Report to the
Global CCS Institute

Development of the
Tenaska Trailblazer Energy Center

Final Report

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Abstract

This paper discusses the development of the Tenaska Trailblazer Energy Center, a supercritical pulverized coal electric generating station under development in Nolan County, Texas, United States. The site is located approximately nine miles east of Sweetwater, Texas and it is expected to be the first new-build coal plant to incorporate a commercial-scale carbon dioxide capture plant into the initial design. This report describes the history of the project development and looks at some of the key challenges being faced by the Project, including permitting, water supply and financing.

Development of the
Tenaska Trailblazer Energy Center

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1.0 Introduction

The Tenaska Trailblazer Energy Center (Trailblazer or Project) is a 760 MW gross, 600 MW net supercritical pulverized coal-fueled electric generating station under development in Nolan County, Texas, United States. The Project site is located approximately nine miles east of Sweetwater, Texas. The Project is expected to be the first new-build coal-fueled power plant to incorporate a commercial-scale carbon dioxide (CO_2) capture plant into the initial design. It is being designed to capture 85 to 90 percent of the CO_2 that otherwise would be emitted into the atmosphere.

This report discusses the Project's development efforts from Project inception to the current date as shown by the following timeline:

- 2007
  - Conceptual phase conducted
  - Tenaska Board approves development of the Project
- February 2008
  - Site procured
  - Air permit application filed with the Texas Commission on Environmental Quality (TCEQ)
  - Electric interconnection request filed with the Electric Reliability Council of Texas (ERCOT)
  - Project announced
- July 2008
  - Local office in Sweetwater, Texas opened
- September 2008
  - ERCOT issues its initial study of the Project's interconnection request
- January 2009
  - Nolan County tax abatement granted
- February 2009
  - TCEQ issues draft air permit for public comment
- March 2009
  - Hospital district tax abatement granted

- May 2009
  - Texas Legislature passes clean energy legislation that provides grants and tax incentives for carbon-fueled electric generating projects that capture at least 70 percent of the CO_2 they otherwise would emit and meet stringent air emission standards for nitrogen oxides, sulfur dioxide, particulate matter and mercury
  - Texas Legislature passes legislation that establishes a framework for regulation of CO_2 sequestration and storage
- June 2009
  - Fluor Enterprises (Fluor) selected as Engineering, Construction and Procurement (EPC) contractor
- July 2009
  - Tenaska requested direct referral of its air permit application to the Texas State Office of Administrative Hearings for a contested case hearing
- March 2010
  - Arch Coal, Inc. (Arch Coal) purchases 35 percent share of Project company
  - Project signs a 20-year coal supply agreement with Arch Coal
- April 2010
  - Tenaska commits to use of dry cooling technology
  - Tenaska signs settlement agreement with the Environmental Defense Fund (EDF)
- June 2010
  - Trailblazer signs a funding agreement with the Global Carbon Capture and Storage Institute (Global CCS Institute) to receive a $7 million (USD) grant
- July 2010
  - Fluor Econamine FG Plus^{sm} carbon capture technology is selected
- August 2010
  - Fluor begins the Front End Engineering and Design (FEED) study for the carbon capture plant
- December 2010
  - Trailblazer Receives its final air permits from the TCEQ

2.0 Purpose and Goals

The purpose and goals of this paper are as follows:

- To discuss the development of a coal-fueled power plant with Carbon Capture and Storage (CCS)
- To discuss some of the key relationships necessary for the successful development of a coal-fueled power plant with CCS
- To provide a high-level discussion of the rational for developing the Project
- To discuss challenges encountered and lessons learned to date in the development of the Project.

3.0 Executive Summary

The Project has been under development for almost three years. During that time, it has made significant strides and answered several challenges.

3.1 Public Acceptance

In general, the Project has been well received in the local community. An economic impact study of the Project on the potential economic and tax revenues impact on Nolan County, Texas, commissioned early in the Project's development, helped define the benefits of the Project to the local community.

National environmental groups opposed to any use of coal as an energy source have provided support to the small number of local citizens who had concerns about the Project. The Project is supported, however, by EDF, a highly respected national environmental group that has been called "America's most economically literate green campaigners" by *The Economist* magazine.

The primary issue among concerned citizens is the volume and source of water required to support the steam electric generation cycle at the proposed plant. The semi-arid climate and environmental group opponents help feed this understandable local concern. See Section 7.0 for a further discussion of Tenaska's community relations approach surrounding water.

3.2 Air Permit

Tenaska filed its air permit application in February 2008. Approximately 200 area residents attended a public hearing on Trailblazer's draft air quality permit. Many business and local government leaders, including the Sweetwater mayor and the Nolan County judge, commented positively on the draft permit. As evidenced by the comments at the air quality permit hearing and other locally held public hearings regarding the Project's application, **the community at large was not concerned about air emissions from the Project**. **The primary concerns raised, despite it not being a topic for decision, related to the plant's water use and the source of that water .**

The Project received its final air permits from the TECQ in December 2010. See Section 7.2 for a further discussion of the air permitting process.

3.3 Electric Transmission Interconnection

The Project filed its interconnection request in February 2008 and received an initial screening study from ERCOT in September 2008. **Charges that the Project would negatively affect the West Texas wind industry by occupying transmission space needed to export wind energy were disproved** by ERCOT's initial screening study and by wind industry associations, which understand this is not an issue. See Section 7.3 for a further discussion of the electric transmission interconnection process.

3.4 Water

Tenaska's goal is to secure a water source that meets the Project's needs while maintaining the region's ability to grow.

As mentioned above, **water is the one issue that resonates with the citizenry at large in semi-arid West Texas**. This issue would exist for any coal-fueled plant being proposed in the region, whether it includes CCS or not.

Tenaska has taken several steps to address this issue with area residents, including a commitment to be the first large scale coal plant in Texas to utilize water saving dry cooling technology. Until a water source is secured, we expect that water will continue to be an issue used by environmental groups opposing the Project. See Section 7.4 for a further discussion of the Project's efforts to secure water.

3.5 Contractor and Technology Selection

The Project has selected Fluor as the EPC contractor for the overall Project and as the CO_2 capture technology provider. In both instances, the selection was made after a competitive process that considered, among other things**, indicative pricing, experience, and ability to perform**. See Sections 7.5 and 7.7 for a further discussion of the selection processes.

3.6 Partner Selection

There are two ways to approach selection of a partner for a large project like Trailblazer. The developer can seek a financial partner, who provides development dollars but has no real input into the development process. Alternatively, the developer can seek a strategic partner who brings not only development funds, but also specific expertise that can benefit the project. **Given the complexities of the Trailblazer project, Tenaska elected to look for a strategic partner, and in March 2010 sold a 35% share of the Project to Arch Coal, one of the United States' largest coal suppliers**.

3.7 Financing

Tenaska has a significant amount of experience in the financial markets, having raised approximately USD$10.3 billion in aggregate financing through various financing resources. Trailblazer will employ the same non-recourse financing strategy Tenaska has employed on other projects. Long-term sales agreements with creditworthy counterparties for both electricity and CO_2 will be in place prior to financial close in order to support financing of the Project. **It is possible that the Project will be economically viable based on electricity, CO_2 and by-product sales alone. However, the Project's base case contemplates that some recognition of societal value achieved by demonstrating the viability of capturing CO_2 from the flue gas of a conventional coal-fired electric generating station will be required to make the Project economically viable.** That recognition could come in the form of grants, tax credits, bonus allowances, loan guarantees or other mechanisms that recognize the value of

capturing and storing CO_2.

The State of Texas has provided significant economic incentives for projects that meet stringent air quality and CO_2 capture standards. On the Federal level, the U.S. House of Representatives passed the Waxman-Markey bill, which included provisions that would place a value on capturing CO_2, in June 2009. The bill stalled in the U.S. Senate, and no similar legislation currently is being considered in that body.

As discussed in Section 5.3.1, President Barak Obama remains supportive of CCS efforts. Tenaska will continue to monitor Federal programs that could provide economic support to the Project.

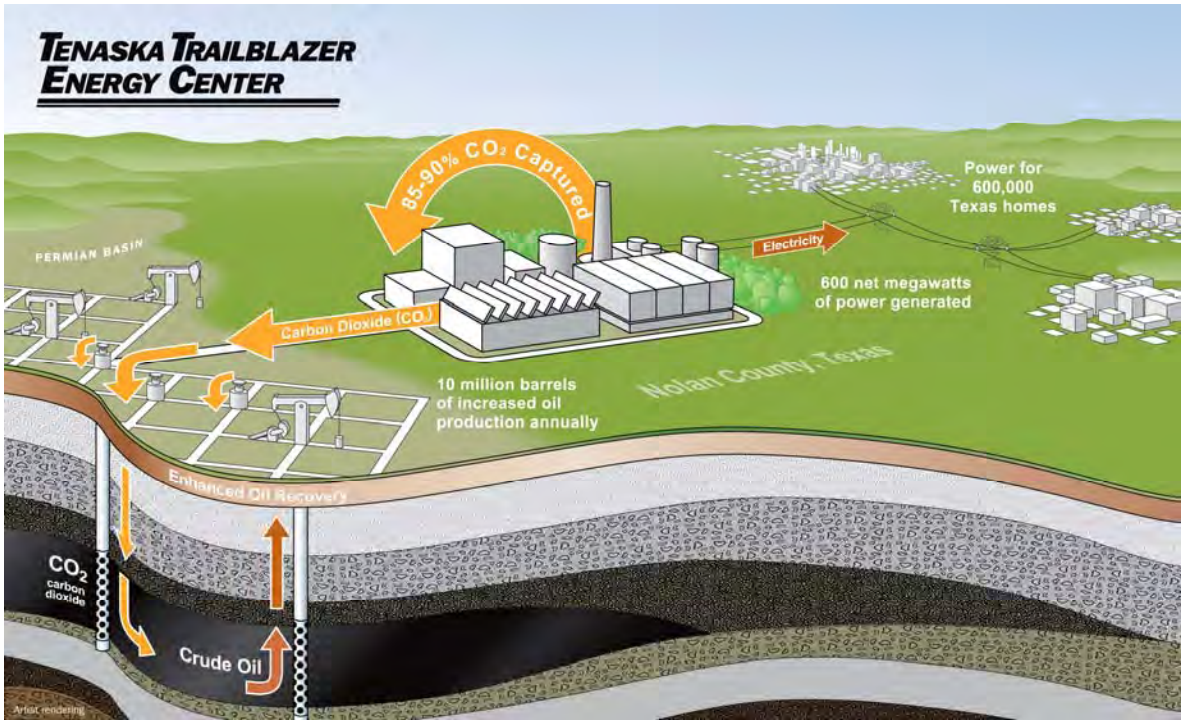
4.0 Overview

4.1 Project Overview

4.1.1 General

Trailblazer is a nominal 760 MW gross, 600 MW net supercritical pulverized coal electric generating station under development in Nolan County, Texas, United States, about nine miles east of Sweetwater, Texas. The Project is expected to be the first new-build pulverized coal plant in the United States to incorporate a commercial-scale CO_2 capture plant into the initial design. As shown in Figure 4.1.1.A, it is being designed to produce enough electricity to power 600,000 Texas homes and capture 85 to 90 percent of the CO_2 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% by affiliates of Tenaska and 35% by Arch Coal.

FIGURE 4.1.1.A – What the Trailblazer Energy Center Can Do

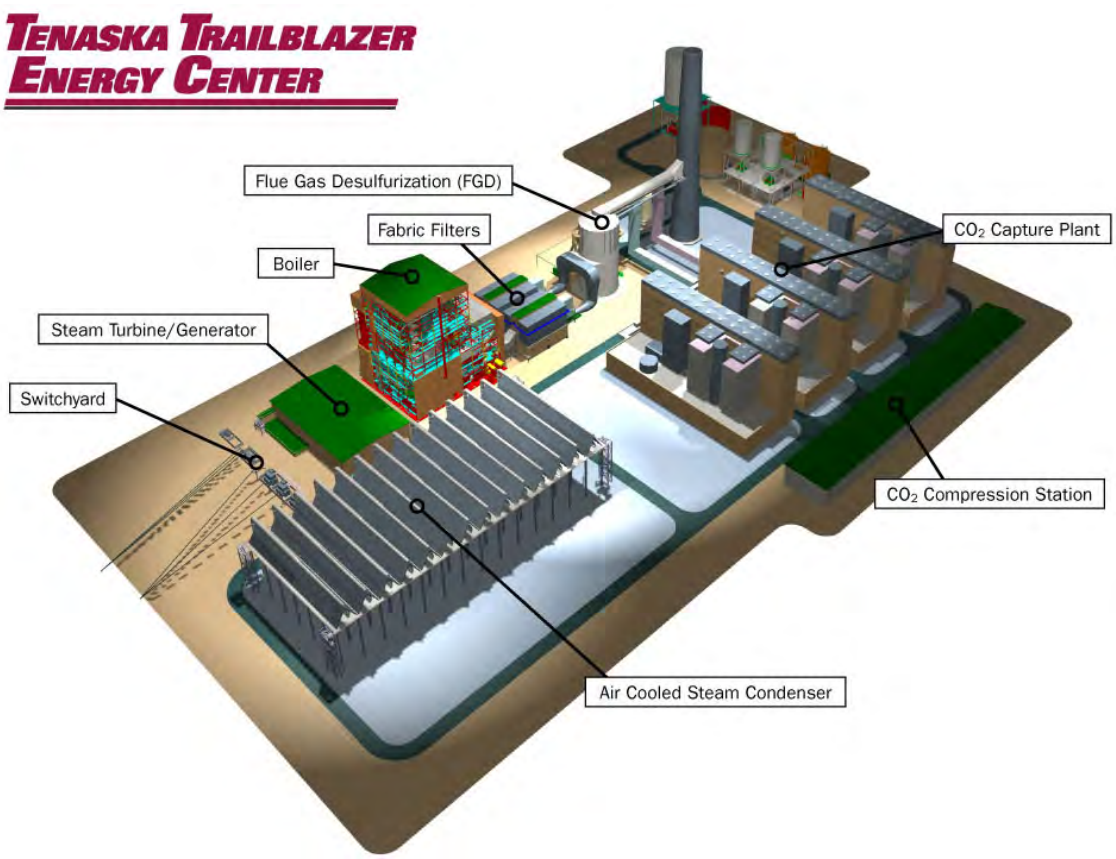


Sub-bituminous coal will be delivered to the Project from the Powder River Basin via either the Union Pacific (UP) or Burlington Northern Santa Fe (BNSF) railroads. The Project site is bordered on the north by the UP and on the south by the BNSF, as shown on the map in Figure 6.3. An existing natural gas pipeline crosses the site. The Project will interconnect to the existing Electric Reliability Council of Texas (ERCOT) 345 kV system, most likely at a substation about two miles from the Project site.

CO_2 from the Project will be sold into the robust Permian Basin CO_2 market, where it will be used in Enhanced Oil Recovery (EOR) efforts and ultimately permanently stored underground. The Project plans to sell the CO_2 at the fence line, so issues associated with monitoring, measurement, and verification of storage will fall to the CO_2 purchaser. Should federal laws be implemented that make geologic storage more economically attractive than the sale of CO_2 for EOR, geologic storage will be considered. The potential for geologic storage in Texas will be discussed in a future report.

Figure 4.1.1.B shows an artist's conceptual layout of the Project.

FIGURE 4.1.1.B



4.1.2 Emission Controls

The Project will use state-of-the-art emission control equipment to achieve significant reductions in nitrogen oxides (NO_x), sulfur dioxide (SO_2) and CO_2 emissions compared to the average emissions of the United States fossil fuel electric generating fleet, as

shown in Figures 4.1.2.A and 4.1.2.B. Note that Figures 4.1.2.A and 4.1.2.B compare actual historic fossil fuel plant emission rates to the maximum emission rates contained in the Project's draft air permit.

FIGURE 4.1.2.A – NO_x and SO_2 Comparison

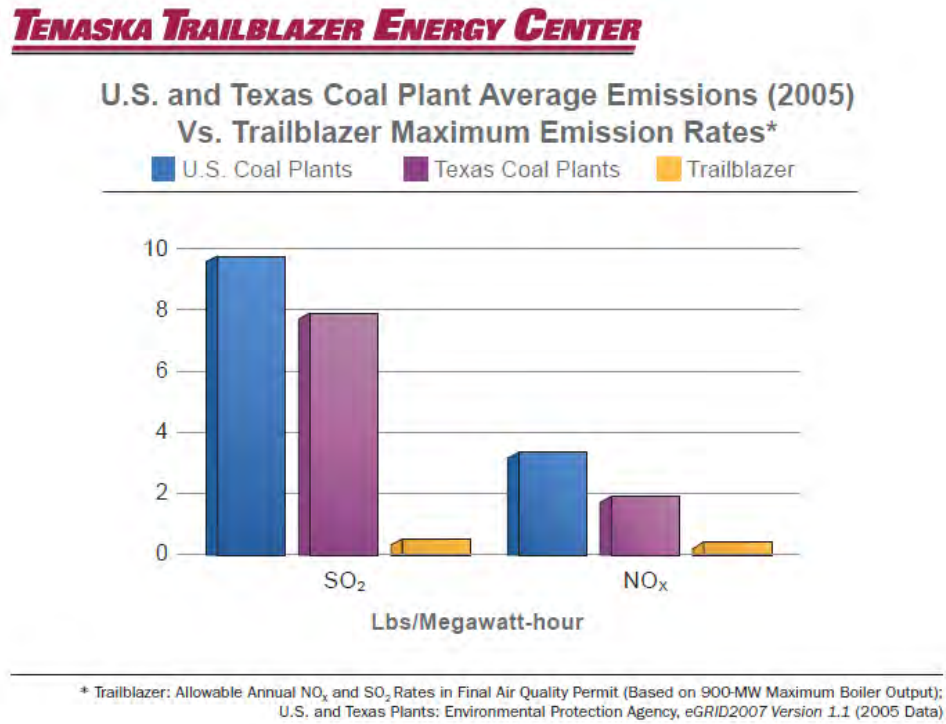
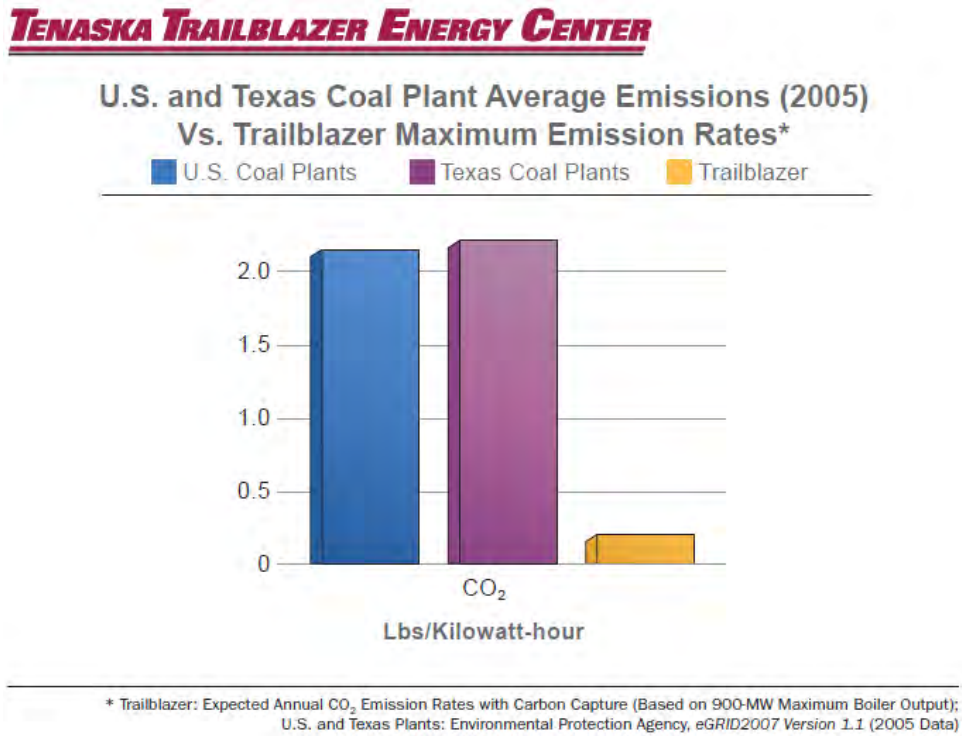


FIGURE 4.1.2.B – CO_2 Comparison



4.1.3 Economic Benefits

The Project will provide significant economic benefits, both locally and regionally. The Project has commissioned two economic impact studies for the Project – as previously mentioned, one that looked at the impact on Nolan County, where the Project is located, and one that looked at the broader impact on Abilene, the largest nearby city. Both studies used extremely conservative assumptions, and thus represent the floor for the benefits that would be realized.

The Nolan County study showed the following benefits:

- $742 million in added local economic activity during the five-year construction period;
- $308 million ANNUALLY in added local economic activity during operation;
- 1,500 construction jobs at the peak of the five-year construction period; and
- 105 direct jobs and 71 indirect jobs from increased local spending once the Project is in operation.

The Abilene study showed the following benefits:

- 500 direct and indirect jobs would be created for Abilene residents over the five-year construction period;
- $140 to $175 million in added economic activity in Abilene during the five-year construction period;
- 41 direct and indirect jobs would be created for Abilene residents during the operation of the Project; and
- $1 to $3 million annually in added economic activity in Abilene during the operation of the Project.

It is important to note that the benefits of the Project will be felt far beyond Nolan County and Abilene. In 2004, the Texas Bureau of Economic Geology conducted a study on the potential impact of expanded CO_2-EOR in Texas and stated that conservative estimates indicated the potential for $200 billion in economic value to the state and the creation of 1.5 million jobs in Texas. [1]

4.2 Developer Overview

Since its founding in 1987, Tenaska has successfully developed and constructed 15 power generation facilities, totaling more than 9,000 MW. Today, Tenaska operates eight power generation facilities totaling 6,700 MW that it owns in partnership with other companies.

Tenaska also provides energy risk management services and is involved in asset acquisition and management, power marketing, fuel supply, natural gas exploration, production and transportation systems, biofuels marketing and electric transmission development. For further information see: http://www.tenaska.com.

Tenaska Capital Management, an affiliate, provides management services for standalone private equity funds, with almost $5 billion in assets, including nine power plants and multiple natural gas midstream assets, including gas storage, gathering and processing facilities. In 2009, Tenaska and its affiliates managed approximately 34,000 MW of assets on behalf of a variety of customers and private equity investors.

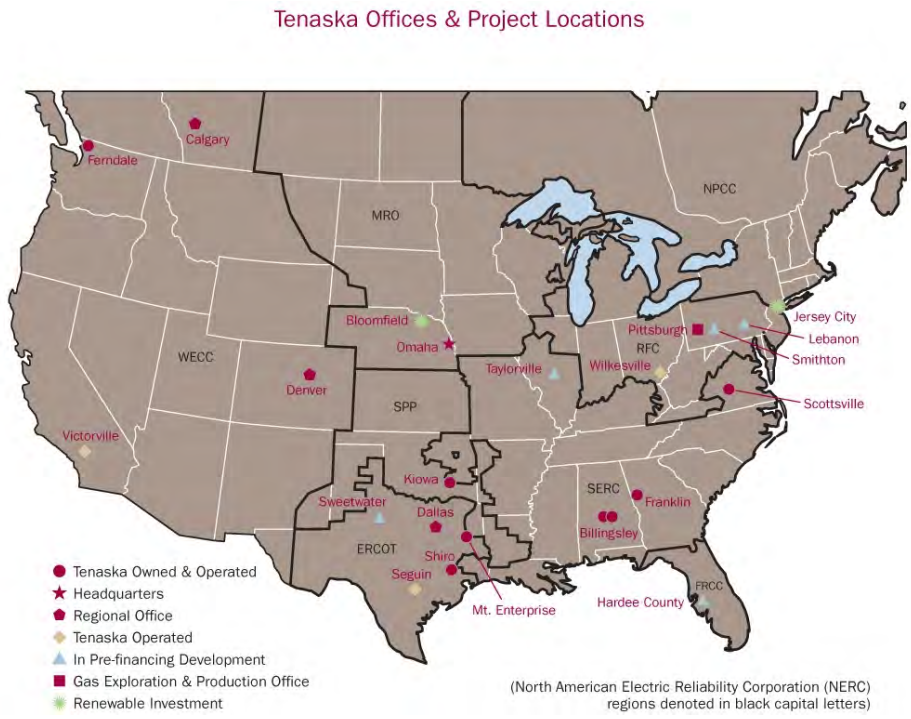
An affiliate, Tenaska Marketing Ventures (TMV), is regarded as one of the top 10 natural gas marketers in North America, and provides natural gas commodity, volume management, hedging and asset management products and services. In 2009, TMV was ranked No. 1 in the United States in natural gas pipeline capacity trading according to Boston-based CapacityCenter.com, which monitors and collects capacity and operational information on all interstate pipelines. Customers responding to Mastio & Company's "Value and Loyalty Benchmarking" survey in 2009 ranked TMV No. 1 in the nation among major marketers for value and loyalty.

Another affiliate, Tenaska Power Services Co., specializes in physical power marketing and electric asset management for utilities and non-utility generators, and is one of the largest marketers of physical power in the United States. Tenaska Power Services Co. (TPS) has developed a significant presence in the wind industry, and currently schedules about 20% of the wind generation in ERCOT.

In 2009, Tenaska had gross operating revenues of $7.9 billion and assets of approximately $2.8 billion. In 2009, *Forbes* magazine ranked Tenaska as 16th among the largest privately-held United States companies, based on 2008 revenues.

Figure 4.2 is a map showing the breadth of Tenaska's enterprises.

FIGURE 4.2 – Tenaska Offices and Project Locations



4.3 Partner Overview

In March 2010, Arch Coal acquired a 35% share of Tenaska Trailblazer Partners, LLC from affiliates of Tenaska. St. Louis-based Arch Coal is the second largest U.S. coal producer, with revenues of $2.6 billion in 2009. Through its network of mines in the Powder River Basin (PRB), Arch supplies cleaner-burning, low-sulfur coal to U.S. power producers to fuel roughly 8 percent of the nation's electricity. The company also ships coal to domestic and international steel manufacturers as well as international power producers. For further information see: http://www.archcoal.com.

In total, Arch Coal contributes about 16% of the United States' coal supply from 11 mining complexes in Wyoming, Utah, Colorado, West Virginia, Kentucky and Virginia.

Arch Coal controls a vast domestic reserve base totaling 4.7 billion tons. Of that total, 88% is low in sulfur and nearly 83% meets the most stringent requirements of the United States' federal *Clean Air Act*, without the application of expensive scrubbing technology.

In addition to becoming a valued partner, Arch Coal also will provide low-sulfur PRB coal to the Project under a 20-year coal supply agreement.

5.0 Project Inception

5.1 Expected CO_2 Legislation

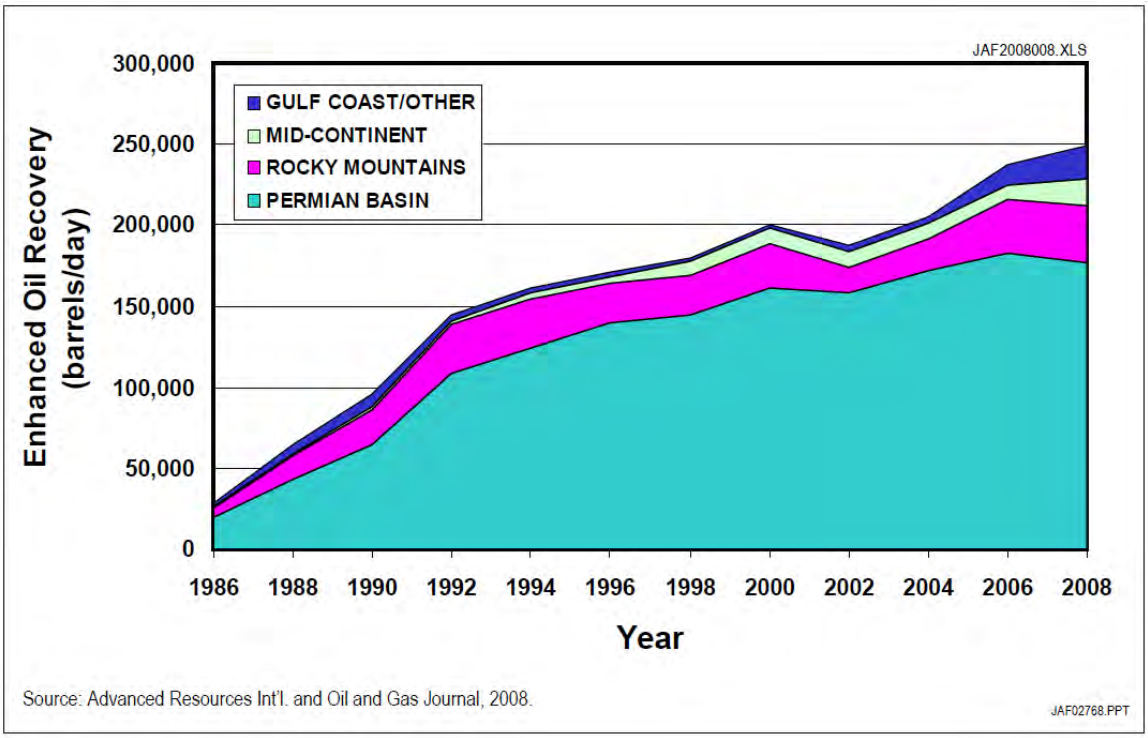
By early 2007, Tenaska began to believe it was increasingly likely that the United States Congress would take steps to regulate CO_2 emissions. In response, the company formed a multi-discipline task force to investigate the development opportunities that would be created in a carbon-constrained environment. The task force believed there could be incentives for "first movers" that might not be available on an ongoing basis.

Task force members were drawn from the Development, Environmental and Engineering groups. After a six-month review, the task force recommended development of a pulverized coal plant with carbon capture in West Texas. The recommendation was taken to the company's Executive Board, whose members approved the recommendation in the fourth quarter of 2007.

5.2 Emerging CO_2 Markets

The recommendation to locate the Project in West Texas was of critical importance, due to the fact that one of the world's largest and most robust CO_2 market is located there. Although EOR opportunities exist on the Gulf Coast and in the Rocky Mountains in the United States, the vast majority of CO_2-based EOR in the United States is conducted in the Permian Basin[2], as shown in Figure 5.2.

FIGURE 5.2 – Growth of CO_2-Based EOR in the United States



EOR has been used in the Permian Basin since the early 1970s.[3] In Texas, rules and regulations are already in place with regard to CO_2 handling and disposal. The addition of CO_2 capture equipment will increase the cost of the Project and, in Trailblazer's case, consume a significant amount of the electricity that otherwise would be available for sale. As a result, Tenaska viewed a robust CO_2 market as being essential to the Project's success.

5.3 National Energy Security

The Project was conceived in a period of energy turmoil in the United States. Venezuela's reduced oil production in 2003, China's increasing demand for oil throughout the mid 2000s, and the huge price spikes caused by Hurricanes Katrina and Rita in 2005 were all events that brought the United States' energy situation into sharp focus.

Trailblazer is envisioned to enhance the United State's national energy security interests in three ways:

1) Providing a path forward for the use of coal – the nation's most abundant and affordable fossil fuel – as an electric generating fuel in a carbon-constrained world;
2) Boosting domestic oil production using anthropogenic CO_2; and
3) Providing affordable, reliable base load electric energy to help meet the nation's growing electricity demand.

All of these goals have been recognized by the United States government as being important to the continued energy security of the United States.

5.3.1 Continuing Use of Coal

The United States Department of Energy (DOE) recognizes the importance of coal to the United States, stating, "Coal is one of the true measures of the energy strength of the United States. One quarter of the world's coal reserves are found within the United States, and the energy content of the nation's coal resources exceeds that of all the world's known recoverable oil. Coal is also the workhorse of the nation's electric power industry, supplying more than half the electricity consumed by Americans."[4]

In 2001, the Clean Coal Power Initiative (CCPI) was developed to implement President George W. Bush's National Energy Policy recommendation to increase investment in clean coal technology. The CCPI program was designed to address the national challenge of ensuring the reliability of the United States electric supply while simultaneously protecting the environment. According to the National Energy Technology Laboratory (NETL), the goal of the CCPI program is "to accelerate commercial deployment of advanced technologies to ensure that the United States has clean, reliable, and affordable electricity for the long term."[5]

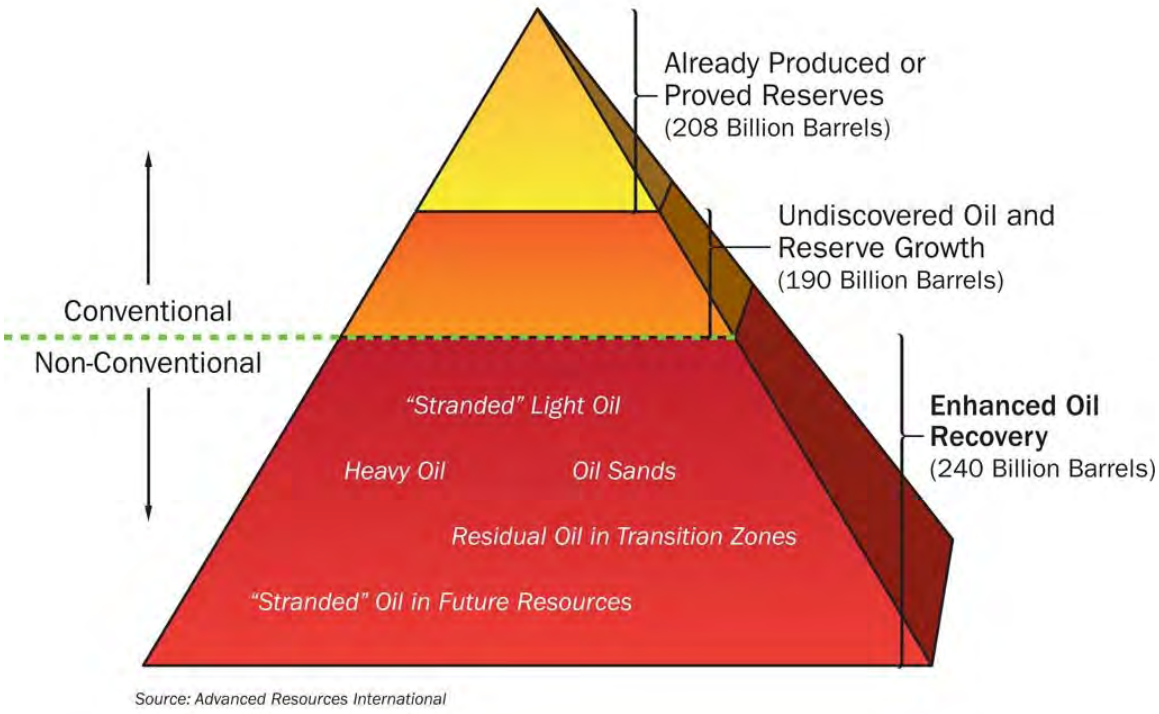
In February 2010, President Barak Obama formed a task force with a charter to develop a comprehensive and coordinated federal strategy to speed the development and deployment of clean coal technologies. The President called for five to ten commercial

demonstration projects to be constructed and operating by 2016.[6] The task force released its report in August 2010, and found that, "By playing a leadership role in efforts to develop and deploy CCS technologies to reduce GHG emissions, the United States can preserve the option of using an affordable, abundant, and domestic energy resource, help improve national security, help to maximize production from existing oil fields through enhanced oil recovery (EOR), and assist in the creation of new technologies for export."[7]

5.3.2 Production of CO_2 for EOR

A study prepared for the DOE, by the Advanced Resources Institute (ARI), in 2006 listed "large, affordable 'EOR-ready' supplies of CO_2" as one of the keys to converting the technical potential from EOR into economic reserves. The study stated that, "A preliminary look at how much of the large CO_2 enhanced oil recovery technical potential could be converted to economic reserves shows that "state-of-the-art" CO_2-EOR technology, when combined with "risk mitigation" actions and low cost supplies of CO_2, would enable a significant portion, — 25 billion barrels — of the domestic "stranded" oil (in the six areas and basins studied) to become economically recoverable…"[8] Figure 5.3 shows graphically the potential for future oil recovery using EOR.[9]

FIGURE 5.3 – Oil Resources Pyramid



Trailblazer is designed to capture approximately 17,500 tons of CO_2 per day, or approximately 5.75 million tons per year. At a conservative two barrels of oil per ton of injected CO_2[10], the CO_2 captured by Trailblazer when used in EOR could result in at least 10 million barrels of additional domestic oil production per year.

5.4 Pulverized Coal vs IGCC Technologies

As the idea of building a coal plant with carbon capture in West Texas began to take shape, a decision had to be made about the technology that would be implemented. The decision to build a conventional, supercritical pulverized coal plant, as opposed to an integrated gasification combined-cycle (IGCC) plant, was made for several reasons.

5.4.1 Powder River Basin Coal Supply

Due to the Project's location adjacent access to two major railways, it will freight in low sulfur, sub-bituminous PRB coal as its fuel. IGCC plants in operation in the United States today utilize high sulfur, bituminous coal as their fuel. Tenaska is not aware of any proven, successful IGCC project that utilizes sub-bituminous coal as a feedstock. This likely is because PRB coal has a higher moisture and ash content, which adversely affects IGCC operations.

5.4.2 Elevation

The Project will be located at an elevation of about 1,950 feet. Higher elevations reduce the efficiency of an IGCC plant's combustion turbines, eliminating any relative efficiency advantage an IGCC plant might otherwise have.

5.4.3 CO_2 Capture Economics

Sales of CO_2 are important to the Project's economics. Larger quantities of CO_2 can be captured more economically when utilizing pulverized coal with post-combustion capture technology than when using IGCC technology. IGCC with CO_2 capture technology can generally only capture up to 65 percent of the CO_2 on a plant-wide basis without utilization of hydrogen-fueled combustion turbines or the addition of post-combustion carbon capture equipment. Operation of hydrogen-fueled combustion turbines has not been demonstrated in an IGCC setting to Tenaska's knowledge, and the addition of post-combustion carbon capture equipment would make IGCC prohibitively expensive. Trailblazer, on the other hand, will capture 85 to 90 percent of the CO_2 it otherwise would emit, in a simpler configuration.

5.4.4 Technology Risk

Tenaska determined that IGCC was not as good an option from the standpoint of equipment availability, cost certainty, reliability, industry experience, competitive procurement and development cost. The company determined these risks could be better managed through the use of supercritical pulverized coal technology with post-combustion carbon capture.

6.0 Site Selection

The overall business purpose of Trailblazer was twofold:

1) to construct a base load, PRB coal-fueled electric generating station to produce electricity for sale; and

2) to use CO_2 capture technology to capture a maximum amount of CO_2 to sell to support EOR efforts in the Permian Basin of Texas.

The site selected needed to support both of those goals.

6.1 Decision to Build in Texas

There were two logical geographic locations to consider for the Project. One option was to locate the Project near the fuel source and send the CO_2 via pipeline to its market, while the other option was to locate the Project near the CO_2 market and bring the fuel to the site via rail. Both options had their clear advantages and disadvantages. Among the factors that tipped the scale toward locating near the CO_2 market were the substantially higher demand for electricity in Texas and the passage of legislation in Texas designed to encourage the development of clean energy facilities.

6.1.1 Electricity Demand

According to the Energy Information Administration, in 2007 total retail electricity sales in the state of Texas were 343,828,582 megawatt hours (MWh). Total retail electricity sales in the state of Wyoming during the same time period were 15,535,552 MWh.[11] According to the U.S. Census, the population in Texas increased by more than 14 percent from April 2000 to July 2007, while the population of Wyoming increased only 6 percent.[12] Both the considerably larger size of the electricity market and the growth profile in the area clearly pointed to Texas as the preferred location for the Project.

6.1.2 Texas Clean Energy Legislation

In 2007, the Texas Legislature passed House Bill (HB) 3732, which set standards for Advanced Clean Energy Projects (ACEP) and provided tax, financial and regulatory incentives to projects that could meet those standards. To quality as an ACEP, a project must:

- Reduce SO_2 emissions by 99 percent;
- Reduce Mercury emissions by 95 percent;
- Meet a NO_x emission rate of no more than 0.05 pounds/million British Thermal Units;
- Render CO_2 capable of capture, sequestration or abatement; and
- Use coal, biomass, petroleum coke, solid waste, or fuel cells using hydrogen derived from these fuels.

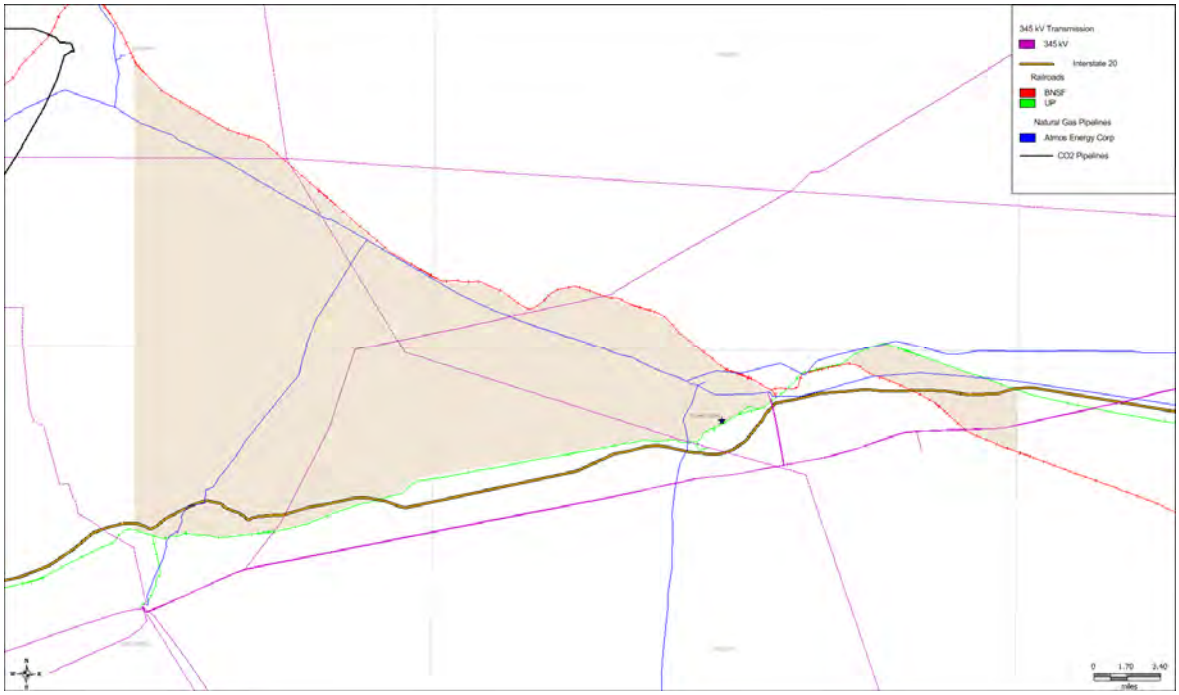
In 2009, the Texas Legislature passed additional legislation to provide incentives to projects that capture CO_2. That legislation included:

- HB 469 – provides sales tax exemptions for equipment that captures (at least a 50% rate), transports and stores CO_2; provides that the first three projects achieving a 70% carbon capture rate will quality for a $100 million franchise tax credit; provides a 30-year, 75% severance tax exemption for oil recovered using CO_2 captured from man-made emission sources.
- Senate Bill 1387 – provides a framework for regulation of CO_2 sequestration and storage between the Texas Railroad Commission and the TCEQ.

6.2 Key Factors in Site Selection

Once the decision was made to locate the Project in Texas, Tenaska began to identify the key factors it would use to determine a final location. They included proximity to CO_2 pipeline infrastructure, proximity to dual rail, proximity to high-voltage electric transmission lines, proximity to natural gas lines (used to start up the Project), proximity to water resources and existence of supportive local leadership. The shaded area in Figure 6.2 shows the initial target area identified by Tenaska within which to locate the Project.

FIGURE 6.2 – Initial Site Target Area

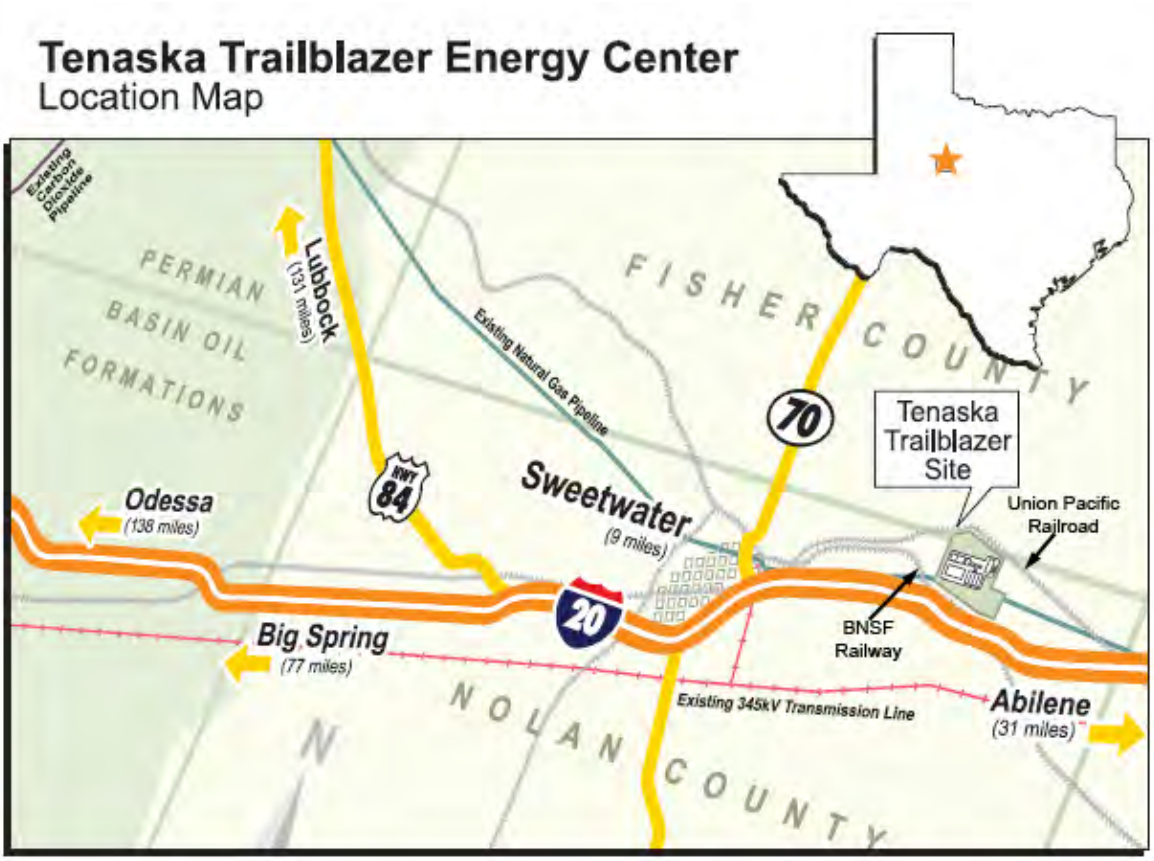


Based on the factors mentioned above, the development team began looking for a site of at least 1,200 acres. The team limited its initial investigations to tracts that already were on the market. The initial hope was that the team could find a property that was bordered on one side by one of the two major railroads – the BNSF or the UP, with the thought of building a spur to the other railroad in order to obtain a competitive rail advantage.

6.3 Project Site

The team located a 1,900 acre tract of land used for private recreational purposes (not being utilized for agriculture), for sale in a sparsely populated area that was bordered by both the BNSF and the UP railroads, as shown in Figure 6.3. A natural gas pipeline runs through the site, which is situated about two miles from a 345 kV electric transmission line owned by Oncor Corp. Tenaska signed an option to purchase the property that contained a 60-day due diligence period, during which initial environmental assessments and survey work were conducted. Tenaska purchased the site in February 2008, just prior to the Project's formal announcement.

FIGURE 6.3 – Trailblazer Site Location



Tenaska subsequently acquired a second adjacent parcel that gave the Project direct access to Interstate 20, bringing the total site acreage to approximately 2,400.

7.0 Project Development

7.1 Community Reaction

The community reaction to the announcement and development of the Project has been overwhelmingly positive with many in the community recognizing the benefits, opportunities and kudos associated with this first of a kind project type. Tenaska has been pro-active in the community and has committed publicly to working collaboratively with the local community to progress the Project and address community needs and concerns.

7.1.1 Community Outreach

Tenaska publicly announced the Project on February 19, 2008 at a meeting arranged by the Sweetwater Enterprise for Economic Development (SEED), the economic development group for Sweetwater and Nolan County.

Not long after the Project was announced, Tenaska hired a respected retired banker from Sweetwater to be the Project's local representative and opened a community office in Sweetwater. Tenaska has found the presence of a local representative to be very beneficial in gaining and maintaining trust in the community and in terms of efficient information exchange. Having a local source of accurate information is invaluable in dispelling rumors and keeping the community informed.

Tenaska has spoken at most civic clubs in Sweetwater on multiple occasions. The Project has run informational ads in the *Sweetwater Reporter*, in County weekly newspapers and in the *Abilene Reporter News*, the largest newspaper in the area. In addition, the Project has developed a large stakeholder email list, which allows Tenaska representatives to update interested local residents on the project in a timely manner. The Project has its own web site, www.tenaskatrailblazer.com, where updates and more in-depth reference materials are available. The Project also has held supporter luncheons, briefed countless residents and elected officials in one-on-one sessions and conducted numerous site tours. Tenaska's public relations efforts will be the subject of a detailed future report.

In July 2010, Tenaska held an open house in the Sweetwater Middle School gymnasium. About 200 people attended the open house, at which they could visit any of 10 stations staffed by experts in various aspects of the Project. Topics covered were:

- General information about Tenaska and Trailblazer
- Dry cooling
- Fuel handling and ash management
- Emissions
- Electric interconnection and effect on West Texas wind energy industry
- Enhanced oil recovery
- Economic benefits
- Project engineering and design
- Jobs

- Legislative support

7.1.2 Community Support

The Project has received broad and virtually unanimous support from elected officials and the business community in Sweetwater and Nolan County. The significant economic impact of a $3.5 billion project is not lost on community leaders. Tenaska has received resolutions or votes of support from the Nolan County Commissioners Court, the Sweetwater City Commission, the Sweetwater Chamber of Commerce and SEED. Prior to the County Commissioners' vote on the tax abatement mentioned below, Sweetwater merchants collected petitions with almost 800 individual signatures in support of the Project.

As previously mentioned Tenaska commissioned an economic impact study by a respected Austin, Texas firm, TXP Inc., which concluded that, even using conservative assumptions, the Project would result in about $742 million in additional economic activity during the five-year construction period and about $300 million annually in additional economic activity once the Project was in operation. Based in part on that study, county leaders have granted the Project a 75 percent tax abatement from County and hospital district taxes for the first 10 years of operation.

7.1.3 Community Concerns

A small number of residents, consisting primarily of families who own property in the immediate vicinity of the Project, do have concerns about the Project, although it should be noted that not all property owners near the Project are opposed to it. A small group of concerned local citizens has organized into a group called the Multi-County Coalition (MCC). As Project development continued, national environmental groups that oppose the continued use of coal as an energy source began assisting the MCC.

7.2 Air Permit

The Project filed its air permit application with the TCEQ in February 2008. Subsequent to the initial filing, a case-by-case Maximum Achievable Control Technology analysis, a Class II area air dispersion modeling analysis and a Class I area air dispersion modeling analysis were submitted. The TCEQ issued a Draft Air Permit in January 2009. A public meeting was held in March 2009, which was attended by supporters and citizens with questions and concerns about the Project.

As a result of contested case hearing requests for the Project, Tenaska elected to request a direct referral to SOAH. Tenaska could have asked the TCEQ Commissioners to rule on each request for a contested case hearing, and potentially could have limited the topics that were allowed for discussion at such a hearing if the requests were granted. Since Tenaska believed it was likely that the TCEQ would grant the requests, it elected to request a direct referral to a contested case hearing and avoid the potential three to six month delay that would have resulted from asking the TCEQ Commissioners to rule on each separate request. A preliminary hearing was held in Sweetwater in October 2009, during which the Sierra Club and EDF were granted standing. In addition, the MCC was

granted standing, and retained a sole practitioner from Dallas as its legal counsel.

There were a small number of residents who expressed concern about the air emission aspects of the Project at the preliminary hearing. Rather than focusing on emissions, opponents expressed concern over the Project's proposed water use. These water concerns, specifically that the Project would jeopardize local water supplies, are discussed in greater detail below in Section 7.4. These issues are directly outside those to be considered in the application adjudicated by TCEQ.

In April 2010, Tenaska committed to utilizing dry cooled technology for the Project. Dry, or air, cooling technology reduces the Project's water consumption by more than 90 percent. This decision provided assurance to area residents that Tenaska was committed to finding a win-win agreement on the issue of water supply. Subsequently, Tenaska reached an agreement with EDF in which EDF agreed to withdraw from the contested case hearing for the Project's air permit and support the Project. In return, Tenaska signed a legally binding agreement committing to install the equipment designed to capture at least 85 percent of the CO_2 that otherwise would be emitted by the Project and committing to purchasing no more than 2000 acre feet per year of water, enough only to support dry cooling at the plant. Please see Exhibits 1 and 2 for copies of the news releases announcing the decision to dry cool the Project and the EDF agreement, respectively.

Seven days of hearings were held by the SOAH in Austin, Texas in June 2010. The TCEQ staff, Tenaska, the MCC and the Sierra Club presented witnesses. The Administrative Law Judges assigned to the case to issued their proposed decision in October 2010 and the TCEQ Commissioners to issued a final ruling granting the permit in December 2010.

7.3 Electric Transmission Interconnection

Tenaska filed its electric transmission interconnection request in February 2008. ERCOT issued its initial screening study in November 2008. It found that the Trailblazer Energy Center would not negatively impact transmission in the area, and that additional transmission facilities may not be needed. The full interconnection study remains in progress and is expected to be complete in the first quarter of 2011. Once the full interconnection study is complete, the interconnect agreement will be prepared.

Even after ERCOT issued its initial screening study, project opponents attempted to make transmission an issue, by suggesting that the Project would negatively impact the large wind generation industry in West Texas. In fact, the addition of a base load generating facility in the area would provide reliable capacity and support to the power delivery system, which could allow even more wind generation to be built. The mayor of Sweetwater also is the Executive Director of the West Texas Wind Consortium, and his assurances that the wind community was not concerned about the transmission impacts of the Project on current or future wind developments helped answer transmission concerns.

7.4 Water Supply

The Project is located in a semi-arid area, with annual rainfall averaging about 22 inches (56 centimeters). Although Tenaska explored full wet cooling and partial wet cooling options, its base case assumption from the beginning was that Trailblazer would need to employ dry cooling in order to reduce water usage. That assumption was driven by the water requirements of the power plant – the CCS plant did not add appreciably to the Project's water requirements.

Use of dry cooling reduces Trailblazer's water needs by more than 90 percent - from an average of more than 10 million gallons per day (mgd) to an average of about 1 mgd. While dry cooling has a small negative impact on the plant's efficiency and capacity, it seemed to be a logical path forward in a semi-arid climate.

7.4.1 City of Sweetwater

After making initial inquiries with a large number of municipals and other potential water sources, Tenaska chose to begin serious discussions with the City of Sweetwater for a water supply. Based on the significant community interest and concern, Tenaska committed to requesting no more than the amount required to dry cool the Project from Sweetwater sources, and also agreed to use municipal treated wastewater first, with surface or ground water use only if there wasn't sufficient wastewater. This approach satisfied the parties for whom water use was the only concern. In the end, however, the small size of Sweetwater's wastewater pool and its inability to provide firm service led Tenaska to suspend negotiations with the City of Sweetwater. Although Tenaska determined Sweetwater could not be the Project's primary water source, it did not preclude Sweetwater from ultimately becoming a supplemental water resource.

7.4.2 City of Abilene

Once Tenaska determined that the City of Sweetwater would be unable to serve as the primary water source for the Project, the company turned its attention to the City of Abilene, located approximately 30 miles east of the Project site. In April 2009, Tenaska sent a letter to the City of Abilene requesting that it consider selling up to 2,000 acre feet of treated municipal wastewater to the Project.

In support of the request, Tenaska worked with a local marketing firm to develop an initial stakeholder list of prominent business and opinion leaders. Tenaska also commissioned an economic impact study that looked at how Abilene specifically would benefit from the Project. Tenaska held two luncheons in November 2009 and February 2010 for local business leaders introducing the company and the Trailblazer project, and discussing the results of the Abilene economic impact study. In addition, Tenaska representatives met with a number of individuals on a one-on-one basis to provide them with information and answer questions.

In December 2009, Tenaska participated in a City workshop, at which presentations were given by the City Water Department and by Tenaska. The Water Department presented a study which determined that there was sufficient treated wastewater to meet existing

demand, provide for future wastewater users and still provide water to Tenaska.

After the presentations, the public was invited to express their opinions at the workshop. The comments were split about 50/50 between supporters of the Project and those with concerns. A small number of area residents, along with national and state environmental groups, specifically objected to the sale of the treated wastewater. Most of those opposed expressed the belief that the Project could be stopped if Abilene refused to sell it water, and asked the Mayor and the Council to vote against a water sale for that reason.

In on one-on-one meetings with business and opinion leaders, Tenaska representatives identified concerns that Tenaska would try to later expand its request to get the 10-12 million gallons of water per day required to wet cool the Project. Most of these concerns were resolved in April 2010, when Tenaska announced its commitment to dry cool the Project. That commitment was backed up later in April by the Project's agreement with EDF, which legally bound the Project to purchase no more than 2,000 acre feet of water per year.

Calling and letter-writing campaigns to Abilene elected officials and the local news media by concerned citizens, opposing environmental groups and supporters ensued. As is often the case, the silent majority who support the Project and the sale of water were not as motivated as those with concerns.

In mid-June 2010, the Mayor scheduled another public hearing to provide area residents another opportunity to express their views on the proposed wastewater sale. A month prior to the scheduled public hearing, however, the Mayor held a press conference to say he would not support the sale of treated wastewater to Tenaska. Later that day, two of the Abilene City Council members also told the press that they did not support selling water to Tenaska.

Given that three of the seven people who ultimately would vote on the request were not comfortable pursuing a treated wastewater sale to the Project, Tenaska decided to withdraw its request, and did so on July 1, 2010.

7.4.3 Key Learnings from This Experience

Observations that might be useful to other CCS project developers include:

- Water use for industrial purposes in a semi-arid region is a highly emotional issue that evokes strong reactions. CCS proponents should not underestimate this issue for any project;
- Articulating and promoting the local and regional economic, energy security and other benefits of a project may not be enough to win over support;
- Projects should focus on finding water sources that do not compete, or be seen to compete with the region's ability to grow;
- Early and continuous education for community leaders on the benefits of both the project and the water agreement is key to gaining support;
- Publicly committing to the use of water-conserving dry cooling technology and reinforcing that commitment through a legally binding agreement was effective in

gaining opinion leader support in this case, in particular with the initial opponents of the air permit process; and

- Leaders must weigh many factors in planning for their future water use, and sometimes an industrial water sale is not a good fit. To keep moving forward, a project should be respectful of those local decisions and investigate all possible opportunities to ascertain the best local solution.

7.5 Selection of EPC Contractor

In June 2009, Tenaska selected Fluor as the Engineering, Procurement and Construction (EPC) contractor for the Project. Fluor was selected in a competitive proposal process, where the evaluation was based on indicative pricing, experience, performance, schedule, commercial terms and ability to perform. Exhibit 3 is the news release announcing Fluor's selection as the EPC contractor for the Project.

7.6 Partner Selection

Tenaska often brings partners into its projects, typically, however, after they are constructed and are in operation. Given the unique nature of this project, Tenaska elected to investigate taking on a strategic partner.

7.6.1 Overview

In Trailblazer's case, however, the upfront development costs are significantly higher than those experienced in the development of a combined cycle natural gas-fired plant, so the decision was made to bring in a partner during the development process to help defray development expenses. Because of Tenaska's extensive experience in managing partner relationships, the Project does not anticipate any issues associated with having a partner during the development process.

There are two ways to approach selection of a partner for a large project like Trailblazer. The developer can seek a financial partner, who provides development dollars but has no real input into the development process. Alternatively, the developer can seek a strategic partner who brings not only development funds, but also specific expertise that can benefit the project. Given the complexities of the Trailblazer project, Tenaska elected to look for a strategic partner.

7.6.2 Selection of Arch Coal

In March 2010, Tenaska announced that Arch Coal had acquired a 35 percent share of the Trailblazer project company, Tenaska Trailblazer Partners, LLC. The investment was consistent with Arch's ongoing strategy of making small but strategic investments in technology companies focused on making coal use cleaner. In the news release announcing the sale, Tenaska Development President David Fiorelli said, "As one of the largest suppliers of low-sulfur Powder River Basin coal, Arch brings its 40 years of experience in the energy and coal industries. By working together, we will help lead the way to using our nation's most abundant energy resource in an environmentally responsible manner." Exhibit 4 is the news release announcing the sale to Arch Coal.

Arch's in-depth knowledge of the characteristics of PRB coal and the complexities of coal transport from the PRB region will be invaluable to the Project.

7.7 Selection of Carbon Capture Technology

Tenaska entered into a pre-qualification and competitive bid process to select a carbon capture technology vendor who would conduct an eight-month FEED study. The FEED study will quantify capital cost for the carbon capture plant, including all interface costs with the pulverized coal plant, and establish performance guarantees.

The process yielded four competitive bids which included estimates of performance and indicative cost of the carbon capture plant and firm FEED pricing. The bid evaluation was done on a present-day indicative capital cost and 30-year life cycle cost (for performance parameters) basis. Performance parameters included in the 30-year life cycle cost were:

- steam usage;
- auxiliary power usage;
- system pressure drop;
- solvent usage; and
- water consumption.

Other factors included in the economic evaluation were:

- technology license fee charge for each bidder;
- contingency included by each bidder; and
- relative accuracy of the estimate as characterized by each bidder (requested accuracy was -5%/+25%).

In addition to the economic evaluation, an analysis was conducted regarding the basis of performance which included pilot and demonstration plants in service for each bidder, scale-up factors used by each bidder in the carbon capture process to date, and scale-up factors used for equipment being proposed for Trailblazer. Finally, the organization and financial strength of the bidders were analyzed.

Based on the bid responses, Tenaska selected Fluor and its Econamine FG Plus^{sm} technology for this important aspect of the Project. Exhibit 5 is the news release announcing the selection of Fluor's carbon capture technology.

Details regarding the selection of carbon capture technology partner for the Project will be detailed in a separate, later report.

7.8 Markets

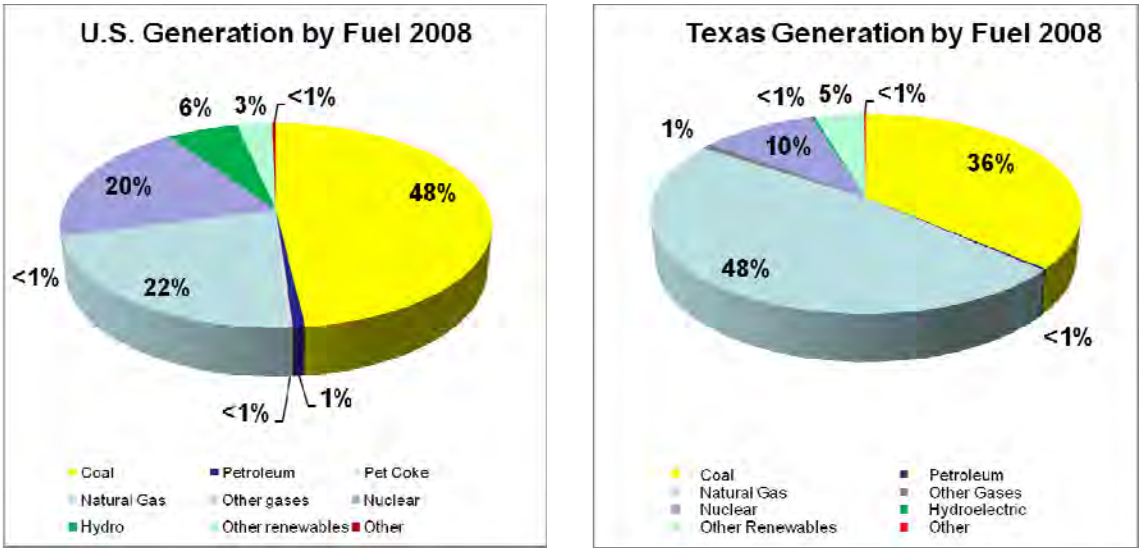
Even under favorable market conditions for electricity and CO_2 sales, it is likely that local, state, federal and/or global incentives will continue to be necessary to make CCS projects economic. The recent global economic downturn has lowered both current domestic electric demand and future projections for demand growth, which affects the price that Trailblazer can command for both its electric and CO_2 output. Nevertheless

Texas' economy fared better than many other regions of the United States during the economic downturn. Texas is positioned to recover quickly as the economy begins to improve, and this supports the decision to locate Trailblazer in the state. .

7.8.1 Electricity

The ERCOT market experienced a significant influx of new natural gas-fired generating plants in the late 1990s through the early 2000s. From January 1, 1998 to December 31, 2003, more than 30,000 MW of nameplate natural gas-fueled capacity entered commercial operation in ERCOT.[13] As a result, Texas generates significantly more electricity using natural gas than the United States as a whole, as illustrated in Figure 7.8.1.

FIGURE 7.8.1 – Generation Fuel Sources for the United States and Texas[14]



ERCOT has recognized that it would be beneficial to reduce the market's reliance on natural gas,[15] through diversification, and market participants have recognized this as well. Tenaska intends to sell the electricity produced by the Project through long-term power sales contracts with utilities in ERCOT that need additional base load generation.

7.8.2 Carbon Dioxide

One of Trailblazer's stated goals is to produce CO_2 for use in EOR efforts in the Permian Basin, where the world's most robust CO_2 market has been operating for more than 35 years. The ability to transform CO_2 from a waste into a commodity that can provide a significant income stream is a key Project consideration. A study conducted by ARI for the DOE estimated that there are up to 20.8 billion additional barrels of oil in the Permian Basin that could be produced using EOR.[16] The same report estimates that applying CO_2-EOR to the Permian Basin's oil reservoirs would enable 2.5 billion tons of CO_2 emissions to be stored.[17] It also found that the overall market for purchased CO_2 in the Permian Basin could be up to 49.0 trillion cubic feet.[18]

Tenaska's preliminary discussions with the major oil producers in the Permian Basin utilizing EOR, as well as some mid-tier companies, about purchasing the Project's CO_2, indicate that there is ample appetite for the approximately 5.75 million tons of CO_2 that the Project will produce annually. It is Tenaska's intention to enter into a long-term contract with a credit-worthy counterparty for the sale of the CO_2 captured by the Project.

7.8.3 By-products

Trailblazer will produce several by-products, including fly ash, gypsum and bottom ash. Although marketing of the by-products will not begin until engineering is complete and the exact characteristics of the by-products are known, Tenaska believes there will be potential markets for some, if not all, of these by-products. It is the Project's intention to sell as many of these by-products as possible. Two large gypsum plants are located in Nolan County, one of which already has indicated an interest in the gypsum the Project will produce. The Project has been approached by several entities that have expressed an interest in the bottom ash produced by the Project for use as a roadbed material. It should be noted, however, that Tenaska believes the revenues from by-product sales will not be significant in the overall context of the cost of the Project. Even so, they will provide another useful revenue stream to offset the commercial gaps in the Project.

Coal ash disposal has been a national topic of discussion recently. In May 2010, the U.S. Environmental Protection Agency (EPA) proposed two alternative methods to regulate coal ash landfills. Under both approaches, the EPA would leave in place exemptions for beneficial uses of coal ash in which coal combustion residuals are recycled as components of products instead of placed in impoundments or landfills. Large quantities of coal ash are used today in concrete, cement, wallboard and other contained applications.[19]

Any byproducts that cannot be sold will be stored in a lined on-site landfill, consistent with state and federal requirements.

7.9 Financing

All of Tenaska's projects have been financed using non-recourse project financing. 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. Tenaska, Inc. affiliates have raised approximately USD$10.3 billion in aggregate financing through various financing resources such as commercial banks, capital markets and equity.

The Project is currently estimated to cost approximately $3.5 billion, with roughly $1 billion of that amount being attributable to the carbon capture and storage components. The financing plan contemplated for the Project is similar to that used by Tenaska's other independent power projects which have closed project financing. Tenaska Trailblazer Partners, LLC, a special purpose affiliate of Tenaska, Inc., has been formed to construct, own and operate the Project, and to enter into purchased power and CO_2 sales agreements. As mentioned above, Arch Coal has acquired a 35% interest in Tenaska Trailblazer Partners, LLC. Equity funds required for this Project are being provided from

cash on hand and/or funds generated by other corporate activities, and by contributions from Arch Coal and other equity partners that may be brought in at financial close. Additional funding may be provided by State or Federal grants. 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 any Project partner as well as the lenders. 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.).

As discussed above, long-term contracts for the electric and CO_2 output of the Project will be used to support the financing of the Project. However, the cost of adding carbon management equipment to Trailblazer is significant. The additional equipment will increase the capital cost of the Project by at least 30 percent, depending on the final technology chosen. In addition, the carbon capture and compression equipment will reduce the net electricity generated by the Project by approximately 20 percent. It is possible that the Project will be economically viable based on electricity, CO_2 and byproduct sales alone. However, the Project's base case contemplates that some recognition of societal value achieved by demonstrating the viability of capturing CO_2 from the flue gas of a conventional coal-fueled electric generating station will be required to make the Project economically viable. That recognition could come in the form of grants, tax credits, bonus allowances, loan guarantees or other mechanisms that recognize the value of capturing and storing CO_2.

7.10 Next Steps

Following are some of the next steps for the Project development team:

- The Project continues to work with ERCOT on interconnection studies, and expects to receive an interconnect agreement in early 2011.
- Tenaska continues to review and evaluate other potential primary water sources. The City of Sweetwater could provide 0.5 mgd of treated wastewater to the Project, so it still is a viable supplemental source.
- The carbon capture FEED study should be completed in the second quarter of 2011.
- Tenaska will continue discussions with potential power and CO_2 customers.

8.0 Relevance to Carbon Capture and Storage

Trailblazer will be the first new pulverized coal plant to incorporate a full-scale carbon capture plant into its initial design. As such, the knowledge gained during the development and execution of the Project will be invaluable to the overall goal of advancing projects worldwide that will capture and store CO_2.

The Project will confirm the ability to successfully scale proven carbon capture technology to accommodate the entire flue stream from a commercial-scale coal-fueled electric generating station.

The carbon capture technology being utilized by the Project could be adapted for use in commercial-scale retrofit applications, paving the way for the installation of such equipment on existing fossil-fueled plants worldwide.

In addition, the Project's location near one of the most robust CO_2 market in the world will allow for a detailed look at how CO_2 markets should work efficiently and effectively and provide information that could be used by developing CO_2 markets.

9.0 Conclusions

Tenaska has applied the disciplined approach that it has refined through the development of more than 9,000 MW of power generation facilities to the development of this Project.

The Project is located in the ERCOT electric market, where there is a need to add base load coal generation. Its location in West Texas will help provide stability to an electric grid serving a large concentration of wind generation. CO_2 produced and captured by the Project will help meet the need for additional domestic oil production through its use in EOR activities in the Permian Basin.

Almost all of the infrastructure for the Project is located nearby. It is uniquely situated between the two major railroads serving the western United States, bordered on the north by the UP and on the south by the BNSF. Dual rail provides the Project with significant flexibility and will help keep coal transportation costs low. A natural gas pipeline crosses the site, a major interstate highway is just to its south and a 345kV transmission line is only two miles away.

The biggest challenge the Project has experienced thus far relates to securing water. Water is a precious resource in West Texas and increasingly is an issue around the world. This issue more than any other, has been used by opponents as a way to alarm area residents who otherwise would not be concerned about the Project. Tenaska has responded to the concerns of the public by committing to the use of dry cooling technology and signing a legally binding agreement that will limit it to purchasing no more than 2,000 acre feet of water per year.

The Project has garnered significant state and local support, and has made great strides towards its goal of becoming the first new-build coal-fueled power plant to incorporate a commercial-scale carbon dioxide capture plant into the initial design.

10.0 Acronyms and Citations

10.1 Acronyms

All references to dollars, $, are references to United States Dollars (USD).

Acronym	Definition
ACEP	Advanced Clean Energy Project
ARI	Advanced Resources Institute
BNSF	Burlington Northern Santa Fe Railway
CCPI	Clean Coal Power Initiative
CCS	Carbon Capture and Storage
CO_2	Carbon Dioxide
DOE	U.S. Department of Energy
EDF	Environmental Defense Fund
EOR	Enhanced Oil Recovery
EPA	U.S. Environmental Protection Agency
EPC	Engineering, Construction and Procurement
ERCOT	Electric Reliability Council of Texas
FEED	Front End Engineering and Design
Fluor	Fluor Enterprises
Global CCS Institute	Global Carbon Capture and Storage Institute
HB	House Bill
IGCC	Integrated Gasification Combined Cycle
NETL	National Energy Technology Laboratory
NO_x	Nitrogen Oxides
PRB	Powder River Basin
Project	Tenaska Trailblazer Energy Center
SB	Senate Bill
SEED	Sweetwater Enterprise for Economic Development
SOAH	State Office of Administrative Hearings (Texas)
SO_2	Sulfur Dioxide
TCEQ	Texas Commission on Environmental Quality

Acronym	Definition
Tenaska	Collectively, Tenaska, Inc. and its affiliates, including Tenaska Trailblazer Partners, LLC, the project company developing the Trailblazer Energy Center
TMV	Tenaska Marketing Ventures
TPS	Tenaska Power Services Co.
Trailblazer	Tenaska Trailblazer Energy Center
UP	Union Pacific Railroad

10.2 Citations

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[2] *Storing CO_2 and Producing Domestic Crude Oil with Next Generation CO_2-EOR Technology: An Update*, U.S. Department of Energy, DOE/NETL-2010/1417, April 30, 2010, p. 13.

[3] *Basin Oriented Strategies for CO_2 Enhanced Oil Recovery: Permian Basin*, Advanced Resources International for the U.S. Department of Energy, February 2006, p. 2-3.

[4] http://www.energy.gov/energysources/coal.htm.

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[8] *Undeveloped Oil Resources: The Foundation for Increasing Oil Production and a Viable Domestic Oil Industry*, Advanced Resources International for the U.S. Department of Energy, February 2006, Section 2, p. 7.

[9] *Undeveloped Oil Resources: The Foundation for Increasing Oil Production and a Viable Domestic Oil Industry*, Advanced Resources International for the U.S. Department of Energy, February 2006, page A-11, updated as discussed in the U.S. Department of Energy *Project Facts* (http://www.fossil.energy.gov/programs/oilgas/publications/eor_co2/G_-_Updated_U_S__Oil_Resources_Table_2-1.pdf)

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[11] *State Electricity Profiles 2007*, Energy Information Administration, April 14, 2009, pp. 259 and 301.

[12] http://www.census.gov/popest/states/NST-ann-est.html.

[13] Ventyx Energy Velocity Suite

[14] U.S. Energy Information Administration

[15] http://www.ercot.com/content/news/presentations/2010/Doggett_-_State_Affairs_04-29-10.pdf, p. 9.

[16] *Basin Oriented Strategies for CO_2 Enhanced Oil Recovery: Permian Basin*, Advanced Resources International for the U.S. Department of Energy, February 2006, p. 1-7.

[17] *Basin Oriented Strategies for CO_2 Enhanced Oil Recovery: Permian Basin*, Advanced Resources International for the U.S. Department of Energy, February 2006, p. 1-8.

[18] *Basin Oriented Strategies for CO_2 Enhanced Oil Recovery: Permian Basin*, Advanced Resources International for the U.S. Department of Energy, February 2006, p. 1-7.

[19] http://yosemite.epa.gov/opa/admpress.nsf/0/4ECA022F6F5C50118525771900 5DFB1B.

Exhibits

Exhibit 1

TENASKA TRAILBLAZER ENERGY CENTER

News Release

FOR IMMEDIATE RELEASE – April 6, 2010

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Tenaska to Use Water-Conserving Technology at Trailblazer Energy Center

Carbon Capturing Plant Adds Dry Cooling to Environmental Features

SWEETWATER, Texas – The Tenaska Trailblazer Energy Center, the advanced technology electric generating plant with carbon capture and storage now under development near here, will use "dry cooling" equipment to conserve water, Tenaska announced today.

Dry cooling equipment uses air to cool water and steam rather than evaporating water. Because there is no evaporation, the consumption of water is reduced by more than 90 percent when compared to traditional "wet cooling" methods predominantly used by power plants today. Instead of consuming an estimated 10 million gallons of water per day, Trailblazer is expected to use an average of 1 million gallons per day, and no more than 2 million gallons a day even during periods of great demand for electricity, such as extremely hot or cold days.

In dry cooling, also known as air cooling, fans draw cool air across heat exchangers to cool low pressure steam. Although more expensive to build, such a design substantially reduces loss of water due to evaporation.

The Trailblazer Energy Center will be the first coal-fueled power plant in Texas to use the dry cooling method on a large scale.

"After extensive review of the potential water sources in the region, we decided to use the most water-efficient cooling method," said Tenaska Business Development Manager Helen Manroe. "We are moving forward with design and engineering work based on dry cooling."

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"Tenaska understands how valuable water is in West Texas, which is why we are proposing to buy treated municipal wastewater for use at Trailblazer," Manroe said. "Municipal wastewater serves the company's long-term needs and maintains the area's quality of life and capacity to grow."

Since Trailblazer was announced in 2008, Tenaska operated under the assumption that dry cooling might be incorporated. The company has focused on securing enough treated wastewater from area municipal sewer treatment plants to support operations at Trailblazer with a dry cooling design. The city of Abilene is considering Tenaska's request to purchase the up to 2,000 acre feet per year of treated sewer water required to dry cool the plant.

Tenaska has a history of efficient water use, Manroe said, noting that one of its power plants was designed and operated using reclaimed water. In fact, she said, Tenaska developed a power generation project in Texas that included one of the largest water reuse projects of its time.

"Trailblazer is leading the way toward more environmentally responsible electric power generation with water-conserving dry cooling technology, state-of-the-art environmental controls and carbon capture," Manroe said. "We are committed to bringing today's most highly advanced technologies to West Texas. Trailblazer's contribution to the region's growing reputation for clean energy production will do much to enhance the area's economy."

"As one who has been deeply involved in water policy issues for many years, I am aware of the requirement to balance water conservation with our equal need for energy to support economic growth," said Sen. Robert Duncan, R-Lubbock, whose district includes the proposed site of the Trailblazer Energy Center. "Tenaska is to be commended for recognizing the importance we place on preserving our water resources and, accordingly, seeking the latest technologies designed to minimize water use at its Trailblazer plant."

"Tenaska's decision to design the plant to use as little water as possible is good for West Texas," said Rep. Susan King, R-Abilene. "We realize that dry cooling poses an additional expense, and believe it speaks to Tenaska's efforts to listen to the public concerns. The decision shows their willingness to go that extra mile to help preserve our area's water resources."

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The Trailblazer Energy Center will be among the first new conventional coal-fueled power plants to capture on a commercial scale 85 to 90 percent of the carbon dioxide (CO_2) that would otherwise be emitted and will provide for its geologic storage. The CO_2 will be shipped via pipeline to Permian Basin oil fields for use in enhanced oil recovery, boosting oil production by an estimated 10 million barrels per year.

A study by Texas-based economic analyst TXP, Inc., indicates the Trailblazer Energy Center will create 1,500 new jobs at peak construction and more than 100 well-paying jobs during operation. In addition, the Nolan County area will gain approximately $742 million in increased local spending during construction and $300 million annually each subsequent year of operation. A second independent study, conducted by J&A Consulting Group, LLC, of Abilene, determined that Abilene would see an increase of between $146 million and $175 million in economic activity during the five-year construction period and an additional $1 million to $3 million annually during the 50-year life of the project. The study conservatively assumes that a maximum of 33 percent of the project's construction and long-term employees would come from Abilene, although the actual percentage could be higher.

Construction of Trailblazer is expected to begin late next year, pending the receipt of necessary permits and the evaluation of any federal action promoting projects that capture and store CO_2.

About Tenaska

Tenaska is an energy company, headquartered in Omaha, Nebraska, that develops, constructs, owns and operates non-utility generation and cogeneration plants. The company also markets natural gas, biofuels and electric power, and provides risk management services. Tenaska is involved in asset acquisition, fuel supply, natural gas exploration, production and transportation systems, and electric transmission development. Tenaska has developed approximately 9,000 megawatts (MW) of electric generating capacity across the United States. Tenaska's affiliates operate and manage eight power plants in six states totaling more than 6,700 MW of generating capacity owned in partnership with other companies. Tenaska Capital Management, an affiliate, is the manager of private equity funds with approximately $5 billion in assets, including nine power plants (with approximately 5,400 MW of capacity), natural gas assets, and transmission infrastructure construction and maintenance operations. In 2008, Tenaska was listed in benchmarking studies by the Natural Resources Defense Council as having the best record in the United States for controlling fleet-wide average emissions of carbon dioxide and as one of the top performing companies for controlling emissions of nitrogen oxides and sulfur dioxide. For more information about Tenaska, visit www.tenaska.com.

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Exhibit 2

FOR IMMEDIATE RELEASE – April 19, 2010

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EDF Agrees Not to Oppose Trailblazer Energy Center Based on Tenaska Environmental and Water Commitments

AUSTIN, Texas – Environmental Defense Fund (EDF), an influential organization with a leadership position in the nation's efforts to maintain a sustainable environment, will not oppose air quality permits for the Tenaska Trailblazer Energy Center under development between Abilene and Sweetwater, Texas, and will withdraw from the contested case process currently in progress.

Tenaska and EDF signed an agreement regarding the advanced energy facility today. Under the agreement, Tenaska has agreed that the plant will contain equipment designed to capture at least 85 percent of the carbon dioxide (CO_2) produced by the plant. The company will also contract for delivery and sequestration of the captured CO_2 to third parties authorized by Texas and federal law to inject the gas into approved geologic formations. Tenaska also agrees the water obtained for operation from outside sources will not exceed 2,000 acre-feet of water per year, enough to support the most water efficient cooling design for the plant.

In return for Tenaska's agreement, EDF agrees to withdraw from the contested case hearing and not to protest Tenaska's draft air quality permits issued by the Texas Commission on Environmental Quality. EDF also will not seek to delay the granting of any future air quality permits required for the Trailblazer Energy Center, and will not assist others who might seek to do so.

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"The era of building traditional coal plants without carbon capture and storage is over," said Jim Marston, EDF national energy program director. "This groundbreaking agreement addresses carbon as well as water, a scarce resource in that region. Tenaska is to be commended for ending business-as-usual coal-fired power production."

“Our Trailblazer power plant represents commercial demonstration of carbon capture and storage technologies, with potential applications throughout the world,” said Dr. Greg Kunkel, Tenaska Vice President of Environmental Affairs. “We are very pleased to be able to cooperate with one of the nation’s most respected environmental organizations in this groundbreaking endeavor. Because it is widely respected, EDF’s support will be valuable in bringing this project to fruition and helping demonstrate the environmental advantages of the advanced Trailblazer technology.”

Tenaska, an energy company based in Omaha, Neb., is developing a site between Abilene and Sweetwater in West Texas for construction of Trailblazer, a 600-megawatt (net) coal-fueled, advanced technology power plant. Trailblazer would be among the first conventional, commercial coal-fueled power plant in the world to capture 85 to 90 percent of the CO_2 that would otherwise be emitted and provide for its geologic storage. Tenaska plans to send the CO_2 to nearby Permian Basin oil fields for use in enhanced oil recovery, a well-established petroleum industry process.

On April 6, Tenaska announced its decision to employ water-conserving dry cooling technology at the Trailblazer Energy Center. Dry cooling equipment uses air to cool water and steam rather than evaporating water. Because dry cooling substantially reduces evaporation, the consumption of water is reduced by more than 90 percent when compared to traditional “wet cooling” methods predominantly used by power plants today.

Dr. Kunkel said the agreement also helps reinforce Tenaska’s respected international reputation for living up to its commitments. “The agreement with EDF is another example of Tenaska doing what it says it’s going to do. A few years ago, we determined it would be shortsighted to build new coal-fueled electric generating plants without answering the CO_2 question. Our philosophy hasn’t changed. If anything, our strategy in developing large-scale carbon capture has been reinforced since the U.S. Environmental Protection Agency has officially recognized CO_2 as a pollutant.”

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About Tenaska

Tenaska is an energy company, headquartered in Omaha, Nebraska, that develops, constructs, owns and operates non-utility generation and cogeneration plants. The company also markets natural gas, biofuels and electric power, and provides risk management services. Tenaska is involved in asset acquisition, fuel supply, natural gas exploration, production and transportation systems, and electric transmission development. Tenaska has developed approximately 9,000 MW of electric generating capacity across the United States. Tenaska's affiliates operate and manage eight power plants in six states totaling more than 6,700 MW of generating capacity owned in partnership with other companies. Tenaska Capital Management, an affiliate, provides management services for standalone private equity funds, with more than $5 billion in assets, including nine power plants (with approximately 5,400 MW of capacity), natural gas assets, and transmission infrastructure construction and maintenance operations. In 2008, Tenaska was listed in benchmarking studies by the Natural Resources Defense Council as having the best record in the United States for controlling fleet-wide controls average emissions of carbon dioxide and among the top performing companies for controlling nitrogen oxides and sulfur dioxide. For more information about Tenaska or the Trailblazer Energy Center, visit www.tenaska.com or www.tenaskatrailblazer.com.

About Environmental Defense Fund

Environmental Defense Fund is a leading national nonprofit organization, representing more than 700,000 members. Since 1967, Environmental Defense Fund has linked science, economics, law and innovative private-sector partnerships to create breakthrough solutions to the most serious environmental problems. For more information, visit www.edf.org.

Environmental Defense Fund is dedicated to protecting the environmental rights of all people, including future generations. Among these rights are accesses to clean air and water, healthy and nourishing food, and flourishing ecosystems. Guided by science, Environmental Defense Fund evaluates environmental problems and works to create and advocate solutions that win lasting political, economic and social support because they are nonpartisan, cost-efficient and fair. EDF's national headquarters is in New York City. Its Texas Regional Office is in Austin, Texas.

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Exhibit 3

TENASKA TRAILBLAZER ENERGY CENTER

News Release

FOR IMMEDIATE RELEASE – JUNE 18, 2009

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Tenaska Selects Fluor as Engineering, Construction Firm for Trailblazer Energy Center

Contractor Taking Proposed $3.5 Billion Carbon-Capturing Coal Plant to Next Development Phase

SWEETWATER, Texas – Moving forward in the advanced development phase of the Tenaska Trailblazer Energy Center, Tenaska has selected Fluor Corporation (NYSE: FLR) to be the engineering, procurement and construction (EPC) contractor for the project. Tenaska has signed a memorandum of understanding with Fluor that will be the basis of a joint Tenaska-Fluor preliminary engineering phase of work.

Trailblazer would be a next-generation, advanced-technology power plant that, even during its construction, would provide jobs and strong economic development opportunities for this region of Texas.

"Fluor is one of a select group of engineering and construction companies capable of designing, engineering and constructing a plant the scale of the proposed Trailblazer plant," said Tenaska Business Development Manager Helen Manroe.

"Fluor is known and respected for its expertise and experience in building power plants across the globe and has experience both in coal-fueled facilities and in advanced carbon capture technology," she said.

Trailblazer is expected to be the first conventional commercial coal-fueled power plant in the United States, and possibly worldwide, to produce electricity while designed to capture 85 to 90 percent of the carbon dioxide (CO_2) emissions and providing for its use in enhanced oil recovery (EOR) and geologic storage. The plant's advanced air quality control system will also minimize release of other emissions. Trailblazer is being designed to generate approximately 600 megawatts (MW) of electricity, enough to supply power to approximately 600,000 Texas homes.

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The CO_2 captured by Trailblazer's groundbreaking technology will be delivered via pipeline to the Permian Basin, where it will be used to increase annual oil production by an estimated 10 million barrels, enhancing the West Texas economy and helping reduce dependence on foreign oil. CO_2 has been used for enhanced oil recovery in Texas for more than 30 years to improve production and increase economic value.

"The selection of Fluor represents another milestone in Trailblazer's path toward becoming a revolutionary and state-of-the-art generator of needed electric energy in Texas," said Manroe.

The engineering phase, to last approximately 12 months, will produce the preliminary design and the cost to build the plant. It will be a factor in Tenaska's final decision on whether to proceed with construction of Trailblazer. If Tenaska decides to proceed, Manroe said, the company intends to sign a contract with Fluor for engineering, procurement and construction services for the facility, including implementing design requirements, engineering, equipment procurement, construction and start-up of the plant.

Fluor would locate offices and move personnel to Sweetwater once the decision to proceed has been made and the contract for construction is signed, said James Mackey, vice president of Fluor's Power Group.

Manroe added, "We are pleased to have been able to select a Texas-based EPC contractor for the Trailblazer project. Tenaska and its contractors have a history of making concerted efforts to hire qualified personnel locally when possible to increase the project's benefits to the local area. Persons interested in future employment, subcontracting and service and material supply opportunities can find a Fluor contact person listed on Trailblazer's Web site: www.tenaskatrailblazer.com.

The Texas Legislature, in the session just concluded, also helped advance the prospects for Trailblazer development by passing progressive incentives and a regulatory framework to attract capital-intensive clean energy projects to Texas, including a grant to help fund front end engineering and design (FEED) studies for carbon-capturing energy facilities.

Fluor Corporation is a century-old FORTUNE 150 company headquartered in Irving, Texas, which performs engineering, procurement, construction, maintenance and project management services to private sector and government clients in diverse industries in more than 25 countries. Fluor's experience covers all aspects of pulverized coal including advanced supercritical facilities like Trailblazer.

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Construction of Trailblazer, on a West Texas site east of Sweetwater, could begin as early as 2010, with operation in 2015. Construction and operation of the plant would mean a significant and decades-long economic boost to the Nolan County area. Studies indicate the project would provide: 1,500 jobs in West Texas at the peak of construction and more than 100 for plant operations; more than $742 million in local economic activity during construction and more than $300 million annually over the 50-year life of the project; and a 50 percent increase in taxable property in Nolan County.

"We look forward to working with Tenaska on the first phase of this next-generation power plant," said Dave Dunning, president of Fluor's Power Group. "We believe Trailblazer will set a new standard for clean coal generation of electricity globally using advanced carbon capture technology and we are pleased to be a part of this innovation in clean energy production."

About Fluor

Fluor Corporation (NYSE: FLR) designs, builds and maintains many of the world's most challenging and complex projects. Through its global network of offices on six continents, the company provides comprehensive capabilities and world-class expertise in the fields of engineering, procurement, construction, commissioning, operations, and maintenance and project management. Headquartered in Irving, Texas, Fluor is a FORTUNE 150 company and had revenues of $22.3 billion in 2008. For more information, visit www.fluor.com.

About Tenaska

Tenaska is one of the largest privately-owned energy companies. *Forbes* and *Fortune* magazines rank Tenaska 24th and 25th, respectively, among the largest privately-held U.S. companies. Headquartered in Omaha, Nebraska, it develops, constructs, owns and operates non-utility generation and cogeneration plants. The company also markets natural gas, biofuels and electric power, and provides risk management services. Tenaska is involved in asset acquisition, fuel supply, natural gas exploration, production and transportation systems, and electric transmission development. Tenaska has developed approximately 9,000 megawatts (MW) of electric generating capacity across the United States. Tenaska's affiliates operate and manage eight power plants in six states totaling more than 6,700 MW of generating capacity owned in partnership with other companies. In 2008, Tenaska was listed in benchmarking studies by the Natural Resources Defense Council as having the best records in the United States for lowest fleet-wide average emissions of carbon dioxide, nitrogen oxides and sulfur dioxide. For more information about Tenaska and the Trailblazer Energy Center, visit www.tenaska.com or www.tenaskatrailblazer.com.

Exhibit 4

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FOR IMMEDIATE RELEASE

Arch Coal Acquires Stake in Trailblazer Energy Center

ST. LOUIS (March 11, 2010) – Arch Coal, Inc. (NYSE:ACI) and Tenaska, Inc. announced today that Arch has acquired a 35% equity interest in the Trailblazer Energy Center, which is being developed by Tenaska near Sweetwater, Texas. Arch's investment will be staged over time as the development of the project reaches key milestones.

The Trailblazer Energy Center will rank among the world's cleanest fossil-fuel-based power plants and act as a strategic source of carbon dioxide for enhanced oil recovery (EOR) applications in West Texas. Moreover, Trailblazer will supply the Texas economy with an additional 600 megawatts of clean, secure, reliable electric generating capacity.

"We are enthusiastic about partnering with Tenaska – a successful and highly respected leader in power plant development – to make the Trailblazer Energy Center a reality," said David B. Peugh, Arch's vice president of business development. "Trailblazer will harness the most advanced coal-based technologies to supply secure, low-carbon production of electricity to the rapidly growing Texas marketplace. Furthermore, Trailblazer's success could set the stage for a new generation of power plants fueled with America's most abundant, reliable and cost-competitive fuel."

Tenaska Business Development President David Fiorelli said the partnership with Arch will bring a number of strategic benefits to the Trailblazer project. "The agreement is another indication of the significant progress Tenaska, as managing partner, is making in the development of the pioneering Trailblazer Energy Center," said Fiorelli. "As one of the largest suppliers of low-sulfur Powder River Basin coal, Arch brings its 40 years of experience in the energy and coal industries. By working together, we will help lead the way to using our nation's most abundant energy resource in an environmentally responsible manner."

In capturing 85 to 90 percent of the carbon dioxide emissions from the plant, Trailblazer will emit 70 percent less carbon dioxide than the cleanest natural gas-based power plants. Moreover, Trailblazer will ship the captured carbon dioxide to the nearby Permian Basin, where it will be used to boost oil production and extend the life of that critically important domestic energy resource.

As part of the agreement, Arch will supply the plant's fuel needs for the first 20 years of operation from its Powder River Basin operations in Wyoming.

A recent Electric Reliability Council of Texas (ERCOT) report projects that Texas will need to add more than 55 gigawatts of new and replacement power-generating capacity over the next two decades to meet projected demand growth.

Today's announcement is consistent with Arch's ongoing strategy of making small but strategic investments in technology companies focused on making coal use cleaner. In addition to Trailblazer, Arch's technology portfolio includes an equity interest in DKRW Advanced Fuels, which is planning to convert coal into clean-burning transportation fuel on Arch reserves in southern Wyoming, and ADA-ES, a leading-edge emissions control company.

Tenaska, Inc. is one of the largest privately-owned energy companies in the United States, with revenues of approximately $8 billion in 2009. Forbes and Fortune magazines rank Tenaska 16th and 25th, respectively, among the largest privately-held U.S. companies. Headquartered in Omaha, Nebraska, it develops, constructs, owns and operates non-utility generation and cogeneration plants. The company also markets natural gas, biofuels and electric power, and provides risk management services. Tenaska is involved in asset acquisition, fuel supply, natural gas exploration, production and transportation systems, and electric transmission development. Tenaska has developed approximately 9,000 megawatts (MW) of electric generating capacity across the United States. Tenaska's affiliates operate and manage eight power plants in six states totaling more than 6,700 MW of generating capacity owned in partnership with other companies. In 2008, Tenaska was listed in benchmarking studies by the Natural Resources Defense Council as having the best fleet-wide record in the United States for controlling emission of CO2 and as one of the top performing companies for controlling emissions of nitrogen oxides and sulfur dioxide. For more information about Tenaska and the Trailblazer Energy Center, visit www.tenaska.com and www.tenaskatrailblazer.com.

St. Louis-based Arch Coal is the second largest U.S. coal producer, with revenues of $2.6 billion in 2009. Through its national network of mines, Arch supplies cleaner-burning, low-sulfur coal to U.S. power producers to fuel roughly 8 percent of the nation's electricity. The company also ships coal to domestic and international steel manufacturers as well as international power producers.

Forward-Looking Statements: *This press release contains "forward-looking statements" – that is, statements related to future, not past, events. In this context, forward-looking statements often address our expected future business and financial performance, and often contain words such as "expects," "anticipates," "intends," "plans," "believes," "seeks," or "will." Forward-looking statements by their nature address matters that are, to different degrees, uncertain. For us, particular uncertainties arise from changes in the demand for our coal by the domestic electric generation industry; from legislation and regulations relating to the Clean Air Act and other environmental initiatives; from operational, geological, permit, labor and weather-related factors; from fluctuations in the amount of cash we generate from operations; from future integration of acquired businesses; and from numerous other matters of national, regional and global scale, including those of a political, economic, business, competitive or regulatory nature. These uncertainties may cause our actual future results to be materially different than those expressed in our forward-looking statements. We do not undertake to update our forward-looking statements, whether as a result of new information, future events or otherwise, except as may be required by law. For a description of some of the risks and uncertainties that may affect our future results, you should see the risk factors described from time to time in the reports we file with the Securities and Exchange Commission.*

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Exhibit 5

News Release

FOR IMMEDIATE RELEASE – July 26, 2010

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Tenaska Chooses Fluor Carbon Capture Technology

*Trailblazer Energy Center Will Use **Econamine FG Plus** at Pioneering Plant*

SWEETWATER, Texas – Tenaska has chosen Fluor Corporation's Econamine FG Plus^{sm} carbon capture technology for use in its proposed Tenaska Trailblazer Energy Center, being developed near Sweetwater.

Trailblazer will be a pioneering 600-megawatt (net) electricity generating plant fueled by pulverized coal and is expected to be among the first full-scale commercial power plants in the nation, and the first in Texas, to capture 85 to 90 percent of the carbon dioxide (CO_2) byproduct, sending it via pipeline to the Permian Basin to be used in enhanced oil recovery.

Based on the projected rate of capture, the plant will emit significantly less CO_2 than an equivalent capacity natural gas-fueled plant.

Econamine FG Plus^{sm} is a Fluor (NYSE: FLR) proprietary, amine-based technology for large-scale, post-combustion CO_2 capture. The technology is one of the first and among the most widely applied commercial solutions proven in operating environments to remove CO_2 from high-oxygen content flue gases.

"Fluor's Econamine FG Plus^{sm} technology has been licensed at commercial scale in 26 industrial plants worldwide, including three in the United States," said Michael Lebens, president of Tenaska's Engineering & Operations Group. "The combination of Fluor's expertise with the technology and its 20 years of experience in practical applications makes it the best choice for use at Trailblazer."

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Tenaska's initial design and engineering work for Trailblazer also is being performed by Fluor, the project's engineering, procurement and construction contractor. Fluor, based in Irving, Texas, designs, builds and maintains many of the world's most challenging and complex projects.

Dave Dunning, president of Fluor's Power Group, said the company is pleased that its technology has been chosen for the Trailblazer project. "Trailblazer represents an innovative environmental breakthrough in clean energy production that will have positive implications worldwide," he said. "Fluor is eager to move forward and begin building this important new energy source for Tenaska and Texas."

Trailblazer will generate more than $740 million in Nolan County economic impact during construction and during operation will provide more than 100 direct well-paying permanent jobs, plus an estimated 70 secondary jobs from increased local spending. In addition, the captured CO_2 used in enhanced oil recovery will add more than 10 million barrels of oil production annually to the West Texas economy.

Arch Coal, Inc. has a 35 percent equity interest in the project and will supply the coal from the Powder River Basin in Wyoming.

Tenaska recently completed an administrative hearing on its application for a Texas Commission on Environmental Quality (TCEQ) air quality permit, and expects to have a final permit by the end of this year.

About Tenaska

Tenaska has developed approximately 9,000 megawatts (MW) of electric generating capacity across the United States. Tenaska's affiliates operate and manage eight power plants in six states totaling more than 6,700 MW of generating capacity owned in partnership with other companies. Tenaska Capital Management, an affiliate, provides management services for stand-alone private equity funds, with nearly $5 billion in assets, including nine power plants (with approximately 5,400 MW of capacity) and multiple natural gas midstream assets, including gas storage, gathering and processing facilities.

Tenaska is applying proven pre- and post-combustion technologies on a commercial scale in its two environmentally friendly clean coal projects. Taylorville Energy Center in Christian County, Illinois, will convert Illinois coal into clean-burning substitute natural gas, use it to generate electricity and capture more than 50 percent of the plant's CO_2 emissions. Trailblazer Energy Center in Nolan County, Texas, is expected to be the first commercial scale, conventional coal-fueled power plant in the world to capture a significant portion of its CO_2. This plant's success would demonstrate how existing plants in the U.S. and China could be retrofitted cost-effectively with this carbon-reducing technology. Tenaska was recently listed in benchmarking studies by the Natural Resources Defense Council as having among the very best fleet-wide records in the United States for controlling emissions. For more information about Tenaska, visit www.tenaska.com

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About Fluor Corporation

Fluor Corporation (NYSE: FLR) designs, builds and maintains many of the world's most challenging and complex projects. Through its global network of offices on six continents, the company provides comprehensive capabilities and world-class expertise in the fields of engineering, procurement, construction, commissioning, operations, and maintenance and project management. Headquartered in Irving, Texas, Fluor is a FORTUNE 150 company and had revenues of $22 billion in 2009. For more information, visit www.fluor.com.

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Exhibit 6

TENASKA TRAILBLAZER ENERGY CENTER

News Release

FOR IMMEDIATE RELEASE – December 14, 2010

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Trailblazer Energy Center Receives Final Air Quality Permits

Permit Needed for Construction of One of First Carbon Capturing Power Plants in Nation

AUSTIN, Texas—The Commissioners of the Texas Commission on Environmental Quality (TCEQ) voted unanimously to grant the air quality permits necessary for the Tenaska Trailblazer Energy Center under development near Sweetwater, Texas, to begin construction.

Trailblazer will be the first new-build carbon capturing coal plant in Texas to receive an air quality permit – a critical approval that opens the door for future construction of the energy center. State-of-the-art technology at the plant will capture 85 to 90 percent of the plant's carbon dioxide (CO_2) and greatly minimize other emissions.

"Trailblazer will provide electricity for Texans in a safe and environmentally responsible way," said Tenaska Development President David Fiorelli. "At the same time, the plant will promote energy security by using the most abundant fossil fuel to generate baseload electricity and increase Permian Basin oil production in West Texas by providing a valuable supply of CO_2 for enhanced oil recovery."

"Tenaska is proud to be leading the way, not only in the United States but across the globe, to commercialize this proven technology that can help provide the clean energy the world is seeking in a cost-effective way," Fiorelli continued.

The project is already receiving international attention, having been awarded a $7.7 million grant from the Australia-based Global Carbon Capture and Storage Institute and featured in a series about clean energy aired internationally by the British Broadcasting Company.

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Among the environmental features of the project is Tenaska's commitment to use dry cooling technology to reduce Trailblazer's water use by 90 percent. The Trailblazer Energy Center would be the first large-scale coal project in Texas to use dry cooling. Citing the contributions the Tenaska Trailblazer Energy Center would make to more environmentally responsible, water-conserving energy production, the Environmental Defense Fund in April this year withdrew its opposition to the project's air quality permit application.

Construction and operation of the $3.5 billion 600-megawatt (net) plant will provide an immense economic boost to West Texas, bringing up to 1,500 jobs at the peak of construction, more than 100 permanent jobs when the plant is in operation, and at least another 70 full-time jobs in the community itself.

Nolan County Judge Tim Fambrough and Sweetwater Mayor Greg Wortham attended the TCEQ meeting to make statements of support for the plant's permit.

Trailblazer's air quality permits are required in order to begin construction on the power plant. However, a number of other tasks and contracts must be completed before construction can begin, including engineering and design studies, securing customers for the electricity and CO_2, and securing state, federal and local incentives designed to encourage development of carbon capture and storage projects. Internationally recognized energy contractor, Fluor Corporation, based in Irving, Texas, is performing engineering and design work.

About Tenaska

Tenaska has developed approximately 9,000 megawatts (MW) of electric generating capacity across the United States. Tenaska's affiliates operate and manage eight power plants in six states totaling more than 6,700 MW of generating capacity owned in partnership with other companies. Tenaska Capital Management, an affiliate, provides management services for stand-alone private equity funds, with nearly $5 billion in assets, including nine power plants (with approximately 5,400 MW of capacity), and multiple natural gas midstream assets, including storage gathering and processing facilities.

Tenaska is applying proven pre- and post-combustion technologies on a commercial scale in its two environmentally responsible clean coal projects. Taylorville Energy Center will convert Illinois coal into clean-burning substitute natural gas, use it to generate electricity and capture more than 50 percent of the plant's carbon dioxide (CO_2) emissions. Trailblazer Energy Center in Nolan County, Texas, is expected to be the first commercial scale, conventional coal-fueled power plant in the world to capture 85 to 90 percent of its CO_2 after combustion. This plant's success would demonstrate how existing plants in the U.S. and China could be retrofitted cost-effectively with this carbon-reducing technology. Tenaska is repeatedly cited in benchmarking studies by the Natural Resources Defense Council as having among the best fleet-wide records in the United States for controlling emissions. For more information about Tenaska, visit www.tenaska.com.