance provider: ACA Financial Guaranty Corp.)

**Rating/Outlook:** A insured, BB-(SPUR)/Stable

**Description:** The village of Lombard, Ill. built a hotel and conference center on a 6.7-acre portion of Yorktown Mall. The hotel opened in Aug 2007. Westin Management Co. manages the 500-room hotel. Hark Lombard LLC will manage the 63,500 square-foot conference center.

### Longview Power LLC

**Sector:** Power

**Location:** West Virginia, U.S.

**Debt amount:** \$300 mil term B bank ln due 2014

\$350 mil delayed draw bank ln due 2014

\$100 mil synthetic L/C bank ln due 2014

\$100 mil revolv bank ln due 2013

\$250 mil construction fac (w/ term conversion) bank ln due 2014

**Rating/Outlook:** BB/Stable

**Description:** Longview will build a single-unit 695 MW (net) supercritical, pulverized coal-fired electric generating facility in Monongalia County, W.Va. The project is sponsored by GenPower Holdings L.P., a joint venture that is 10% owned by GenPower LLC, a power project developer, and 90% owned by First Reserve Fund XI L.P., a \$7.8 billion private equity fund sponsored by First Reserve Corp..

### LoyVic Pty Ltd. (Loy Yang B)

**Sector:** Power

**Location:** Australia

**Debt amount:** A\$490 mil bank ln due 2012

A\$617 mil bank ln due 2017

**Rating/Outlook:** BBB/Stable

**Description:** IPM Australia Ltd. and LoyVic Pty. Ltd. are the financing and trading vehicles for the Loy Yang B power station project, domiciled in Victoria, Australia. The project is a 2x500 MW brown coal-fired thermal power plant in the Latrobe Valley, about 160 km southeast of Melbourne.

### LS Power Acquisition Co. I LLC

**Sector:** Power

**Location:** Minnesota/Wisconsin, U.S.

**Debt amount:** \$150 mil 1st lin revolving credit fac bank ln due 2013

\$165 mil 1st lien LOC bank ln due 2014

\$700 mil 1st lien term bank ln due 2014

**Rating/Outlook:** BB-(prelim)/Stable

**Debt amount:** \$300 mil 2nd lien term bank ln due 2014

**Rating/Outlook:** B(prelim)/Stable

**Description:** The proposed \$1.315 billion debt issuance will be used to finance LS Power Equity Partners LLC's acquisition of six gas-fired power-generation facilities that Mirant Corp. (B+/Watch Neg/—) previously owned and operated. The asset sale follows Mirant's announced intention to focus on its core markets in the Mid-Atlantic and Northeast regions and in California. The assets represent 3,736 MW of capacity, of which 52% are combined-cycle intermediate load facilities and the remaining 48% simple-cycle peaking assets.

### LS Power Funding Corp.

**Sector:** Power

**Location:** Minnesota/Wisconsin, U.S.

**Debt amount:** \$226.449 mil 8.08% bonds ser A due Dec 2016

\$105.551 mil 7.19% bonds ser A due June 2010

**Rating/Outlook:** BBB/Stable

**Description:** Owned by LSP-Cottage Grove L.P. and LSP-Whitewater L.P., the two 245 MW gas-fired cogeneration plants sell electricity to Northern States Power Co. and Wisconsin Electric Power Co. under long-term contracts.

### LSP Batesville Funding Corp./LSP Energy L.P.

**Sector:** Power

**Location:** Mississippi, U.S.

**Debt amount:** \$150 mil 7.164% sr sec'd bonds ser A due Jan 2014

\$176 mil 8.16% sr sec'd bonds ser B due July 2025

**Rating/Outlook:** B+/Stable

**Description:** Previously owned by Complete Energy, the 850 MW gas-fired power plant is being sold to KGen LLC. The plant sells electricity to SMEPA and J. Aron under two long-term contracts.

### M6 Duna Autopalya Koncessios Zartkoruen Mukodo Eszvenytarsasag

**Sector:** Transport

**Location:** Hungary

**Debt amount:** €200 mil sr sec'd EIB bank ln due 2024 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

€212 mil fltg rate gtd send nts due March 2025 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA/Stable

**Description:** Hungary's government granted a 22-year concession to M6 Duna to design, finance, build, operate, and maintain the second section of the M6 motorway. The 58 km section stretches from Erdi-teto to Dunajvaros, at which point it intersects with the planned M8 motorway.

### **MACH Gen LLC**

**Sector:** Power

**Location:** New York, U.S.

**Debt amount:** \$580 mil 1st lien term B bank  
ln due 2014

\$60 mil 1st lien synthetic LC fac bank ln  
due 2013

\$100 mil 1st lien working capital fac bank ln  
due 2014

**Rating/Outlook:** B+/Stable

**Description:** MACH Gen owns a 3,600 MW portfolio of four gas-fired combined-cycle power plants in New York, Michigan, Arizona, and Massachusetts. MACH Gen was formed by the lenders in the wake of National Energy Group's 2002 bankruptcy.

### **Maritimes & Northeast Pipeline LLC**

**Sector:** Pipelines

**Location:** U.S.

**Debt amount:** \$240 mil 7.7% bonds due  
Nov 2019

**Rating/Outlook:** A-/Watch Neg

**Description:** Owned by affiliates of Duke Energy Corp., Exxon Mobil Corp., and Emera Inc., Maritimes & Northeast Pipeline LLC and Maritimes & Northeast Pipeline L.P. are the owners of the U.S. and Canadian portions, respectively, of a \$1.2 billion pipeline that transports 530 million cubic feet per day of natural gas from the Sable Island area to markets in Atlantic Canada and the northeastern U.S. Maritimes & Northeast Pipeline LLC consists of a 330-mile extension from Baileyville, Maine to various points in Massachusetts.

### **Maritimes & Northeast Pipeline L.P.**

**Sector:** Pipelines

**Location:** Canada

**Debt amount:** C\$260 mil 6.9% notes due  
Nov 2019

**Rating/Outlook:** A/Stable

**Description:** See Maritimes & Northeast Pipeline LLC above. Maritimes & Northeast Pipeline L.P. consists of a 670-mile pipeline that extends from Goldboro, Nova Scotia to the U.S.-Canadian border near Baileyville, Maine.

### **Massachusetts Development Finance Agency (SEMASS)**

**Sector:** Power

**Location:** Massachusetts, U.S.

**Debt amount:** \$118 mil resource recovery  
revenue bonds ser 2001B due Jan 2009

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** Majority owned by a subsidiary of American Ref-Fuel Co. LLC, the SEMASS facility processes 1.1 million tons of waste and sells in excess of 600,000 megawatt-hours of electricity per year to Commonwealth Electric Co.

### **Max Two Ltd. (Breeze One Transaction)**

**Sector:** Power

**Location:** Germany, Portugal

**Debt amount:** €100 mil 5.7% (Breeze One) amort bnds due Sept 2024

**Rating/Outlook:** BBB-/Negative

**Description:** Max Two is a special-purpose vehicle that raised funds for the Breeze One wind power financing transaction. Max Two has no operating assets and its shares are owned by Max Two Trust, a charitable trust. Debt proceeds were used to provide senior loans to a number of wind parks in Germany and Portugal and, through an escrow account providing about €5.7 million (\$7.4 million) of collateralized subordinated debt, various wind parks or finance repowering measures.

### **Metronet Rail SSL Finance PLC and Metronet Rail BCV Finance PLC**

**Sector:** Transport

**Location:** U.K.

**Debt amount:** £515 mil fixed/index-linked bonds due March 2032 (Guarantors: Ambac Assurance UK Ltd. and Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BB+(SPUR)/Negative

**Debt amount:** £810 mil bank loan due 2030

**Rating/Outlook:** BBB/Negative

**Description:** The two entities are part of the Metronet consortium responsible for the operation, maintenance, and upgrade of the Bakerloo, Central, and Victoria lines, as well as the District, Circle, Metropolitan, Hammersmith & City, and East London Underground lines under a long-term private/public partnership agreement.

### **Metropolitan Biosolids Management LLC**

**Sector:** Other

**Location:** Illinois, U.S.

**Debt amount:** \$53.4 mil tax-exempt rev bnds due 2023

**Rating/Outlook:** BBB/Stable

**Description:** Metropolitan Biosolids is a special-purpose entity formed to build an inside-the-fence facility that processes wastewater sludge generated by the Metropolitan Water Reclamation District of Greater Chicago. The fatalities in June 2007 of two construction workers have further delayed the project.

### **MGTI Finance Co. Ltd.**

**Sector:** Other

**Location:** Indonesia

**Debt amount:** \$145 mil 8.375% nts due Sept 2010 (Guarantors: MGTI Global Finance B.V.; Mitra Global Telekomunikasi Indonesia (P.T.))

\$20 mil 9% nts due Jan 2011 (Guarantors: MGTI Global Finance B.V.; Mitra Global Telekomunikasi Indonesia (P.T.))

\$105 mil 7% nts due 2007 (Guarantors: MGTI Global Finance B.V.; Mitra Global Telekomunikasi Indonesia (P.T.))

**Rating/Outlook:** B+/Stable

**Description:** MGTI has a fixed-line telecom network in the Central Java area (known as KSO IV) and has assigned all of its exclusive operating rights to state-owned PT Telekomunikasi Indonesia Tbk. (BB+/Stable/—), under an amended joint operating agreement that expires Dec. 31, 2010. Telkom, in turn, has agreed to make fixed U.S. dollar monthly payments to MGTI at a predetermined rate and schedule.



### Midwest Generation LLC

**Sector:** Power

**Location:** Illinois, U.S.

**Debt amount:** \$500 mil revolv bank ln due 2012

\$813.5 mil 8.56% pass thru cert lse oblig ser B due Jan 2016 (Guarantor: Edison Mission Energy)

\$333.5 mil 8.3% pass thru cert lse oblig ser A due July 2009 (Guarantor: Edison Mission Energy)

**Rating/Outlook:** BB+/Stable

**Description:** Indirectly wholly owned by Edison Mission Energy, Midwest Generation owns or leases 9,218 MW of baseload, mid-merit, and peaking capacity in the Mid-American Interconnected Network region.

### Mirant Corp.

**Sector:** Power

**Location:** Georgia, U.S.

**Issuer Credit Rating:** B+/Watch Neg/—

**Description:** Mirant has interests in 10,301 MW of electric generation capacity in the U.S. The company recently sold all international operations.

### Monterrey Power S.A. de C.V.

**Sector:** Power

**Location:** Mexico

**Debt amount:** \$235.2 mil 9.625% sr secd bonds due Nov 2009

**Rating/Outlook:** BBB/Stable

**Description:** Owned by ABB Energy Ventures and Nissho Iwai Corp., Monterrey Power is a special-purpose entity that has entered into a trust agreement to build a dual-fired (natural gas and diesel) plant in exchange for payments from the Comision Federal de Electricidad.

### MPC Funding Ltd.

**Sector:** Infrastructure

**Location:** Australia

**Debt amount:** A\$50.5 mil var rate CPI indexed annuity bnds due Dec 2025 (Bond insurance provider: Financial Security Assurance Inc.)

A\$141.1 mil var rate CPI indexed annuity bnds due Dec 2033 (Bond insurance provider: Financial Security Assurance Inc.)

A\$152.4 mil var rate nominal indexed annuity bnds due Dec 2033 (Bond insurance provider: Financial Security Assurance Inc.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The project involves the design, construction, and financing of a new 5,000-seat Melbourne convention center, associated works, and ongoing facilities management for the state of Victoria under a 25-year concession. Completion is expected by the end of Dec 2008. Upon commercial acceptance of the works, the project will also be responsible for maintaining an adjoining existing (and operating) exhibition center and its 1,050 car-park spaces.

### NewHospitals (St. Helens and Knowsley) Finance PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £149.2 mil index-linked sr secd EIB bank ln due June 2038 (Bond insurance provider: Financial Security Assurance (U.K.) Ltd.)

£178.3 mil index-linked bnds due Feb 2047 (Bond insurance provider: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The funds are being used to finance the design, construction, and maintenance of hospital facilities at two sites for the St. Helens and Knowsley Hospital Trust, under a 41.23-year private-finance initiative concession agreement.

### **Northeast Biofuels LLC**

**Sector:** Oil and gas

**Location:** New York, U.S.

**Debt amount:** \$140 mil sr sec'd 1<sup>st</sup> lien term B bank ln due 2013

**Rating/Outlook:** B+/Stable

**Description:** Northeast Biofuels is building an ethanol facility in Fulton, N.Y., with a nameplate capacity of 100 million gallons per year (mmgpy), which is expected to ramp up to 114 mmgpy within two years of operations. The project is in Riverview Business Park, on the site of a former brewery, and will use certain existing structures, infrastructure, and tanks. Construction is scheduled to be completed by Dec. 31, 2007.

### **Northampton Generation Co. L.P. (Pennsylvania Economic Development Authority)**

**Sector:** Power

**Location:** Pennsylvania, U.S.

**Debt amount:** \$25 mil 7.88% sr taxable conv ser 1994 B due Jan 2007

\$153 mil tax exempt ser 1994 A Jan 2019

**Rating/Outlook:** B+/Negative

**Description:** Northampton is a 112 MW waste coal-fired generation facility that sells its entire electric output to Metropolitan Edison Co. under a 25-year, must-take power-purchase agreement.

### **NRG Energy Inc.**

**Sector:** Power

**Location:** Minnesota, U.S.

**Issuer Credit Rating:** B+/Stable/B-2

**Description:** NRG Energy owns and operates U.S. merchant power generating facilities, thermal production and resource recovery facilities, and various international independent power producers.

### **NRG Peaker Finance Co. LLC**

**Sector:** Power

**Location:** Louisiana/Illinois, U.S.

**Debt amount:** \$325 mil fltg rate sr sec'd bonds ser A due June 2019 (Bond Insurance Provider: XL Capital Assurance Inc.)

**Rating/Outlook:** AAA/Stable

**Description:** NRG Peaker Finance is a wholly owned subsidiary of NRG Energy Inc. and was formed to offer bonds for a portfolio of five peaker power plants totaling 1,319 MW.

### **NSG Holdings LLC**

**Sector:** Power

**Location:** Texas, U.S.

**Debt amount:** \$32.5 mil sr sec'd synthetic L/C bank ln due June 2014

\$286 mil sr sec'd term bank ln due June 2014  
\$514 mil 7.75% sr sec'd nts due Dec 2025  
(Co-issuer: NSG Holdings Inc.)

**Rating:** BB(prelim)/Stable

**Description:** NSGH is a wholly owned subsidiary of Northern Star Generation LLC that owns or has beneficial interest in 12 electric generation facilities having a combined capacity of about 2,100 MW (gross) or about 1,451 MW (net). The facilities are located in five states, 10 of the assets are qualifying facilities, and two operate as exempt wholesale generators. All of the assets currently have power-purchase agreements or tolling agreements over the life of the debt from 2007–2025.

### **Octagon Healthcare Funding Corp.**

**Sector:** Healthcare

**Location:** U.K.

**Debt amount:** £341.23 mil 5.333% bonds due Dec 2035 (Bond insurance provider: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** This entity's debt is being used to fund the construction of the Norfolk and Norwich University Hospital.

### **Oleoducto Central S.A. (OCENSA)**

**Sector:** Pipelines

**Location:** Colombia

**Debt amount:** \$650 mil 9.66% sr debt tranche A credit fac bank ln

**Rating/Outlook:** BB+/Stable

**Description:** OCENSA is a capital stock company formed to acquire, develop, own, and operate the 840 km Oleoducto Central pipeline, which transports crude oil from the Cupiagua and Cusiana oil fields in Colombia's Llanos Basin to the port of Covenas.

### **Oleoducto de Crudos Pesados**

**Sector:** Pipelines

**Location:** Ecuador

**Debt amount:** \$900 mil bank ln due July 2016

**Rating/Outlook:** BBB/Stable

**Description:** The project is an integrated, blended stream, heavy crude oil pipeline system to transport crude oil about 500 km from production areas running from the Amazonas Oil Terminal in the Oriente Basin of eastern Ecuador to the export facilities on the Pacific coast near Esmeraldas.

### **Orange Cogen Funding Corp.**

**Sector:** Power

**Location:** Florida, U.S.

**Debt amount:** \$110 mil 8.175% sr sec'd bonds due March 2022

**Rating/Outlook:** BBB-/Stable

**Description:** Orange Cogen is a 103 MW gas-fired cogeneration facility owned by indirect subsidiaries of El Paso Corp. and American Electric Power Co. Inc.

### **Paiton Energy Funding B.V.**

**Sector:** Power

**Location:** Indonesia

**Debt amount:** \$180 mil 9.34% bnds due Feb 2014 (Guarantor: Paiton Energy Co. (P.T.))

**Rating/Outlook:** B/Stable

**Description:** This 2x615 MW coal-fired plant, composed of units seven and eight of the Paiton power-generating complex, sells electricity to PT Perusahaan Listrik Negara under a long-term contract.

### **Peterborough (Progress Health) PLC**

**Sector:** Healthcare

**Location:** U.K.

**Debt amount:** £7.52 gtd swap fac due Sept 2042 (Guarantor: FGIC UK Tld.; Swap

Guarantor: ABN AMRO Bank N.V.)

£14.5 mil gtd liq fac due Sept 2042 (Guarantor: FGIC UK LTD.)

£7.25 mil gtd change in law fac due March 2037 (Guarantor: FGIC UK Ltd.)

£442.8 mil (incl £50 mil var bnds) fixed rate gtd bnds due Oct 2042 (Guarantor: FGIC UK Ltd.)

**Rating/Outlook:** AAA(prelim), BBB-(SPUR)/Stable

**Description:** The project will use bond proceeds to implement the Greater Peterborough Health Investment Plan, which involves a significant development of the existing Edith Cavell Hospital site on the outskirts of Peterborough, and a smaller development on the existing Peterborough District Hospital in central Peterborough. All existing buildings on both sites will be demolished and replaced with a 612-bed acute facility, a 102-bed mental health unit, and a new integrated care center.

### **Petropower Energía Limitada**

**Sector:** Power

**Location:** Chile

**Debt amount:** \$122.2 mil 7.36% trust certs due 2014

**Rating/Outlook:** BBB/Stable

**Description:** Petropower is a delayed coker, hydrotreater, and net 59 MW cogeneration facility that burns green coke, a byproduct of its host refinery, Petrox S.A. Refineria de Petroleo.

### **Petrozuata Finance Inc.**

**Sector:** Oil and gas

**Location:** Venezuela

**Debt amount:** \$75 mil 8.37% bonds ser C due Oct 2022 (Guarantor: Petrolera Zuata, Petrozuata C.A.)

\$287.2 mil 7.63% bonds ser A due April 2009 (Guarantor: Petrolera Zuata, Petrozuata C.A.)

\$625 mil 8.22% bonds ser B due April 2017 (Guarantor: Petrolera Zuata, Petrozuata C.A.)

**Rating/Outlook:** B/Watch Neg

**Description:** Petrozuata produces heavy crude oil from Venezuela's Orinoco Belt, processes it at an upgrader to produce synthetic crude, and then sells it either to Petroleos de Venezuela and to ConocoPhillips or into the market.

### **Phoenix Downtown Hotel Corp.**

**Sector:** Lodging

**Location:** Arizona, U.S.

**Debt amount:** \$156.71 5% sr bnds ser 2005A due July 2040

**Rating/Outlook:** AAA/Stable

**Description:** The Phoenix Downtown Hotel Corp. is using bond proceeds to build a 1,000-room hotel in downtown Phoenix, Ariz. The hotel will be operated under a Sheraton flag and is scheduled to open in 2008.

### **Phoenix Park Funding Ltd./Phoenix Park Gas Processors Ltd.**

**Sector:** Oil and gas

**Location:** Trinidad & Tobago

**Debt amount:** \$110 mil 7.26% sr bonds due April 2013

\$38.7 mil sr sec'd notes due 2017, \$185 mil sr sec'd notes due 2020

**Rating/Outlook:** A-/Stable

**Description:** Phoenix Park processes and sells natural gas liquids, propane, butane, and natural gasoline from native natural gas streams.

### **Pine Prairie Energy Center LLC**

**Sector:** Oil and gas

**Location:** Louisiana, U.S.

**Debt amount:** \$270 mil term loan B bank ln due 2013

\$50 mil revolving credit fac bank ln due 2011

**Rating/Outlook:** B+/Stable

**Description:** Proceeds from the loan are being used to build and develop a three-cavern, high-deliverability salt-dome natural gas storage facility in Evangeline Parish, La. The project will have access to seven major pipelines with eight interconnections serving the Midwestern, Northeastern, Mid-Atlantic, and Southeastern markets through a proposed header system.

### **Plum Point Energy Associates LLC**

**Sector:** Power

**Location:** Arkansas, U.S.

**Debt amount:** \$700 mil fltg rate sr sec'd term bank ln (Bond Insurance Provider: Ambac Assurance Corp.)

\$17 mil sec'd working capital bank ln (Bond Insurance Provider: Ambac Assurance Corp.)

\$102 mil sec'd loc bank ln (Bond Insurance Provider: Ambac Assurance Corp.)

**Rating/Outlook:** AAA/Stable

**Description:** Plum Point is building the Plum Point Energy Station, a 665 MW coal-fired, base load electrical generating facility with advanced emissions controls that will be in Osceola, Ark., about 30 miles north of Memphis, Tenn. The facility will dispatch into the Entergy subregion of the Southeast Electric Reliability Council region.

### **Power Contract Financing LLC**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$802 mil sr sec'd notes

**Rating/Outlook:** BBB/Stable

**Description:** Power Contract Financing was formed to monetize a long-term contract under which Calpine Energy Services sells electricity to the California Dept. of Water Resources.

### Power Receivable Finance LLC

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$432.45 mil 6.29% sr sec'd notes due Jan 2012

**Rating/Outlook:** BBB/Stable

**Debt amount:** \$22.2 mil 10.75% sub notes due Feb 2012

**Rating/Outlook:** BB+/Stable

**Description:** Power Receivable Finance, a wholly owned subsidiary of The Goldman Sachs Group Inc., uses proceeds from its notes to refinance a long-term contract between the California Dept of Water Resources and Allegheny Trading Finance Co.

### PPL Montana LLC

**Sector:** Power

**Location:** Montana, U.S.

**Debt amount:** \$338 mil 8.903% trust cert pass-thru due July 2020

**Rating/Outlook:** BBB-/Stable

**Description:** PPL Montana is a package of 1,157 MW coal- and hydro-generating power plants in Montana, which are wholly owned by PPL Corp., and sells power under a long-term contract to Northwestern Corp.

### Premier Transmission Financing PLC

**Sector:** Pipelines

**Location:** U.K.

**Debt amount:** £107 mil 5.2022% nts due March 2030 (Guarantor: Financial Guaranty Insurance Co.)

**Rating/Outlook:** AAA, A(SPUR)/Stable

**Description:** The note proceeds were used to acquire Premier Transmission Ltd. from its previous ultimate 50% owners, KeySpan Energy Development Corp. and BG Energy Holdings Ltd., to repay Premier Transmission's existing debt obligations, and prefund the various cash reserves. Premier Transmission owns and operates the Scotland-Northern Ireland Pipeline.

### Promotora y Administradora de Carreteras S.A. de C.V.

**Sector:** Transport

**Location:** Mexico

**Debt amount:** MxP4.2 bil sr sec'd bnds due Feb 2028 (Guarantor: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, mxAAA, BBB+(SPUR)/Stable

**Debt amount:** MxP1.47 bil sub debt certs due Feb 2030

**Rating/Outlook:** mxA+/Stable

**Description:** The Mexico-Toluca toll road is a 19-km highway between Mexico City and Toluca, in the state of Mexico.

### Proyectos de Energia S.A. de C.V.

**Sector:** Power

**Location:** Mexico

**Debt amount:** \$100 mil 9.75% sr sec'd notes due July 2013

**Rating/Outlook:** BBB/Stable

**Description:** Proyectos de Energia is a special-purpose vehicle created to fund the construction of 13 electrical energy substations, with a total capacity of 1,213 megavolt amps that are delivered to Comision Federal de Electricidad.

### Queens Ballpark Co. (Mets Stadium)

**Sector:** Other

**Location:** New York, U.S.

**Debt amount:** \$58.39 mil installment purchase bnds ser 2006 sue Jan 2046

\$7.125 mil lease rev bnds ser 2006 due Jan 2046 (insured by AMBAC)

\$547.5 mil PILOT rev bnds ser 2006 due Jan 2046

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The bond proceeds will be used to build a new baseball stadium for the New York Mets, a Major League Baseball team, in Queens, N.Y. The new stadium will be built on a site owned by New York City and leased to NYCIDA, adjacent to Shea Stadium. It will replace the existing Shea Stadium, which was built in 1964. The new stadium will be almost 25% smaller than Shea Stadium with a capacity of about 45,000, compared with Shea Stadium's approximately 57,000. The new stadium will have significantly more seats with high-end amenities.

### **Quezon Power (Philippines) Ltd. Co.**

**Sector:** Power

**Location:** Philippines

**Debt amount:** \$215 mil 8.86% bnds ser 1997 due June 2017

**Rating/Outlook:** B-/Negative

**Description:** Quezon Power is a 470 MW base load, pulverized coal-fired power plant and 31-km transmission line that sells to Manila Electric Co. under a long-term contract.

### **Ras Laffan Liquefied Natural Gas Co. Ltd.**

**Sector:** Natural gas liquids

**Location:** Qatar

**Debt amount:** \$800 mil 8.29% bnds due March 2014

\$609 mil 3.437% bnds due Sept 2009

**Rating/Outlook:** A/Stable

**Description:** Ras Laffan, which is owned primarily by Qatar Petroleum and Exxon Mobil Corp, is a two-train liquefied natural gas (LNG) plant that has a potential (mtpy) capacity of 6.6 million metric tons per year and sells to Korea Gas Corp. under its sole long-term contract.

### **Ras Laffan Liquefied Natural Gas Co. Ltd. (II) and Ras Laffan Liquefied Natural Gas Co. Ltd. (3)**

**Sector:** Natural gas liquids

**Location:** Qatar

**Debt amount:** \$850 mil 5.838% sr secd bnds ser B due Sept 2027 (Guarantor: Ras Laffan Liquefied Natural Gas Co. Ltd. (II))

\$1.4 bil 5.298% sr secd bnds ser A due Sept 2020 (Guarantor: Ras Laffan Liquefied Natural Gas Co. Ltd. (3))

\$1.55 bil ser C and ser D bnds due Sept 2027 (Guarantor: Ras Laffan Liquefied Natural Gas Co. Ltd. (II))

**Rating/Outlook:** A/Stable

**Description:** RasGas II and RasGas 3 plan to source about 1.9 trillion cubic feet per year of natural gas from Qatar's North Field and use it to produce about 30 million mtpy of LNG, 62.4 million barrels of condensate, and 2.1 mtpy of liquefied petroleum gas. At this size, RasGas II and RasGas 3 jointly will be the world's largest LNG producers, with about 12% of the global LNG market by 2010, according to the sponsors. By mid-2007, RasGas II will consist of three fully operational trains producing a total of 14.1 mtpy of LNG, and, by the end of 2009, RasGas 3 will consist of two fully operational LNG trains producing a total of 15.6 mtpy.

### **Redbank Project Pty. Ltd.**

**Sector:** Power

**Location:** Australia

**Debt amount:** A\$200.3 mil 6.8% bank ln due June 2023

A\$61.2 mil 6.8% bank ln due June 2018

**Rating/Outlook:** BBB-/Negative

**Description:** Redbank is a special-purpose entity that owns and operates a 132 MW waste coal-fired electric power plant in the State of New South Wales. The plant has a 30-year hedge agreement to April 2031 and a fuel supply agreement with the adjacent Warkworth mine to July 2031.

## Reliance Rail Finance Pty Ltd.

**Sector:** Transport

**Location:** Australia

**Debt amount:** A\$178.5 mil bank ln due Dec 2018 (Bond Insurance Provider: XL Capital Assurance Inc.)

A\$178.5 mil bank ln due Dec 2018 (Bond Insurance Provider: FGIC UK Ltd.)

A\$160 mil fltg rate nts ser 9 due Sept 2020 (Bond Insurance Provider: XL Capital Assurance Inc.)

A\$160 mil fltg rate nts ser 10 due Sept 2020 (Bond Insurance Provider: FGIC UK Ltd.)

A\$190 mil fltg rate nts due Sept 2018 (Bond Insurance Provider: XL Capital Assurance Inc.)

A\$190 mil fltg rate nts ser 8 due Sept 2018 (Bond Insurance Provider: FGIC UK Ltd.)

A\$200 mil fltg rate nts ser 6 due Sept 2017 (Bond Insurance Provider: XL Capital Assurance Inc.)

A\$200 mil fltg rate nts sre 5 due Sept 2017 (Bond Insurance Provider: FGIC UK Ltd.)

A\$200 mil fltg rate nts ser 3 due Sept 2016 (Bond Insurance Provider: FGIC UK Ltd.)

A\$200 mil fltg rate nts ser 4 due Sept 2016 (Bond Insurance Provider: XL Capital Assurance Inc.)

A\$150 mil var rate CPI nts ser 1 due Dec 2035 (Bond Insurance Provider: FGIC UK Ltd.)

A\$150 mil var rate CPI nts ser 2 due Dec 2035 (Bond Insurance Provider: XL Capital Assurance Inc.)

**Rating/Outlook:** AAA, A-(SPUR)/Stable

**Description:** Reliance Rail has the concession to design, build, deliver, and maintain 78 commuter trains (comprising eight carriages per train) for the public rail service in New South Wales. Included in the delivery is the design and construction of a maintenance facility and train simulators for driver training. Revenue is earned based on train availability over the trains' 30-year operating life. Delivery of the trains into service is expected to commence in April 2010 and provisionally ceases 30 years after delivery of the 69th train set. The final train set is expected to be delivered in Sept 2013.

## Reliant Energy Mid-Atlantic Power Holdings LLC

**Sector:** Power

**Location:** Texas, U.S.

**Debt amount:** \$210 mil 8.554% certs pass-thru ser A due July 2020

\$421 mil 9.237% certs pass-thru ser B due July 2017

\$220 mil 9.681% certs pass-thru ser C due July 2026

**Rating/Outlook:** B+/Positive

**Description:** Reliant provides electricity and energy services to more than 1.9 million retail customers in Texas, serves commercial and industrial customers in the PJM Interconnection region, and provides electricity to wholesale customers in a number of U.S. regions through a portfolio of about 16,000 MW.

## Riverside Energy Center LLC/Rocky Mountain Energy Center

**Sector:** Power

**Location:** Wisconsin, Colorado, U.S.

**Debt amount:** \$368.5 mil sr secd bank ln due 2011

\$264.9 mil sr secd bank ln due 2011

**Rating/Outlook:** B/Stable

**Description:** A 617 MW natural gas-fired, combined-cycle electric generating plant that sells to Wisconsin Power & Light Co. and Madison Gas & Electric Co. under long-term contracts.

## RMPA Service PLC

**Sector:** Other

**Location:** U.K.

**Debt amount:** £680 mil 5.337% due Sept 2038 (Guarantor: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The bond proceeds are being used to finance the construction of a new Ministry of Defence garrison near the town of Colchester in England. The project will also provide certain facility management services for the new garrison. The total concession period is 35 years.

### Road Management Consolidated PLC

**Sector:** Transport

**Location:** U.K.

**Debt amount:** £165 mil 9.18% sec'd bonds due June 2021 (Guarantor: Ambac Assurance Corp.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The bond proceeds were used to partially fund the construction of two U.K. design, build, finance, and operate shadow toll roads: the A1(M) between Alconbury and Peterborough; and the A419/A417 between Swindon and Gloucester. Construction works on both roads were completed in 1998.

### Rowville Transmission Facility

**Sector:** Power

**Location:** Australia

**Debt amount:** A\$28 mil bnds due Dec 2028 (Guarantor: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, A(SPUR)/ Stable

**Description:** Rowville is a special-purpose entity that owns, operates, and maintains two vital 500 kilovolt and 220 kilovolt step-down transformer and associated switchyard in Latrobe Valley, Victoria. The assets' operating risk is passed through entirely to an operator that has a strong credit quality.

### Sabine Pass LNG L.P.

**Sector:** Oil and gas

**Location:** Texas, U.S.

**Debt amount:** \$1.482 bil 7.5% sr nts due Nov. 2016

\$550 mil 7.25% sr sec'd nts due Nov. 2013

**Rating/Outlook:** BB/Stable

**Description:** Sabine Pass's only asset is its 100% ownership of the 4 billion cubic feet (bcf)/day Sabine Pass LNG regasification terminal that is currently under construction. The proceeds were used to refinance the existing unrated project credit facility at Sabine Pass; refinance the \$600 million term loan B at Cheniere LNG Holdings LLC, which owns 100% of the equity of Sabine Pass; to fund the remaining construction costs for the terminal, and to fund a debt-service reserve.

### Sacramento Cogeneration Authority

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$86.135 mil bonds ser 1998 due 2021

**Rating/Outlook:** AAA/Stable

**Debt amount:** \$182.9 mil cogen proj rev (Procter & Gamble Project) bnds ser 1995 due July 2021 (Bond insurance provider: MBIA Insurance Corp.)

**Rating/Outlook:** BBB/Stable

**Description:** The project is a 120 MW combined cycle cogeneration facility that sells capacity and energy to the Sacramento Municipal Utility District.

### Sacramento Municipal Utility District Financing Authority

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$245.105 mil proj rev bnds ser 2006 due July 2030 (Bond insurance provider: MBIA Insurance Corp.)

\$55.27 mil 5.125% proj rev bnds ser 2006 due July 2029 (Bond insurance provider: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The project is a new 495 MW gas-fired combined-cycle plant that began commercial operation Feb 2006. The project is a joint powers authority formed by Sacramento Municipal Utility District (SMUD) and the Modesto Irrigation District under California law. The power purchase agreement with SMUD is structured as a tolling contract, with SMUD obligated to provide natural gas to the project and assume fuel price risk, in addition to paying all operating costs as long as the plant meets the agreement's performance standards.



### **Sacramento Power Authority**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$122.96 mil 3.75% cogen proj rev rfdg bnds ser 2005 due July 2022 (Bond insurance provider: Ambac Assurance Corp.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** Sacramento Power is a 160 MW gas-fired combined-cycle cogeneration facility for which the Sacramento Municipal Utility District is the sole offtaker.

### **Salton Sea Funding Corp.**

**Sector:** Power

**Location:** California, U.S.

**Debt amount:** \$285 mil 7.475% sr secd bonds ser F due Nov 2018

\$65 mil 8.3% sr secd bonds ser E due May 2011

\$109.25 mil 7.84% sr secd bonds pass-thru ser C due May 2010

**Rating/Outlook:** BBB-/Stable

**Description:** Salton Sea is a project-funding vehicle, owned by MidAmerican Energy Holdings Co., that financed the purchase and construction of 10 geothermal power projects with a total capacity of 327 MW. The project sells most of its power to Southern California Edison Co.

### **San Antonio Convention Center Hotel Finance Corp.**

**Sector:** Other

**Location:** Texas, U.S.

**Debt amount:** \$129.93 mil rev bnds ser 2005A due July 2039 (Bond insurance provider: Ambac Assurance Corp.)

**Rating/Outlook:** AAA, BBB-(SPUR), Negative

**Description:** Combined with \$77 million in equity contributions, the proceeds of the bonds are being used to build a 1,000-room convention center headquarters hotel in San Antonio, Texas. The project has implemented a revised construction schedule and increased the workforce to meet its scheduled opening in Feb 2008.

### **Selkirk Cogen Funding Corp.**

**Sector:** Power

**Location:** New York, U.S.

**Debt amount:** \$227 mil 8.98% 1st mortgage bonds due June 2012

\$165 mil 8.65% 1st mortgage bonds due Dec 2007

**Rating/Outlook:** BBB-/Stable

**Description:** Selkirk is a 345 MW cogeneration project consisting of two electrically separate, but thermally integrated, gas-fired generating units that provide energy under long-term contracts with Niagara-Mohawk Power Corp. and Consolidated Edison Co. of New York Inc.

### **Services Support (Manchester) Ltd.**

**Sector:** Other

**Location:** U.K.

**Debt amount:** £100 mil sr secd bank ln due 2029

**Rating/Outlook:** BBB/Stable

**Description:** The company is responsible for designing, building, financing, and operating of 16 police stations under a public finance initiative project agreement until March 2030 with the Greater Manchester Police Authority.

### **Sithe/Independence Funding Corp.**

**Sector:** Power

**Location:** New York, U.S.

**Debt amount:** \$408.6 mil 9% sr secd bonds due Dec 2013 (Guarantor:

Sithe/Independence Power Partners L.P.)

**Rating/Outlook:** B/Stable

**Description:** A 1,000 MW combined-cycle, natural gas-fired cogeneration plant that sells capacity to Consolidated Edison Co. of New York Inc. and Dynegy Inc.

### **Sociedad Concesionaria Autopista Central S.A.**

**Sector:** Transport

**Location:** Chile

**Debt amount:** \$250 mil 6.223% bonds due Dec 2026 (Bond insurance provider: MBIA Insurance Corp.)

\$268.2 mil 5.3% (UF13 mil Chilean inflation protected units) bonds due Dec 2026 (Bond insurance provider: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The consortium of Dragados, Skanska, Sade, Belfi, and Brotec was awarded the concession for the North-South (Sistema Norte Sur) urban toll road system in Santiago, Chile in Aug 2000. The consortium operates now as Autopista Central. The total length of the concession highway is 60.13 km.

### **Sociedad Concesionaria Costanera Norte S.A.**

**Sector:** Transport

**Location:** Chile

**Debt amount:** UF1.9 mil (Chilean inflation protected units) 5% nts ser A1/A2 due June 2016 (Bond insurance provider: Ambac Assurance Corp.)

UF7.6 mil 5.5% nts ser B1/B2 due Dec 2024 (Bond insurance provider: Ambac Assurance Corp.)

**Rating/Outlook:** AAA, BBB(SPUR)/Stable

**Description:** The consortium of Impregilo Spa (Italy), Fe Grande (Chile), and Tecsa (Chile) was awarded the concession for Costanera Norte in Nov 1999. In Dec 2005, Italian toll road operators Autostrade SpA (A/Negative/A-1) and SIAS SpA reached an agreement with the original shareholders to acquire 100% of the shares in Costanera. The project consists of a 30.4-km six-lane urban toll highway on the north side of the Mapocho River, which runs from east to west through Santiago, Chile. The total length of the concession highway is 42.3 km.

### **Sociedad Concesionaria Vespucio Norte Express S.A. (AVN)**

**Sector:** Transport

**Location:** Chile

**Debt amount:** US\$432 mil nts due June 2028 (Guarantor: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** AVN (the toll-road operating company of the consortium of Grupo ACS, Hochtief, and Cofides) was awarded the concession for the Sistema Américo Vespucio Nor-Poniente urban toll road system in Santiago, Chile, in 2002. AVN provides 29 km of high-speed urban motorways, 29 km of service roads, and seven grade-separated junctions.

### **Societe Marseillaise Du Tunnel Prado-Carenage (SMPTC)**

**Sector:** France

**Location:** Transport

**Debt amount:** €65.34 mil sr secd bank ln due 2020 (Insurance provider: CIFG Europe)

€14.5 mil sr secd out bank ln due 2009 (Insurance provider: CIFG Europe)

**Rating/Outlook:** AAA

**Description:** SMTPC owns and operates a 2.5-km tunnel in Marseilles under a 32-year contract ending in 2025. The tunnel was opened in 1993.

### **Southern Power Co.**

**Sector:** Power

**Location:** U.S.

**Debt amount:** \$200 mil 6.375% sr unsecd nts ser E due November 2036

\$525 mil 4.875% sr unsecd nts ser C due 2015

\$575 mil 6.35% sr unsecd nts due July 2012

\$400 mil credit facility due July 2011

**Issuer credit rating:** BBB+/Stable/A-2

**Description:** Southern Power is the unregulated, wholly owned subsidiary of Southern Co. that owns or has interests in 7,371 MW of electric generation capacity in operation and construction.

### **Sutton Bridge Financing Ltd.**

**Sector:** Power

**Location:** U.K.

**Debt amount:** \$150 mil 7.97% gtd sec'd bonds due June 2022 (Guarantor: Sutton Bridge Power)

£195 mil 8.625% gtd sec'd bonds due June 2022 (Guarantor: Sutton Bridge Power)

**Rating/Outlook:** BBB-/Stable

**Description:** The 790 MW combined-cycle gas turbine power plant, which includes two General Electric gas turbines, sells power under a long-term tolling agreement with EDF Energy PLC (A/Stable/A-1) and is ultimately owned by EDF Energy PLC.

### **Talca-Chillan Sociedad Concesionaria (TACHI)**

**Sector:** Transport

**Location:** Chile

**Debt amount:** ChP5.65 mil 3.04% (approx \$170 mil) deb ser B due 2019 (Guarantor: MBIA Insurance Corp.)

**Rating/Outlook:** AAA, BBB(SPUR)

**Description:** TACHI holds a concession to build, operate, renovate, improve, and expand a 194-km toll road that is part of the current Ruta 5. The concession starts north of Talca and runs southward to Rucapequén, which is located to the south of Chillán.

### **Tenaska Alabama II Partners LLC**

**Sector:** Power

**Location:** Alabama, U.S.

**Debt amount:** \$410.5 mil 6.125% sr sec'd bonds due March 2023

**Rating/Outlook:** BBB-/Stable

**Description:** Tenaska Alabama is a 885 MW combined-cycle generation facility that sells power to Coral Power LLC under a 20-year energy conversion agreement.

### **Tenaska Alabama Partners L.P.**

**Sector:** Power

**Location:** Alabama, U.S.

**Debt amount:** \$361 mil 7% sr sec'd bnds due June 2021

**Rating/Outlook:** BB/Stable

**Description:** TAP is a Delaware limited partnership that owns the 844 MW Tenaska Lindsay Hill Generating Station, a combined-cycle, natural gas- and oil-fired power plant in Autauga County near Billingsley, Ala. The plant began commercial operations in May 2002 and sells fuel-conversion services under a 25-year tolling agreement with Williams Power. Williams Power has announced an agreement to sell this toll, along with other power assets, to Bear Energy L.P., an unrated subsidiary of the Bear Stearns Cos. Inc. (A+/Stable/A-1).

### **Tenaska Gateway Partners Ltd.**

**Sector:** Power

**Location:** Texas, U.S.

**Debt amount:** \$347 mil 6.052% sr sec'd bnds due Dec 2023

**Rating/Outlook:** BBB-/Stable

**Description:** Gateway is a Texas limited partnership that owns an 845 MW (nominal) combined-cycle gas power plant located in Rusk County, Texas and related project contracts. The project sells capacity and energy under a 22.5-year tolling agreement with Coral Power LLC and Coral Energy Holding L.P. that expires in Jan 2024.

### **Tenaska Georgia Partners L.P.**

**Sector:** Power

**Location:** Georgia, U.S.

**Debt amount:** \$275 mil sr sec'd bonds due Feb 2030

**Rating/Outlook:** BBB-/Stable

**Description:** Tenaska Georgia is a 942 MW gas-fired, simple-cycle peaking facility located 40 miles from Atlanta, Ga. The project consists of six gas-fired turbines and electric generators that were completed in two phases. The project's first phase began commercial operation in June 2001, and the second phase came on line in June 2002. The project generates capacity and energy revenue under the terms of a 29-year tolling agreement with Exelon Generation Co. LLC (BBB+/Watch Neg/A-2).

### Tenaska Oklahoma I L.P.

**Sector:** Power

**Location:** Oklahoma, U.S.

**Debt amount:** \$73.5 mil 6.528% sr secd nts due Dec 2014

**Rating/Outlook:** BB-/Stable

**Description:** Tenaska Oklahoma I L.P. is the holding company of Kiowa Power Partners LLC. Kiowa sells capacity and energy under an 18-year electricity manufacturing agreement with Coral Power LLC, a subsidiary of Coral Energy Holding L.P.

### Tenaska Virginia Partners L.P.

**Sector:** Power

**Location:** Virginia, U.S.

**Debt amount:** \$483.5 mil 6.119% sr secd bonds due March 2024

**Rating/Outlook:** BBB-/Stable

**Description:** Tenaska Virginia is an 885 MW combined-cycle, gas- and oil-fired plant, owned by Tenaska Inc., that sells capacity and energy under a 20-year energy conversion agreement with Coral Power LLC.

### Tenaska Washington Partners L.P.

**Sector:** Power

**Location:** Washington, U.S.

**Debt amount:** \$189 mil 6.79% 1st mort bonds due 2011

**Rating/Outlook:** BBB-/Stable

**Description:** Tenaska Washington's Ferndale cogeneration project is a 270 MW facility near Ferndale, Wash., which sells power exclusively to Puget Sound Energy Inc. (BBB-/Stable/A-3) under a purchase-power agreement whose primary term expires Dec. 31, 2011.

### TermoEmcali Funding Corp.

**Sector:** Power

**Location:** Colombia

**Debt amount:** \$153.7 mil sr secd nts due Dec 2019

**Rating/Outlook:** CCC+/Stable

**Description:** TermoEmcali is a 234 MW combined-cycle, natural gas-fired power generation facility that sells capacity and energy to Empresas Municipales de Cali under a long-term contract.

### Thermal North America Inc.

**Sector:** Other

**Location:** Massachusetts

**Debt amount:** \$305 mil term bank ln due 2008

\$30 mil synthetic letter of credit bank ln due 2008

\$35 mil revolv bank ln due 2008

**Rating/Outlook:** BB/Watch Pos

**Description:** TNA owns a portfolio of assets that provide district heating and cooling services. Veolia Energy, a wholly owned subsidiary of Veolia Environment S.A., announced its intention to acquire TNA in June 2007. TNA has the largest district heating and cooling portfolio of companies in the U.S.

### The Hospital Co. (QAH Portsmouth)

**Sector:** Other

**Location:** U.K.

**Debt amount:** £262.04 mil credit guarantee fac govt ln due 2039 (Guarantor: Financial Security Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA(prelim), BBB(SPUR)/Stable

**Description:** The funds will be used to finance the design and construction of new and refurbished facilities for the Portsmouth Hospitals NHS Trust to provide an advanced hospital facility to Portsmouth, Fareham and Gosport, and East Hampshire, in southern England.

### **Transform Schools (North Lanarkshire) Funding PLC**

**Sector:** Other

**Location:** U.K.

**Debt amount:** £87.8 mil 2.343% (plus £15 mil variation bnds) index-linked gtd bnds due 2036 (Bond insurance provider: XL Capital Assurance (U.K.) Ltd.)

£70 mil sr secd EIB bank ln due 2034 (Bond insurance provider: XL Capital Assurance (U.K.) Ltd.)

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The funds are being used by Transform Schools to finance the design and construction of new schools facilities for the Council of North Lanarkshire, in Scotland, under a 32-year project agreement, which expires on March 31, 2037.

### **TransGas de Occidente S.A.**

**Sector:** Pipelines

**Location:** Colombia

**Debt amount:** \$240 mil 9.79% notes due Nov 2010

**Rating/Outlook:** BB+/Stable

**Description:** TransGas was formed to build, operate, and maintain a 3,440-km, 20-inch diameter natural gas pipeline running from Mariquita, in central Colombia, to Cali, in the southwest of the country. The pipeline has the design capacity of about 234 million cubic feet per day without compression.

### **Transurban Finance Co. (CityLink)**

**Sector:** Transport

**Location:** Australia

**Debt amount:** A\$300 mil fltg rate credit wrapped med-term nts due Nov 2017 (Bond insurance provider: MBIA Insurance Corp.)

A\$300 mil fltg rate credit wrapped med-term nts due Nov 2015 (Bond insurance provider: MBIA Insurance Corp.)

A\$360 mil fltg rate nts due Aug 2009 (Bond insurance provider: MBIA Insurance Corp.)

**Rating/Outlook:** AAA/Stable

**Debt amount:** A\$255 mil tranche A revolv cash advance bank ln due June 2008

A\$195 mil tranche B revolv cash advance bank ln due June 2010

A\$150 mil fltg rate revolv cash advance bank ln due March 2008

\$300 mil deferred interest nts due 2016

A\$300 mil med-term nts ser 10 due Sept 2011

\$38.94 mil 5.17% Tranche B fixed rate nts ser 2004-1 due 2016

\$250 mil private placement nts due 2015

\$108.56 5.47 mil Tranche C fixed rate nts der 2004-1 due 2019

\$100 mil 5.02% Tranche A fixed rate nts ser 2004-1 due 2014

A\$72 mil fltg rate Tranche D nts ser 2004-1 due 2019

A\$150 mil 4.97% fixed rate nts ser 1 due Dec 2009

A\$1.8 bil sr secd med-term note program

**Rating/Outlook:** A-/Negative

**Description:** Transurban Finance Co. is the financing vehicle for the Transurban Group. Transurban fully owns and operates the CityLink toll road concession in Melbourne. After it took over Sydney Roads Group in April 2007, Transurban controls or has an interest in most of Sydney's toll road concessions including the Hills Motorway, Eastern Distributor, M4 and M5 Motorways, and a 47.5% equity share in WestLink.

### Trigen Atlantic Station LLC

**Sector:** Other

**Location:** Georgia, U.S.

**Debt amount:** \$13.6 mil tax-exempt sr rev bnd  
\$4.5 mil taxable sr rev bnd

**Rating/Outlook:** BBB/Stable

**Description:** Trigen Atlantic Station is a special-purpose entity formed to finance, build, own, and operate the district cooling project. TNA acquired Atlantic Station from Maxon Holdings LLC in March 2007. The district cooling system, which is currently under construction, consists of three 2,500-ton chiller trains and the related piping system. The chilled water will be sold to subdevelopers within the Atlantic Station development under a separate 20-year service agreement.

### Tube Lines (Finance) PLC.

**Sector:** Transport

**Location:** U.K.

**Debt amount:** £285 mil sr secd EIB A bank ln due 2031 (Guarantor: Ambac Assurance Corp., Guarantor: Ambac Assurance UK Ltd.)  
£15 mil sr secd EIB B bank ln due 2031 (Guarantor: Ambac Assurance Corp., Guarantor: Ambac Assurance UK Ltd.)

**Rating/Outlook:** AAA/Stable

**Debt amount:** £1.15 bil 5.54% sr secd A-1 nts due March 2031

**Rating/Outlook:** AA/Stable

**Debt amount:** £76.75 mil 7.4547% sr secd B nts due March 2031

**Rating/Outlook:** BBB/Stable

**Debt amount:** £134.2 mil 8.6801% sub C nts due March 2010

**Rating/Outlook:** BBB-/Stable

**Debt amount:** £21.59 million 11.1776% sub D nts due March 2010

**Rating/Outlook:** BB/Stable

**Description:** Tube Lines (Holdings) Ltd. owns this finance company, which raised the debt to support the holding company's service contract with London Underground Ltd., which owns and operates the London underground rail system. Under a 30-year public-private partnership Tube Lines will manage the infra-

structure of three London Underground lines: Jubilee, Northern, and Piccadilly.

### Utility Contract Funding LLC

**Sector:** Power

**Location:** New Jersey, U.S.

**Debt amount:** \$829 mil sr secd bonds due Oct 2016

**Rating/Outlook:** BBB/Stable

**Description:** The project monetizes the long-term agreement between El Paso Corp.'s Eagle Point Cogeneration Partnership and Public Service Electric & Gas Co.

### VeraSun Energy Corp.

**Sector:** Oil and gas

**Location:** South Dakota, U.S.

**Debt amount:** \$210 mil 9.975% sr nts due Dec 2012

**Rating/Outlook:** B+/Stable

**Debt amount:** \$450 mil sr unsecd nts due June 2017

**Rating/Outlook:** B-/Stable

**Description:** VeraSun Energy Corp. owns nine current and prospective ethanol facilities with a total capacity of 1 billion gallons per year expected to come on line by the end of 2008. The 2007 acquisition of ASAlliances Biofuels' three ethanol plants of 110 mmpgy each gives Verasun 670 mmpgy of capacity following the recent completion of its Charles City, Iowa facility.

### **ViaOeste - Concessionaria de Rodovias do Oeste de Sao Paulo S.A.**

**Sector:** Transport

**Location:** Brazil

**Debt amount:** BrR650 mil deb ser 3 due 2015

**Rating/Outlook:** brA+/Stable

**Description:** The ViaOeste system consists of three main roads: Rodovia Presidente Castello Branco (SP 280), Raposo Tavares (SP 270), and Senador José Ermírio de Moraes (SP 075), operating over 161.78 km in the key state of São Paulo. Every year around 45 million vehicles use this system.

### **West Coast Train Finance PLC**

**Sector:** Railroads

**Location:** U.K.

**Debt amount:** £480 mil 6% asset-backed nts due March 2015 (Lessee: Angel Leasing Co. Ltd.)

**Rating/Outlook:** A/Stable

**Description:** West Coast Train Finance has a secured loan agreement with Angel Leasing Co. Ltd., the purchaser of the advanced tilting train used on Virgin Rail Group's rail franchise.

### **Windsor Financing LLC**

**Sector:** Power

**Location:** Virginia, U.S.

**Debt amount:** \$268.5 mil 5.881% sr secd bnds due July 2017

**Rating/Outlook:** BBB-/Watch Neg

**Debt amount:** \$52 mil 6.937% sub secd nts due Jan 2016

**Rating/Outlook:** BB/Watch Neg

**Description:** Windsor is a single-purpose entity created to refinance three Cogentrix Energy Inc. (BB-/Stable/—) power plants (at two sites) subsequent to the restructuring of their power-purchase agreements and power purchase operating agreements with Virginia Electric Power Co. The two sites are in Richmond, Va. and Rocky Mount, N.C. The Richmond site has two plants, Richmond I and Richmond II, and Rocky Mount has one facility.

### **Windsor Petroleum Transport Corp.**

**Sector:** Transport

**Location:** Delaware, U.S.

**Debt amount:** \$111.7 mil serial secd nts due 2010 (Guarantor: BP PLC)

**Rating:** AA+/Stable

**Debt amount:** \$239.1 mil 7.84% term secd nts due Jan 2021

**Rating/Outlook:** BB+/Stable

**Description:** Windsor Petroleum Transport funded the construction of four very large crude oil carriers, each of which is a 300,000 dead-weight-ton, double-hulled tanker and operates under a long-term charter contract with BP Shipping.

### **Wolf Hollow I L.P.**

**Sector:** Power

**Location:** Texas, U.S.

**Debt amount:** \$156 mil 1st lien sr secd term bank ln due June 2012

\$104 mil 1st lien sr secd synthetic LC fac bank ln due June 2012

\$30 mil 1st lien sr secd working capital bank ln due Dec 2010

**Rating/Outlook:** BB-/Negative

**Debt amount:** \$110 mil 2nd lien sr send term bank ln due Dec 2012

**Rating/Outlook:** B/Negative

**Description:** Wolf Hollow will use the loan proceeds to fund a portion of the acquisition of the Wolf Hollow power plant, a 720 MW, combined cycle, gas-fired power plant located in Granbury, Texas, fund certain reserve accounts, and pay transaction fees. The facility dispatches into the north subregion of Electric Reliability Council of Texas. The plant has been in service since Aug 2003.

### **Yankee Stadium L.P.**

**Sector:** Other

**Location:** New York, U.S.

**Debt amount:** \$25 mil rental rev bnds series 2006 (insured by MBIA)

\$930 mil pilot rev bnds ser 2006 due March 2046

**Rating/Outlook:** AAA, BBB-(SPUR)/Stable

**Description:** The proceeds of the bonds will be used to build a new baseball stadium for the New York Yankees, a Major League Baseball team, in the Bronx, N.Y. The stadium will be built in the adjacent Macomb's Dam and John Mullaly Parks, next to and north of the existing stadium. It will have a capacity in excess of 50,000 plus about 2,000 standing-room spots for a total capacity of between 52,000 and 53,000, slightly smaller than the existing stadium of 57,400. It will replace the existing stadium that was built in 1923 and renovated in the 1970s. ■



## Credit Services

# Project & Infrastructure Finance Customized Services

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Private credit analysis is a preliminary indicator of creditworthiness expressed in a broad rating category. It is not a formal rating.

Determined through a review of summary information, a private credit analysis provides an evaluation of the general strengths and weaknesses of a company or a proposed financing structure. In many situations, it can serve as a first step toward a fully developed Standard & Poor's rating.

For example, a private credit analysis can play a valuable screening role for governments evaluating concession bids from different consortia. During the bid stage, the analysis offers valuable early insight into the financial viability of a proposed project. Likewise, governments, utilities, or project sponsors can use this service to evaluate the creditworthiness of contractors hired to undertake large-scale infrastructure development projects.

Consortia bidding for concessions can also benefit from a Standard & Poor's private credit analysis. For example, private credit analysis can demonstrate a consortium's ability to optimize its debt-financing plans through a bank, agency, or the capital markets.

### Standard & Poor's Underlying Ratings

Standard & Poor's Underlying Ratings (SPURs) demonstrate an issue's credit quality on a stand-alone basis, independent of any and all guarantees such as those provided by bond insurance and multilateral or governmental agencies. SPURs have become an essential part of a growing number of transactions because banks and institutional lenders generally require an underlying evaluation before purchasing debt backed by a guarantee.

A SPUR can provide issuers with the leverage they need to negotiate more favorable terms with the guarantor than might otherwise be possible. Moreover, a SPUR offers insight that can play an important role in deciding whether to obtain a financial guarantee. In fact, a strong SPUR might be enough to demonstrate that not obtaining a financial guarantee is actually the most cost-effective financing strategy for a particular issue.

SPURs are determined through the same comprehensive analytical review as traditional Standard & Poor's ratings and may be published or kept confidential at an issuer's discretion. If published, they are accompanied by a presale credit report and ongoing surveillance reports that can facilitate loan syndication or enhance liquidity in the secondary market.

### Rating Evaluation Service

Standard & Poor's Rating Evaluation Service provides a formal determination of the credit effect of business, strategic, or funding initiatives under consideration by governments or organizations. It is a superior alternative to

"best-guess" estimates of the credit implications of potential business ventures.

Undertaken by the same analytical team and rating committee that would assign ratings to an issuer's existing or proposed debt issues, rating outcomes determined through the Rating Evaluation Service can play a valuable role in internal strategic and financial planning. In addition, the Rating Evaluation Service provides issuers with a consistent, well-respected way to demonstrate the potential credit ramifications of important business or financial decisions to investors, lenders, counterparties, and other key audiences.

### Bond And Loan Pool Ratings

Standard & Poor's can provide ratings for open-ended or closed pools of collateralized bonds or loans. Whatever a portfolio's composition, Standard & Poor's analysis begins with a thorough review of each component and includes an evaluation of the extent of over-collateralization and other structured supports for the debt.

A Standard & Poor's portfolio review can serve as a central component of annual due diligence or as an ad hoc analysis to determine the entire risk profile of a specific portfolio. In addition, reviews can play an important role in the valuation of financial assets prior to purchase, sale, or securitization.

### Peer Analysis Reports

A peer analysis report (PAR) provides an entity with an in-depth quantitative and qualitative analysis of how it compares to its peer group across major credit-sensitive analytical categories comprising Standard & Poor's rating methodology. The analysis is conducted by Standard & Poor's analysts, who are experts in a given industry or sector, by comparing an entity's position and performance across business and financial risk categories that are material to creditworthiness. The service is valuable to a company or entity in benchmarking its competitive strengths and weakness, and in understanding the factors driving its ratings and credit risk profile. The peer group is selected by the rated entity, not by Standard & Poor's.

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However you work with Standard & Poor's, you will find that Standard & Poor's analysis

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