TENASKA TRAILBLAZER PARTNERS, LLC

Report to the

Global CCS Institute

Financing a New Pulverized Coal Plant With Post Combustion Carbon Capture

September 2011

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Abstract

The Tenaska Trailblazer Energy Center is a proposed multi-billion dollar, first-of-its-kind conventional coal plant with post-combustion carbon capture incorporated into its initial design, to be located near Sweetwater, Texas, United States of America. This Report discusses both the general challenges associated with financing such a large, complex project and the specific financing challenges relating to this project.

Financing a New Pulverized Coal Plant With Carbon Capture

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1.0 Introduction

The Tenaska Trailblazer Energy Center (Trailblazer or Project), a United States Dollars (USD) $3.5 to $4.0 billion, 600 MW net supercritical pulverized coal electric generating station under development in Nolan County, Texas, United States of America (USA), was strategically located to tap both the growing Texas electricity market and the largest and most robust carbon dioxide (CO_2) market for enhanced oil recovery (EOR) in the world.

Trailblazer will sell electricity into the Electric Reliability Council of Texas (ERCOT) market and will sell CO_2 into the Permian Basin of Texas, where it will be used in EOR efforts and ultimately stored underground permanently.

The Project will produce enough electricity to power approximately 600,000 Texas homes and capture 85 to 90 percent of the CO_2 (approximately 5.75 million tons, or 5.22 million metric tons annually) that otherwise would be emitted into the atmosphere. The Project is being developed by Tenaska, Inc., (Tenaska) and is owned by Tenaska Trailblazer Partners, LLC. Tenaska Trailblazer Partners, LLC is owned 65 percent by affiliates of Tenaska and 35 percent by Arch Coal, Inc. (Arch Coal)

Tenaska, in its role as developer, will be responsible for obtaining financing for the Project. Tenaska is a respected energy company that has developed, financed and constructed 15 power projects, totaling more than 9,000 MW. Additionally, Tenaska operates or oversees 16 plants in 11 USA states totaling approximately 12,000 MW. Tenaska has raised approximately USD$11.4 billion in aggregate financing, including USD$4.7 billion in bank facilities, USD$3.0 billion in capital market transactions and USD$3.7 billion in corporate facilities.

This report discusses the issues associated with financing the Trailblazer project. Although a detailed discussion of the revenue gap currently facing the Project was provided in the Global CCS Institute report entitled "*Bridging the Commercial Gap for Carbon Capture and Storage*" dated July 2011, a recap will be provided in this report. This report also will discuss the financing considerations this and other large carbon capture and storage (CCS) projects will face, as well as factors that can mitigate financing risks. Finally, the report will outline Tenaska's plan for financing the Project.

2.0 Executive Summary

In the course of developing 15 power generation projects totaling approximately 9,000 megawatts, Tenaska has become very familiar with the elements required to complete a successful project financing, including robust financial metrics, careful contracting, appropriate risk mitigation and quality equity.

2.1 Financial Metrics

There are three components to the Project's proforma that drive, and are essential to, its economic viability: 1) electricity revenues, 2) CO2 revenues, and 3) local, state and federal incentives.

2.1.1 Electricity Revenues

As discussed in detail in Tenaska's report to the Global CCS Institute entitled "*Bridging the Commercial Gap for Carbon Capture and Storage*" dated July 2011, Tenaska has produced an analysis of the ERCOT market that forecasts annual power prices in the ERCOT West Zone, based on publicly available information. Table 2.2.1 shows the results of that forecast.

TABLE 2.2.1 – Annual Forecasted Power Prices (USD) in the ERCOT West Zone

ERCOT West Zone Modeled Power Prices (nominal USD$/MWh)	
Year	**Price**
2013	37.45
2014	38.81
2015	40.55
2016	42.30
2017	43.70
2018	45.64
2019	47.62
2020	50.51
2021	53.21
2022	55.98
2023	59.23
2024	62.23
2025	65.15
2026	68.18
2027	71.25
2028	73.71
2029	75.76
2030	77.57

2.1.2 CO_2 Revenues

Trailblazer will sell approximately 5.75 million tons of CO_2 annually into the Permian Basin CO_2 market – the most mature and robust CO_2 market in the world. Tenaska retained Steve Melzer, a well-known geological engineer whose expertise includes reservoir characterization, CO_2 flood performance and CO_2 geologic sequestration, to conduct a CO_2 market analysis.

Tenaska considers its projections of CO_2 revenues to be highly confidential, since negotiations with CO_2 suppliers have not yet been concluded. However, Mr. Melzer provides a rule of thumb algorithm of CO_2 price per thousand cubic feet (Mcf) = 2 percent of the posted project equivalent oil price per barrel delivered to the oil field operator. With oil prices between USD$85 and USD$110 per barrel, CO_2 prices would be between USD$1.70 and USD$2.20 per Mcf using this rule of thumb.

2.1.3 Government Support

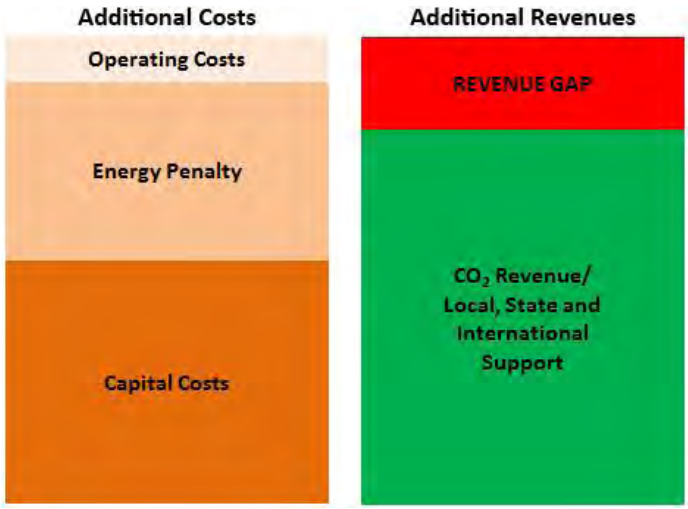
Based on current prices for electricity and CO_2, government support will be required to make Trailblazer economically viable. Trailblazer already enjoys support at the local and state level, in the form of tax incentives and other policies that encourage the development of clean energy projects. At the federal level, however, the situation is much less certain. Statements from the current administration supporting clean coal have not translated into policies with sufficient certainty to support Trailblazer's financing. Cap and trade legislation, which likely would provide sufficient additional revenue to bridge the revenue gap, appears to be stalled for the foreseeable future. Existing tax credits will no longer be available once credits have been claimed for a certain number of tons of CO_2. Since there is no way to determine when those credits will be exhausted, these existing tax credits do not provide the certainty that financial institutions require to loan billions of dollars.

Despite the uncertainty, Tenaska believes the likelihood of receiving sufficient federal incentives to further this important technology is high enough to warrant continued development of the Project.

2.1.4 Revenue Gap

Currently, there is a gap between the additional costs associated with a carbon capture plant and the revenue that can be achieved by selling CO_2. Although Tenaska considers precise information about its costs and revenue forecasts confidential, Figure 2.1.4 shows, on a very gross level, what the revenue gap looks like. Figure 2.1.4 assumes no revenue in the value of avoiding carbon emissions.

FIGURE 2.1.4 – Carbon Capture Plant Revenue Gap



The energy penalty shown on the "Additional Costs" side is determined by multiplying the number of MW not available for sale into the ERCOT market due to the operation of the carbon capture plant by the model ERCOT power prices shown in Table 2.2.1.

Today, Tenaska sees three ways in which that gap could be filled:

- Federal policies could change to bridge the gap.
- If oil prices increase significantly, CO_2 revenues potentially could increase enough to bridge the gap; or
- Electric prices could increase enough to bridge the gap.

Technological improvements and/or a reduced risk premium as technology matures also could help bridge the gap.

2.2 Independent Engineer

Lenders will hire an Independent Engineer (IE) to assess the contractual, technical and projected financial attributes of a project. After a thorough review, the IE will issue a report opining on a project's viability.

Tenaska has significant experience in financing large electric generating stations. All Project contracts will be structured to satisfy the IE review.

2.3 Contracting

Contracts with creditworthy counterparties that carefully allocate risks to the parties best able to mitigate them are critical to a successful financing. Key contracts for Trailblazer include:

- Power purchase agreement;
- CO_2 purchase agreement;
- Engineering, Procurement, Construction (EPC) agreement;

- Construction management agreement;
- Operations management agreement;
- Maintenance agreements;
- Transmission interconnection agreements;
- Fuel agreements;
- Water agreements; and
- Federal loan guarantees (if any)

2.4 Proforma Analysis

The project sponsors must provide lenders a financial proforma showing that cash flows generated by a project will be sufficient to cover expenses and service its debt over the life of the loan. In addition to looking at a project's expected assumptions, the proforma can be stressed to provide lenders with comfort that a project can withstand results less favorable than those which are expected. The lenders also may adjust assumptions in a project's expected case based on input from the IE.

Under current conditions, Trailblazer's proforma would be unable to demonstrate sufficient cash flows to obtain financing. Federal policies incenting first movers to capture CO_2 or significant increases in the revenues received for CO_2 and electricity, will be required before the Project will be able to obtain financing.

2.5 Trailblazer Financing Plan

2.5.1 Debt

Tenaska plans to finance the Project in a manner similar to that used for Tenaska's other independent power projects. The Project will be financed on its own merits with no cross default provisions to other projects. Loan documents will be collateralized by all of the Project's assets. It is anticipated that the Project will finance all debt in the commercial bank and/or capital markets.

2.5.2 Equity

Tenaska intends to retain a significant portion of the Project's equity, while selling equity subscriptions in amounts and at times that maximize the value of the Project's equity. In 2010, Tenaska sold a 35 percent interest in the Project to Arch Coal, a strategic partner who brings a wealth of experience in coal supply and management to the Project. It is possible that other strategic or financial partners also could purchase interests in Tenaska Trailblazer Partners LLC prior to financial close.

3.0 Purpose and Goals

The purpose of this report is to provide a better understanding of the challenges faced in financing a multi-billion dollar, first-of-its-kind greenfield coal-fueled power plant with post-combustion carbon capture built into its original design, whether those challenges would apply to such projects in general or to the Trailblazer project in particular. Specifically, this report will:

- Provide a high-level overview of the current markets for electricity and CO_2 available to the Project;
- Discuss the gap between the Project's likely revenues and its costs;
- Assess the likelihood that different potential governmental support mechanisms would be sufficient to allow financing of the Project;
- Discuss the financing considerations associated with a first mover project like Trailblazer; and
- Discuss the various components of the Project's financing plan.

4.0 Revenues and the Commercial Gap

The Project will make two main products – electricity and CO_2. The inability to achieve sufficient revenue from product sales to cover the significant additional costs associated with carbon capture and storage makes obtaining financing more difficult. Although the markets for electricity and CO_2, and the likely commercial gap the Project will face, have been discussed in detail in Tenaska's report to the Global CCS Institute entitled "*Bridging the Commercial Gap for Carbon Capture and Storage*" dated July 2011, a recap will be provided here as the Project economics play such a key role in any financing scenarios.

4.1 Electricity Revenues

As noted in the "*Bridging the Commercial Gap"* report, Tenaska has used its extensive experience in the electric and gas markets to develop specific, accurate, proprietary information not available to the general public. Quantitative proprietary data is incorporated into the electric pricing models discussed below, yielding more accurate results. In addition, Tenaska's electric transmission and marketing experts have unique insights that assist in interpreting the data produced by both models, providing more useful conclusions. Tenaska's internal natural gas and energy demand forecasts have been replaced in this analysis by the USA Department of Energy's Energy Information Administration's (EIA) Natural Gas Price forecast and ERCOT's energy demand forecast. These are widely accepted third-party forecasts that are publicly available.

Trailblazer will sell the power it produces into the West Zone of the ERCOT market. Using two well-known electric pricing models, Aurora^{XMP} and PowerWorld™, Tenaska has produced an analysis of the ERCOT market that predicts the electric revenues Trailblazer could expect to achieve through 2030, based on its expected dispatch and a price forecast for the West Zone.

It should be noted that this analysis assumes no overall price on carbon emissions, as the enactment of USA cap and trade legislation that would have provided such a price no longer seems likely in the near term.

Electric generating units in the ERCOT market are incented to bid based on their variable operating costs to ensure that they get called to dispatch. Because Trailblazer will be able to offset the majority of its fuel and variable operations and maintenance (O&M) costs with the revenue it will earn from the sale of CO2 into the Permian Basin EOR market, Tenaska's dispatch analysis shows that Trailblazer's variable operating costs would be among the lowest of all ERCOT generators. Due to its low variable operating costs, the analysis allows Tenaska to confidently predict that Trailblazer would operate at least 90 percent of the time.

Using publicly available natural gas price and ERCOT energy demand forecasts, Tenaska forecasts power prices in the ERCOT West Zone ranging from USD$37.45/megawatt hour (MWh) in 2013 to USD$77.57/MWh in 2030 (in nominal USD). This forecast is based on publicly available data only.

By simulating hourly supply and demand and incorporating each unit's forecasted dispatch cost, the model is able to produce an hourly power price forecast for the study period that is incorporated into Trailblazer's energy revenue for the hours it dispatches to the market. It should be noted again that for this report the model used publicly available information, rather than Tenaska's proprietary information, for several key model inputs. Therefore, the prices shown in Table 4.1 below do not represent Tenaska's view on the forecasted power prices in ERCOT. They do, however, provide an indication of the pricing Trailblazer might see in the market.

TABLE 4.1 – Annual Forecasted Power Prices (USD) in the ERCOT West Zone

ERCOT West Zone Modeled Power Prices (nominal USD$/MWh)	
Year	**Price**
2013	37.45
2014	38.81
2015	40.55
2016	42.30
2017	43.70
2018	45.64
2019	47.62
2020	50.51
2021	53.21
2022	55.98
2023	59.23
2024	62.23
2025	65.15
2026	68.18
2027	71.25
2028	73.71
2029	75.76
2030	77.57

4.2 CO_2 Revenues

Trailblazer will sell approximately 5.75 million tons of CO_2 annually into the Permian Basin CO_2 market – the most mature and robust CO_2 market in the world. Tenaska retained Steve Melzer, a well-known geological engineer whose expertise includes reservoir characterization, CO_2 flood performance and CO_2 geologic sequestration, to provide the CO_2 market analysis for this report.

Mr. Melzer concludes that new sources of anthropogenic CO_2 are critical to the growth of conventional CO_2 EOR reservoirs and development of the residual energy zones that are just beginning in the Permian Basin. Mr. Melzer also points out that mature CO_2 EOR regions such as the Permian Basin have the advantage of proven reservoirs, as well as excellent oil response to CO_2 injection, and therefore producers in the region are able to pay higher prices for CO_2.

Tenaska considers its projections of CO_2 revenues to be highly confidential, since negotiations with CO_2 suppliers have not yet been concluded. However, Mr. Melzer provides a rule of thumb algorithm of CO_2 price per Mcf = 2 percent of the posted project equivalent oil price per barrel delivered to the oil field operator. With oil prices between USD$85 and USD$110 per barrel, CO_2 prices would be between USD$1.70 and USD$2.20 per Mcf using this rule of thumb.

4.3 Revenue Gap

Tenaska considers its revenue forecasts to be confidential and proprietary information. The same is true of its construction and O&M costs. Even so, Tenaska is willing to provide some general information to help the Global CCS Institute's members gain insights into the challenges facing projects such as Trailblazer that add carbon capture equipment to a conventional pulverized coal-fueled plant. Therefore, this analysis focuses on the additional costs and revenues that result from the addition of carbon capture equipment.

In general, the addition of a carbon capture plant adds about 30 percent to a project's capital costs. In addition, it adds approximately 10 percent to a project's O&M costs. Finally, and most importantly, operation of the carbon capture plant consumes a significant amount of steam and electricity, thereby reducing the net electrical output by about 25 percent of what otherwise would be available for sale. The energy penalty depicted in Figure 4.3 is determined by multiplying the reduction in net electrical output resulting from operation of the carbon capture plant by the ERCOT power prices shown in Table 4.1.

On the plus side, assuming a project is located where its captured CO_2 is a saleable product and not a waste stream, the project gains additional revenue from CO_2 sales. In the State of Texas, there are state and local incentives available to Advanced Clean Energy Projects, as defined by state statute, which provide some additional revenue. However, the revenues achieved through CO_2 sales plus available state and local incentives are not sufficient to make up for the increased capital and O&M costs, and the energy penalty caused by the carbon capture plant's consumption of electricity that otherwise would be available for sale. Figure 4.3 shows in a very general way the relative impacts the addition of a carbon capture plant has on costs and revenues.

FIGURE 4.3 – Revenue Gap

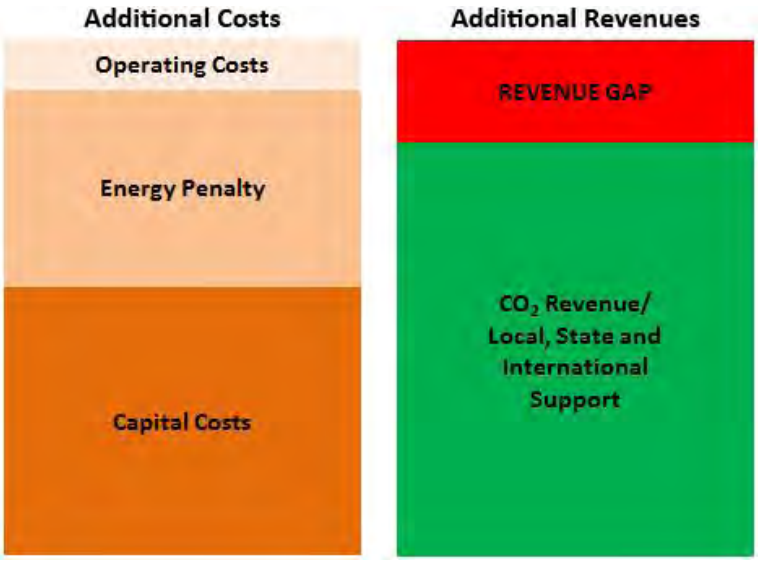


Figure 4.3 shows the current gap that needs to be filled in order for Trailblazer to be economic. Today, that gap can be filled in one of three ways:

- Federal policies could change to bridge the gap.
- If oil prices increase significantly, CO_2 revenues potentially could increase enough to bridge the gap; or
- Electric prices could increase enough to bridge the gap.

Technological improvements and/or a reduced risk premium as technology matures also could help bridge the gap.

4.4 Potential Federal Government Support

Absent a major, sustained increase in oil prices (and an attendant major, sustained increase in CO_2 prices) and/or electric prices, additional government support will be required to make the Project economic.

Although local and state incentives are extremely important, in Trailblazer's case they are not sufficient to completely bridge the current gap between the additional cost of the carbon capture plant and the revenues the Project will realize from the sale of CO_2. In order to offset the added costs of this first-of-its-kind carbon capture plant, either some value must be placed on the reductions of greenhouse gases that the Project provides, or direct, policy-based inducements need to be developed to encourage early CCS deployment and ultimate commercialization. Under current conditions, Trailblazer cannot move forward without such support, unless the market prices for CO_2 and electricity change significantly.

A discussion of some of the legislation that has been put forward at the USA federal level to help address the gap follows.

4.4.1 Cap and Trade

Cap and trade is an environmental policy tool that sets a mandatory cap on emissions while providing sources with flexibility in how they comply. Examples of successful cap and trade programs include the USA's nationwide Acid Rain program and the regional NO_x Budget Trading Program in the Northeastern USA.

Under a cap and trade program, each electric generating plant would receive a certain number of CO_2 emission credits. Plants whose CO_2 emissions exceed the number of credits they are allowed must go out into the market to purchase additional emission credits from plants that do not need all of the credits they receive.

There have been two recent major CO_2 cap and trade proposals before the USA Congress – the American Clean Energy and Security Act (Waxman-Markey) and the American Power Act (Kerry-Lieberman). Waxman-Markey passed the USA House of Representatives in July 2009, but failed to get any traction in the USA Senate. Kerry-Lieberman was issued as a draft bill in the USA Senate in May 2010, but never gained any momentum there. Because Trailblazer would capture 85 to 90 percent of the CO_2 that otherwise would be emitted into the atmosphere, under a cap and trade scenario, the Project would have a significant number of CO_2 emission credits to sell. Under either Waxman-Markey or Kerry-Lieberman, Tenaska believes that Trailblazer would have received sufficient revenue from the sale of CO_2 emission credits to move the Project forward, because it would have received "bonus" allowances for being a first mover in the CCS industry.

4.4.2 Section 45Q Tax Credits

The Energy Improvements and Extension Act of 2008, as amended by the American Recovery and Reinvestment Tax Act of 2009, enacted Section 45Q of the USA Internal Revenue Code. This Act provides tax credits for taxpayers that capture $CO_2$from an industrial source that otherwise would be released into the atmosphere and dispose of the CO_2 in secure geological storage within the USA.

Section 45Q provides for a tax credit of USD$20 per metric ton of qualified CO_2 that is captured and disposed of in secure geologic storage, and USD$10 per metric ton of qualified CO2 that is captured and used as a tertiary injectant in a qualified EOR project then disposed of in secure geologic storage.

For Trailblazer, which expects to capture 5.22 million metric tons of CO_2 per year for use in EOR projects, this would result in approximately USD$52.2 million per year in tax credits.

Importantly, the 45Q tax credits are available only for the first 75,000,000 metric tons of qualified CO_2 from all combined projects that apply for credits. Once that threshold is reached, no more credits would be available. Because of the uncertainty associated with how long (if at all) these tax credits would be available, they would not be considered as a revenue source by lenders in a financing.

There are some attempts being made in Congress to modify the 45Q tax credit program to: 1) increase the value of the tax credit; 2) increase the quantity of credits available; and

3) provide the certainty that would be required to help projects obtain financing. It remains to be seen whether those efforts will be successful.

4.4.3 Clean Energy Standard

In March 2011, President Barack Obama issued his "Blueprint for a Secure Energy Future." The document sets a national goal of generating 80 percent of the country's electricity from "clean energy sources, including renewable energy sources like wind, solar, biomass, and hydropower; nuclear power; efficient natural gas; and **clean coal**." (emphasis added).

It also proposes a Clean Energy Standard, which would work by giving power plants clean energy credits for every megawatt-hour of electricity they generate from clean energy. Clean energy credits would be issued for electricity generated from renewable sources and nuclear power, with partial credit for generation from efficient combined-cycle natural gas plants and fossil fuel plants that capture and store CO_2. Theoretically, revenue from the sale of clean energy credits could be used to help close the revenue gap.

It is unclear whether the President's Clean Energy Standard will gain the necessary support to become law. It also is unclear whether a market for clean energy credits would be sufficient by itself to bridge the revenue gap.

4.4.4 Lugar Practical Energy Plan

In June 2011, Republican Senator Dick Lugar of Indiana introduced the "Practical Energy Plan of 2011," which contains some provisions that might be useful to Trailblazer. However, it includes a "revenue generating fail-safe" provision, which allows the Secretary of the Treasury to suspend the program if projected income from new oil production fails to pay for the program, so it is unlikely to offer the certainty that would be required by lenders. Sen. Lugar's bill has been referred to the Senate Finance Committee.

4.4.5 USA Federal Loan Guarantees

The USA federal loan guarantee program was established by Title XVII of the Energy Policy Act of 2005 (EPACT 2005). EPACT 2005 empowered the Secretary of Energy to provide loan guarantees for up to 80 percent of the cost of bringing projects to commercial operation that use "innovative technologies" that "avoid, reduce or sequester air pollutants or anthropogenic emissions of greenhouse gases" and "employ new or significantly improved technologies as compared to technologies in service in the United States at the time the guarantee is issued." There were 10 categories of eligible projects for loan guarantees under Title XVII:

1. Renewable energy systems.
2. Advanced fossil energy technology (including coal gasification meeting the criteria in subsection [d]).
3. Hydrogen fuel cell technology for residential, industrial or transportation applications.
4. Advanced nuclear energy facilities.

5. Carbon capture and sequestration practices and technologies, including agricultural and forestry practices that store and sequester carbon.
6. Efficient electrical generation, transmission, and distribution technologies.
7. Efficient end-use energy technologies.
8. Production facilities for fuel-efficient vehicles, including hybrid and advanced diesel vehicles.
9. Pollution control equipment.
10. Refineries, meaning facilities at which crude oil is refined into gasoline.

Source: Energy Policy Act of 2005, Section 1703(b)

The Department of Energy could guarantee up to USD$8 billion total for coal-based power generation and industrial gasification facilities that incorporate carbon capture and sequestration or other beneficial carbon uses and advanced coal gasification facilities. Trailblazer's development was not advanced enough to qualify for a loan guarantee during the application period, primarily because the Project's carbon capture technology had not yet been selected at that time. The Project today is developed to a point where it could apply for any additional loan guarantees that may become available in the future.

5.0 Financing Considerations

5.1 Overview

The economics and financing of the Project reflect the challenges associated with pioneering new technology. As mentioned above, the cost of adding carbon management equipment to the Project is significant. The additional equipment will increase the capital cost of the facility by about 30 percent and O&M costs by approximately 10 percent. In addition, the carbon capture and compression equipment will reduce the net electricity generated by the Project by around 25 percent. Although these additional costs are partially offset by the projected income from the sale of CO_2, there currently is no mechanism to capture the additional societal value achieved by demonstrating the viability of capturing CO_2 from the flue gas of a conventional coal-fired electric generating station.

Typical energy projects that employ proven technologies are financed with capital from two sources, debt and equity. Many utilities in regulated markets will finance and build projects "on-balance-sheet." That is, they utilize corporate level debt and equity to fund the construction of their assets. Revenues sufficient to cover capital costs, operating expenses and profit are derived through a regulated rate making structure. Other projects, typically those developed by independent parties (like Tenaska), are financed on a non-recourse project basis in which debt and equity capital are raised specifically for the project and are supported only by the revenues generated by the project. All of Tenaska's projects have been financed using non-recourse project financing. A non-recourse project financing provides several benefits and protections to the project, including no risk of cross defaults to other projects, and strict debt covenants. 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 their fixed obligations, primarily interest payments and repayment of principal. Lenders' security and collateral is normally limited to 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 built around a group of agreements and contracts between lenders, project sponsors, and other interested parties. A finite amount of debt will be issued on inception and the project will operate in a focused line of business over a finite period. The lenders (and, in some cases rating agencies) will analyze relevant risks when determining the credit quality of a project finance transaction and, ultimately, decide whether to lend to the project sponsors based on the risks and merits of the project. However, the primary focus is the determination of the project's ability to service debt based upon the projected cash flow of the project and the identification and mitigation of risk.

Projects that employ new technologies face additional challenges in raising capital. Many of these types of projects must rely on some form of Federal and State incentives to support the financing.

Standard & Poor's (S&P), a worldwide leader in financial market intelligence, periodically issues a report on project finance debt rating criteria. The most recent S&P guidance on project finance debt rating criteria, which was issued in September 2007, is included as Exhibit 1 to this report. The discussion below attempts to address several of the principal factors identified by S&P as being critical to the lending community.

5.2 Offtake Agreements/Contracts

Contracts with creditworthy counterparties that carefully allocate risks to the parties best able to mitigate them are key to a successful financing. Following is a discussion of the types of contracts S&P points to as being particularly important from a financing perspective.

Offtake agreements are contractual obligations that provide surety of revenue to the project, which is dependent upon the credit profile of the offtake counterparty and its long-term viability. Some projects rely on unregulated energy markets in lieu of or to augment a long-term offtake agreement. These are referred to as "merchant" projects. Merchant projects are generally difficult to finance without substantially higher equity commitments from project sponsors due to market power prices, and thus cash flow, uncertainty. The need for a larger amount of equity to construct a merchant facility is due to the fact that lenders will want more cushion in cash flow available for debt service (CFADS) to address the risk associated with a facility whose revenue stream is exposed the market price for power. This is accomplished through the requirement for higher debt service coverage ratios (DSCRs). The DSCR is the cash-basis ratio of CFADS to interest and mandatory principal obligations. CFADS is calculated by taking cash revenues from operations only and subtracting cash operating expenses, cash taxes, and cash major maintenance costs, but not interest or principal. 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. According to S&P, lenders and rating agencies will rely on DSCRs as the primary measure of a project's financial strength. The lenders will require base case financial projections to meet predetermined DSCR targets and will also stress test the pro forma to assess the financial strength of the project under certain downside scenarios. A strong project will be able to withstand stresses and still remain able to service the debt with a margin above a 1.0 DSCR.

It is highly unlikely that a project such as Trailblazer could be financed as a merchant plant, given the risks associated with it being a first-of-its-kind facility. Given the large amount of capital required to construct such a project, it is most likely that there is limited liquidity in the debt markets for this type of risk, even if a substantial portion of the capital cost is supported by sponsor equity. The universe of lenders willing to take merchant financing risk is much smaller than that of those willing to finance a contracted plant. The certainty of cash flow associated with a fixed contract for power and CO_2 would give lenders more comfort that the facility can withstand potential issues during the initial work out period and operations going forward.

5.2.1 Offtake Contracts

Lenders generally require offtake contracts to remain in effect for at least the term of the debt and potentially two to three years beyond. The project sponsor typically has various obligations to maintain the facility in a state of readiness to assure it can reliably and efficiently produce and deliver power when requested by the offtaker or, in the case of a merchant facility, when market prices for power make it economically viable to sell energy into the market. Compliance with these obligations is typically enforced through bonus and penalty provisions in the contracts for ongoing performance compared to predetermined standards of performance. The purchasers of capacity and energy and other products produced by the project may provide guarantees from a creditworthy entity to enhance the credit profile of the debt used to finance the project.

Tenaska intends to have long-term sales agreements with creditworthy counterparties for both electricity and CO_2 in place prior to financial close in order to support financing of the Project.

As part of a power plant financing, lenders require an independent market study from a reputable firm. The study assesses the markets for power and fuel, projected energy demand and capacity additions for the project's region, new entrant capital and operating costs, as well as other factors affecting the plant's relative competitiveness in its region. The assessment will show a projected dispatch for the plant, which can then be fed into the proforma for sensitivity analysis under various scenarios. These scenarios can give lenders an indication of the financial impact of changes in the market. Two examples of sensitivities performed by the market consultant are a high fuel price environment or a capacity overbuild scenario. Either of these could have an effect on how the plant is dispatched and could potentially impact its cash flow and ultimately its ability to make debt service payments. In the case of a power plant project with CCS, that proposes to sell the captured CO_2, lenders also will require an independent study of the CO_2 market.

As described above, Tenaska has an electric dispatch model similar to those used by market consultants in producing their reports. As is the case with Trailblazer, Tenaska employs this tool throughout the development process as the project continues to be evaluated over time. This is especially helpful during the power contract and maintenance agreement negotiation phases as these are key drivers to the economics of any project. Also as mentioned above, Trailblazer has contracted with an expert in the West Texas CO_2 market to assist in evaluating CO_2 market conditions. Having these market assessment tools available as the Project is being developed provides valuable intelligence to Tenaska.

5.2.2 Engineering Procurement and Construction (EPC) Contract

The structure of EPC contracts is an important factor in allocating risks in the construction of a project. A creditworthy EPC contract will have the following characteristics:

- A creditworthy and experienced contractor
- A fixed-price, date-certain turnkey contract
- Performance guarantees

- Adequate performance and delay liquidated damages
- Completion guarantees from creditworthy parties or letters of credit from a qualified institution
- Competitively priced equipment and construction labor

Generally, experience suggests that more creditworthy projects will allocate the bulk of construction risk to experienced contractors, usually under fixed-price, date-certain EPC contracts. If adequately structured, these contracts can provide strong assurance to lenders that the project will be completed as forecast. Contract provisions should include at least material liquidated damage penalties and bonus incentives for schedule and technical performance, strong completion tests, strict limits on change orders, and payment based on progress made. In addition, contractors should provide warranties of at least one year on work performed—perhaps longer when situations require.

Project lenders frequently rely on the reputation of the EPC contractor or the project sponsor as a proxy for technical risk, particularly when lending to unrated transactions. Lenders place considerable importance on the technical evaluation of project-financed transactions

In June 2009, Tenaska selected Fluor Enterprises (Fluor) as the EPC contractor for the Project. Fluor was selected in a competitive proposal process, where the evaluation was based on preliminary pricing, experience, performance, schedule, commercial terms and ability to perform. Fluor also has been selected to provide the carbon capture technology for the Project, providing Project owners with a single point of responsibility and insulating them from cost, schedule and performance risk. Critically, Fluor has the financial strength to assume commercial risks associated with new technology. Additional information on Tenaska's selection of Fluor can be found in Tenaska's reports to the Global CCS Institute entitled *"Building a Consortium to Develop a New Pulverized Coal Plant With Post-Combustion Carbon Capture"* and *"CO_2 Technology Evaluation, Methodology and Criteria."*

5.2.3 Construction Management

EPC contractors and project sponsors generally co-manage the construction process. Weekly or monthly progress is compared to budgets and schedules to ensure that timely progress is made and important milestones are met in the process.

In the fall of 2008, Tenaska selected Burns & McDonnell to be the Owner's Engineer for the Project. The Owner's Engineer acts as an agent for the owner, essentially becoming an extension of the owner's organization. Burns & McDonnell was selected due to their significant amount of recent experience working on coal-fueled electric generating stations. Tenaska will work with Fluor to manage construction of the Project, with assistance from Burns & McDonnell as the Owner's Engineer.

5.2.4 Operations Management

It is important that projects have experienced operators to ensure that the facility is operated safely and in accordance with industry standard prudent operating practices. This helps ensure that the project operates within budget and maintains high availability.

Ineffective operations management could jeopardize the project's viability. Operators are typically obligated to meet established performance obligations and must be creditworthy to stand behind such obligations.

Tenaska Operations, Inc. (TOI), a wholly owned subsidiary of Tenaska, is expected to provide O&M services to the Project pursuant to an industry-standard, arms-length O&M agreement. TOI will provide the skilled personnel, procedures, training, administration, management, and technical services necessary for the safe and reliable start-up, commissioning, and O&M of the facility. While there is little experience in the USA operating carbon capture facilities, adequate operating and maintenance procedures would be developed using a) support from Fluor, the EPC contractor and carbon capture technology supplier, and b) Tenaska's in-house expertise on chemical plant operation and maintenance. Training on these procedures would likely be conducted by TOI and Fluor prior to operation. During startup and commissioning, TOI will gain extensive experience to support commercial operations.

TOI and its affiliated companies employ approximately 275 people to provide efficient and reliable operation of the approximately 12,000 megawatts of natural gas-fueled generating capacity. TOI has received many awards for safety and its management and operation of these facilities. In 2010 alone, TOI-operated plants received the following safety awards:

- 10 Occupational Excellence Achievement Awards (injury and illness rate in top 50 percent of industry);
- 10 Perfect Record Awards (no lost-time injuries in calendar year 2010);
- 7 Safety Leadership Awards (no lost-time injuries for 5 consecutive years); and
- 3 Superior Safety Performance Awards (no lost-time injuries for 10 consecutive years).

In addition, there are two TOI facilities that have received the Star Award from the Occupational Safety and Health Administration Voluntary Protection Program. Only a few thousand out of more than seven million worksites have achieved this award.

TOI's commitment to excellence extends beyond safety. In 2010 and 2011, TOI plants earned seven Best Practices Awards each year from the Combined Cycle Journal publication. They included awards for environmental stewardship, operations and maintenance, safety, and design and management.

5.2.5 Maintenance Agreements

Many projects elect to enter into long-term service agreements (LTSA) with the original equipment suppliers or other experienced maintenance providers in order to ensure the adequacy of replacement parts, refurbishments and the technical expertise for performing routine maintenance on the facility. These agreements typically transfer parts-life, performance and availability risk to the provider in exchange for regular payments. The existence of maintenance agreements with proper performance bonus and penalty structures that effectively allocate risks will enhance the credit rating of the debt used to finance the project.

In some cases, a project-financed energy project will elect to not enter into an LTSA. In

such cases, lenders will require a funded reserve at the project level to cover expected maintenance and repair costs over the term of the debt.

The Project intends to perform maintenance with its internal workforce and external third-party contractors. External contractors will be used for some routine maintenance, major and minor overhauls, and specialty work. Additionally, the Project intends to work with the original equipment manufacturers' approved vendors during the applicable warranty periods. LTSAs are fairly uncommon for conventional coal plants do to the unpredictability of major maintenance timing and cost. Therefore, Trailblazer will most likely put a maintenance reserve in place.

5.2.6 Transmission and Interconnection

Electric generating projects will need to secure electric interconnection agreements and, if applicable, firm transmission rights in order to deliver energy to the offtake counterparty. It is necessary to file interconnection requests with the owner of substations or transmission lines in order to obtain access to those facilities, which is generally a lengthy process. Newly constructed electric generating projects may also require system upgrades to the electric grid to relieve congestion or accommodate additional capacity. Occasionally, there may be other prospective generators that have entered the queue to obtain an interconnection that may delay access to the electric grid for others who have filed requests later in the queue. There may be some risk that an interconnect request is never granted to a prospective electric generation project due to limited capacity or prohibitive system upgrade costs.

Oncor Electric Delivery, the electric transmission and distribution company to whom the Project will be interconnected, has completed the interconnection studies for the Project. It is anticipated that the interconnection agreement will be executed by the end of 2011.

5.2.7 Fuel

Electric generating projects need a long-term supply of readily available fuel in order to remain viable. Fuel supply agreements ensure that adequate proven sources of fuel are available and will also provide price assurance on the supply of fuel.

Depending on the structure of the offtake agreement, the project may take on the obligation to procure and deliver fuel to the project. Such obligations are satisfied through long-term procurement, transportation and hedging contracts. Counterparties to these contracts must be viable and creditworthy. The project, in turn, must also provide credit support behind its obligations under these arrangements. Examples of credit support include a guarantee, a letter of credit (LC), or cash. This is not always the case though. Sometimes power contracts will require the power offtaker to also procure the fuel. In this case, the sponsor would not be required to post credit support.

At the same time Tenaska sold a 35 percent interest in the Project to Arch Coal, the Project Company signed a 20-year fuel supply agreement with Arch Coal. In 2009, Arch Coal had sales volume of 96.1 million tons of coal produced at the Black Thunder and Coal Creek mines in Wyoming. The Project Company's fuel supply agreement with Arch Coal provides the Project with a firm fuel supply from low-sulfur Powder River Basin mines served by both the Union Pacific and Burlington Northern Santa Fe

railroads. Arch Coal controls approximately 2.8 billion tons of reserves in the Powder River basin.

5.2.8 Water

Water is another key resource for a coal-fired electric generating station with post-combustion CO_2 capture. Lenders want assurance that a project's water supply will continue to be available even during the drought of record. If the project's water supply is subject to curtailment during drought situations, large water storage facilities may be necessary to provide sufficient surety to lenders.

Tenaska is working with local municipalities to obtain the water it will need for the Project. Since the decision was made early on to dry cool the Project, it will require only about one million gallons of water per day (mgd), with a peak demand of about two mgd. Tenaska has signed a contract with the City of Stamford, Texas, to provide more than half of the water required for the Project. Based on Tenaska's extensive financing experience, the Stamford water supply arrangement will be acceptable to lenders. Work continues on locating additional water supplies.

5.3 Liquidity

Two forms of credit support used by sponsors to secure their obligations under loan documents or other project documents are LCs or cash funded reserves. For example, lenders require that a debt service reserve be established to accommodate six to twelve months of total debt service. This reserve can be drawn upon to make debt service payments in the event there is a temporary disruption in the operations of a project, which affects the project's CFADS. Additionally, a lender will require the project to maintain adequate working capital in the project to protect against short term fluctuations in cash on hand or unforeseen expenses. In this situation, a cash funded reserve or line of credit can be put in place. Project participants may also use LCs or cash funded reserves to back other financial obligations of the project. For example, a power purchaser may require the project to post credit to secure its performance under a power contract. Tenaska anticipates using a combination of LCs and a working capital line of credit for Trailblazer.

5.4 Insurance

Lenders typically require the project to obtain property insurance in the event the property becomes impaired by an insurable event. Business interruption insurance is used in the event a disruption to the plant's operations prevents the project from delivering its required output under the revenue contracts and therefore suffers a reduction in the revenue to the project for a period of time. Various forms of insurance are usually required during the construction period including builder's risk, delay in start-up, marine cargo insurance and liability insurance. The lenders will hire an independent insurance consultant during the diligence period to determine the adequacy of the project's insurance coverage.

5.5 Proforma Analysis

As part of a financing, project sponsors are required to provide to the lenders a financial

proforma, which shows cash flows generated by the project. In addition to showing the project's ability to service debt under the likely scenario, the proforma can be sensitized to provide lenders with comfort that the project has adequately addressed the risks that could preclude it from generating sufficient revenues to cover expenses and service its debt.

In addition to the general DSCR parameters discussed in Section 5.2, lenders and rating agencies will evaluate the capital structure of a project to assess whether the project is levered adequately enough to withstand certain stresses without violating DSCR requirements. Additionally, things such as the risk associated with the performance or reliability of the technology or the risk that the counterparty might not maintain its financial viability may limit the amount of leverage the project is allowed to secure. This is a more subjective determination, but it is still an important component to assessing a project's financial strength. Unproven technology, for example, will be scrutinized as it can bring into question a project's ability to perform reliably or predictably.

As discussed in Section 4.3 above, under the Project's current proforma analysis, Trailblazer would be unable to demonstrate the kind of financial performance required to obtain financing. Changes in the CO_2 and electricity markets or Federal policies recognizing the value of CO_2 capture will be required before the Project will be able to obtain financing.

5.6 Independent Engineer

A vital part of the lenders' due diligence is an IE's report. The lenders will hire an IE to assess the contractual, technical and projected financial attributes of the project to come to a conclusion as to the viability of the project. Examples of various aspects of the project reviewed are listed below:

- Offtake Agreements/Contracts – Review of offtake agreement to assess the strength of the contract. Additionally, the IE will review the independent market study and assess the validity of its assumptions and conclusions.
- EPC Contract - Review of costs, schedule, guarantees and other contractual arrangements to provide an expert and independent evaluation of their reasonableness. Lenders will conduct their technical assessment in several ways, including a review of the IE's project evaluation. This review assesses whether the scope and depth of the IE's investigation support the sponsor's and EPC contractor's conclusions. The lenders will supplement their review of the report by arranging meetings with the IE, the project's management, and the EPC contractor.
- Construction Management – The roll of the IE is not simply relegated to producing its report. The IE also will actively participate in the oversight of the construction process to evaluate such process and help ensure that the lenders are supplied with adequate and timely information. The IE must approve each construction loan drawdown request from the sponsor before the lenders will release the funds. The IE's active role in the oversight of construction management assists in the prompt funding throughout the construction process.
- Operations and Maintenance – Review of relevant operational contracts such as

LTSA, operating agreement, and water supply agreement will be performed. Additionally, the IE will conduct detailed analysis of the technical aspects of the facility, including guarantees, to verify that it could be expected to perform as the sponsor intends. An analysis to determine whether the projected maintenance outage schedule is appropriate given the specific technology and anticipated dispatch profile is performed as well.

- Interconnections – The IE's report will contain a review of the location and adequacy of interconnects such as electrical, water, and fuel. The strength of the various interconnection contracts will also be assessed and the IE will opine as to their sufficiency.
- Fuel - The IE and consultants will make a detailed assessment the project's fuel plan in terms of supply, price, and how it is delivered it to the project. They also will review the creditworthiness of the counterparty that is providing the fuel.
- Water - The IE and consultants for the lenders will analyze a project's ability to obtain the water required, even during very hot weather and times of drought.
- Counterparty Risk – The IE will assess the strength of the project contracts as they relate to protection and risk mitigation for the project sponsor under the contracts. The IE will also look at the experience of the contract counterparties as to reach an opinion as to whether the contractors are sufficiently qualified to construct the project as designed, on time, and on budget.
- Proforma –The findings of the IE, based upon their review and analysis of the various components of the project described above, eventually culminate in the evaluation of the proforma. To the extent the IE analysis does not agree with the information provided by the sponsor, the IE may adjust the assumptions provided by the sponsor in the proforma. The IE will then stress the model provided by the sponsor to measure the impact on DSCRs. These sensitivities will bring to light the strength of the project and its ability to service its debt.

6.0 Trailblazer Financing Plan

6.1 Debt

The financing plan contemplated for the Project is similar to Tenaska's other independent power projects, which have closed project financing. Tenaska Trailblazer Partners, LLC, a special purpose affiliate of Tenaska, has been formed to construct, own and operate the Project, and to enter into purchased power and CO_2 sales agreements. Equity funds required for the Project are being provided from cash on hand and/or funds generated by other corporate activities, as well as from Arch Coal. The Project will be financed on its own merits with no cross default provisions to other projects so that a default on any other Tenaska project would not impact the financing for the Project.

Loan documents for the Project will contain strict covenants that will bind Tenaska Trailblazer Partners, LLC. These covenants provide protection to Project partners as well as the lenders. For example, the lenders will require the Project to meet certain financial metrics such as a target DSCR or operational performance standards. Covenants will also restrict or limit items such as certain forms of additional indebtedness or material changes to the project documents or plant configuration without lender approval. The loan documents will be collateralized by all of the Project's assets, including hard assets (i.e. equipment, land, etc.) and soft assets (i.e. project contracts, permits, etc.).

The non-recourse financing model used in previous transactions Tenaska has developed is based on a comprehensive contract structure that will include (1) an EPC contract with a creditworthy contractor or contracting consortium, (2) long-term offtake agreements with creditworthy purchasers for electric power and CO_2, (3) water supply and wastewater return agreements (4) an O&M agreement with TOI or another experienced and reputable operator and (5) a fuel supply agreement from a supplier with proven adequate reserves such as Arch Coal.

It is anticipated that Trailblazer would finance all debt in the commercial bank and/or capital markets. Tenaska believes this project will be able to attract debt from the markets based on the sound financing principles described in this report. Tenaska has engaged in a number of preliminary discussions with financial institutions, although the optimum time for the beginning of the financing process will not be until offtake contracts and other Project agreements are finalized. The financing process for a bank or capital markets transaction will incorporate the following major elements:

- Distribute an Information Memorandum with detailed term sheet and a request for proposals to a number of leading underwriters;
- On the basis of term sheet discussions, select one or more underwriters as lead arranger or co-arrangers;
- Commence detailed due diligence by lead arranger, lenders' counsel, IE, and third-party consultants;
- Commence documentation process;

- Undertake focused marketing activities for syndication of the debt to a group lenders (a syndicated loan is arranged by one or more lead lenders and has multiple lending participants holding varying amounts of the debt); and
- Closing.

It is anticipated that the senior bank loan will have a tenor of at least 8 years, including the construction period. As the initial senior bank loan approaches maturity, the Project loan will be refinanced in the capital markets. Tenaska has successfully financed projects with loan tenors of up to 30 years. Typical providers of funds for this long term financing include institutional investors such as insurance companies and pension/annuity providers as well as capital market bond investors. Average debt service coverage ratios during the period of long term financing are projected to be comparable to debt service coverage ratios on previously rated project financed debt.

Tenaska has successfully raised more than USD$11.4 billion in aggregate financing including USD$4.7 billion in bank facilities, USD$3.0 billion in capital market transactions and USD$3.7 billion in corporate facilities. As mentioned above, Tenaska Capital Management has raised equity in excess of USD$3.7 billion in the closing of two private equity funds and related co-investment.

The financing strategy is based on current market conditions. In the event that the market conditions change prior to financing, alternate financing strategies could include an institutional private placement or public style financing, or a combination of these strategies.

Tenaska is well known in the project finance markets to arrangers, participating lending institutions and the rating agencies. Project Finance Magazine named Tenaska as its 2004 "Project Sponsor of the Year" for North America due to its success in implementing capital markets financings of power plants. In addition, Forbes magazine ranked Tenaska 24th largest privately held company in 2008, based on 2007 revenue. The company is highly regarded in the financial community, as evidenced by the recognition it has received through the years, such as:

Forbes Magazine

- Ranks Tenaska 34th among the top privately held companies, based on 2009 revenues.

Project Finance International Magazine

- *Sponsor of the Year, 2004,* based on Tenaska's completion of refinancings in Oklahoma and Virginia, as well as renewal of its USD$200 million credit revolver.
- *Bond Deal of the Year, 2004,* for the Company's success and innovation in refinancing the Tenaska Kiamichi Generating Station.
- *Bond Deal of the Year, 2003,* for the Company's success in refinancing the Tenaska Central Alabama Generating Station.

Euromoney's Project Finance Magazine

- *North American Single Asset Deal of the Year, 2003*, for the Company's success in refinancing the Tenaska Central Alabama Generating Station.
- *North American Single Asset Deal of the Year, 2002,* for the Company's financing of the Tenaska Virginia Generating Station.

A June 5, 2005 article in the *Omaha World Herald* contained the following quotes that reflect the financial community's evaluation of Tenaska:

- Quote from Tom Nelthorpe of *Project Finance* magazine: "[Tenaska is] one of the last good names left in this business of developing and operating power plants."
- Quote from Michael Messer of Standard & Poor's: "[Tenaska] has an extraordinary attention to detail that certainly improves the credit quality of their projects. They put a lot of thought into the projects they want to develop…It's like a puzzle, and with Tenaska, there aren't any loose ends…We see that as being a real source of strength in the Tenaska deals we've looked at."

6.2 Equity

Tenaska often brings partners into its projects. Typically, however, partners are not brought in until at earliest financial close, and often after the projects are constructed and are in operation. Given the unique nature and significant expense required to develop Trailblazer, Tenaska looked for a partner in the development phase of the Project.

There are two ways to approach selection of a development-phase partner for a large project like Trailblazer. The owner can seek a financial partner, who provides development and investment dollars but doesn't bring expertise that could be beneficial to the project. This type of partner is only seeking a required return on its financial investment. Alternatively, the owner can seek a strategic partner who brings not only development funds, but also specific expertise that can benefit the project. Due to the complexities of the Trailblazer project, Tenaska elected to search for a strategic partner during the development phase.

In March 2010, Arch Coal purchased a 35 percent share of Tenaska Trailblazer Partners, LLC. Among Tenaska's considerations in bringing Arch Coal in to the Project were:

- Strategic Value – As one of the largest suppliers of low-sulfur PRB coal, Arch Coal brought to the partnership its 40 years of experience in the energy and coal industries. This was a critical consideration to Tenaska, since Arch Coal's expertise in coal characteristics, handling and transportation will clearly benefit the Project. In addition, Arch Coal brought a reliable supply of PRB coal to the Project.
- Performance – Even in the face of the most significant economic downturn since the Great Depression, in 2009 Arch Coal recorded revenues of almost USD$2.6 billion and adjusted net income of more than USD$63 million, while boosting their reserve base by 25 percent.
- Values – Headquartered in St. Louis, Missouri, Arch Coal shares Tenaska's

conservative values and belief that coal can and must continue to play a vital role in our energy future.

Tenaska intends to retain a significant portion of the Project's total equity while selling equity subscriptions in amounts and at times that maximize the value of the equity in the Project. Additional equity investors must have an appetite for a long-term position and the ability tolerate the technology and construction risk that the Project poses, as well as having a commitment interest to clean energy with carbon capture and sequestration.

Tenaska has successfully raised equity from multiple creditworthy counterparties for investment in all of its domestic projects. Tenaska Capital Management has leveraged these relationships while relying upon the long-standing reputation of Tenaska as a diligent, conservative sponsor in the successful close of two private equity funds and related co-investment with aggregate commitments in excess of USD$3.7 billion.

7.0 Lessons Learned

Obtaining financing for CCS projects becomes increasingly difficult as they move from small pilot projects to full-scale commercial ones. Following are some observations regarding the potential financing of a full-scale CCS project like Trailblazer:

- The financing of a full-scale CCS project is different than financing for a traditional power project in several ways:
    - There is additional risk associated with the implementation of first-of-its-kind technology. That risk can be partially mitigated by selecting a highly qualified, creditworthy technology provider that provides performance guarantees;
    - The sheer magnitude of the debt necessary to construct an electric generating unit with a full-scale CCS project makes obtaining financing much more difficult;
    - The lack of an operating track record for a plant of this type represents a level of risk some lenders may not be willing to take; and
    - In some markets, it is possible that lenders would perceive carbon storage to be a risk. Tenaska does not believe that would be the case with Trailblazer, since the Project is located near the Permian Basin, where CO_2 has been transported and used in EOR efforts for more than 35 years.
- Tenaska believes it would be very difficult to obtain traditional project financing in the commercial bank or bond market for a project like Trailblazer under current market conditions.
- Federal loan guarantees can greatly increase the likelihood that a full-scale CCS project can obtain financing. The guarantee program described in Section 4.4.5 was established to allow innovative, and in some cases first time, projects like Trailblazer to obtain financing. Trailblazer's development was not advanced enough to qualify for a loan guarantee during the application period, primarily because the Project's carbon capture technology had not yet been selected at that time. The Project today is developed to a point where it could apply for any additional loan guarantees that may become available in the future.
- Federal grants or tax subsidies can defray upfront capital cost or tax liabilities going forward, thus making a CCS project more economically viable.

8.0 Acronyms and Citations

Acronym/Abbreviation

Acronym	Meaning
Arch Coal	Arch Coal, Inc.
CCS	Carbon Capture and Storage
CFADS	Cash Flow Available for Debt Service
CO_2	Carbon Dioxide
CO_2 EOR	Carbon Dioxide Enhanced Oil Recovery
DSCR	Debt Service Coverage Ratios
EIA	Energy Information Administration
EOR	Enhanced Oil Recovery
EPACT 2005	Energy Policy Act of 2005
EPC	Engineering Procurement and Construction
ERCOT	Electric Reliability Council of Texas
Fluor	Fluor Enterprises
IE	Independent Engineer
Kerry-Lieberman	American Power Act
LC	Letters of Credit
LTSA	Long Term Service Agreement
Mcf	Thousand Cubic Feet
MGD	Million Gallons per Day
MWh	Megawatt Hour
O&M	Operations and Maintenance
Project	Tenaska Trailblazer Energy Center
S&P	Standard & Poor's
SPE	Special Purpose Entity
Tenaska	Tenaska, Inc.
TOI	Tenaska Operations, Inc.
Trailblazer	Tenaska Trailblazer Energy Center
USA	United States of America
USD	United States Dollars
Waxman-Markey	American Clean Energy and Security Act

Exhibit 1
Standard & Poor's
Project Finance Debt Rating Criteria

STANDARD &POOR'S

Global Credit Portal
RatingsDirect®

September 18, 2007

Criteria | Corporates | Project Finance:

Updated Project Finance Summary Debt Rating Criteria

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Updated Project Finance Summary Debt Rating Criteria

(Editor's Note: This is an update to the Sept. 16, 2004, article "Project Finance Summary Debt Rating Criteria", to reflect Standard & Poor's Ratings Services' revised methodology for rating project-finance debt."

The world of project finance has continued to grow since Standard & Poor's 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 & 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 table 1. 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.

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.

Framework for Project Finance Criteria

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

- Project-level risk
- Transactional structure
- Sovereign risk
- Business and legal institutional development risk
- 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;
- 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 (LOCs), 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
- 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 majuere 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 bio-mass 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
- 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
- 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 Rating Direct 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 (DSCRs) 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 RatingDirect 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 1.0x—-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 project 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 tranactions. 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 capital 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 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 projects 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 (SPEs).

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 rations 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 Rating Direct 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 Corporation, 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, S&P needs 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 an 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 (FER) 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 projects 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.